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7.1 International Council for Science (ICSU)

SCOR was a supporting applicant on three proposals for ICSU funding this year:

1. Dynamics of semi-enclosed marine ecosystems: the integrated effects of changes in sediment and nutrient inputs from land (SCOPE leading, also with IUGG/IAPSO)
2. Geohazards: Extreme Natural Events and Societal Implications (GENESIS). (with IUGS leading, also with International Geographical Union (IGU), International Union of Soil Sciences (IUSS), International Society for Photogrammetry and Remote Sensing (ISPRS), Integrated Global Observing Strategy – GeoHazards (IGOS-GeoHazards), Earthquakes and Megacities Initiative (EMI), and International Consortium on Landslides (ICL).
3. Argo-Ed: A Window on the Global Ocean (IUGG/IAPSO leading)

ICSU approved US\$50,000 for the first activity and SCOPE, IAPSO, and SCOR will be setting up a planning committee in the coming months, which will meet early in 2006.

Three other ICSU activities with relevance to SCOR include the (1) ICSU Special Workshop on Comet/Asteroid Impacts and Human Society, (2) International Polar Year, and (3) the ICSU regional office in Africa

ICSU Special Workshop on Comet/Asteroid Impacts and Human Society

Michael MacCracken was appointed by SCOR to serve as its representative to an ICSU project on Comet/Asteroid Impacts and Human Society, which had as its major activity a workshop. The following is MacCracken's report and additional information about the ICSU meeting.

6 January 2005

Liaison Report: ICSU Workshop on Comet/Asteroid Impacts and Human Society

In order to evaluate the importance of comet and asteroid impacts for society, ICSU sponsored the "Workshop on Comet/Asteroid Impacts and Human Society" to bring together scientists studying the astronomical and physical/chemical aspects with the archeological, anthropological, and social science communities. The intent was not to focus on the effects of impacts in the past, although such events were considered to provide context, but to instead focus on the current and future importance for society of potential future impacts, and what, if anything, should be done to learn more and even prepare for such impacts.

The workshop met from 27 November to 2 December 2004 in La Laguna, Santa Cruz de Tenerife. The workshop was hosted by the Astrophysical Institute of the Canary Islands, and a number of tours were organized, including one to travel through the volcanically created landscape¹. The scientific program was organized under the joint leadership of Dr. Hans

¹ This was particularly appropriate as one of the expected consequences of an oceanic impact would be a tsunami, and there are those who suggest that a volcanic eruption in the Canary Islands could induce a major landslide that

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Rickman of the Astronomical Observatory in Uppsala, Sweden (representing the astronomical community), and Peter Bobrowsky of the Geological Survey of Canada (representing the geological community). The rest of the planning committee, of which I was one, broadened the disciplinary range to include atmospheric and oceanic sciences and a bit more. There were ultimately about 40 attendees representing a very wide range of disciplines, including economics, social sciences, risk management and communication, etc., as well as from across the spectrum of the physical sciences.

To be reimbursed for travel, attendees had to prepare a paper in advance of the meeting, and this led to submission well before the workshop of roughly 35 papers that provided a rich range of input on everything from surveys of the population of objects in space to evidence about past impacts to analyses of the potential physical, economic, and social consequences of an impact and how a preparedness program might be structured. These papers are now being revised in light of other presentations and discussions at the workshop, will then be peer-reviewed, and by later this year, are expected to be published as a book that will provide an up-to-date status report on applicable research and understanding.

The workshop devoted its first day to plenary presentations of major papers from each of 14 perspectives, ranging from the population of objects to the potential psychological and sociological consequences of major impacts. The second day was devoted to meetings of three interdisciplinary breakout groups that each discussed four thematic issues: (1) the vulnerability of society and whether it is increasing or decreasing; (2) reduction of consequences and the possible need for a societal disaster plan; (3) the potential for surprise impacts (i.e., large enough to have effects, but objects that are small enough or dark enough to avoid detection before impact) and the implications of near misses (i.e., close encounters) and uncertain predictions (e.g., where there is some small chance of an impact on the Earth); and (4) whether we fully understand the potential consequences of impacts. Within the most relevant of these various discussions, the authors of the additional papers were each given several minutes to present their major findings.

The morning of the final day of the workshop was devoted to rapporteur reports on each of the thematic issues from each of the three breakout groups and then plenary discussion on each of the topics. The afternoon was then devoted to a discussion of the key findings and messages that should be presented in a relatively brief report to ICSU for their consideration in organizing further attention to this issue. I was asked to chair the final session, and to get the discussion going presented a tentative list of ten possible key findings. This effort was a success in the sense that it generated a great deal of discussion and input, discussion that is still continuing via email several months after the workshop and that should be providing a rich base of perspectives for Hans Rickman, who has taken on the task of preparing the first draft of the workshop report for ICSU.

Recognizing that this process is still ongoing, a few personal perspectives (i.e., from the view of a physical scientist) on some of the most interesting findings and issues:

would similarly create a large Atlantic-crossing tsunami. I should add that the estimates from leading scientists of the likelihood of this vary greatly (e.g., see Reuters article on this by Daniel Flynn dated 5 January 2005).

1. Impacts happen. Impacts of small objects (e.g., tens of meters, as for example, the Tunguska event of 1908) happen relatively frequently (every few centuries or perhaps more often) and apparently have at most regional effects, whereas impacts of large objects (e.g., a kilometer or more in diameter) happen rarely, but have had significant global-scale effects. There is every reason to expect that there will be impacts in the future—the key questions are when, how big, what would they mean, and can we do anything about them.
2. No known large object on a collision course with the Earth has been detected. A survey program is currently underway involving groups at a few observatories around the world that is aimed mainly at identifying objects of kilometer size and larger. Based on what is believed to be (see caveat below) a good (power law) estimate of the population of various sized asteroids (but not of the smaller number of comets and comet fragments), all objects of greater than 3-kilometer diameter size have been found and none is on a collision course with Earth (for at least the next 100 years). Within a few years (at a spending level in the United States that is equivalent to a little over a penny per year per citizen, and spending levels are less outside the United States), this effort should be able to spot virtually all of the objects larger than about a kilometer in size that have the potential to strike the Earth over the next century or more (barring an unlikely impact from a stray comet). There will be some near misses, however; for an up-to-date listing, see <http://impact.arc.nasa.gov/> (NEO catalog).
3. Examination of the geological record of impact structures records about one such crater-creating event per 100,000 years over the Quaternary (note that a single object may break apart and create more than one crater). That the dates of these structures are not roughly randomly spaced in time (e.g., almost a third are during the Holocene) suggests that actual impacts occur considerably more often than the average and that either the search needs to be intensified or erosional processes are destroying the evidence. In addition, all of the identified structures are on land, so that the actual impact rate would be roughly another 3 times as high given that there is no reason to expect the oceans to not receive a proportional share of the impacts (and anthropological analysis of oral histories and myths from around the world as well as evidence of likely past tsunamis suggest that such impacts have occurred). If all of these indications of oceanic impacts are valid (versus, for example, the tsunami evidence resulting from tsunamis created by either volcanic eruptions or earthquakes), then the Earth is experiencing more impacts than the astronomical inventories of asteroid and comet impacts indicate would be expected. It was agreed that this discrepancy needs to be investigated to see if it is real, and, if so, to be resolved.
4. While there is convincing evidence for an impact at the K-T boundary that would have caused massive regional impacts and tsunamis in the Caribbean region, the mechanisms for causing severe impacts to wildlife and vegetation around the world remain to be pinned down. Possibilities seem to include: darkness and/or climatic cooling due to lofted dust, leading to starvation of wildlife; increased UV due to destruction of the ozone layer; CO₂ and soot induced climate warming from induced fires; broiling due to radiation generated by re-entry of lofted debris; or some combination of the above. At the other end of the size spectrum, most objects up to a few tens of a meter in diameter are destroyed aloft in the multi-megaton explosions that they generate, with the larger of these objects causing blast effects at the ground

(e.g., the Tunguska event flattened forest over more than 2000 km²); some other objects of this size or smaller survive and crash to the ground causing very local damage. Objects, or parts of objects, somewhat larger than a few tens of meters in diameter generally make it to the surface and create a crater on land, leading to regional consequences, including those induced by the blast, shaking of the ground, effects on the weather caused by lofted debris, and tsunamis if the impact is in the ocean. While the conventional wisdom has been that it would take an object of roughly a kilometer in diameter to induce global scale effects, a new analysis by Birks, Crutzen and Roble suggests that an object only a few hundred meters in diameter could destroy the global stratospheric ozone layer.

5. For potential oceanic impacts, the size and ultimate consequences of the tsunami waves that might be generated were the subject of considerable discussion (and the workshop was before the Indian Ocean tsunami). Some evidence from the nuclear test programs of several decades ago suggests that the type of long wavelength tsunami that would be created would break on the coastal shelves (so generally a few or more kilometers at sea) rather than breaking at the coast as happens for earthquake-generated waves. Because tsunami-created damage could be very large and spread around the globe, resolving scientific issues relating to impact-created tsunamis (e.g., the size of tsunami for various size objects, effects of ocean depth, and the types of waves) was considered a key requirement for getting better estimates of potential consequences for society. It was also suggested that the existing tsunami-sensing network needs to be evaluated to determine if it would detect tsunamis created by impacts, and, of course, a global network would be needed if society really wanted to be warned about tsunamis that might be created by impacts of objects that are too small to be detected in advance, but are large enough to create destructive waves.
6. The physical, chemical, and biological effects of an impact for society could be very diverse, but remain quite uncertain. The uncertainty arises in part because of a lack of understanding of relevant mechanisms, and in part because of dependence on where and when the impact might occur (and what if anything might be done about the prospect of an impact). This is especially the case regarding the potential for societally important impacts because communities and the key resources and economic and other linkages that society relies on tend to be concentrated in particular regions over the Earth. The analysis is further complicated because a terrestrial impact would create devastation in the particular region of the impact, whereas a nearby oceanic impact could create impacts around the world—and analysis for each would require consideration of how the particular areas affected are coupled to the world. As an example of the potential linkages, the destruction of a relatively small area of New York on September 11, 2001 caused impacts and societal reaction around the world—and, while the chance of an object hitting in such a region is very, very low, the impact of an object of only a few tens of meters in diameter could cause major damage over a much larger area.
7. With respect to protecting society from the horrors of such an impact, knowing the population distribution is useful only for estimating potential risk. Only a survey that identifies each potential impactor offers the potential for diverting the object, evacuating a region, or preparing for the consequences of the impact. For this reason, a more exhaustive survey is under consideration that would seek to identify most objects down to about 140 meters in diameter, a size determined based on a relatively conventional (and some argued rather simplistic) risk-benefit analysis. Such an effort

would cost the equivalent of only about a penny per month per U.S. citizen (roughly ten times the current level of effort); money for such an effort has yet to be found, however. For most objects found through such a survey, there would be multi-year warning times, allowing time for communication to the public and for possible diversion or destruction of the object, which would be expected to be much less disruptive than preparing for the impact itself (which in turn would be much, much less disruptive than the impact itself without preparation).

8. Trying to identify objects down to the size of the Tunguska object (to a few tens of meters in diameter) that would have localized to regional impacts would be much more costly and involved. As a result, society will remain vulnerable to surprise impacts by such objects. There was discussion of what sorts of public education and preparation would be useful and are needed (e.g., providing a model section on this issue for emergency manager resource volumes, making sure one has a notification system up the chain and out to potentially affected areas that would work promptly, etc.). In addition, there was discussion of how various groups in society might respond, both to a warning and to an impact itself, based on their religious, political, and historical perspectives. In that even near misses have led to some rather mystical interpretations and responses, ICSU's first effort to reach across the wide spectrum of disciplines and perspectives was deemed a good start, but only a start.

Note: The views expressed herein are the views and reactions of the author. These views do not necessarily represent the views of the workshop organizers or attendees, who are assembling a report to ICSU based on the views of all participating.

Submitted by Michael MacCracken, 27 January 2005.

International Polar Year

ICSU's International Polar Year activity received more than 1000 Expressions of Interest (EOIs) for work in the Antarctic, Arctic, or both, in the International Polar Year (2007-2009). The EOIs have been grouped in various ways and potential*lead projects and organizations identified (see below). SCOR-related projects are highlighted. Fuller proposals are due on 30 September 2005. IPY has a database of EOIs at <http://www.ipy.org/development/eoi/index.htm>.

**TENTATIVE LISTING OF ALL EOIS (see numbers in database) SORTED INTO TOPICS
(OR MISSIONS)**

EOI CLUSTERING 1

Topics	Sub-Topics or Regions	Potential Lead Projects or Lead Organisations	Other Eoi's	Cross-Cutting
MARINE BIODIVERSITY	Arctic	64 (Arc-OD) - CoML	77; 95; 126; 293; 307; 364; 460; 602; 621; 624; 640; 713; 752; 801; 814; 962	Geology (156) Oceanography (80; 109; 139; 211; 269) Space (172; 554; 197; 807)
	Antarctic	83; CAML - CoML	148; 189; 192; 205; 219; 236; 330; 379; 949	education and outreach (159; 409)
	Antarctic Deep	111 ANDEEP-SYSTECS	817; 818; 863; 953	
	Bipolar	397	144; 204, 287	
TERRESTRIAL AND LIMNETIC BIODIVERSITY AND ENVIRONMENTS	Arctic	60 (Arctic soil Microbes) 252 Arctic biota	328; 569; 646; 649; 676; 706; 707; 753; 754; 815, 881, 913, 979	Space (172; 554; 197; 807) Human (505; 531; 556) education and outreach (159; 409)
	Antarctic	SCAR-RiSCC	205 (Antarctic Microbiology) , 930	
	Bipolar	429 Polar Microbes	110; 231; 429, 1018	
LIFE IN POLAR REGIONS: PATTERNS, EVOLUTION AND ADAPTATION	Arctic	61 BIRDHEALTH	61; 75; 222; 335; 460; 490; 525; 703; 705; 733; 735; 744; 758; 774; 785; 827; 960	Geology (37; 20) Oceanography (80; 109; 139; 211) Glaciology (392; 764; 766) space (172; 554; 197; 807)
	Antarctic	577 EBA	153; 161; 379; 479; 714; 405; 533; 591; 189	meteorology & climate: human (620; 217; 435; 454; 793; 177; 71; 466; 541)
	Bipolar		49; 119; 257; 543; 565; 589	education and outreach (159; 409)

LIFE UNDER NATURAL AND ANTHROPOGENIC CHANGES: STRESS, RESPONSES AND ADAPTATIONS	Arctic terrestrial	122 (ITEX); 427 (MAVCEC); 569 (GOA)	38; 93; 102; 115; 130; 131; 132; 137; 170; 200; 216; 253; 289; 291; 340; 366; 387; 961 1015; 388; 427; 432; 456; 526; 545; 552; 556; 611; 633; 642; 658; 660; 663; 670; 672; 674; 675; 677; 680; 701; 704; 708; 709; 746; 778; 794; 826; 849; 917; 991, 994	Oceanography (80; 109; 139; 211, 269;) Space (172; 554; 197; 807) meteorology & climate: (89) human (620; 217; 435; 454; 793; 177; 71; 466; 541) education and outreach (159; 409)
	Boreal	360(Arctic Border) 390 (Coco Grande) 966		
	Arctic marine	305 (ESSAS) 402(DYNAFLUX); 403 (HERMES) 545 (N. SEAS)		
	Antarctic	193 (CLICOPEN); 543 (HABIPOL)	194; 248; 290; 356; 365; 441; 401; 563; 726; 839	
	Bipolar	10 (RiSCC/ITEX) 512 (BTF); 821(PMEC)	47; 55; 65; 96; 227; 497, 613;	
MIGRATIONS: INVASIONS, EXPANSIONS, REDUCTIONS	Arctic		254; 553; 669; 711; 780;	oceanography (80; 109; 139; 211) space (172; 554; 197; 807) human (181; 516; 791; 760; 495; 518) education and outreach (159; 409)
	Antarctic	852 (Antarctic Aliens)	1020	
NATURAL RESOURCES: USES, MANAGEMENT AND CONSERVATION	Arctic	505 (CARMA) 539 Circum-Arctic Lakes)	217; 252; 661; 737; 773; 264; 969	oceanography (80; 109; 139; 211, 269; 604) space (172; 554; 197; 807) human (782; 521; 636; 176; 519) education and outreach (159; 409)
	Antarctic	533-ICEFISH/CCAMLR	243;	
	Bipolar		17; 846	

Eol Clustering 2

Topic	Sub-Topic or International Organisation	Potential Lead	Other Eols
TERRESTRIAL CRYOSPHERE	Terrestrial Cryosphere	607	639, 644, 790, 831
	Processes in the Northern Hemisphere	392	73, 644, 764, 766, 798, 998, 999
PERMAFROST	Permafrost studies	125	15,140,175,191,199,228,230, 316,391,431,439,492,627,651, 718,738,799,824,836,882,913, 916, 971, 981, 987, 1002, 1004
GLACIERS AND ICE CAPS	Arctic glaciers and climate	30, 654, 756	24, 97, 242, 245, 288, 393, 428,535, 564, 684, 664, 883, 884, 897, 920
	Glaciers and sea level	446	143, 233, 716, 717, 728
SUBGLACIAL LAKE	Subglacial Antarctic Lake Exploration	876	22, 598, 944
SEA ICE & ICEBERG	Antarctic Sea-ice	270	52, 68, 277, 302, 440, 921
	Icebergs	21	239, 249,
	Arctic Sea-ice	185	54, 86, 154, 164, 329, 487, 532, 574, 619, 769, 796, 798, 892, 903, 904, 921, 1006
	Observations on "North Pole" Drifting Stations and Arctic Icebergs	796	124, 421, 755
PALEOCLIMATOLOGY (ICE CORE)	Ice Core Studies	203	40, 434, 890, 891, 918
ANTARCTIC ICE SHEET	Mass balance	351	232, 579, 593, 812, 823, 907, 910
	Traverse	301	292, 424, 440, 788, 890
	West Antarctica	226	112, 327, 528, 822,895, 906
	Antarctic Peninsula	359	87, 178, 1010
GREENLAND ICE SHEET	Mass balance and ice dynamics	418	74,91,94,423,579,812,813,136,88 3,907,910,951
	Stability	561	2, 69, 187, 245, 334, 376, 381, 445, 765, 136, 784, 581
EVOLUTION OF POLAR GLACIATION	Evolution of Polar Glaciation	183	105, 171, 190, 210, 220, 276, 284, 357,411, 433, 486, 622, 873, 885, 995, 1000, 1001, 1003, 1005, 1009, 1011, 1019
SNOW PROPERTIES	Physical properties		141, 202
	Chemical properties		184, 272, 626, 630, 631, 653,
Glacier geomorphology			210, 220, 684
NETWORK/OBSERVATORY			6, 302, 487, 831
CROSS-CUTTING PROJECTS			6,97,164,184,272,276,284,411, 423,433,528,535,622,626,630, 631,653,718,769,798,813,824, 891, 892,

Eol Clustering 3

Topic or Mission	Sub-Topic or Region	Potential Lead Activity	Other Eols
PALEOCLIMATE (31)	Arctic	62 (BIPOMAC) to potentially coordinate all paleoclimate	33, 43, 103, 106, 121, 127, 240, 378, 601, 606, 629, 696, 722, 724, 775, 777, 786, 925, 973, 1011
	Antarctic	20, 37	3, 46, 59, 186, 1011
	Bipolar		53, 62, 491, 511, 529, 816
GEOPHYSICAL OBSERVATORIES (18)	Arctic	234 (POLENET) and 536 (GOIA) to consider joint coordination	34, 400, 412, 464, 659, 913, 972, 984
	Antarctic		166, 377, 383, 399, 502, 536, 548, 931
	Bipolar		396, 768, 789
PLATE TECTONICS AND GATEWAYS (18)	Arctic	20 (Polar Gateways) to consider coordinating "Plate Tectonics and Gateways"	90, 174, 209, 319, 407, 662, 696, 739, 835, 878, 937
	Antarctic		156, 246, 386, 395, 568, 829,
	Bipolar		527
EXPLORATION BENEATH THE ICE, TRAVERSES, EARTH HISTORY (45)	Arctic	Arctic Earth History – the cluster should self organize, possibly with a Gakkel Ridge focus group	56, 151, 209, 319, 331, 407, 472, 616, 641, 657, 662, 692, 693, 734, 763, 771, 772, 740, 741, 878, 933
	Antarctic	Cluster to self-organise, possibly under SCAR Geoscience umbrella with perhaps a Gamburtsev focus	41, 107, 221, 256, 258, 349, 384, 412, 499, 540, 558, 575, 583, 586, 652, 795, 934
	Bipolar	Cluster to self-organise	789, 772
	Maps	Self organize, possibly under SCAR Geosciences umbrella.	85, 295, 375, 576, 877
RESOURCES (10)	Arctic	No clear lead	913, 941 Gas hydrates 481, 718 Petroleum 655, 719 Minerals 229, 723, 763, 958 Thermal energy 634
	Bipolar	No clear lead	Gas hydrates 104 Thermal energy 772

Possible cross-cutting with other fields:

Biology: 20, 37, 43, 601,

Glaciology, subglacial lakes: 37, 41, 62, 107, 121, 127, 221, 258, 349, 529, 583, 586, 718,

Climate: 62,

Oceanography (also for sampling strategy): 20, 43, 46, 62, 86, 127, 242, 464, 481, 499, 816,

Observatories (see list above)

Social: Education (79, 777), Resources (see list above),

Eol Clustering 4

Topic or Mission <i>(total number of Eols)</i>	Sub-Topic	Potential lead Activity or Project	Eols
Clouds, aerosols and atmospheric chemistry (incl ozone depletion and anthropogenic impacts) (34)		89, 213, 244, 268, 299, 542	13,28, 48, 50, 116, 165, 198, 212, 309, 312, 318, 322, 325, 347, 371, 438, 484, 530, 557, 566, 595, 720, 725, 748, 797, 808, 819, 820, 833, 834, 847, 900, 919, 923, 926, 965, 985
Multi-discip observing systems (19)		129,138, 699, 732,	452, 544, 546, 656, 678, 690, 721, 732, 825, 828, 436, 729, 787, 430
Weather and climate (including improved forecasts) (27)		THORPEX-IPY	70, 133, 134,146, 167, 179, 206, 339, 410, 810, 113, 134, 294, 638, 811, 394, 582, 600, 618, 805, (382/837), (408), (500), (297), 92, 326, 442, 851, 990, 1012
Teleconnections between polar and mid-latitude (including modes of climate variability) (5)			117, 149, 224, 251, 279, 337, 891, 936
Hydrological cycle and freshwater budget (7)		362	67,158, 201, (314), 414, 665, 982, 997
Palaeoclimate and climatic compilations (12)		IPICS	78, 207, 286, 437, 463, 560, 605, 632, 757, 762, 850
Ecosystem response to change and variability in the physical environment (6)			313, 353, 668, 695, 792, 853, 916

EOI CLUSTERING 5

Category	Sub-Topic or Region	Lead Project	EoIs
OCEAN CIRCULATION	Arctic	80 - iA00S	18, 35 , 42, 98 , 114, 120 , 139 , 145, 157, 223, 241, 324 , 343, 363, 367, 385, 522 , 537, 578 , 681, 688 , 691, 712, 731, 804, 832, 855, 896, 902, 915, 916, 932, 940, 948
	Antarctic	109 - CASO	108, 173, 180, 225, 284, 320, 567, 599, 604, 730, 770, 806, 924, 932
	Bipolar		51, 63, 320, 350,
BIOGEOCHEM, AND ECOSYSTEMS	Arctic	344 - OASIS - SOLAS	29, 45, 58, 323, 344, 637, 687, 689, 698, 860, 901, 916, 942, 976, 1017
	Antarctic	417 - ICCED	16, 271, 283, 419, 426, 584, 862, 976
	Bipolar	269 - GEOTRACES	147, 269, 321, 406, 880, 1008
COASTS AND MARGINS	Arctic	182 "ACCONET" IPA	101, 182 , 280, 300, 304 , 374, 562, 666, 679, 682, 761 , 916, 975
	Antarctic	9 - SASSI - iAnZone project	9, 57, 237, 310, 573, 585, 596, 635, 911
	Bipolar	211 - GLOSS	211 , 485 , 580 , 590

Possible links to other fields:

Meteorology and Climate: 179, 605

Legacy = observing systems (blue) [35](#), [98](#), [120](#), [139](#), [182](#), [211](#), [304](#), [324](#), [485](#), [522](#), [578](#), [580](#), [688](#), [761](#),

EOI CLUSTERING 6

Major Research Areas/Missions	Suggested Synchronizing of Eol's	Other Eols
1. CHANGE: ADAPTATION AND VULNERABILITY; COUPLED HUMAN-ENVIRONMENT SYSTEMS ☞Link to Climate, Oceanography, Sea Ice, Weather, Biodiversity	454, 435, 793, 71, 215, 336, 466 496, 498, 513, 521, 531, 541, 603, 694, 620, 916, 964, 974, 983	218, 455, 482, 570, 854
2. NORTHERN RESOURCES (Economies, Sustainability, Resource Management) ☞Link to Biodiversity	66, 100, 177, 176, 218, 478, 503, 519, 614, 636, 782, 967, 968, 989	263, 282, 298, 338,
3. NEW RISKS AND STRESSES (Health, Contaminants, Nutrition, Living Conditions, Social Risks) ☞Link to Biodiversity, Air and Ocean Chemistry, Ozone Studies	152, 181, 473, 742, 538, 523, 524, 710, 516, 791, 495, 760, 518, 742, 914, 956, 977, 978, 980, 996	483, 494
4. TRANSITIONS AND BORDERZONES (Social Change, Globalization, Languages, Cultural Heritage) ☞Prospective link to Biodiversity	467, 747, 759, 214, 694,751, 783, 899	5, 142, 208, 447, 450, 453, 488, 504, 506, 514, 625,
5. RAPID CHANGE – SOCIETAL RESPONSES (Communities, Wellness)	749,	23, 1, 476, 493, 845, 927
6. LOCAL AND INDIGENOUS VISIONS (Local Observations and Local Knowledge) ☞Link to Data Management	332, 520, 510, 643,715, 922	128,
7. PRESERVATION OF THE IPYS LEGACIES (Early IPYs and IPY 2007 ☞ Link to EOC	76, 238	7,8,
8. SCIENCE INFRASTRUCTURE, (Research Logistics, Meetings, Support)	315, 416, 861	420, 510

Eol Clustering 7 – Space-related

Topic	Region	Potential Lead Eol's	Other Eol's
ICESTAR/IHY	BIPOLAR	172, 554	11, 12, 14, 31, 72, 99, 118, 159, 163, 250, 274, 352, 355, 422, 547, 550, 551, 555, 587, 603, 615, 648, 803, 894, 945, 946, 947, 950, 938
IPY ASTRONOMY	BIPOLAR		25, 84, 155, 195, 261, 348, 389, 549, 559, 588, 628, 736, 795
IPY Space Snapshot	BIPOLAR	197, 501	259, 308, 592, 594, 608, 866, 867, 869, 870, 871, 368, 623, 868
IPY SPARC	BIPOLAR	807	27, 425, 959

The Data Sub-committee is yet to meet to discuss the data proposals in more detail.

Eol Clustering 8 - DATA

IPY Data	BIPOLAR	150, 409	169, 265, 275, 317, 342, 398, 443, 445, 462, 507, 572, 750, 830, 913, 993
EOC related Data			358, 480, 451, 457, 475, 515, 645, 879

Eol Clustering 9 - Education and Outreach

There will be an EOC sub-committee that will consider these proposals in more detail. Most of the proposals are not international as drafted. However, some of them have potential for becoming international by linking them together. Proposals in bold are at present the most promising. Those listed under other topics have been redistributed from other Science clusters and are still to be tentatively sorted.

Topic	Lead Eol	Other Eol's
Education	404, 415	19, 32 , 36, 44, 79, 81, 164, 266, 267 , 273, 278, 281, 296, 311, 448, 458, 459, 468, 471, 509 , 517, 534, 571, 609, 617, 683, 685, 776, 802, 841, 842, 928, 929, 970, 971, 1013
History		26 , 413, 610, 640, 898
Publications		162, 247, 303, 469,
Social Science		135 , 686, 743
Exhibitions/Communication		188, 235, 341, 474, 612, 781
Policy		262
Other topics		88, 160, 196, 345, 346, 361, 370, 444, 449, 461, 470, 477, 489, 647, 650, 745, 767, 800, 843, 866, 886, 889, 928

Eol Clustering 10 – Potential LEGACY Projects

These projects stand independently of other clusterings and do not necessarily fit easily into all the IPY criteria. They will be encouraged to develop their proposals further and look to interact with other proposals as appropriate.

ID	Topic		Status
123	Integrated International Stations in Dronning Maud Land	Antarctic	International
372	New International Research Ice-breaking facility for the Polar Oceans	Bipolar	International
373	New Explorers of the 21st Century: Autonomous Vehicles	Bipolar	International
597	Enhancing Svalbard as a research base	Arctic	International
671	Upgrading and networking of Northern Research facilities	Arctic	National
673	The Canadian Research Icebreaker Amundsen	Arctic	International
697	NWT Environmental Sciences Centre of Excellence	Arctic	National
700	Development of a Legacy Research and Outreach Centre in the Yukon	Arctic	National
702	Beringia – Research and Monitoring in a Northern Crossroads	Arctic	National
809	A US Federal Land Grant Act to create the Toolik Arctic Observatory in Arctic Alaska	Arctic	National
888	Concordia – a new facility for international and long term scientific activities on the Antarctic Plateau	Antarctic	International
887	CORBEL -A clean station for atmospheric chemistry in Svalbard	Arctic	International?
939	A relocation of the Auroral Station in Adventdalen, Svalbard, Norway	Arctic	
952	A new hyper spectral imaging micro satellite, Svalbard	Arctic	

**Mission Report by Prof GB Brundrit
to the Scientific Committee on Oceanic Research
on attendance at the
First Regional Meeting for Africa
Of the International Council for Science ICSU
9-11 October 2004, Harare, Zimbabwe**

The ICSU 27th General Assembly in September 2002 decided to establish four ICSU Regional Offices for Developing Countries. These would promote the further development and strengthening of science in the context of regional priorities and bring the science of developing countries closer to ICSU. The purpose of the First Regional Meeting for Africa was to do this for the ICSU Regional Office for Africa, to be initially established at the National Research Foundation in South Africa. At the same time delegates to the Meeting were able to witness the launch of the Zimbabwe Academy of Sciences.

ICSU has set out a mandate for the Regional Offices, in that they SHALL

- Promote increased participation of developing country scientists and scientific organisations in ICSU programmes and activities; and
- Assist ICSU in strengthening science and capacity building through south-south and north-south collaboration.

Scientists from Africa could then consider what activities would be appropriate for the Regional Office for Africa, and what priorities could be assigned to such activities.

As the representative of SCOR at the Meeting, I was able to place the experience of SCOR in Africa onto the record of the meeting. I was also able to assure the meeting that the establishment of the Regional Office for Africa met with the full approval of SCOR, and that SCOR looked forward to working together with the Regional Office for Africa on achieving its mandated activities.

In particular, the following points were made and noted:

- The Regional Office for Africa will cover the countries of sub-Saharan Africa. It appears that the sole country member of SCOR in the region is South Africa. Similar weak representation was reported by other ICSU entities. However, in its partnerships with international organisations such as UNESCO and the Third World Academy of Sciences, and particularly through its jointly sponsored international scientific programmes, ICSU has contacts with many more African scientists and institutions. The Regional Office for Africa will facilitate these contacts through its networking activities on behalf of ICSU. Thus SCOR will be able to strengthen its contacts, and its visibility, with scientists and scientific institutions in some forty African countries.
- These networks will also strengthen the co-operation between SCOR and other ICSU entities involved in joint African initiatives. For example, the IUGG has initiated a programme on the GeoSciences in Africa, together with other Unions. It has also embarked on a programme to establish a single African (geodetic) Reference Frame. It does not appear that SCOR is

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involved in either of these two programmes. It should be; and the Regional Office for Africa can play a role in ensuring the participation of SCOR in these endeavours.

- Scientific activities can only contribute effectively to the ICSU mission of “strengthening international science for the benefit of society” if such activities are placed within a proper political framework. In Africa, this framework is the New Partnership for African Development. Through the Regional Office for Africa, SCOR can ensure that its activities in Africa are recognised by NEPAD.
- Finally, through vigorous and urgent contact with the new Regional Office for Africa, SCOR can go to the ICSU GA in Beijing in 2005 with the knowledge that its activities are placed within a comprehensive African perspective.

The delegates to the Meeting completed their business and have provided the Regional Office for Africa with a considered set of priority activities. The meeting hoped that the Regional Office for Africa will shortly begin its operations and work speedily towards fulfilling its mandate for the International Council for Science.

[Note from Ed Urban: The ICSU Regional Office has been opened and their Web site can be found at <http://www.icsu-africa.org/secretariat.htm>. Negotiations are being concluded with the Academy of Sciences in Mexico and the National Council for Science and Technology (CONACYT) to host the ICSU Regional Office for Latin America and the Caribbean in Mexico City. The First ICSU Regional Meeting for Asia and the Pacific was hosted in Kuala Lumpur on 25-27 April. Invitations were sent to all National Members in the region and to ICSU Scientific Unions and Joint Initiatives. The meeting discussed regional priorities for ICSU, membership of the Regional Committee and the location of the Office. Major partners, such as TWAS and UNESCO, were also invited to attend. Consultations are on-going for a regional office in the Middle East. The Executive Board decided to consult with National Members in the region regarding an appropriate designation.]

7.1.1 International Geosphere-Biosphere Programme

While IGBP itself is a rather large research network, Earth System science is even larger and collaboration with other programmes is essential. This is recognized explicitly in our new goal statement:

Vision statement: The Vision of IGBP is to provide scientific knowledge to improve the sustainability of the living Earth.

Goal statement: IGBP studies the interactions between biological, chemical and physical processes, and human systems. IGBP collaborates with other programmes to develop and impart the understanding necessary to respond to global change.

The excellent collaboration between IGBP and SCOR continued on a number of joint activities during the past year. In addition to our jointly sponsored projects (GLOBEC, IMBER, SOLAS), SCOR and IGBP cooperated on a number of other initiatives, such as the development of LOICZ and the Fast Track Initiatives on (a) The Global Iron Cycle and (b) Ocean Acidification Over Time. This update will focus on the development of relevant Science Plans and the status of the Fast Track Initiatives.

In September 2004, Kevin Noone took over from Will Steffen as Executive Director of the IGBP Secretariat. Kevin is an atmospheric physicist previously at the University of Stockholm. Will Steffen remains in the network as IGBP Chief Scientist. At the end of 2004 Guy Brasseur completes his term as Chair of the Scientific Committee of IGBP and will be replaced by Carlos Nobre from the National Space Research Institute in Brazil.

IGBP Projects

Both the IMBER and LOICZ Science Plans are now approved and either printed (LOICZ) or in press (IMBER) in July 2005. These and the SOLAS Science Plan and Implementation Strategy (printed 2004) can be downloaded from www.igbp.net. The two integration projects of IGBP (PAGES and AIMES) have developed considerably over the last year (see below) and updates will be presented at the SCOR meeting.

Analysis, Integration and Modeling of the Earth System (AIMES)

AIMES – the successor project to GAIM in terms of systems-level analysis, integration and modeling in IGBP – has continued to develop during the past year. An overall description of the project was prepared for presentation at the IGBP Scientific Committee meeting in early 2005, and was used as the basis for a successful proposal to the U.S. National Science Foundation to support the international project office. Funding for the IPO was granted late in 2004, and the office was established at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado (USA). AIMES will build on the legacy established by its predecessor project GAIM, and will focus on a) the functioning and interactions of global biogeochemical cycles, b) the causes and consequences of changes in atmospheric composition through glacial-interglacial cycles looking at coupled climate-biogeochemistry interactions on long timescales, c) the interplay of environmental changes with human activities in history and prehistory and the coupling between the biophysical environment and human activities, d) the operation of the contemporary Earth System, perturbed by and influencing human actions, and e) possible scenarios for the interaction of climate, biogeochemistry and society in the 21st century and their

implications for the sustainable use of natural resources. AIMES plans to work closely with ESSP partners, and to develop an institutional network to help support its integrative activities. The first of these institutional efforts was the development of a workshop to launch a post-doctoral network fostering communication and collaboration across the human/environmental sciences.

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email: kathyh@ucar.edu

Website: <http://www.aimes.ucar.edu>

Past Global Changes (PAGES)

The primary objective of PAGES remains the facilitation of international collaboration and interdisciplinary science aimed at providing a better understanding of the Earth's past environment in order to make predictions for the future. PAGES' main emphasis continues to be on high-resolution studies of the past environment that assess natural variability and anthropogenic impact. Those, together with climate models, better allow sound estimates of future global change and its consequences. The PAGES International Project Office (IPO) continues to serve as the primary communication hub for the various project elements, and between PAGES and other global change organizations. A new Executive Officer, Thorsten Kiefer was appointed since last year's SCOR meeting. Ground-breaking studies within PAGES research include the undisturbed climate record from the NGRIP ice core (North Greenland Ice Core Project; *Nature*, September 2004) and the eight glacial cycles recorded in the EPICA ice core from Dome C (European Project for Ice Coring in Antarctica; *Science*, June 2004).

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Fast Track Initiatives

In 2003 the Scientific Committee of IGBP launched three 'Fast Track Initiatives' (FTIs) as a means to foster integration and synthesis of IGBP science. FTIs are short-lived activities designed to address cross-cutting topics of current interest in Earth System science. FTIs have a lifetime of no more than three years, and should result in a key product such as a review article, book, new activity or database.

The first FTIs were investigations into (i) the global iron cycle (in collaboration with SCOR), (ii) the role of fire in the Earth System, and (iii) the global nitrogen cycle (in collaboration with SCOPE). At the 2005 meeting of the IGBP-SC, three new FTIs were initiated: (i) Ocean Acidification Over Time, in collaboration with SCOR; (ii) An Earth System Perspective on Sustainability: Research Challenges; and (iii) AIMES were asked to develop a proposal regarding the State of the Earth in 2050. Below is a short description of the Iron Fast Track Initiative. Attached is the Ocean Acidification proposal.

The Global Iron Cycle

The IGBP/SCOR Iron Fast Track Initiative was initiated at a workshop in April 2004. The objective was to conduct an analysis and review of the global dust/iron cycle cutting across conventional boundaries, bringing together terrestrial, atmospheric, and aquatic scientists who do not normally work together. 19 Participants from 12 countries, with appropriate expertise in particular aspects of the global dust/iron cycle participated in the activity. The Iron FTI has culminated in a review paper published in *Science* (see Science Highlights Section), with three more papers either submitted or in preparation for *Global Biogeochemical Cycles* (GBC). The first of these GBC papers will focus on the production and atmospheric transport of dust, the second on deposition of dust to the oceans and the biogeochemical response to this addition, and the third on the palaeo-record of dust transport and deposition. SCOR and IGBP successfully obtained a grant from ICSU to support this activity and, in addition, SCOR supported the participation of a number of developing country scientists.

Jickells, T.D., Z. S. An, K. K. Anderson, A. R. Baker, G. Bergametti, N. Brooks, J. J. Cao, P. W. Boyd, R. A. Duce, K. A. Hunter, H. Kawahata, N. Kubilay, J. laRoche, P. S. Liss, N. Mahowald, J. M. Prospero, A. J. Ridgwell, I. Tegen and R. Torres, Global Iron Connections Between Desert Dust, Ocean Biogeochemistry, and Climate, *Science*, Vol 308, Issue 5718, 67-71, 1 April 2005.

The Global Nitrogen Cycle

The International Nitrogen Initiative began in early 2003 and was approved as an IGBP FTI the same year. It is jointly sponsored by SCOPE and IGBP. The overall goal is to optimise nitrogen's beneficial role in sustainable food production, and minimise nitrogen's negative effects on human health and the environment resulting from food and energy production. The INI has established regional centers in Africa, Asia, Europe, Latin America and North America. This FTI is a large initiative with several international activities including, in 2004, (1) a workshop (held in Uganda) to assess the fate of mineral fertilizer N with a view to enhancing the overall efficiency of mineral N use and reducing impacts on the environment; a book and Executive Summary brochure were published from this workshop; (2) a workshop (held in USA) on denitrification across terrestrial, freshwater and marine systems, producing at least 8 papers; (3) a workshop (held in Puerto Rico) on nitrogen cycling issues in the Americas, producing several papers; and (4) co-sponsor of the Third International Nitrogen Conference, held in Nanjing, China, with more than 400 participants. The INI produced for the conference "Changes in the Global Nitrogen Cycle as a Result of Anthropogenic Influences". The conference produced the *Nanjing Declaration on Nitrogen Management*, a document created to encourage the involvement of international policy makers. Products of the above activities can be found at <http://initrogen.org>. The FTI also interacted with other relevant activities including those of UNEP, CBD and FAO.

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Website: www.initrogen.org

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Fast Track Initiative Proposal (approved by IGBP-SC in 2005 and co-sponsored by SCOR)

Atmospheric CO₂ and ocean biogeochemistry: modern observations and past experiences

Proposal for IGBP Fast Track Initiative “Ocean Acidification”

**Atmospheric CO₂ and ocean biogeochemistry:
modern observations and past experiences**

Co-Chairs:

Harry Elderfield, Cambridge, UK (confirmed)

Ulf Riebesell, IFM-GEOMAR, Kiel, Germany (confirmed)

Ken Caldeira, Lawrence Livermore, U.S.A. (confirmed)

Joanie Kleypas, NCAR, U.S.A. (confirmed)

IGBP-SC liaison: Bob Duce

Organisational lead: PAGES

Overarching Question: What can we learn from past changes in the Earth system to better understand the consequences of ongoing ocean acidification?

Statement of objectives

The atmospheric concentration of carbon dioxide is now higher than experienced on Earth for at least the last 400,000 years, and presumably the last several million years. Moreover, the current rate of CO₂ rise of 1.1 ppm/year exceeds even the relatively rapid increases at transitions from glacial to interglacial periods by about two orders of magnitude. As a direct effect of rising CO₂, global temperatures are predicted to increase by several degrees during this century. Another likely, although less highlighted, consequence will be increased surface ocean *p*CO₂ and a lowering of the pH of the surface ocean. For example, as atmospheric CO₂-levels will double over their pre-industrial values by the middle of this century, accompanying surface ocean pH changes are expected 3 times greater than those experienced during glacial to interglacial transitions.

Many questions on the effect of increasing atmospheric CO₂ on ocean chemistry and marine life are unanswered or cannot be answered quantitatively. These include a robust prediction of ocean pH changes, the buffering effect of carbonate sediments, the effect of weathering rates and fluvial input, the feedback with the plankton community in particular carbonate producers, the effect on overall marine production, including fish, the tolerance of corals to changing water chemistry, and others. There have been recent initiatives (e.g. SCOR-IOC symposium “The ocean in a high CO₂ world”, Royal Society study on surface ocean acidification) to approach these questions mainly on the basis of oceanographic observations and modelling. However, modern day observations are fundamentally limited by the small range of CO₂ variations that can be observed naturally. On the other hand, lab experiments and model simulations are limited by the requirement to simplify the complexity of the atmosphere-ocean-biosphere system.

One way around this dilemma is to complement modern observations and modelling results with palaeoenvironmental reconstructions from earth historic periods of major atmospheric CO₂

changes. It is clear that there is no perfect palaeo-analogue to the greenhouse scenario predicted for the next decades and centuries, in terms of absolute CO₂ level and rate and magnitude of CO₂ rise. Nevertheless, the record of earth history contains periods of rapidly rising and/or persistently high atmospheric CO₂ levels, which provide opportunities to observe earth system responses in a range of scenarios. Three main target periods to be addressed by the proposed FTI could be:

- The five glacial-interglacial transitions of the last 500,000 years, where atmospheric CO₂ repeatedly increased by ~80 ppm (40%), accompanied by a surface ocean pH decrease of the order of 0.15 units.
- The Paleocene Eocene Thermal Maximum 55 million years ago, where catastrophic release and oxidation of methane hydrates resulted in a transient CO₂ increase of the order of several hundred ppm, presumably at a high rate that approximates the present situation. This event also provides the opportunity to observe recovery times of the earth system to a CO₂ perturbation.
- The middle Cretaceous ~100-80 million years ago as an example of an extreme and lasting Greenhouse world with estimated atmospheric CO₂ concentrations three to ten times higher than present.

The main purpose and benefit of a cross-disciplinary IGBP FTI would be to test and refine concepts of the effect of increasing atmospheric CO₂ on ocean chemistry and marine biology. Added value will be achieved by bringing together marine (and maybe atmospheric) researchers from a range of disciplines working on present day observations and past environmental reconstructions.

Planned products

Special volume, e.g. Global Biogeochemical Cycles
Higher profile synthesis publication(s)

Timeline

December 2005 alongside AGU fall meeting: meeting of chairs on details of first workshop
(assisted by email communication)
Beginning 2006 workshop to define state of art, burning questions, and achievables within following year
Spring 2007 synthesis workshop
End 2007 publication of special volume
Early 2008 Synthesis publication(s)

Interactions with stakeholders/user community

PAGES, SOLAS, GLOBEC, IMBER, LOICZ, IOCCP, GCP, SCOR, Policymakers

Key scientific areas

Marine Biology, Marine Geochemistry, Atmospheric Chemistry, Palaeoceanography, Biogeochemistry

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Draft list of participants (preliminary collection of suggestions for core group)

Paul Pearson, UK – Mesozoic carbon system	in the Mediterranean, effect on benthos
Richard Zeebe, U.S.A. (confirmed)	John Raven, Dundee, U.K.
Martin Palmer, Southampton, UK	Peter Liss, University of East Anglia, U.K.
Bärbel Hönisch, Lamont, U.S.A.	Andy Watson, University of East Anglia, U.K.
Jelle Beijma, Bremerhaven, Germany	Kunsan Gao, China, CO2/pH effects on marine organisms
Mark Pagani, Yale, U.S.A.	Tiegang Li, China, paleoceanography, paleo-pH
David Archer, Washington, U.S.A., Modelling	Yoshihisa Shirayama, Japan
Andy Ridgwell, UBC, Vancouver, Canada, Modelling	Jean-Pierre Gattuso, France/presently US
Joan Kleypas, National Center for Atmospheric Research, USA	Kitack Lee, South Korea
Robbie Toggweiler Geophysical Fluid Dynamics Lab USA	Anja Engel, Germany/presently US
Laurent Bopp LSCE, France	Toby Tyrrell, UK
Carol Turley Plymouth Marine Laboratory, UK	Philippe Tortell, Canada
Ove Hoegh-Guldberg Centre for Marine Studies University of Queensland, Australia	David Hutchins, US
Michel Legrand, Laboratoire de Glaciologie et Géophysique de l'Environnement, France	Jim Orr, France, Modelling
Jason Hall-Spencer, Plymouth, CO ₂ vent site	Corinne LeQueré, Germany/UK, Modelling
	Ellen Druffel, Irvine, US
	Robert Buddemeier, University of Kansas, US, corals
	Bradley Opdyke, ANU, Australia, corals
	Stephen Smith, CICESE, Mexico, corals
	Chris Langdon, LDEO, US, corals

Budget notes for the proposed activities:

Chair's meeting alongside the AGU Fall meeting, December 2005:

2-4 pers. accommodation 2k US\$

Early 2006 workshop (in U.S.):

15 invited participants, travel, accommodation, facilities 35k US\$
(15k US\$ asked from each IGBP and SCOR; 5k US\$ to be contributed by core projects)

Spring 2007 synthesis workshop (probably in U.K.):

15 invited participants, travel, accommodation, facilities 35k US\$

Newsletter special issue:

8k US\$

total -----
80k US\$

7.1.2 World Climate Research Programme (WCRP)

Liaison Report:

Meeting of the Joint Scientific Committee of the World Climate Research Program

The Joint Scientific Committee (JSC), which is jointly sponsored by the WMO, ICSU and the IOC (Intergovernmental Oceanographic Commission of UNESCO) and is responsible for overseeing the World Climate Research Programme (WCRP), held its 26th session in Guayaquil, Ecuador from 14-18 March 2005.² Fifteen of its 18 members were able to attend. In addition, there were about 25 invited experts and observers, mainly representing the various WCRP project offices and several of the sponsoring and participating organizations. I was able to attend the first four days of the meeting, officially representing SCOR, IUGG, and IAMAS, and unofficially being a liaison for the Arctic Climate Impact Assessment.

A major topic of discussion was COPES, the draft description of which had been in circulation for comment since just after the preceding JSC meeting. The COPES Task Force, jointly led by John Church of Australia and Brian Hoskins of the UK, described the nature of the various comments and the revisions that had been incorporated in the latest version. In that there had been considerable confusion and comment about whether COPES was a programme, project, guide, or something else, a new, formal name was announced: Coordinated Observation and Prediction of the Earth System (COPES): the WCRP Strategic Framework 2005-2015. Through this fuller name, COPES is meant to incorporate and bring together everything that WCRP does, and the JSC is itself the custodian of COPES—there is no separate steering committee, etc. Thus, the revised description recognizes that WCRP has and will continue to be made up of four core projects (i.e., GEWEX, CLIVAR, CliC, and SPARC) and several working groups (e.g., on numerical experimentation, etc.), and what the new strategic framework will introduce are special panels on modeling (with J. Shukla as the chair) and observations (with Kevin Trenberth as the chair). These panels are charged with ensuring that the projects and working groups are meeting the overall aim of the WCRP, namely “to facilitate analysis and prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society.” With each of the projects and working groups focused on particular aspects of this overall effort (e.g., on a region, or a process, etc.), the draft brochure they are considering states that “COPES will provide the unifying context and agenda for the wide range of climate science coordinated by, and performed through, WCRP core projects and other activities, and for demonstrating their relevance to society. WCRP through COPES will aim to determine what aspects of the climate are predictable, how far in advance and where. This information will provide invaluable input for climate risk management in both the public and private sector, contribute to planning for sustainable development and form a basis for natural hazard disaster reduction and mitigation.” To enhance outreach efforts, a “Partners (or Patrons) Board Group” is being proposed to link directly with users, both to provide results for them and to receive input on priorities.

Considerable discussion ensued, both when the revised version of COPES was first presented and then throughout the meeting. Among the issues to be raised were: linkages to and possible overlaps with other WMO programmes and activities (e.g., weather forecasting and THORPEX),

² Our group picture was taken about noon on 17 March, and it being near vernal equinox and with Guayaquil being at about 2°S, the Sun was indeed directly overhead, and our shadows disappeared.

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linkages to and possible overlaps with other international programmes (e.g., how is COPES distinct from IGBP, and, in particular its new AIMES project, and should there be a merger), on users versus the scientific community setting the priorities, on the overview and/or oversight relationships of the panels and the WCRP core projects, on the visibility of the projects in the write-up, on the adequacy of attention to meeting the special needs of developing countries, and so on. These and other items were also the subject of discussion during the subsequent reports of various activities.

Recognizing the extensive user interest in having useful seasonal forecasts, the COPES Modeling Panel has created a special Task Force on Seasonal Prediction, and is initially making contact with the core project teams and their regional panels as well as creating an inventory of relevant modeling activities. As a way of testing prediction skill (and going beyond the EU's ENSEMBLE project), the Task Force is also proposing a major, coordinated modeling intercomparison study in which groups with fully interactive coupled atmosphere-ocean-land-ice models would create 10-member ensembles of 6-month lead forecasts (and possibly continuing the simulations by running out as far as a decade), initializing with each month from 1979 to the present. The COPES Observation and Assimilation Panel is just beginning its work.

A series of special presentations were also made on topics that are of broad interest (so of interest to COPES) and that cut across the various WCRP core projects. Tony Busalacchi and Soroosh Sorooshian reported on progress by CLIVAR and GEWEX on the various continental *Monsoon Systems* and plans for upcoming monsoon workshop (15-17 June 2005). Alan O'Neill reported on the *Atmospheric Chemistry and Climate* (AC&C) activities, wondering if the WCRP is really doing enough on issues of tropospheric ozone and whether SPARC could also focus on tropospheric chemistry; discussion led to a proposal for a joint WCRP-IGBP task force to lay out a joint roadmap (perhaps also involving IHDP in scenario development). John Church described steps being taken to develop better estimates of future *Sea Level Rise*; a workshop in late 2005/early 2006 was proposed to pull together the various international efforts on sea level rise and to identify needed research, including how to resolve uncertainties about changes in terrestrial water storage, which were a major contributor to the wide range in projections of future sea level rise in IPCC's Third Assessment Report (SCOR and the IUGG's InterUnion Body on Snow and Ice might want to join WCRP, IOC, GCOS, and IAPSO as sponsors).

John Mitchell summarized progress in the area of *Anthropogenic Climate Change* (ACC), providing an overview of such topics as ensemble predictions (to help in quantifying uncertainties), climate sensitivity studies, and improved coupled models. Tony Busalacchi provided the CLIVAR perspective on ACC, indicating that CLIVAR encompasses all time scales from seasons to centuries, and is doing much of what is needed by the ACC interest area. In addition to descriptions of regional activities and scientific progress, a number of organizational issues facing the JSC arose in the discussion relating to how various of the projects, panels and working groups should be reporting and structured within COPES, about linkages with IGBP, and about the relationship to THORPEX and weather forecasting. John Mitchell, representing the JSC Working Group on Coupled Modeling covered a number of activities relating to how this group's activities relate to ACC, including model intercomparison studies, detection and attribution of climate change, paleoclimatic modeling, inputs for the IPCC Fourth Assessment Report, regional modeling, linkages to carbon cycle modeling, etc.

Mel Shapiro presented a description of THORPEX, which is a project of the WMO to improve weather forecasting, particularly of teleconnections and the generation of unusual and extreme events, which is something that the various climate modeling groups and CLIVAR are also very interested in. Shapiro argued that weather prediction time scales need to be extended so that the unusual changes in the circulation that are created can be carried downstream long enough and well enough to improve forecasting of extreme weather events (and later in projecting how they will change). Both Shapiro and Brian Hoskins in a follow-on presentation urged much closer association of the weather and climate activities, with additional focuses on such issues as blocking events, the Madden-Julian (40-50 day) Oscillation, the North Atlantic Oscillation, storm tracks, and more. Both saw many fruitful areas of collaboration.

There then followed reports from leaders of the various WCRP core projects, some of which, it was argued, are already doing what COPES and its new panels and focus on various interest areas are proposing to be doing. Tony Busalacchi reported on the progress of CLIVAR and, in particular, its very successful five-year conference in June 2004 in Baltimore. He also reported on the evaluation panel report done regarding CLIVAR and how this was being responded to, including restructuring around four themes: anthropogenic climate change, ENSO, decadal thermohaline circulation, and monsoons. He went through a dizzying set of activities relating to various ocean basins and regions of the world, observation and data efforts, linkages with other programs, and issues relating to COPES and CLIVAR and the other core projects. There followed considerable discussion about the relative scopes of COPES and CLIVAR and other activities.

Soroosh Sorooshian then reported on GEWEX and its various projects, which are increasingly intertwined with CLIVAR activities, indicating that the second phase of GEWEX will focus around integration across its themes of hydrometeorology (including clouds), radiation (including aerosols, which they will be working on more intensively), and modeling, especially over relatively shorter time scales. They are now working more closely with water resource managers on scales of watersheds, providing downscaled and region specific information, and a very detailed observational record for use in model verification studies, etc. They will be expanding their efforts to gather an extensive period of data for comparison of satellite and surface observation systems, and this will eventually merge into GCOS. Much of the discussion focused on how the GEWEX efforts link to GEOSS, the COPES Observations Panel, and to sustaining surface observation systems.

Barry Goodison presented the emerging plans for CliC, which is taking over after ACSYS. Linkages are being built with SCAR and a number of other entities (including the Arctic Science Council, which helped oversee the Arctic Climate Impact Assessment and is to join ICSU). The main CliC themes are to be: cold climate hydrometeorology; glaciers, ice caps, ice sheets, and their relation to sea level; marine cryosphere and interactions with high latitude oceans and atmosphere; and linkages between the cryosphere and global climate. A project office has been established in Tromso, Norway, and their first major meeting is 11-15 April 2005 in Beijing. Coordination has been established with ICARP II, which is an effort to identify research priorities growing out of the Arctic Climate Impact Assessment. Linkages with IPY are still being worked out, and an important issue is how to relate the short focus of IPY and the longer focus of CliC. As part of the discussion, Vladimir Ryabinin of the WCRP Joint Planning Staff (JPS) in Geneva reported on IPY activities and their progress in identifying a set of 40-50 lead projects, which are to be finalized and organized this summer. Other issues coming up in the

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discussion included coordination with IGBP, problems arising when two or a few countries create and push a project outside the framework (a troubling trend that seems to be becoming a bit more evident by the United States), etc.

Alan O'Neill reported on progress of SPARC. Rather than take an organizational approach to describing activities, he focused on limits in our understanding of several key scientific issues and the implications for research efforts. The issues included explaining: the rapid decrease to a minimum in springtime ozone around Antarctica; differing estimates of trends in stratospheric ozone; the impact of the stratosphere on the troposphere; the tropopause transition layer; satellite observations of stratospheric aerosols and clouds; the solar influence on the climate; and stratospheric data assimilation. Questions arose about treatment of volcanic influences, effects of the monsoon system on the stratosphere (in the context of climate change), coordination with IGBP's IGAC, etc.

The JSC then went on to reports from several of its Working Groups. M. Miller reported for the Working Group on Numerical Experimentation, covering evaluations and intercomparisons of global models, skill of forecast systems (and skill in winter is now useful out to 8-9 days), data assimilation and reanalyses, benefits of high-resolution process parameterization, Earth system modeling, coupling to COPES and THORPEX, reducing systematic errors, "seamless prediction" (i.e., with one comprehensive model) across time and space scales, etc.

Sergei Gulev of the WCRP JPS reported on the Working Group on Surface Fluxes (and the link to SOLAS), indicating that data bases and model results are being assembled and are to be compared, a handbook has been prepared on how best to make measurements from ships and buoys, etc. On behalf of Peter Liss, Vladimir Ryabinin then presented SOLAS activities, and their focus on biogeochemical interactions, exchange processes, and the fluxes of CO₂ and other long-lived gases, summarizing results on organics in aerosols, direct measurement of fluxes, interannual variability in CO₂ fluxes, the effect of lowered pH on marine mechanisms, the field experiment in the Southern Ocean (OASIS), and the somewhat ambiguous results of iron fertilization experiments. An interesting question being considered is whether monthly averages of fluxes really make any sense, or if one has to have temporally resolved values.

The major ESSP (Earth System Science Partnership) projects were then covered. There are four projects and each of the sponsoring organizations (WCRP, IGBP, IHDP, and Diversitas) is responsible for leading one of them. Pep Canadell reported on the *Global Carbon Project*, which appears to be furthest along. They have an office, a Web site serving as a "carbon portal" at www.carbonproject.org, and are developing research plans and linkages across the various sponsoring entities. Marcel Endejan reported on the *Global Water System Project*; they have an office and are still framing issues that they will be looking at, generally in the area of the water cycle, biogeochemical links, and human modifications. Fast-track activities as they are getting established include developing a digital water atlas, summarizing governance structures for water, etc. Interestingly, they are not looking at coupling to sea level; linkages to various ongoing entities also need to get worked out. David Carson, director of the WCRP JPS, reported that the *Global Environmental Change and Food Study* (GCAFS) and the *Global Environmental Change and Health* projects are still being organized. Mike Manton then reported on START activities,

indicating how their support of specific research projects are helping both to build capacity in developing countries and couple those in these countries to the various international projects.

There were also reports from several of the observational activities. Mike Manton reported on GCOS and its relationship to the WCRP, including mention of the Global Upper Air Network (GUAN), the decaying state of the surface network, the establishment of the Global Precipitation Climatology Center in Germany, progress on setting up an aerosol network in cooperation with the Baseline Surface Radiation Network and Global Atmosphere Watch stations, and the state of the infrastructure and commitment for doing reanalyses (an effort that really is helping by providing a high-quality record of the past state of the system). Ed Harrison reported for the Ocean Observation Panel for Climate, and the activities of GCOS, GOOS, and WCRP, and indicated there is now a plan for what a network needs to be (which would require roughly a \$200M addition per year to existing efforts), and the hope is to gradually build the network up with floats, moorings, ships of opportunity, etc. and to produce a real-time data set that can be used in ocean assimilation efforts. Issues he raised included the need to encourage researchers to share data in real time, to develop better indices of ocean state (e.g., presence of El Niño), assuring data streams through budget cutbacks, etc.

Regarding coordination of meetings, I did talk with a number the project leaders, encouraging more coordination with the various international associations and commissions. It was also announced that the Second ESSP Open Science Conference will be held the week of 16 October 2006 in Beijing (Gordon McBean is chair of the international organizing committee).

Toward the end of the JSC meeting, it was evident that a number of key themes kept arising: (1) a tremendous amount is going on, and generally going well, thanks to very dedicated efforts by a lot of individuals and international entities; (2) the JSC needs to continue working on organization within COPES and amongst the projects and working groups; a revised COPES write-up is to be prepared; (3) working on coordination with IGBP; a joint meeting is to be held; and (4) funding is very tight, with UNESCO-IOC cutting back on their contribution to the WCRP, with some nations focusing more on bilateral rather than international projects, etc.; ongoing efforts to communicate the science and promote support for research is clearly needed.

Report by: Michael MacCracken, 18 April 2005

7.1.3 Scientific Committee on Antarctic Research (SCAR)

SCOR agreed to co-sponsor SCAR's Expert Group on Oceanography at the 2004 SCOR General Meeting in Venice. Since then, Julie Hall and Laurent Labeyrie for SCOR and Eberhard Fahrbach for SCAR worked out the terms of reference and membership for the group, which are given below. An informal first meeting of the group was held in Cambridge, UK on 28 June 2005. A full meeting of the group is planned in Venice, Italy on 7-8 October 2005, to capitalize on the fact that the Third International Conference on the Oceanography of the Ross Sea takes place there from 10-14 October, and that iAnZone will be holding its 9th Coordination Meeting there as well.

SCAR/SCOR Expert Group on Oceanography

Membership

Membership is initially for a period of 2 years, starting June 1, 2005, recognizing that over time the balance of the disciplines may have to change in response to changing requirements.

Eberhard Fahrbach (Germany), Chair
Eileen Hofmann (USA), Vice-chair
Julie Hall (New Zealand)
Ilana Wainer (Brazil)
Isobel Ansorge (South Africa)
Hans-Werner Schenke (Germany)
Mike Meredith (UK)
Enrico Zambianchi (Italy)
Karen Heywood (UK)

Hein de Baar (The Netherlands)
Steve Rintoul (Australia)
Manfred Reinke (Germany)
Alexander Klepikov (Russia) – not confirmed
Steve Nicol (Australia)
Philippe Pondaven (France) – not confirmed
Christine Provost (France)

Terms of reference:

- to encourage an inter-disciplinary approach to Southern Ocean observations, modelling and research, recognizing the inter-dependence of physical, chemical and biological processes in the ocean at present and in the past;
- to facilitate coordination between the physical oceanographic research groups currently active and those planning research in the Southern Ocean;
- to identify historical and reference data set of value to researchers, focusing initially on physical oceanography data
- to encourage the exchange of information with operational agencies.

The group recognizes the need to develop initiatives for education and training.

The initial focus of the Group will be on physical oceanography, to ensure that a comprehensive view is obtained of the physical processes on which biological and chemical processes ultimately depend. The activities of the Group are complementary to, and do not duplicate, the activities of

other groups currently active in Southern Ocean research, such as Southern Ocean GLOBEC, the CLIVAR/CliC/SCAR Southern Ocean Implementation Panel, iAnZone (which is affiliated to both SCAR and SCOR), and future projects sponsored by SCOR, such as GEOTRACES, the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) project, and the Surface Ocean-Lower Atmosphere Study (SOLAS).

We plan to hold the first meeting of the Group on Friday and Saturday October 7 and 8, in Venice, Italy, to capitalize on the fact that the Third International Conference on the Oceanography of the Ross Sea takes place there from 10 to 14 October, and that iAnZone will be holding its 9th Coordination Meeting there as well.

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7.1.4 Scientific Committee on Problems of the Environment (SCOPE)

6 July 2005

50th SCOPE Executive Committee Meeting New Delhi, India, 11 February 2005

DRAFT RECORD of DECISIONS

The Executive Committee of SCOPE met at the Indian National Science Academy on Friday 11 February 2005 following the closure of the XII General Assembly. The following were present: Officers - Osvaldo Sala (President), Wang Rusong (Vice-President), Ian Douglas (Treasurer); Members: Annelies Pierrot Bults, V.P. Sharma, Holm Tiessen, Reynaldo Victoria. At the invitation of the President, the following attended the meeting: John Stewart (Editor-in-Chief); Nimbe Adedipe, Chris Field and Carlo Heip (cluster coordinators); and Snowy Baijnath, Manuwadi Hungspreugs and Bernie Goldstein (EC 2001-2005). Jerry Melillo (Past-President), Mary Scholes (Secretary-General) and Wandera Ogana (Member) were excused.

1. Opening of the meeting

No decision requested.

2. Adoption of the Agenda

The agenda for the meeting was adopted without modifications.

3. Record of the 49th Executive Committee decisions

John Stewart mentioned that his name was missing from the list of participants to the meeting. With that addendum, the record of the decisions taken by the Executive Committee at its 49th meeting (7 February 2005) was approved.

4. Review of SCOPE scientific activities

The Executive Committee reviewed the SCOPE programme, considering in particular steps to be taken for implementing the Resolutions passed by the General Assembly.

Management of societal and natural resources

Southern African Savannas network - The Executive Committee encouraged Jeremy Woods and Helen Watson to finalise and submit their final report for publication in a scientific journal, with a view to closing the project once this is achieved.

Global invasive species programme (GISP) – The Executive Committee acknowledged that the mandate and structure of GISP currently focus on advocacy and expert advice to decision makers as regards invasives, using the integrated strategy developed during Phase 1 of GISP.

SCOPE shall withdraw its sponsorship, looking forward to further cooperation with GISP, should it undertake scientific reviews in the future.

Urban solid waste management (USWM) – The Executive Committee encouraged Nimbe Adedipe and Joe Baker to synthesise and publish the results of USWM, with a view to closing the project once this is achieved.

Forest management in an information rich world - The Executive Committee invited the Officers to discuss ways to finalise and terminate this project with Tony Janetos.

Bridging the gap between environmentalists, decision makers and resource managers in Latin America – The Executive Committee noted that the project document focuses more on capacity building than on the synthesis and review of the science base. The President will write to Regino Zamora explaining how to finalise the project document according to SCOPE's project guidelines, especially as regards a SAC, budget, project plan, etc. Reynaldo Victoria volunteered to help Regino Zamora develop the project plan with a view to re-applying to IAI for funding. The Executive Committee stressed that this project should remain independent from the IAI/SCOPE project under development.

Assessment of sustainability indicators (ASI) – The Executive Committee noted that all draft chapters of the forthcoming volume need substantial revision, and that Tomas Hak is in charge of coordinating this process. Once the revised chapters are in hand, an editorial meeting should take place in Paris.

Adaptive ecopolis development – The Executive Committee approved the nomination of Philip Vergragt to the Scientific Advisory Committee of the project. The Executive Director will contact Peter Dogse and his colleagues at UNESCO regarding possible support for the project.

Consequences of industrial animal production (CIAP) – The Executive Committee congratulated Hal Mooney and his colleagues for the progress in this project.

New agricultural technologies and practices for the 21st century (AG21 – new project) – The Executive Committee thanked Holm Tiessen for his efforts in coordinating development of this project.

Ecosystem processes and biodiversity

Earth surface processes (ESPRMUD) - The Executive Committee encouraged Ian Douglas to finalise the synthesis report, with a view to closing the project once the manuscript has been accepted for publication.

Biodiversity and ecosystem functioning (BD-EF) – The Executive Committee congratulated Andrea Pfisterer and her colleagues for the work accomplished and encouraged them to finalise their results for publication in a science journal.

Land ocean fluxes; the silica cycle – The Executive Committee encouraged Venu Ittekkot to collaborate with the Editor-in-Chief and Island Press concerning the publication of the synthesis volume.

International nitrogen initiative (INI) – The Executive Committee congratulated Jim Galloway and his colleagues for the accomplishments of INI over its first year of existence, thanking especially Arvin Mosier, Keith Syers and John Freney for their dedication and leadership of a very successful Nitrogen Fertiliser RAP. The Executive Committee encouraged the development of RAPs on nitrogen and wellbeing and on nitrogen impacts on the open oceans, the latter possibly in collaboration with SCOR, IGBP/IMBER (integrated marine biochemistry and ecosystem research) and IGBP/SOLAS (surface ocean – lower atmosphere study). The Executive Committee expressed concern about uncertainties regarding the financing of INI.

Monsoon Asia integrated regional studies (MAIRS) – The Executive Committee received the report of John Stewart concerning the editing and publication of the first volume.

Emerging ecosystems – The Executive Committee requested the Officers and Secretariat to plan the next phase of the project together with the Division of Ecological and Earth Sciences of UNESCO, in line with the resolutions passed by the General Assembly of SCOPE.

Microbial environmental genomics (MicroEnGen) – The Executive Committee requested the Officers and Secretariat to assist project leaders in further developing the project plan and budget and in fundraising efforts.

Bio-indicators of water quality – The Executive Committee invited Norman (Jake) Peters to develop the project plan with assistance from Ian Douglas.

Dynamics of semi-enclosed marine systems (PACKMEDS) – The Executive Committee decided to re-submit the project to ICSU for funding in 2006. It invited Paola Rizzoli and the Officers to consult with SCOR and IUGG on ways to ensure appropriate synergy between this project and the new SCOR working group on hypoxia.

Capacity building in the Americas for global change research – The Executive Committee appointed Osvaldo Sala, Holm Tiessen and Reynaldo Victoria as SCOPE representatives in the Steering Committee of this joint IAI/SCOPE project which will be developed as a RAP.

Environment and health

Scientific group on methodologies for the safety evaluation of chemicals (SGOMSEC) – The Executive Committee encouraged the SGOMSEC leadership to review its membership with careful consideration of the SGOMSEC studies planned for the coming years, and to the appropriate disciplinary, geographic and gender balance.

The President drew attention to the need to promote new projects under the Environment and health cluster, as ongoing projects on Radioactivity at military sites (RADSITE), Environmental cadmium in the food chain, and Biodiversity, health and the environment are

all approaching completion.

Themes for future projects recommended by the General Assembly in its Resolutions

Land and water management in the arid zones – The Executive Committee encouraged the Egyptian Committee for SCOPE to submit a project proposal.

Contribution of ecological sciences to sustainability issues – The Executive Committee reaffirmed that SCOPE is interested in collaborating with UNESCO on a joint project addressing this theme, following the recommendation made by the General Assembly.

Shifts in the carbon based economy and ecosystem management – The Executive Committee reaffirmed that SCOPE is interested in collaborating with UNESCO on a joint project addressing this theme, following the recommendation made by the General Assembly.

Heavy metals cycling and their effects on environment and health – The Executive Committee encouraged the Indian Committee for SCOPE to develop a project on this theme, based on proposals for a Mercury project presented to the General Assembly.

EXTREME – The Executive Committee confirmed SCOPE's interest in activities linked to the prevention and mitigation of extreme events in coastal zones, in liaison with ICSU's initiatives in this field.

Human population dynamics, demographic changes and environment drivers and impacts – The Executive Committee invited the Officers to approach IHDP and IGU in order to discuss possible joint initiatives in this field.

Biomass burning and its impact on ecosystem processes – The Executive Committee encouraged Norman (Jake) Peters and his IUGS colleagues to develop a proposal addressing this topic.

Nano-particle technologies – The Executive Committee encouraged SGOMSEC to consider a possible future study on methodologies to assess the effects of nano-particle technologies on health and environment.

Harmonisation of environmental impact assessments – The Executive Committee will look into the feasibility and desirability of such a project by SCOPE.

5 Finances

The Executive Committee reviewed the Resolutions passed by the General Assembly on finances and discussed ways to implement these Resolutions. The Treasurer will write to SCOPE Members to present the yearly contributions payable in 2006-2008, according to the 4% increase per year, over 3 years, voted by the General Assembly.

The Executive Committee approved financial estimates for the year 2006, with the proviso that staff salaries will be increased by 3% per year over 3 years, starting in April 2005.

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Bernie Goldstein and Ian Douglas will explore the possibility of establishing a body to collect voluntary donations to SCOPE.

The Executive Committee decided that no project can receive more than \$7,000 seed money from the SCOPE central budget, barring exceptional circumstances.

The Executive Committee instructed the Secretariat to re-submit revised versions of the PACKMEDS and AG21 applications to the ICSU/UNESCO grant programme, taking into account comments made by ICSU reviewers last year.

6 ICSU

Wang Rusong and the Executive Director will represent SCOPE at the ICSU General Assembly in China in October 2005.

7 Membership

The Executive Committee decided to approach the Royal Jordan Academy of Sciences and invite it to become a member of SCOPE.

8 Future policy meetings

The Executive Committee will hold its next meeting in Paris in November 2005 at the SCOPE Secretariat, if financial circumstances permit.

The Officers and Secretariat will discuss the next Open meeting of the Executive Committee that must be held in 2006 with the SCOPE Committees in Poland and Italy.

Reynaldo Victoria volunteered to explore possibilities for holding the next General Assembly of SCOPE in Brazil in early 2008.

9 Any other authorised business

Ian Douglas, Snowy Baijnath and the Executive Director will review the text of the Constitution of SCOPE and make proposals for changes to the next meeting of the Executive Committee.

Annelies Pierrot Bults will represent SCOPE at the next General Meeting of SCOR in September 2005.

7.2 Affiliated Organizations

7.2.1 International Association for Biological Oceanography (IABO)

Report of the International Association of Biological Oceanography for
the period 2000-2003, to the Scientific Committee on Ocean Research
July 2005

The members of the Committee elected at the IABO general assembly in 2001 were: Dr Annelies Pierrot-Bults (President), Dr Mark J. Costello (Secretary), Dr Fred Grassle (Past President), Dr Jack Matthews (Past Secretary), and Dr Charles Griffiths.

The main activity in the past 3 years has been the co-organization of the Dynamic Planet 2005 meeting from 22-26 August 2005 in Cairns, Australia, jointly with the International Associations for Geodesy (IAG) and the Physical Sciences of the Oceans (IAPSO). Themes of the IABO-only symposia were the Census of Marine Life (www.coml.org) and Pelagic Biogeography. There were 6 joint symposia with IAPSO and one symposium jointly by SCAR, IAPSO and IABO. The 2005 Assembly will be held on 24th August 2005 during the Dynamic Planet meeting.

The IABO national representatives are under review. Many countries are currently without representation. Proposals and suggestions of new national representatives are welcomed.

There is a proposal to implement a closer cooperation between IABO and the Census of Marine Life (CoML), as CoML is a major programme dealing with the main IABO topics as decided in the Mar del Plata IABO meeting in 2001 (e.g. Marine Biogeography and Taxonomy).

An IABO Web site was created in the past year (www.iabo.org) and is now hosted by the Scottish Association for Marine Sciences (SAMS).

In 2004, IABO co-sponsored the Ocean Biodiversity Informatics conference. This was in association with the Intergovernmental Oceanographic Commission (IOC), International Council for the Exploration of the Sea (ICES), International Ocean Data and Information Exchange (IODE), and the Census of Marine Life Ocean Biogeographic Information System (OBIS). It was held in Hamburg, Germany from 29th November to 1st December 2004.

Selected publications are being published in a Theme Section of *Marine Ecology Progress Series*.

7.2.2 International Association for Meteorology and Atmospheric Sciences (IAMAS)

International Association of Meteorology and Atmospheric Sciences Report for the 2005 SCOR Executive Committee Meeting

During the past year, planning and preparation have been non-stop leading up to the IAMAS 2005 Scientific Assembly to be held in Beijing on 2-11 August 2005. Approximately 1400 scientists have registered to attend, and IAMAS and the Local Organizing Committee are providing substantial support for scientists from developing countries to attend. An even larger number of abstracts have been submitted to the 45 symposia that are to be held, with the lead authors of papers not accepted for full oral presentation getting at least a few minutes to describe the highlight of their poster presentation. This is the largest number of papers and attendees for any IAMAS scientific assembly, covering subjects from aerosols to clouds, droughts to monsoons, polar meteorology to hurricanes and typhoons, past to future changes in climate, and so forth. Several of the symposia have been organized by affiliated scientific groups, including the International Association of Hydrological Sciences (IAHS) and the International Commission on Snow and Ice (which IUGG has approved as an InterUnion body and is expected to be approved as the International Association of Cryospheric Sciences at the IUGG Assembly in Perugia in 2007).

The Second Open Science meeting of PAGES will be held on 10-12 August 2005 at the same conference center, which should provide a special opportunity for learning about the latest results from paleoclimatic investigations and how these findings can enrich understanding about past and future changes in climate. Arrangements are being made so attendees at each meeting can also attend the other meeting for a very modest cost. Registration for this meeting totals almost 300.

IAMAS2005 will also provide an opportunity for a number of the IAMAS commissions to meet. Since the last IAMAS Assembly with IUGG in 2003 in Sapporo, three commissions have held their own very successful meetings: the Quadrennial Ozone Symposium (1-8 June 2004 in Kos, Greece); the 14th International Conference on Clouds and Precipitation (18-23 July 2004 in Bologna, Italy); and the Quadrennial Radiation Commission Meeting (23-28 August 2004 in Busan, Korea).

The primary items on the agenda for the meeting of the IAMAS Executive Committee will be: making recommendations for the program of the IUGG Assembly to be held on 2-13 July 2007 in Perugia, Italy; moving forward on the emerging proposal that IAMAS and IAPSO hold a joint assembly in Montreal, Canada in 2009; and appointing a nominating committee for the IAMAS elections in 2007.

With the help of Gareth Marshall and John Turner of the British Antarctic Survey, IAMAS began distribution of twice-yearly e-newsletters this past winter. We are hopeful that these newsletters will be a useful addition to our Web site for communicating with the scientific community, the IAMAS commissions, IUGG and other associations, and with the IAMAS national representatives.

Although ICSU was unable to provide funding, IAMAS is supporting a panel that is preparing an Assessment of Effect of Pollution on Precipitation. This panel was set up after IUGG and WMO

in 2003 both approved an IAMAS initiative to explore the links between precipitation and aerosol pollution (including biomass burning). A Joint IUGG/WMO International Aerosol-Precipitation Science Assessment Group, IAPSAG, was setup under the leadership of Professor Peter Hobbs of the University of Washington, with Zev Levin of Israel as vice-chair. One roundtable session on the pollution/precipitation issue was held at the International Cloud Physics Conference, in July 2004 in Bologna. Another session and a roundtable discussion are planned for the IAMAS Assembly in Beijing in 2005, and the issue will be the subject of one of the symposia at IAMAS 2005.

IAMAS also maintained a number of liaisons with other international scientific entities. IAMAS Secretary General Roland List attended several meetings of the WMO in Geneva, and IAMAS President served as liaison to the meeting of the Joint Scientific Committee for the WCRP in Guayaquil, Ecuador (see separate report to SCOR).

In addition, the IAMAS President served on the planning committee for the ICSU Workshop on Comet/Asteroid Impacts and Human Society held in Tenerife in November 2004 (see separate report to SCOR). The papers submitted for this workshop have been reviewed and are now being revised for inclusion in a book due out late in 2005, and a summary report is being prepared for consideration by ICSU. One of the very interesting and unresolved problems identified at this workshop was whether tsunamis created by an ocean impact would break at the shoreline or out at the break of the continental shelf.

IAMAS also continues to participate actively within the IUGG. Among the many relevant activities are plans for the upcoming International Polar Year (IPY), for which former IAMAS SG Michael Kuhn serves as leader, and various other of the international year activities (e.g., eGY, etc.). Among other IUGG initiatives that IAMAS is interested in helping promote is reaching out to scientists in African nations in cooperation with ICSU. The IAMAS International Commission on Climate (ICCL) is also seeking to become a joint commission with IAPSO, and it might arise that other of the IUGG associations join in sponsoring ICCL, creating a broader organization relating to climate science.

IAMAS is also participating in the technical review process of the drafts of the upcoming Fourth Assessment Report of the IPCC by nominating reviewers for several of the chapters, ensuring connections between the various international commissions that are part of IAMAS with the IPCC.

Submitted by Michael MacCracken, President of IAMAS
Date: 6 July 2005

7.2.3 International Association for the Physical Sciences of the Ocean (IAPSO)

2004–2005 IAPSO Activities

During 2004–2005, IAPSO had/will have three major activities. The first of these was the "IAPSO/SCOR Conference on Ocean Mixing" held in Victoria, British Columbia, Canada on 11–14 October 2004. The Conference was organized by the IAPSO/SCOR Working Group 121 on Ocean Mixing. There were more than 120 conferees representing 14 countries. There were 29 oral presentations and 76 poster presentations. A significant number of conclusions and recommendations were made, and various concerns were raised. A full report is posted on the IAPSO Web page (<http://www.olympus.net/IAPSO/>) and SCOR Web page. There are plans to publish a proceedings volume in a special issue entitled "Ocean Mixing" of the Deep-Sea Research Part 2 by early 2006. A Symposium at the 2007 IUGG General Assembly is proposed, and a future follow-up conference is being considered. More detailed report will be given by the WG at the SCOR EC meeting.

The second major activity was the "International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems" held in Cape Town, South Africa on 8–11 November 2004.

The Workshop was sponsored by IUGG and IAPSO in partnership with eight other international, regional and national organizations, including SCOR and IOC. There were over 100 invited participants in the Workshop including 35 from overseas and 25 from neighboring African countries. An important objective of the Workshop was the development of a strong base for an effective and affordable forecasting capability for the South East Atlantic within the global network.

The summary assessment provided by Professor John Woods at the conclusion of the Workshop was that we ARE now ready to design an operational system for forecasting in the Benguela – something that would have been somewhat questionable prior to the Workshop. One of the output products from the Workshop will be a peer-reviewed book entitled "The Benguela: Predicting a Large Marine Ecosystem" to be published in 2005 by Elsevier.

The third activity will be the IAG/IAPSO/IABO Joint Assembly to be held in Cairns, Australia, during 22–26 August 2005; IAG stands for the International Association of Geodesy in IUGG. The Assembly is called "Dynamic Planet 2005". A total of 26 sessions are being planned covering broad topics. One session is supported by SCOR, which is the Joint IAPSO/IABO/SCAR/SCOR Session entitled "Southern Ocean Circulation and Marine Life"; SCAR stands for the Scientific Committee on Antarctic Research in ICSU. More detailed report will be given at the meeting.

A final document on the future of IAPSO entitled "Physical Sciences of the Oceans in the 21st Century: Science and Enabling Strategies for the International Association for the Physical Sciences of the Oceans (IAPSO)" was distributed. A proposed revision to the IAPSO Statutes and By-Laws was distributed to the IAPSO National Correspondents for approval by a mail ballot; a major consideration is the proposed separation of the Treasurer and Secretary General duties.

Shiro Imawaki
The IAPSO President

7.3 Affiliated Programs

SCOR-Affiliated Projects and Programs

SCOR sponsors many, but not all, of the major international ocean research projects and programs. Some projects not co-sponsored by SCOR can gain benefits from association with SCOR, such as (1) increased visibility; (2) participation in SCOR activities, such as project coordination meetings and annual SCOR meetings; (3) opportunities to provide comments on working group proposals and membership; (4) access to national SCOR contacts; and (5) opportunities to apply for SCOR funding for travel of scientists from developing countries and countries with economies in transition to their workshops and symposia. In 1995, SCOR developed the option of formal affiliation of relevant projects/programs with SCOR. Unlike projects sponsored by SCOR, affiliated projects and programs receive funding from organizations besides SCOR and do not need staff support from SCOR.

SCOR's role in relation to affiliated projects and programs is one of advice and regular review. SCOR's gives advice about appropriate balances on the projects' steering committees and adequate rotations of these committees to renew the committees' memberships regularly. SCOR's national contacts can be used to find new members in regions where there is a need, or to entrain new countries into projects. SCOR can also provide an independent mechanism for the review of planning documents such as science or implementation plans.

Application for SCOR Affiliation

Application to SCOR for program affiliation should be initiated with a proposal of 2 to 5 pages, sent to SCOR at least three months before an annual SCOR meeting. The proposal should include an outline of the program's science plan, the terms of reference, current membership of the steering committee, and rotation procedures and schedule. The proposal for SCOR affiliation should also address the following criteria, accepted at the 1995 SCOR Executive Committee meeting (see *1995 SCOR Proceedings*). The Executive Committee agreed that in order to become a SCOR-affiliated project/program, an activity must

- be truly international, with a committee membership that rotates on a regular basis;
- show evidence of existing financial and/or organizational support;
- demonstrate a benefit from SCOR affiliation;
- have a scientifically well-integrated theme;
- show that it is in SCOR's interests to establish this affiliation;
- be of broad scale and global importance;
- show, as appropriate, that any scheme of membership dues includes some nominal level so as to encourage the widest possible international participation by all countries; and
- be willing to adhere to the SCOR Publication Policy.

After a program is affiliated with SCOR, annual reports are required, and scientific presentations may be requested at any annual SCOR meeting, as a basis for the decision on continuing the relationship between SCOR and each project/program. The Chair of each affiliated project/program serves as an ex-officio member of SCOR as a Scientific Rapporteur (see SCOR Constitution, paragraph 4). Continued affiliation with SCOR depends on the project meeting the

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guidelines specified above, and maintaining high scientific quality and adequate rotations of committee members and chairs.

Reports to SCOR

Annual reports to SCOR should answer the following questions and present any additional information that the project/program would like to transmit to SCOR:

- What scientific accomplishments have been achieved by the project/program in the past year?
- How has the project's steering committee membership changed in the past year?
- What is the financial status of the project?
- What is the status of the project's secretariat?
- What are the plans for the scientific development and implementation of the project over the next two to three years?
- How is the project interacting with and contributing to other SCOR activities?

In addition, projects/programs should communicate regularly with their SCOR Executive Committee Reporter regarding their activities and progress.

7.3.1 Applications for New Affiliations

Application for SCOR Affiliation

1) Program name

InterMARGINS

2) Outline of the program's science plan

InterMARGINS is an international and interdisciplinary initiative concerned with all aspects of continental margin research. It is designed to encourage scientific and logistical co-ordination, with particular focus on problems that cannot be addressed as efficiently by nations or national institutions acting alone or in limited partnerships.

Over the past few years continental margins research has become a major focus of the international geoscience community. New national supporting programs have been initiated in many countries, for example, in Japan, UK, and USA. To foster a greater degree of international coordination of margins research activities, to focus sufficient resources on some common, large interdisciplinary investigations, and to help leverage funding in each others countries, a new international geoscience initiative dedicated to continental margins research was formed in 1999

Initially InterMARGINS will focus on the following broadly defined research subjects:

- Rifted Margins
- Sedimentary Processes
- Seismogenic Zone Processes
- Subduction Factory Processes
- Fluid Processes, Geochemistry, Microbiology

InterMARGINS will attempt to foster and enhance communication between national margins-related research programs. It will develop and maintain databases of ongoing national and multinational projects and research activities, initiate and carry out workshops and disseminate information to members through newsletters and other forms of communication.

3) Terms of reference

InterMARGINS seeks to achieve the above broad aims, within the terms of its Constitution, by the following means. These means are liable to be modified by the InterMARGINS Steering Committee from time to time according to changing circumstances.

Principal Items (for priority attention):

- To maintain a dynamic and up to date Web site that acts as an international centre of information exchange about continental margins research (for example; create country-by-country Web pages, cruise maps, minutes of meetings, list funded projects, links to related sites etc.).

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- To publish an InterMARGINS Newsletter twice a year.
- To initiate and/or sponsor international workshops and theoretical institutes and sessions at international conferences that are likely to advance research on continental margins.
- To exchange information and collaborate with international scientific bodies such as the Integrated Ocean Drilling Program or Euromargins.
- To encourage and financially enable, particularly in the case of less developed countries, collaboration between scientists from coastal states and principal investigators and their colleagues working, at sea or on land, on the continental margins of such states. Such collaboration could include participation in research cruises.

Secondary Items (to be addressed as and when resources allow):

- To set up Working Groups to investigate either a) specific technical problems of international significance related to margins research or b) the logistics of international collaboration and data exchange.
- To assemble and maintain lists of facilities or sea-going equipment, for example, submersibles, ocean bottom seismographs, or even ships, suitable for margins research that are available for charter, barter or exchange.

Other items:

- To run the InterMARGINS Office to meet the obligations outlined of the InterMARGINS Constitution and to service the above activities.

4) Current membership of the steering committee

(Principal members)

Dr. Wonn Soh (chair person) Japan

Japan Agency for Earth Marine Science and Technology, 2-15 Natsushima, Yokosuka, 237
JAPAN soh@jamstec.go.jp

Prof. Tony B. Watts United Kingdom

Department of Earth Sciences, University of Oxford, Parks Road, Oxford, OX1 3PR
UNITED KINGDOM tony@earth-sciences.oxford.ac.uk

Dr. Julie Morris

Department of Earth & Planetary Sciences, CB 1169, 108 Wilson Hall, Washington University
St. Louis MO 63130 USA. jmorris@levee.wustl.edu

(member)

Norway

Prof. Jan I. Faleide

Department of Geology, University of Oslo, P.O. Box 1047, Blindern, N-0316 Oslo, NORWAY
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(associated member)

Peoples Republic of China

Prof. Xianglong JIN

Second Institute of Oceanography of SOA, 9 Xixihexia, Hangzhou, Zhejiang, P.R. CHINA
310012

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Germany

Dr. Warner Brückmann

GEOMAR Research Center, Christian-Albrechts-University, Kiel, Wischhofstr. 1-3
24306 Kiel, GERMANY

wbrueckmann@geomar.de

(Permanent Guest and Observer)

Dr. Bilal U. Haq

National Science Foundation

4201 Wilson Boulevard, Arlington, VA 22230 USA. bhaq@nsf.gov

5) Rotational procedures and schedule

The chairperson of the program is rotated every three years. The previous chairperson (Dr. B. Whitmarsh) was rotated off in the last year (end of May 2005) and a new chair person (Dr. W. Soh) was selected. The secretariat moved from Britain to Japan along with the chairman's alternation. The chairperson and secretariat will be rotated off every 3 years. The committee in each participating country elects a representative as a member of the steering committee.

Previous chairperson who was rotated off:

Prof. Bob Whitmarsh

School of Ocean and Earth Science Southampton Oceanography Centre

Southampton SO14 3ZH UNITED KINGDOM bob.whitmarsh@soc.soton.ac.uk

6) Revenue and expenditure

#annual subscription

The level of annual subscription for founding Principal Members (Japan, UK and USA) is US \$15,000. The level of annual subscription for all other Principal Members is US \$10,000. The level of annual subscription for Associate Members is US \$5,000. According to the needs of InterMARGINS, subscriptions will be reviewed annually with the ultimate aim of all Principal Members paying the same rate.

#Support for international symposium and/or workshop

Workshop “modeling the extensional deformation of the lithosphere” 10-16 July (Swiss) 2004
Workshop (planning) “2004 Sumatra Earthquake and Indian Tsunami” November (Germany) 2005

#Home Page <http://www.intermargins.org/>

#News letters twice per year (No. 4 and no. 5, 2004)

7.3.2 Census of Marine Life (CoML) (affiliated in 2002)

Goal and Objectives:

The Census of Marine Life (CoML) is conceived as a decade-long program to promote and fund research assessing and explaining the diversity, distribution, and abundance of species throughout the world's oceans. Related activities integral to this research include the design and implementation of standard databases for marine species in collaboration with other international efforts launched recently, and the design and implementation of innovative biological sampling techniques for the marine environment. Outreach and education efforts will help inform the public about the CoML's potential and actual contributions to knowledge, and help tune the program to the concerns and priorities of governments, commercial and recreational fishers, environmental groups, the research community, and other stakeholders in the oceans.

The initial primary goal of the international Steering Committee is to foster the development of coherent goals and a scientific plan for the CoML. The Steering Committee will carry out this task through workshops, working groups, and other appropriate processes and means. The Steering Committee will also oversee the development of the education and outreach plan and its implementation.

Chair:

J. Frederick Grassle
Institute of Marine and Coastal Sciences
Rutgers, the State University of New Jersey
71 Dudley Road
New Brunswick, NJ 08901-8521, USA

Tel.: +1-732-932-6555 ext: 509
Fax: +1-732-932-8578
E-mail: grassle@IMCS.rutgers.edu

Membership:

Vera Alexander	USA
D James Baker	USA
D. Chandramohan	INDIA
David Farmer	USA
Victor Ariel Gallardo, <i>Vice-Chair</i>	CHILE
Carlo Heip	NETHERLANDS
Poul Holm	DENMARK
Ian Poiner	AUSTRALIA
Yoshihisa Shirayama	JAPAN
Myriam Sibuet	FRANCE
Michael Sinclair	CANADA
Meryl Williams	AUSTRALIA

UN Representatives:

Patricio Bernal	IOC
Serge Garcia	FAO

CoML Staff: Ron O'Dor and Kristen Yarincik

Executive Committee Reporter: Akira Taniguchi

What's New with CoML?

May/June/July 2005

All Program Meeting

The All Program meeting will take place Friday-Saturday, 4-5 November 2005 in Frankfurt, Germany. It will be held in conjunction with a EuroCoML symposium (similar to the Washington DC symposium, October 2003) on Thursday, 3 November (see more under the Europe topic below). For an outline of the scheduled events and a preliminary All Program agenda, visit: www.comlsecretariat.org. Send any comments on the agenda to Kristen Yarincik (kyarincik@coreocean.org) by 1 August 2005. Hotel and other travel related information will be available shortly.

Scientific Steering Committee (SSC)

The SSC will next meet on 26-29 August 2005 in Cape Tribulation, Australia. Future SSC meetings will take place on 6 November 2005, in conjunction with the events in Frankfurt, Germany, and in February 2006, in conjunction with the Ocean Sciences Conference in Honolulu, HI.

A very nice article about SSC Chair Fred Grassle appeared in the 5 June edition of the New York Times. The article honored his enthusiasm for the oceans and accomplishments for the Institute of Marine and Coastal Sciences and Rutgers and in marine science in general.

Education and Outreach

The Census Portal has a new look. The team at URI has updated and improved the Census portal at www.coml.org. There you will find a new front page that highlights new Census developments and a revised layout that makes it easier to connect to other pages. Also, a new section called "Conversations" has been added in an effort to help personalize the Census and the portal. *Conversations* consists of interviews of Census scientists, who explain their work, tell why it is important, and what drove them to study the ocean in the first place. All Census scientists are welcome to be featured in this section. To do so, please contact Darlene Crist at darlene.crist@cox.net.

CoML appeared in the May/June 2005 edition of Scholastic News (<http://teacher.scholastic.com/scholasticnews/magazines/edition1/may05/index.asp>), a U.S.-based news source for elementary school children. The article featured animal discoveries and a picture of SSC member / NaGISA leader Yoshihisa Shirayama.

Conversations continue between CoML and French producer-director Jacques Perrin about a film strongly connected to CoML. Perrin has made several highly regarded nature films, including *Microcosmos* (about insects) and *Winged Migration* (about birds). We are trying to arrange for members of Perrin's team to attend the Frankfurt meeting to discuss possible occasions for cooperation.

Richard Ellis, author of several widely read books about the oceans and also a superb illustrator, is making rapid progress on a popular volume integrating much current knowledge about marine

life on behalf of CoML. If all goes according to plan, the book will be available for the Frankfurt meeting.

The University of Rhode Island has received renewed funding (2.5 years) to continue its work on a strategic approach to education and outreach for CoML and to host the international network of E&O liaisons to the CoML projects and national and regional committees. The Education and Outreach Liaison Network will hold its next workshop on 2 November 2005 in Frankfurt, Germany in conjunction with the All Program Meeting.

Ocean Biogeographic Information System (OBIS)

OBIS International Committee: The OBIS IC met in San Francisco, 22-24 June 2005, bringing together members of the OBIS community with biodiversity informatics, genetic, and taxonomic experts to develop collaborative and coordinated activities and goals. Along with OBIS IC members the following experts participated in discussions:

- Luis Bermudez - Marine Metadata Initiative (MMI) at the Monterey Bay Aquarium Research Institute (MBARI)
- Stan Blum – International Union of Biological Sciences Taxonomic Database Working Group (TDWG) and the Global Biodiversity Information Facility (GBIF)
- Dan Costa - Tagging of Pacific Pelagics (TOPP), a pilot program of the Census of Marine Life (CoML)
- David Kingsbury – Gordon and Betty Moore Foundation
- Gary Poore –Museum Victoria, Melbourne, Australia
- Rick Prelinger – Internet Archive
- David Schindel – Consortium for the Barcode of Life (CBOL)

Regional Nodes: In response to requests from managers of the 10 Regional OBIS Nodes (RONs), from Australia, Canada, China, Europe, India, Japan, New Zealand, South America, Sub-Saharan Africa, and the United States of America, the OBIS Secretariat has published an on-line "how-to" manual for RON development. The resulting RON Development Manual describes four steps for developing an OBIS RON:

- (1) Implement RON activities as described in "Roles and Responsibilities"
- (2) Provide to the Portal a standard set of information about each Node
- (3) Become an OBIS distributed data provider by implementing the OBIS data schema and DiGIR provider server software
- (4) Install the Plone-based RON Portal software (optional)

The RON Development Manual is important because it provides a simple road map of standardized steps for development of a RON. Connections between RONs and the Portal, both virtual and person-to-person, are documented. The RON data, together with data from other providers and researchers in marine biodiversity and informatics, form the loosely federated, collaborative OBIS data system.

OBIS Management Committee: The OBIS MC met in Oostende, Belgium, 23-24 April 2005, hosted by the Vlaams Instituut voor de Zee (VLIZ, Flanders Marine Institute). Discussions between the Intergovernmental Oceanographic Commission's (IOC) International Oceanographic

Data and Information Exchange (IODE) Chair, Lesley Rickards, and Regional OBIS Node (RON) representatives led to significant IODE-OBIS agreements. The foremost of those agreements is that IODE and OBIS will collaborate in mutual development activities at IODE National Oceanographic Data Centres (NODCs) and Regional OBIS Nodes (RONs) where those Centres and Nodes have geographic overlap. The NODCs and RONs are both globally distributed networks that will enhance each other's capabilities, especially in the blending of physical oceanographic data at the NODCs with the marine biological diversity data at the RONs.

Representatives from all 10 Regional OBIS Nodes (RONs), IODE, and the OBIS Portal and Secretariat, participated:

RONs: Kim Finney (Australia), Bob Branton (Canada), Song Sun (China), Edward Vanden Berghe (Europe), Vishwas Chavan (Indian Ocean), Junko Shimura (Japan), Don Robertson (New Zealand), Mirtha Lewis (South America), Ursula von St. Ange (Sub-Saharan Africa), and Mark Fornwall (USA)

IODE: Lesley Rickards (Chair)

OBIS: Phoebe Zhang (Portal), Richard Chinman (Secretariat)

All of the RONs agreed to a set of standards that (a) distinctly identify each as an OBIS Node and (b) support collaborating digitally amongst themselves and with the OBIS Portal.

History of Marine Animal Populations (HMAP)

The HMAP Centers have received two years of renewed funding for research coordination, case studies, discipline building and the launch of a new Southeast Asian center at WorldFish in enang, Malaysia.

Poul Holm, Tim Smith, Ransom Myers, and Stephen Palumbi participated in “Lives of the Sea: symposium on the history of marine life” at Princeton University on 29 April. Their talks included: “Fish out of water: History meets marine science” (Holm); “Industrial exploitation of the ocean: Less than one-tenth of the large fish are left” (Myers); “How many whales before halting? Genetics and the history of populations” (Palumbi); “How much whaling was there and how much whaling?” (Smith).

The HMAP Open Science Conference, *Oceans Past - Multidisciplinary Perspectives on the History of Marine Animal Populations*, will be held 24-27 October 2005 at Hotel Comwell in Kolding, Denmark. The preliminary program is available at: <http://www.hmapcoml.org/Default.asp?ID=249>.

Future of Marine Animal Populations (FMAP)

The FMAP team paper “Predator diversity in the open oceans linked to climate and fishing,” which reports worldwide patterns of tuna and billfish diversity and density over the past 50 years, will appear at the end of July in *Science* magazine.

Ocean Realm Field Projects

Mid-Atlantic Ridge: MAR-ECO

A very successful MAR-ECO all-project workshop and steering group meeting was held in Lisbon on 2-5 June, hosted by IPIMAR. More than 40 papers were presented, discussing preliminary results and progress based on the field efforts in 2003 and 2004.

MAR-ECO will enter a second field phase in 2007, following commitments by UK and USA of further ship-time. The new reasearch ships RV Bigelow (USA) and RRS James Cook will be used for process studies in the Charlie-Gibbs Fracture Zone and around the Sub-polar Front. The UK commitment is for cruises in three consecutive years, starting in 2007.

The sei whale tagged in the Azores in April traveled along the mid-Atlantic Ridge northwards to the Charlie-Gibbs Fractures zone where it stayed a long period before continuing northwestwards and into the Greenland Sea. Its track can be followed on www.mar-eco.no.

Exhibitions of artwork, photographs, and project information are being organized in partner countries. The first was at the Nordic House (Reykjavik, Iceland), where the works of MARECO artist Oernulf Opdahl were exhibited together with photographs by wildlife cameraman David Shale. Icelandic partners added scientific information, thus combing science and art. The exhibit is now being shipped to Horta, the Azores, to be displayed there in August before it returns to Norway in September.

The MAR-ECO project office has received two more years of support for ongoing efforts and coordination, as well as for stimulating the geographic expansion of MAR-ECO approaches to other ridge areas.

See more MAR-ECO news at: http://www.mar-eco.no/mareco_news.

Gulf of Maine: GoMA

In June, Ellen Kenchington, member of the Canadian committee and participant in the Gulf of Maine, participated in a research expedition aboard the Canadian Coast Guard Ship Hudson to "the Discovery Corridor." The Corridor stretches from the New Brunswick shore near St. Andrew's, through the Gulf of Maine, and out beyond George's Bank. On 16 June, Ellen provided an interview to CBC via satellite phone. To listen to some of her discoveries, see: <http://www.cbc.ca/maritimenoon/stories.html>.

In July, GoMA will sponsor a cruise aimed at the high priority question of the Program's Large Vertebrates Working Group: what drives the patterns of utilization by birds and mammals of offshore banks and submarine ridges? For years it has been observed that offshore banks are at times rich in birds and mammals, but at other times are barren of them. Is this pattern being driven by underlying oceanography, by prey fields and the effects of predation, or something else? The study will examine the intersection of foraging with the underlying biology and oceanography. The study site will be Platt's Bank and Three Dory Ridge, about 30 nautical miles off southwestern Maine's shore. The study will combine aerial and vessel surveys to obtain frequent, synoptic, and larger scale views of the area. The PIs are Lewis Incze, Scott Kraus, and Peter Stevick.

Chemosynthetic Ecosystems: ChEss

Since May 2005, ChEss has two coordination offices. One is still based at the National Oceanography Centre, Southampton (UK – formerly the Southampton Oceanography Centre) and is led by Paul Tyler (PI) and Maria Baker (Coordinator). The new office is led by Eva Ramirez Llodra (Coordinator) from the Institute of Marine Sciences in Barcelona (CMIMACSIC, Spain) and is aimed to promote ChEss and the CoML in the Mediterranean Region. Since June 2005, Chris German (Co-PI) is the new Chief Scientist for Deep Submergence at WHOI (USA).

Following the discovery of the first hydrothermal vents in the Mid-Atlantic Ridge south of the Equator by a multidisciplinary team from NOC (UK) and WHOI (USA) led by Chris German, a German research team led by Karsten Haase (Kiel Uni., Germany) has been diving with an ROV on the vents within the framework of the DE-Ridge programme.

Cindy Van Dover (College of William & Mary, USA) has participated in two vent research cruises (PI: Bob Vrijenhoek, MBARI, USA), the first one to the Easter Island Microplate in April 2005 (www.noc.soton.ac.uk/chess/easter05/easter_main.html) and the second one to the Lau Basin in May - June 2005 (www.venturedepocean.org).

Paul Tyler participated in the CoML research cruise to the area of the Indonesian Tsunami. Chuck Fisher (Penn State Univ., USA) is the PI of a cruise (June 2005) to the LAU Basin (www.venturedepocean.org) to investigate the biology, distribution and ecology of vent species in this area. Daniel Desbruyères (Ifremer, France) is one of the taxonomists on board.

In May 2005, Maria Blanco joined the ChEss team as database manager. Maria will be working on ChEssBase (<http://www.noc.soton.ac.uk/chess/database/database.html>) to integrate the InterRidge biological data into the ChEss database, to improve the efficiency of the search facility and to integrate ChEssBase with OBIS by September 2005.

The next ChEss steering committee meeting will take place in Scripps (La Jolla, USA) on 10-11 September 2005. It will be held in conjunction with the 3rd Vent and Seep Symposium, which ChEss is co-organizing, which will also be held at Scripps on 12-16 September 2005: (http://ridge2000.bio.psu.edu/NewR2kSite/mw/Vent_Seep_Biology/ventsymposium.php)

Ana Hilario (NOC, UK) participated in Bob Vrijenhoek's cruise to the hydrothermal vent sites in the LAU Basin in May. Ana worked with ChEss and Ridge2000 to prepare 'Ocean Tales' with illustrated stories about the cruise that were posted on the Ridge2000 web site during June (<http://www.venturedepocean.org/>).

Tagging of Pacific Pelagics: TOPP

TOPP is now in the second year of demonstration projects that involve identifying biological hotspots in the eastern Pacific for top predators; examining the use of animals in ocean observation; and the tagging and analysis of leatherback sea turtles. Each of the projects applies archival and/or satellite tag technologies. Over 1,500 electronic tags have been deployed in the first 15 months of these projects, which involve 40 investigators in the North Pacific.

It promises to be another eventful summer with deployments planned for many of the TOPP species. In addition to tagging 200 or more albacore, bluefin and yellowfin tunas with archival

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tags, the fish and shark team will deploy over 100 tags on blue, mako, white, thresher and salmon sharks in the eastern North Pacific. The cetacean team plans deployments on blue, humpback and fin whales, the seabird team will tag sooty shearwaters with satellite tags in Monterey Bay, and the tuna team will implant archival tags in three species of tuna. Data analyses, focused on linking movements and behaviors to oceanography, are underway for all species tagged to date.

Sharks: The application of SPOT tags (which allow for near real-time tracking) has been extremely successful for following shark movements. We are presently receiving transmission from 30 SPOT tags deployed on blue, mako and salmon sharks with tracks ranging from seven months to three years. The tags record data continuously over consecutive years, providing information on how these sharks use the North Pacific across seasons. This continuous, near real-time data allows rapid mapping of how large pelagic sharks use the North Pacific. TOPP researchers will continue to tag makos, blues, threshers and salmon sharks with spots in 2005.

Fishes: The TOPP tuna team is processing some of the largest datasets in the history of archival tagging. This team, composed of scientists from Stanford University, NOAA Southwest Center and IATTC, has collected over 150 records from three species of tunas: albacore, bluefin and yellowfin. For bluefin tuna, over 90 records ranging up to 1000 days in length have been recorded. The distinctive habitats and behaviors in the eastern North Pacific are now being analyzed.

Mammals: One of TOPP's most elusive and certainly the largest species group is the baleen whales. Considerable effort has focused on maximizing tag retention time. Through the hard work of Bruce Mate and the rest of the cetacean team, we are still tracking one blue whale that was tagged in August 2004, providing one of the longest blue whale tracks to date. Tagged in Central California, this animal migrated south and spent the winter in the Sea of Cortez. The whale returned north earlier this year and is now off the Southern California coast.

In order to maximize the potential for using TOPP animals as oceanographic platforms, we have been working with engineers to develop new tags that record salinity in addition to temperature and depth, and also tags that record light levels at two wavelengths to estimate chlorophyll concentration. The elephant seal team deployed 19 tags in Jan-Feb 2005 and 18 females were recaptured between April and May. All tags were recovered from these seals and although analyses are on going, it appears that the tags performed well while recording oceanographic parameters of the animals' habitat.

Squid: Efforts to collect information on the equally elusive Humboldt squid have also centered on tagging methods. Bill Gilly of Stanford University has been working with Mexican scientists to tag this species of squid. Previous efforts have shown the pop-up satellite archival tags to be the most promising technology. A recent tagging effort off the coast of Magdalena Bay, Mexico resulted in the successful deployment of an additional four pop up tags. The tags are programmed to release over the next month.

Birds: The albatross researchers from TOPP have turned their attention to data analyses to determine where birds go, how they behave when at sea, and what interesting ocean conditions occur that potentially influence their behavior. Sooty shearwaters will get their first TOPP tags in the summer of 2005. This research will focus on the behavior and distribution of the birds in

Monterey Bay using satellite tags to track movements along the coast.

Turtles: In an effort to identify migratory corridors and pelagic hot spots for conservation efforts, the TOPP turtle team has been deploying satellite tags on leatherback sea turtles. Over the last three months we have received transmissions from seven turtles tagged earlier this year and four turtles tagged in early 2004. All but one turtle, which remains near the coast, have traveled offshore to the south with most animals currently foraging in the southern hemisphere. In addition, turtles tagged in Monterey Bay last fall, in an effort lead by Peter Dutton and Scott Benson of the NOAA's National Marine Fisheries Service, are all returning to the east after traveling substantial distances across the Pacific.

E&O: The TOPP Education and Outreach team launched the new TOPP website in May. The lead story focused a recently published paper on electronic tagging of Atlantic bluefin tuna in the journal *Nature*, seminal work that helped lay the foundations for TOPP. In June, the team purchased an innovative display item, a tabletop projector globe from Global Imaginations that allows one to project animated displays of TOPP data against three-dimensional world maps. TOPP debuted the globe during a two day event at the Monterey Bay Aquarium where TOPP staff members and scientists shared program information with over 1,500 visitors and distributed TOPP web cards and Census of Marine Life materials.

Salmon/Coastal Tracking: POST

POST 2005 array is now fully in the water. The deployment is a repeat of the 2004 plan, with some minor changes. The Alaska line went in during the 2nd week of June. It now fully extends to the edge of the continental shelf. Because of the remoteness, the trip took two weeks of traveling to deliver the gear there and return, but the deployment went without a problem. In contrast to 2004, when 1,000 tags were surgically implanted, this year POST affiliated projects have, at last count, implanted approximately 2,700 tags. Acoustic modem equipped units, with a projected 7-year battery life, are out in a large-scale field trial of the performance of these units. These units can be interrogated from the surface, and the data uploaded without having to physically recover the units. We expect that by the end of summer the units can also be reprogrammed from the surface, allowing bug fixes and firmware upgrades.

The POST Management Board will be meeting on 13 July 2005.

Latitudinal/Longitudinal Gradients in Near-Shore Biodiversity: NaGISA.

NaGISA extends a warm welcome to Heloise Chenelot, the new East Pac NaGISA manager working at the University of Alaska Fairbanks, and Dr. Iacopo Bertocci, the soon to be new manager of EU NaGISA working out of the University of Pisa. Both have been funded under contacts for the next two years and we are happy to have them on board.

Fieldwork has occupied most of the NaGISA researcher's time, with more than 7 sites completed in the past two months, including sites in: Vietnam (D. Trong et al.), South Africa (Charles Griffiths and Cape Town University students), Alaska (Katrin Iken, Brenda Konar and UAF students), Baja-California (Matt Edwards et al.), Japan (Robin Rigby, Tetsuya Kato & Tanabe High School), and in the Gulf of Mexico (North West Florida team). In a wonderful show of exchange and cooperation the NW Florida team, including Niceville High School students, teachers and volunteers, joined NaGISA scientists Dr. Patricia Miloslavich and E. Huck from Simon Bolivar University, Venezuela, to sample their *unique** NaGISA sites in Destin's East

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Pass, Florida. For more information see the resulting newspaper article (<http://www.nagisa.coml.org/media/Sampling/BayBeacon%20'05-4-27.jpg>) or photos (<http://www.nagisa.coml.org/SampleFlorida05.htm>) from the collection day. (** These sites are unique as they consist of a jetty and surrounding sandy beach and thus are not part of NaGISA's global focus as detailed in its Protocols. See <http://www.nagisa.coml.org/Protocol.htm>*).

At the end of June, the NaGISA Research and Sorting Center based in Keaserate University closed its doors. This was a difficult decision but it was made in the continued effort to better organize education and training. The intent is to concentrate on a more local scale with the hope that, by doing so, NaGISA will benefit additional players. NaGISA's ties with the researchers and staff of the KU center remain strong, and they will continue to participate in the project as part of West Pac NaGISA.

Abyssal Sediments: CeDAMar

The CeDAMar steering group will next meet 22-23 July 2005 at Ifremer, Brest, France. The meeting is held in conjunction with a *Nodinaut* meeting (20-21 July), during which scientists who participated in the cruise one-year ago will compile and discuss preliminary results. Joelle Galeron of Ifremer hosts both meetings.

Ice Oceans – Arctic: ArcOD

ArcOD scientists Rolf Gradinger (Chief Scientist) and Russ Hopcroft (ROV Coordinator), and Bodil Bluhm are currently participating in an Ocean Exploration cruise – The Hidden Ocean, Arctic 2005. The major focus of the expedition is on a census of the high Arctic fauna and flora in the Canada Basin and associated continental slopes of the Beaufort and Chukchi Seas. All three major realms, the sea ice, water column and the sea floor, will be sampled using both traditional techniques and optical tools (ROV, SCUBA, camera systems). They are joined scientists from the U.S., Canada, Russia and China. The cruise runs from 27 June to 26 July. For background essays, explorer bios, lesson plans and daily logs, visit: <http://www.oceanexplorer.noaa.gov/explorations/05arctic/welcome.html>. Lesson plans were developed by NOAA staff; daily logs and background essays are contributed by ArcOD and scientists. Jack Adams, a science teacher at Barrow High School, will be participating in the cruise under NOAA's *Teacher-at-Sea* program (<http://www.tas.noaa.gov/>). Jack has two decades of teaching experience in the 220-people village of White Mountain and in Barrow, Alaska's North Slope Borough capital. Jack will participate in the field sampling activities, conduct a small research project, contribute web logs and work out ways to translate the scientific information into classroom-relevant activities.

The Russian ArcOD centers in St. Petersburg and Moscow, co-coordinated by Dr. Andrey Gebruk at P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, have designed their database structures for faunal and bibliographic data from the Arctic. Data from about 2,000 stations and over 100 references have already been entered. Please visit Russian ArcOD at <http://www.zin.ru/projects/arccoml/eng/index.html>.

Russian polychaete specialist Sergej Gagaev from the Zoological Institute (ZIN), Russian Academy of Sciences, St. Petersburg, visited ArcOD office members at the University of Alaska Fairbanks. During his stay in Alaska, Dr. Gagaev identified specimens collected during the *Arctic Ocean Transect expedition* in 1994 by Will Ambrose (Bates College), Lisa Clough (East Carolina University) and colleagues. Along with zooplankton specialist Dr. Ksenia Kosobokova (Shirshov Institute of Oceanology, Moscow), Dr. Gagaev is participating in the Canada Basin cruise.

ArcOD researchers Igor Smirnov (ZIN) and Russ Hopcroft (UAF) participated in the first CAML SSG meeting in Belgium in May 2005 to enhance exchange between ArcOD and CAML. An ArcOD poster was designed by the ArcOD office and presented at the 'Climate Variability and Sub-Arctic Marine Ecosystems Symposium' in Victoria, Canada, in May 2005 and at the ASLO meeting in Spain, June 2005.

Planning for the International Polar Year 2007-8 is ongoing. In the tentative listing of all Expressions of Interest (EoI), ArcOD was listed as the potential lead project for Arctic Marine Biodiversity activities (<http://www.ipy.org/>, link to EoI assessment summary). ArcOD had submitted an EoI proposal to the International Council for Science in January 2005. Coordination between projects in the same topic cluster is underway.

Ice Oceans – Antarctic: CAML

The new CoML project, the Census of Antarctic Marine Life (CAML), made a fine start at the Brussels Workshop 25-30 May 2005. The ten-member steering group, appointed by the Scientific Committee on Antarctic Research (SCAR), met with about 20 invited experts to formulate a Science Plan. The CAML website <http://www.caml.aq> went live immediately after the Workshop, and the Members' section is now brimming with the workshop results. CAML will meet again at the SCAR Biology Symposium (July, Curitiba, Brazil) and the Dynamic Planet conference (August, Cairns, Australia). After consideration by the steering group, CAML's Science Plan will be finalized in September 2005.

CAML's next challenge is to secure ship time to undertake the project's core science. CAML Administrator, Professor Michael Stoddart, will make a presentation to the annual meeting of the Council of Managers of National Antarctic Programs (COMNAP, July, Sofia, Bulgaria). Michael is looking for support and ships from the managers of the National Antarctic Programs. The new CAML brochure will be ready for COMNAP, providing background information on the project. Michael's Information Paper on the results of the CAML Workshop was well received at the June Antarctic Treaty Consultative Meeting in Stockholm – visit the ATCM website <http://www.ats.org.ar> for details of his paper #115 or contact caml@aad.gov.au for a copy.

A major undertaking for CAML is participation in the 2007/08 International Polar Year (IPY <http://www.ipy.org>), an international initiative for interdisciplinary cooperative research in polar regions. The IPY provides "an opportunity to engage the upcoming generation of young Earth System scientists and to get the public to realize just how much the cold ends of the sphere we all live on really do influence us". The CAML Expression of Interest to IPY was selected as a lead proposal. We have recently worked this into a full proposal, for consideration by the Joint Committee in the next round. The proposal will also provide a reference for the CAML Steering Committee in formulating the Science Plan. Companion lead proposals in our "Marine

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Biodiversity" cluster have been prepared by members of CAML's Scientific Steering Committee: Professor Angelika Brandt for ANDEEP-SYSTCO on Antarctic benthic deep-sea biodiversity; and Dr Claude De Broyer with newly-appointed Dr Bruno Danis for SCARMarBIN, a Marine Biodiversity Information Network to establish and support a distributed system of interoperable databases within a coordinated network. In the inclusive spirit of CAML and IPY, we have gathered 20 related Expressions of Interest under our lead proposal.

Downunder, CAML is breaking the ice – Project Manager Dr Victoria Wadley will make a presentation at the national Census workshop at the Australian Marine Sciences Association conference (July, Darwin, Australia), particularly to invite young scientists to participate. We are finalising a CAML proposal for Australia's Antarctic Science Advisory Committee, asking for ship time during the IPY. Reported recently in *Journal of Fish Biology*, Australian scientists found a species of fish, *Trematomus scotti*, for the first time in a non-marine Antarctic habitat – the brackish waters of Lake Beaver. A tome on Antarctic Marine Protists was published earlier this year, by Fiona Scott and Harvey Marchant of the Australian Antarctic Division.

Seamounts: CenSeam

The CenSeam Steering Group held its first meeting on 16 May in Horta, Azores, Portugal.

Mireille Consalvey (Gatty Marine Lab, St. Andrews, UK) has joined CenSeam as its liaison to the Education & Outreach Network.

Microbes: ICoMM

A news article highlighting the work of ICoMM was featured in the 21 June 2005 edition of the Honolulu Star-Bulletin. The article quotes project PI Mitch Sogin (MBL, USA) and Open and Coastal Systems working group chair David Karl (Univ. Hawaii, USA).

Zooplankton: CMarZ

CMarZ co-P.I. Shuhei Nishida (Ocean Research Institute, University of Tokyo, Japan) convened the CMarZ Japan / Asia workshop on 16-17 June 2005. More than 20 zooplankton researchers from universities, institutes, and fisheries agencies in Japan participated. The planned CMarZ global survey was discussed, with critical discussions on how and why to approach CMarZ' global sampling objectives. A number of new CMarZ cooperating projects were proposed, including data analysis for the ODATE time-series collections and survey cruises on the research vessel Hakuho-Maru. Five newly proposed cooperating projects resulting from the workshop were subsequently approved by the CMarZ Steering Group. A similar workshop will be convened by the CMarZ / Europe Project Office during Fall 2005 for zooplankton researchers from Germany; a third workshop for zooplankton researchers in the USA is planned for Winter 2005.

CMarZ co-P.I. Sigrid Schiel (Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany) hosted the first CMarZ Steering Group meeting in Bremerhaven on 30 June – 1 July. The CMarZ Steering Group includes 21 members from 14 countries; 16 members from 10 countries were present in Bremerhaven to develop an Implementation Plan for the planned global survey of zooplankton diversity.

Participation in CMarZ is growing through the CMarZ Network, a virtual network of researchers, educators, technical staff, and students who have agreed to help collect samples.

The CMarZ Virtual Network of Taxonomic Experts is also growing - albeit more slowly - and will help meet CMarZ goals for zooplankton sample analysis and species identification. To join the CMarZ Network, see the submittal forms on the project website at www.CMarZ.org.

On July 1st, the CMarZ - USA Project Office moved to the University of Connecticut. CMarZ P.I. Ann Bucklin is now Professor and Head, Department of Marine Sciences and Director, Marine Sciences and Technology Center at the UConn - Avery Point Campus (Tel: +1 860-405-9208; Fax: +1 860-405-9153; Email: ann.bucklin@uconn.edu).

Margaret Van Patten (Connecticut Sea Grant, University of Connecticut) has joined CMarZ as its liaison to the Education & Outreach Network.

Coral Reefs: CReefs

The coral reef field project, CReefs, is now ramping up. Reefs are the most diverse marine ecosystems, and are both highly threatened and economically important around the globe. We are anticipating that the CoML CReefs project will play a crucial role in increasing tropical taxonomic expertise (especially for groups other than corals and fishes) and improving access to scattered information from numerous uncoordinated efforts. This project is managed from centers in Australia and Hawaii and guided by an international panel of coral reef scientists. We are currently developing the CReefs website to provide further information on this effort.

A special session on the "Biodiversity of Coral Reef Ecosystems" was recently approved for the Ocean Sciences Meeting in February 2006, Honolulu. One or more of the CReefs Principal Investigators, Nancy Knowlton of Scripps Institution of Oceanography, Julian Caley of the Australian Institute of Marine Science, Rusty Brainard of National Oceanic and Atmospheric Administration (NOAA), are to be co-convenors for this session. One of the major goals in holding this special session is to bring together lead scientists/taxonomists internationally. Topics of interest for this session will include taxonomic focus in the biodiversity of such understudied groups as sponges, octocorals, mollusks, polychaetes, crustaceans, echinoderms, tunicates, seagrasses, macroalgae (red, brown, and green macroalgae), coralline algae, turf algae, and cyanobacteria, as well as advancement in technology and sampling strategies relative to these foci.

A CoML CReefs discussion workshop will be held back to back with the meeting. Several other meetings/conferences are in the works, including the CoML All Program Meeting in Germany, meetings in Australia, Panama, Mexico and Hawaii, as well as bi-monthly teleconferences. Initial conference calls took place on 9 and 27 June 2005. These calls have included the CReefs Principal Investigators, along with Peter Vroom, Algal Biologist, NOAA, and Megan Moews, CReefs Hawaii Coordinator, NOAA.

The Australian Research Council has announced major new funding for coral reef science, establishing an international Centre of Excellence headquartered at James Cook University, in Townsville, QLD. The new Centre, entitled *ARC Centre of Excellence Innovative science for sustainable management of coral reef biodiversity* will replace the existing *Centre for Coral Reef Biodiversity* at JCU, and is strategically located adjacent to the Great Barrier Reef and reef

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systems in Asia and the Pacific. Terry Hughes will be the inaugural Director. The Centre of Excellence will focus initially on 5 research programs, each one under the stewardship of Program Leaders from James Cook University, the Australian National University and the University of Queensland. Program 4, Genetic, molecular and physiological processes, will be led by Ove Hoegh-Guldberg (CReefs, UQ).

Margins: CoMargE

The CoMargE steering group held its first meeting on 3-4 June 2005 at the Bermuda Biological Station for Research.

National and Regional Activities

Australia

On 13 July, the Australian CoML committee will sponsor and host a one-day workshop at the forthcoming Australian Marine Sciences Association (AMSA) annual conference. The workshop will focus on potential national contributions to the global Census. It aims to identify research activities that can help improve our collective understanding of Australia's marine biodiversity and how Australia can contribute this knowledge to the global CoML program. The workshop will also discuss the establishment of a regional OBIS node, and explore with participants how Australian data providers can both contribute to this network and make use of it. For more information, visit: <http://www.coml.org.au:8080/>.

Kim Finney has moved from the National Oceans Office (NOO) to the Australian Antarctic Division. New Australian CoML support staff at NOO includes Miranda Carver and Emma Campbell.

Canada

In anticipation of CoML's upcoming major reports, the Canadian committee is currently conceptualizing an international workshop to develop the CoML reporting framework. The framework will likely focus on CoML's potential societal benefits and address issues such as regional ecosystems, measures of diversity, and habitat classifications. More information will be available following the international SSC meeting in August.

Caribbean

The Caribbean committee is supporting the development of a new Caribbean HMAP case study on Mega Mollusks. A workshop is planned for 26-28 September 2005 at Isla Margarita, Venezuela, chaired by Andrzej Antczak. Participants include representatives from Japan, New Guinea, Australia, South Africa, Near East, Denmark, UK, USA, Canada, Panama, Brazil, Chile and Venezuela.

NaGISA sampling is also being initiated in the Caribbean. A training workshop is planned to take in Venezuela, joining the South American and the Caribbean regions, under the coordination of Caribbean committee members Patricia Miloslavich and Paula Spiniello. The workshop is planned for the first trimester of 2006, and will have as a main objective to standardize methods. A taxonomic workshop may be planned jointly with this workshop. There are currently 11 sites confirmed for South America, including the Caribbean countries Colombia and Venezuela. Other sites for the rest of the Caribbean are to be confirmed.

Europe

Dr Bhavani Narayanaswamy has recently been appointed as the Project Officer for the European Census of Marine Life. Bhavani is a deep-sea ecologist and has worked in this field for almost 12 years. More recently, she spent 3 months in the Antarctic this year collecting deep-sea benthic samples through ANDEEP, a field project of CeDAMar. You can contact Bhavani at:

Bhavani.Narayanaswamy@sams.ac.uk.

The head office of the European Census of Marine Life is based at the Scottish Association for Marine Science in Oban, Scotland – UK with Prof Graham Shimmield as the Chair. The Executive group will be meeting in UNESCO in Paris on 11 July to discuss, amongst other things, progress on new projects that will come under the EuroCoML umbrella as well as the Symposium being held at the Senckenberg Museum in Frankfurt in November.

Planning for the 3 November EuroCoML Symposium in Frankfurt, co-hosted by the Senckenberg Museum of Natural History, is progressing well. A small planning group met 27 June in Frankfurt and identified nine projects to participate in the symposium, tentatively titled *Into the Deep Blue: Europe and the Census of Marine Life*. Projects requested to participate are CeDAMar, ChEss, MAR-ECO, CoMarge, CMarZ, ArcOD, CAML, EuroNaGISA and the emerging European TOPP/tagging effort.

South America

The South American Committee met 9-11 May 2005 at the University of Concepción in Chile. Discussions focused on South American participation in current CoML initiatives, including NaGISA, OBIS, CMarZ, CAML and ICOMM. The committee also discussed ideas for products to the CoML, such as an integrated map of South American ecosystems and a book or atlas on South American marine ecosystems and related biodiversity.

USA

The U.S. National Oceanographic Partnership Program (NOPP) recently funded five new projects, related to Census of Marine Life, under the topic of New Methods for Detection of Fish Populations or Mapping of Fish Habitat. These projects include:

- Understanding Apex Predator and Pelagic Fish Habitat Utilization in the California Current System by Integrating Animal Tracking with in situ Oceanographic Observations (Lead PI: Dr. Daniel Costa, University of California at Santa Cruz)
- Development of Mid-Frequency Multibeam Sonar for Fisheries Applications (Lead PI: Dr. John Horne, University of Washington)
- Continuous Monitoring of Fish Population and Behavior by Instantaneous Continental-Shelf-Scale Imaging with Ocean-Waveguide Acoustics (Lead PI: Dr. Nicholas Makris, Massachusetts Institute of Technology)
- Novel Acoustic Techniques to Measure Schooling in Pelagic Fish in the Context of an Operational Coastal Ocean Observatory (Lead PI: Dr. Kelly Benoit-Bird, Oregon State University)
- A Novel Technique to Detect Epipelagic Fish Populations and Map their Habitat (Lead PI: Dr. James Churnside, National Oceanic and Atmospheric Administration)

For abstracts, visit: www.nopp.org, and follow the news column link for FY05 NOPP funded

projects.

NOAA's Office of Ocean Exploration has recently announced its FY06 exploration funding opportunity, anticipated at \$14M (including ship and ROV costs) available for expeditions in the categories of General Exploration (\$13M), Marine Archeology (\$600K), and Education and Outreach (\$400K). A 2-page pre-proposal is required for all categories and must be submitted in hardcopy by 5 August 2005. For full details, visit <http://www.explore.noaa.gov> and look under 2006 Announcement of Opportunity.

The next meeting of the CoML U.S. National Committee will be held 18-19 August 2005 at the Alaska Sealife Center in Seward, Alaska.

Crosscutting and Other Related Activities

IOC Resolution

At the recent Intergovernmental Oceanographic Commission (IOC) Assembly (20-29 June, Paris), delegates reviewed a resolution in support of the Census of Marine Life and OBIS. The resolution was brought forward by Australia, with endorsement by a number of countries, including Canada, Portugal, Belgium, Netherlands, Chile, Ecuador, Venezuela, Japan, Cuba, Kuwait, Nigeria, Sri Lanka and the United States.

SCOR Panel on New Technologies

The SCOR Panel on New Technologies for Observing Marine Life was formed to provide advice to individual CoML projects in relation to their technology needs and to help transfer technology information among CoML projects. The Panel met in Goa, India in February 2005 for the first time to begin its work. The meeting summary and recommendations can be found on the Panel Web site (www.scoml.org), which is still evolving. Panel members will attend the All Program Meeting in Frankfurt, Germany in November 2005 and the Panel will meet immediately after the All Program Meeting.

The Panel would like to know which individuals participating in each CoML project are most involved in the technology aspects for the project, so that the Panel can involve them in its meetings and electronic discussions. The Panel also would like to hear from CoML projects about their technology successes and failures, so that this information can be shared among CoML projects through the Panel. Finally, the Panel is available to provide advice on technology to the projects. The Panel can be reached through the Panel Chair, Elgar De Sa (elgar.desa@gmail.com) or the Panel staff person, Ed Urban (Ed.Urban@jhu.edu).

DNA Barcoding

An All Fish Barcoding workshop took place 5-6 June 2005 in Guelph, ON, Canada. The workshop brought together a core group of international collaborators focused on activating FISH-BOL - a network to assemble DNA barcodes for all fish species. Copies of a CD with the

PowerPoint presentations from the All Fish meeting are available from Paul Hebert's lab (pherbert@uoguelph.ca).

General News

Tsunami Cruise

CoML Scientists – Paul Tyler (ChEss, NOC, UK) and Baban Ingole (CenSeam, NIO, India) – participated in a cruise aboard the M/V *Performer* to lead the biological investigation of the area of the earthquake epicenter off the Indonesian coast that caused the deadliest tsunami in recorded history. Cindy Lee Van Dover (ChEss, College of William and Mary, USA) provided additional support aboard the RV *Melville* in the Lau Basin. The cruise team included geologists, geophysicists, biologists, and modeling and visualization experts whose work was filmed for a BBC and Discovery Channel Networks documentary to be released later this year. For the full press release and related media coverage, visit: www.coml.org.

Scientia Marina

The Census of Marine Life Research Plan has been published as two separate articles in the 50th Anniversary issue of *Scientia Marina* (69 (Suppl. 1): 2005). PDF files of these articles can be downloaded at: <http://www.icm.csic.es/scimar/69s1.html>.

Dynamic Planet 2005

Dynamic Planet 2005, a joint assembly of the International Association of Geodesy (IAG), International Association for Physical Sciences of the Oceans (IAPSO) and the International Association for Biological Oceanography (IABO), will be held 22-26 August 2005 in Cairns, Australia. Mark Costello, Ron O'Dor, and Ian Poiner will chair an IABO session on CoML. The session outline is now available at: http://www.dynamicplanet2005.com/prog_B_IABO_sessions.htm#b1. There are other sessions of relevance to CoML work, as well, including an IABO session on Pelagic Biogeography, organized by Chris Reid, Annelies Pierrot-Bults and Graham Hosie.

DIVERSITAS

DIVERSITAS will hold its first Open Science Conference on 9-12 November 2005 in Oaxaca, Mexico. A CoML session, *Oceans of biodiversity - discovering species, habitats and ecologies*, has been accepted under the DIVERSITAS theme of BioDiscovery. Pedro Martinez, Mark Costello, and Carlo Heip chair the session. For more information, visit: <http://www.diversitasoscl.org/>, and click on Science Programme.

Ocean Sciences 2006

The 2006 AGU / ASLO / TOS Ocean Sciences Meeting, 20-24 February 2006, has accepted a CoML-related session on Understanding The Role Of Biodiversity In Marine Ecosystems. Lew Incze (GoMA, Univ. Southern Maine), Mike Sinclair (Canadian CoML Committee, BIO), and Ron O'Dor will convene. Abstract submission opens 14 July and closes on 20 October. For more information, visit: <http://www.agu.org/meetings/os06/>.

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Funding Announcements

Information regarding Calls for Proposals and other opportunities (jobs, fellowships, post-docs, etc.) can be found at the CoML Secretariat website: www.comlsecretariat.org, under “Announcements of Opportunity.”

Calendar of Upcoming Events

July

- 11:** EuroCoML Executive Committee meeting, Paris, France
- 13:** Workshop on Census of Marine Life Australia: Join the Voyage of Discovery, Darwin, Australia
- 13:** POST Management Board Meeting, BC, Canada
- 20-21:** Nodinaut cruise results meeting, Brest, France (CeDAMar)
- 22-23:** CeDAMar Steering group meeting, Brest, France

August

- 18-19:** U.S. National Committee meeting, Seward, AK, USA
- 22-26:** IABO/IAPSO/IAG Dynamic Planet Conference, Cairns, Australia (CoML Session)
- 25-26:** CReefs Principal Investigator Meeting, Hawaii, USA
- 26-29:** CoML SSC Meeting, Cairns, Australia
- 29-1 Sep:** SCOR Executive Committee Meeting (CoML is a SCOR-affiliated program)

September

- 10-11:** ChEss Steering Group meeting, La Jolla, CA, USA
- 12-16:** 3rd Hydrothermal Vent and Cold Seep Symposium, La Jolla, CA, USA (ChEss co-organizing)
- 19-23:** MTS/IEEE Oceans 2005, Washington, DC, USA (USNC co-sponsoring a session)
- 26-28:** Early Human Impact on Mega Mollusks (EHIM) Workshop, Isla de Margarita, Venezuela
- 26-29:** Workshop on “New Molecular Approaches for Characterizing and Understanding the Diversity of Coral Reef Ecosystems,” Bocas del Toro, Panama

October

- 24-27:** HMAP Open Science Conference: “Oceans Past – Multidisciplinary Perspectives on the History of Marine Animal Populations”, Kolding, Denmark

November

- 2:** EuroCoML Committee Meeting, Frankfurt, Germany
- 2:** E&O Network Meeting, Frankfurt, Germany
- 2:** CAML Steering Group Meeting, Frankfurt, Germany
- 2-3:** OBIS International Committee Meeting, Frankfurt, Germany
- 2-3:** NaGISA Steering Group Meeting, Frankfurt, Germany
- 3:** EuroCoML-Senckenberg Symposium & Reception, Frankfurt, Germany
- 3:** MAR-ECO Steering Group Meeting (AM), Frankfurt, Germany
- 3:** EuroCoML Executive Committee Meeting (AM), Frankfurt, Germany
- 4-5:** 2nd CoML All Program Meeting, Frankfurt, Germany
- 6:** CoML SSC Meeting, Frankfurt, Germany
- 6:** CenSeam Steering Group Meeting, Frankfurt, Germany
- 6:** SCOR Panel on New Technologies for Observing Marine Life, Frankfurt, Germany
- 6-7:** OBIS Management Committee Meeting, Frankfurt, Germany
- 9-12:** First DIVERSITAS International Conference on Biodiversity, Oaxaca, Mexico (CoML Session)

7.3.3 International Antarctic Zone Program - iAnZone (Affiliated in 1996)

Goal and Objectives:

The primary goal of the international Antarctic Zone (iAnZone) program is to advance our quantitative knowledge and modeling capability of the seasonal cycle and interannual variability of the ocean and its sea ice cover, with emphasis on climate-relevant fluxes that couple the Antarctic Zone to the atmosphere and to the global ocean. The iAnZone group has been involved in the development and coordination of three large Antarctic zone projects and also organizes meetings intended to inform others of national research and field programs for the purpose of “value-added” linkages among the participants.

Terms of Reference

- To identify, develop, and coordinate research projects meeting the iAnZone goal.
- To provide a forum for the exchange of iAnZone research plans, results, and data.
- To participate in and assist with the coordination between Antarctic Zone and global climate research programs, with other Southern Ocean programs, and with colleagues.
- To advise SCOR on the development of appropriate observing system (e.g., for GOOS, GCOS), data sets, and modeling strategies needed to understand the scales and mechanisms of climate variability within the Antarctic Zone.

For more detailed information on iAnZone’s scientific programs, see their Web site at <http://www.ldeo.columbia.edu/physocean/ianzone/>

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Membership

Andrea Bergamasco	ITALY	Robin Muench	USA (ex officio)
Russell Frew	NEW ZEALAND	Mike Schroeder	GERMANY
Hartmutt Hellmer	GERMANY (ex-officio)	Shuki Ushio	JAPAN
Alexander Klepikov	RUSSIA	Timo Vihma	FINLAND
Mauricio Mata	BRAZIL	Zhanhai Zhang	CHINA-Beijing

Executive Committee Reporter: Ilana Wainer

SCOR AFFILIATED PROGRAMME - International Antarctic Zone (iAnZone)
Report of Activities for 2004 - 2005
38th Executive Committee Meeting of SCOR, Cairns, September 2005

Dr Karen J. Heywood (Chair of iAnZone)

iAnZone mission and activities

iAnZone was conceived in the early 1990s as a sequence of informal biennial meetings of Southern Ocean researchers, primarily physical oceanographers, interested in understanding the Southern Ocean and its role in climate. Accorded status as a SCOR Affiliated Programme in early 1997, iAnZone's goal is to advance our understanding of climate-relevant processes within the region of the Southern Ocean poleward of the Antarctic Circumpolar Current. iAnZone is now also affiliated to SCAR; this was approved in autumn 2004. The Chair of iAnZone also represents the programme on the CLIVAR/CliC/SCAR Southern Ocean Panel, and the SCAR/SCOR Expert Group in Oceanography.

iAnZone (i) provides for exchange of ideas, plans, results and data; (ii) identifies, develops and coordinates research projects; (iii) facilitates coordination among Antarctic and global climate programmes, and among other Southern Ocean programmes; and (iv) advises on the development of appropriate observing systems, datasets and modelling strategies needed to assess the scales and mechanisms of climate variability in the Antarctic Zone. Highly successful iAnZone projects completed in recent years include AnzFlux and DOVETAIL.

This has been an exciting and busy year for iAnZone. In August 2004, we held a three-day iAnZone open workshop at the University of East Anglia (UEA) for our next iAnZone project, SASSI, of which more below. Input was presented from the US, UK, Germany, Spain, Italy, France, Norway, Japan, Finland, Russia and New Zealand. In September 2004, the Chair represented iAnZone at a SCOR Marine Coordination workshop in Venice. This proved to be a stimulating meeting which has led to a number of initiatives and future collaborations, as well as increased awareness and communication.

Much of our attention has been taken with the forthcoming International Polar Year (IPY) in 2007-2009. In December 2004, an Expression of Interest was submitted to the IPY committee (one of over 900) describing the SASSI project. In April 2005, we heard that we had been nominated as the lead project in a cluster of 9 projects addressing scientific topics on the Antarctic coasts and margins. A full proposal is being prepared for the June 2005 deadline on behalf of this cluster.

Current Scientific Activities

ANSLOPE

Recognition of the importance of shelf and slope processes to deep water formation led to the fourth international iAnZone project: the Antarctic Slope project (ANSLOPE). This project seeks to define the roles of the Antarctic slope front and continental slope morphology in the exchanges of mass, heat and freshwater between the shelf and oceanic regimes. Emphasis is on processes that control deep-reaching outflows of shelf water mixtures in the Ross Sea. Although primarily U.S.-led, other participation includes the Italian CLIMA programme. The German BRIOS-2 coupled ice-ocean modelling programme provides a large-scale modelling capability to complement process-driven field studies. The project is now in a mature data analysis and publication phase, having completed the final intensive field campaign at the end of 2004. Further information is on the Anslope website:

<http://www.ldeo.columbia.edu/res/div/ocp/projects/anslope.shtml>

ISPOL-1

The Ice Station Polarstern (ISPOL-1) field programme took place during austral spring-summer of 2004-2005. This is the fifth international iAnZone project and is led by Germany, with international collaborations. It used the concept of a manned drifting station to study spring-to-early summer ocean and sea ice conditions along the western Weddell Sea outer continental shelf and upper slope region. Further information is on the ISPOL website: <http://www.ispol.de/>

Future Scientific Activities

The next (sixth) major project to be coordinated by iAnZone is scheduled for 2007-2008 as a contribution to the International Polar Year (IPY). The first dedicated coordination workshop for this project took place at UEA during August 2004. The resulting proposal, Synoptic Antarctic Shelf-Slope Interactions (SASSI), is available on the iAnZone website. The intention is to cast a web of sections radiating from Antarctica across the continental slope and shelf. These would measure water mass properties and transports, deploy moorings, drifters and floats, and provide a resource for other measurements such as biogeochemical analyses. The scientific goal is to monitor and understand the processes of water mass formation and transformation on the Antarctic continental shelf and slope. Participation by countries new to iAnZone, or new to Antarctic research, is warmly welcomed. SCOR, through this report, may be able to extend our invitation to such scientists to join our research cruises where appropriate.

Future Meetings

The 9th iAnZone biennial coordination meeting is planned to take place in Venice on Sunday 9th October 2005. This meeting will be collocated with an IPAB meeting, a SCAR/SCOR Oceanography Expert Group meeting and a major conference on work in the Ross Sea the following week. It is hoped that this will provide a successful mechanism for coordination of ongoing Southern Ocean research in much the same fashion as the September 2003 Southern Ocean Science Week held at AWI.

Committee Membership

The current steering committee members are as follows. There has not been a formal meeting in person since the last report to SCOR; there will be one in Venice in October 2005. However, members have been active in email discussions.

Karen Heywood (UK) Chair	Shuki Ushio (Japan)
Robin Muench (ex officio as previous Chair, USA)	Russell Frew (New Zealand)
Hartmutt Hellmer (ex officio as previous Co-Chair, Germany)	Zhanhai Zhang (China)
Vicky Lytle (Australia)	Andrea Bergamasco (Italy)
Alexander Klepikov (Russia)	Mauricio Mata (Brazil)
	Mike Schroeder (Germany)
	Timo Vihma (Finland)

The iAnZone website, open to all, is available at

<http://www.ldeo.columbia.edu/res/fac/physocean/ianzone/>

and is used for exchange information regarding projects and opportunities in the Antarctic Zone. We are very grateful to Bruce Huber (LDEO) for maintaining the website on our behalf. He also maintains an iAnZone mailing list (ianzone@ldeo.columbia.edu) to which anyone may subscribe,

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that greatly facilitates rapid exchange of information and project planning.

7.3.4 International Marine Global Change Study (IMAGES) (affiliated in 1995)

IMAGES (International Marine Global Change Study) is a program of Past Global Changes (PAGES), a core project of the International Geosphere-Biosphere Programme (IGBP), and is affiliated with SCOR. IMAGES was initiated to respond to the challenge of understanding the mechanisms and consequences of climatic changes using oceanic sedimentary records. The overriding IMAGES science issue is to quantify climate and chemical variability of the ocean on time scales of oceanic and cryospheric processes; to determine its sensitivity to identified internal and external forcings, and to determine its role in controlling atmospheric CO₂. In order to achieve these scientific objectives, IMAGES proposes to coordinate a global program to collect and study marine sediment records to address three fundamental questions:

1. How have changes in surface ocean properties controlled the evolution of global heat transfer through the deep and surface ocean and thereby modified climate?
2. How have changes in ocean circulation, ocean chemistry, and biological activity interacted to generate the observed record of atmospheric pCO₂ over the past 300 kyr?
3. How closely has continental climate linked to ocean surface and deep-water properties?

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Membership:

J.A. Flores	SPAIN	D. Kroon	NETHERLANDS
F. Florindo	ITALY	C. Lange	CHILE
B. Flower	USA	M.L. Machain-Castillo	MEXICO
F. Grousset	FRANCE	A. Mackensen	GERMANY
I. Hall	UK	H. Neil	NEW ZEALAND
E. Ivanova	RUSSIA	B. Opdyke	AUSTRALIA
E. Jansen	NORWAY	T. Pederson	CANADA
Z. Jian	CHINA	V. Ramaswamy	INDIA
N. Kallel	TUNISIA	J. Rogers	SOUTH AFRICA
H. Kawahata	JAPAN	J. Sopaheluwakan	INDONESIA
K.L. Knudsen	DENMARK	T. Stocker	SWITZERLAND
		A. Völker	PORTUGAL

Director: Ralph Schneider

Executive Committee Reporter: Laurent Labeyrie

IMAGES (International Marine Global Change Study)

Marine program of IGBP-PAGES, affiliated to SCOR in 1995)

IMAGES (International Marine Global Change Study) is a core program of Past Global Changes (PAGES), a core project of the International Geosphere-Biosphere Programme (IGBP), and is affiliated with SCOR. IMAGES was initiated to respond to the challenge of understanding the mechanisms and consequences of climate changes using oceanic sedimentary records. The overriding IMAGES science issue is to quantify climate and chemical variability of the ocean on time scales of oceanic and cryospheric processes; to determine its sensitivity to identified internal and external forcings, and to determine its role in controlling atmospheric CO₂. In order to achieve these scientific objectives, IMAGES coordinates a global program to collect and study marine sediment records to address three fundamental questions:

1. How have changes in surface ocean properties controlled the evolution of global heat transfer through the deep and surface ocean and thereby modified climate?
2. How have changes in ocean circulation, ocean chemistry, and biological activity interacted to generate the observed record of atmospheric pCO₂ over the past 300 kyr?
3. How closely has continental climate linked to ocean surface and deep-water properties?

IMAGES accomplishes these objectives through (1) the planning and coordination of coring cruises to retrieve and exploit in international collaboration giant sediment cores from long, continuous time series in high sedimentation rate areas of the ocean, and (2) the support of symposia, working groups and their workshops.

IMAGES Administration

The program has a permanent office hosted at the University of Bremen in Germany. Our budget covers, in addition to the day-to-day expenses of the office:

- Full-time salary for a data manager.
- Six months of salary per year for an Assistant Director
- Funding or co-funding (with SCOR and PAGES, mainly) of working group meetings and symposia
- Support for training of young scientists (participation to symposia and oceanic cruises)
-

Chair

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IMAGES Office

Ralph Schneider, Executive Director
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28359 Bremen, Germany
(www.images-pages.org)

Membership

25 countries with national consortia of university or governmental research institutes as well as represented by a single institute only are members.

B. Opdyke	AUSTRALIA	E. Jansen	NORWAY
T. Pedersen	CANADA	D. Kroon	NETHERLANDS
C. Lange	CHILE	H. Neil	NEW ZEALAND
Z. Jian	CHINA	A. Völker	PORTUGAL
K.L. Knudsen	DENMARK	E. Ivanova	RUSSIA
F. Grousset	FRANCE	J.A. Flores	SPAIN
A. Mackensen	GERMANY	J. Rogers	SOUTH AFRICA
J. Eriksson	ICELAND	T. Stocker	SWITZERLAND
V. Ramaswamy	INDIA	M.T. Chen	TAIWAN
J. Sopaheluwakan	INDONESIA	N. Kallel	TUNISIA
F. Florindo	ITALY	I. Hall	UK
H. Kawahata	JAPAN	B. Flower	USA
M.L. Machain-Castillo	MEXICO		

Data Archiving and Synthesis

Archiving of IMAGES data, including shipboard and laboratory data has been continued effectively. A new bibliography has been installed on the IMAGES website, which is in service with all recent information concerning our activities (workshops, past and future cruises, database).

Working Groups

IMAGES supports the activity of several IMAGES and SCOR-IMAGES Working Groups (WGs). There are currently seven active WGs, whose main task is to coordinate the acquisition of cores and laboratory data in key areas and to stimulate thematic discussion on specific topics related to paleoenvironmental oceanic conditions. IMAGES has financially supported the first meetings of the new WGs in 2004 and 2005. The active working groups comprise:

- PACE: Reconstruction of Past Ocean Circulation (SCOR 123)*
- LINKS: Present Oceanic Processes and Paleorecords (SCOR 124)*
- EPILOG: Re-evaluation of the LGM conditions*
- Southern Ocean*
- Ice-sheet-Ocean Interaction*
- Holocene Climate Variability*
- PEPD: Past Equatorial Pacific Dynamics*

The WGs *PACE* and *LINKS* had their first meetings in 2004 and an international conference on “Paleocean Circulation” was organized by *PACE* in March 2005 at Georgia Tech University, Atlanta.

PEPD had a meeting in April 2005 at Taipeh and executed an IMAGES cruise (Pecten) in June/July 2005 to Indonesian and Australian waters.

A complete list of all former and still active working groups and their workshop reports can be found on the IMAGES website.

Recent activities

Cruises: From May to July 2005 two CALYPSO coring cruises were executed to the China Seas (Marco Polo, IMAGES cruise XII and to Indonesian and Australian waters (Pecten, IMAGES XIII). New IMAGES cruises are planned for the Peru-Chile Margin for 2006. In addition, several cruise proposals are pending for the Southern Ocean. However, funding for these cruises is not secured yet. In order to overcome difficulties in receiving sufficient funding for CALYPSO coring in the future, IMAGES is trying to establish a consortium at the European level first that aims to develop comprehensive coring proposals which then can be submitted to the European Science Foundation (ESF). ESF has agreed to open a new call for scientific proposals related to IMAGES and IODP coring activities under their EUROCORES program.

Travel Support: With additional financial support from PAGES and SCOR, IMAGES was able to offer travel grants to 34 young researchers from different countries to allow for their attendance at the ICP8 (International Conference on Paleooceanography) which was held at Biarritz, France, in September 2004.

SCICOM: The next IMAGES Scientific Committee Meeting will take place at the Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China, 8-9 August 2005.

7.3.5 InterRidge - International Ridge Studies (affiliated in 1996)

InterRidge is an international and interdisciplinary initiative concerned with all aspects of mid-ocean ridge research. It is designed to encourage scientific and logistical coordination between researchers in all countries of the world, with particular focus on problems that cannot be addressed as efficiently by nations acting alone or in limited partnerships. InterRidge promotes the sharing of ridge-related technologies and facilitates internationally collaborative projects. InterRidge especially encourages the involvement of less industrialized countries in the study, use and protection of ridges. InterRidge has a clear obligation to inform and involve both the public and governments in and about ridge research.

Activities of the InterRidge office range from dissemination of information on existing, single-institution experiments to initiation of fully multi-national projects. The InterRidge website can be found at www.interridge.org.

Terms of Reference:

- To assist in defining and coordinating field programs and experiments through InterRidge working groups.
- To facilitate exchange of ideas/plans, e.g. by convening international workshops.
- To provide current information about research activities, especially sea-going operations through the InterRidge website and *IR News*.
- To help improve procedures for data management, exchange, synthesis, and preservation.
- To encourage participation of smaller oceanographic countries and individual scientists from non-seagoing countries.
- To continue to develop scientific, technical and logistical co-operation among nations and to strengthen international foundations for innovative research.

Chair:

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Membership: InterRidge 2004 Steering Committee

<i>Canada</i>	Prof. Steven Scott	<i>Japan</i>	to be announced
<i>China</i>	Dr. John Chen	<i>Norway</i>	Prof. Rolf Pedersen
<i>France</i>	Dr. Jérôme Dymont	<i>Portugal</i>	Prof. Fernando Barriga
<i>France</i>	Dr. Françoise Gaill	<i>Korea</i>	Dr. Sang-Mook Lee
<i>Germany</i>	Prof. Colin W. Devey	<i>UK</i>	Prof. Paul R. Dando
<i>Germany</i>	Dr. Nicole Dublier	<i>UK</i>	Dr. Timothy Henstock
<i>India</i>	Dr. K.A. Kamesh Raju	<i>USA</i>	Dr. Charles Fisher
<i>Japan</i>	Dr. Nobukazu Seama	<i>USA</i>	Dr. Donna Blackman

Programme Coordinator: Katja Freitag, **Education Outreach Coordinator:** Kristen Kusek
Executive Committee Reporter: Laurent Labeyrie

InterRidge - International Ridge Studies (affiliated in 1996)

InterRidge is an international and interdisciplinary initiative concerned with all aspects of mid-ocean ridge/ocean spreading center research. It is designed to encourage scientific and logistical coordination between researchers of all nations, with particular focus on problems that cannot be addressed as efficiently by nations acting alone or in limited partnerships. InterRidge promotes the sharing of ridge-related technologies and facilitates internationally collaborative projects. InterRidge especially encourages the involvement of less industrialized countries in the study, use and protection of ridges. InterRidge has a clear obligation to inform and involve both the public and governments in and about ridge research.

Activities of the InterRidge office range from dissemination of information on existing, single-institution experiments to initiation of multi-national projects. The InterRidge website can be found at www.interridge.org.

Membership: InterRidge 2005 steering committee

<i>Canada</i>	Prof. Steven Scott	<i>Norway</i>	Prof. Rolf Pedersen
<i>China</i>	Dr. John Chen	<i>Portugal</i>	Prof. Fernando Barriga
<i>France</i>	Dr. Jérôme Dymont	<i>Republic of Korea</i>	Dr. Sang-Mook Lee
<i>France</i>	Dr. Françoise Gaill		
<i>Germany</i>	Prof. Colin W. Devey (Chair)	<i>Spain</i>	Rosario Lunar
		<i>UK</i>	Prof. Paul R. Dando
<i>Germany</i>	Dr. Nicole Dublier	<i>UK</i>	Dr. Timothy Henstock
<i>India</i>	Dr. K.A. Kamesh Raju	<i>USA</i>	Dr. Charles Fisher
<i>Japan</i>	Dr. Nobukazu Seama	<i>USA</i>	Dr. Donna Blackman
<i>Japan</i>	to be announced		

Coordinators: Katja Freitag (program), Kristen Kusek (education outreach)



InterRidge Report 2005
By Katja Freitag
InterRidge Coordinator

InterRidge office activities – update since the 2004 report

Since the last report, InterRidge has a new logo that was introduced in September 2004 to mark the start of the second decade of existence, the InterRidge website was redesigned and reorganized, and numerous activities (workshops, meetings and a field trip) took place.

Information distribution and website overhaul

Providing up-to-date ridge-related information is a fundamental part of InterRidge office activities. This is achieved through the annual newsletter *IR News* and IR info emails which are distributed to more than 1500 people. All relevant information obtained by the InterRidge office is also available to the general community via the InterRidge website which was redesigned and restructured in February 2005 to ensure easy navigation and thus information access <http://www.interridge.org>. All InterRidge publications (IR workshop reports, meeting abstract volumes, IR News, etc) are available at no cost to scientists and students as downloadable PDFs from the IR website (http://www.interridge.org/Downloads_junction.html).

Database management

It has become clear that the resources of the InterRidge office are not sufficient to maintain extensive databases. During this decade the InterRidge office will concentrate on maintaining the database of ridge researchers and cruises, and will create portal pages with information about relevant databases around the world. Currently, the InterRidge biology database is being amalgamated with the ChEss database “ChEssBase”.

InterRidge Activities (workshops, meetings, field trip)

InterRidge Workshop - “Tectonic and Oceanic Processes along the Indian Ridge System”
National Institute of Oceanography, Goa, India, January, 2005.

India, an associate member of the InterRidge, proposed to organize a workshop to provide a forum for national and international ridge researchers to exchange ideas and results and foster collaborations. The proposal was accepted during the 2003 InterRidge Steering Committee meeting, Tokyo, Japan. It was decided that an InterRidge Workshop entitled “Tectonic and oceanic processes along the Indian Ridge system and back arc basins” would be hosted by NIO, in Goa, India, from 19-21 January 2005.

Workshop objectives

- To focus on the geological, geophysical, physical, chemical and biological processes at the Indian Ocean spreading centers
- To provide a forum for exchange of ideas and results
- To encourage international collaboration in exploration of Indian Ocean ridge research using latest tools and techniques.

The three-day workshop focused on spreading axis studies in the Indian Ocean and was opened by Dr. H.K. Gupta, Secretary of the Department of Ocean Development, India. The workshop was well attended with a total of 80 participants from 10 countries. It covered all aspects related to the ridge research in eight technical sessions: (1) Ridge segmentation; (2) Outcropping mantle and mullion tectonics; (3) Ridge-hotspot interaction and mantle dynamics; (4 &5). Hydrothermal processes and ridge biology; (6) Back arc basins; (7) Special Talks; (8) Emerging technologies, as well as poster sessions. Students were especially encouraged to present posters through the award of an InterRidge Student Poster Prize. The prize was split between three excellent posters presented by K.V. Anoop, Dwijesh Ray and Sheryl O Fernandes. The meeting concluded with a forum session to identify key areas for future research in the Indian Ocean.

The workshop was organized with financial help from the Council of Scientific and Industrial Research, InterRidge and Ridge 2000 Program, USA.

MoMar - InterRidge - Ridge 2000 International MoMAR Implementation Workshop
Museu de Ciêcia, Lisbon, Portugal, April 2005.

Workshop objectives

- continue the planning process for long-term monitoring while also taking into account the additional goals of a Ridge 2000 Integrated Study Site;
- design experiments to conduct both in the short term (~3 years) and in the long term when a cable or buoy to provide power and data transmission might be in place; and
- develop implementation plans to move these studies forward.

Monitoring and long-term observation of the spreading axes is the next major necessary step to understanding such systems. Due to the short time scale over which significant events might be expected, the hydrothermal systems are the obvious places to start this effort. InterRidge has, for several years, been fostering efforts to begin observations at a site south of the Azores Islands under the acronym MoMAR (Monitoring the Mid-Atlantic Ridge). The logistical and financial hurdles are formidable.

This workshop, which was attended by approximately 80 scientists from 12 countries, was aimed at making the move beyond planning the observatory (i.e., compiling the wish-list of useful experiments, parameters etc.), which had been achieved by the previous workshop (see report on this InterRidge Workshop at www.interridge.org/SCIENCE/Science_reports/ReportPDFs/momar2report2002.pdf), toward defining the implementation plan to allow us to collect these data.

Hydrothermal sites on spreading axes are also increasingly become the focus of interest from environmental protection groups and the meeting looked at how scientific research, an integral

and essential part of any protection strategy, can best be coordinated to yield maximum results with minimal environmental impact. The workshop report is available as a first draft and will be finalized and available on the InterRidge website shortly.

InterRidge Steering Committee Meeting

IFM-GEOMAR, Kiel, Germany, 11-12 April 2005.

The 2005 InterRidge steering committee meeting took place in Kiel, Germany in April, and was well attended with 13 of the 16 then current members present. Since the meeting, Spain has become an associate member of InterRidge. Apart from introducing new steering committee members and presenting updates of the national ridge programs and activities, a lot of discussion regarding the code of conduct for research at hydrothermal vent sites, which InterRidge is developing, took place. The meeting outlines InterRidge activities for the upcoming year, and always presents an opportunity to establish networks amongst the different nations.

Cyprus Field trip

InterRidge and Ridge 2000 organized a field school and field trip to the Troodos Ophiolite in Cyprus in May 2005. Both events lasted a week and were led by Joe Cann, Leeds University, UK. Participation was good, with 38 students attending the field school and 19 scientists on the field trip. For many of the students, this was their first opportunity to meet students from other countries.

Upcoming meetings 2005-2006

12-16 September 2005 - 3rd International Symposium on Seep and Hydrothermal Vent Biology, La Jolla, Scripps, CA, USA;

Feb/March 2006 – Arctic Mid-Ocean Ridges workshop, Genova, Italy;

Mid-2006 – InterRidge Steering Committee meeting, Moscow, Russia.

Summary of 2004-2005 Publications

- Working group meeting report – *Mid-ocean ridge ecosystems, February 2004*
- InterRidge Science Flier, *September 2004*
- InterRidge News, *vol. 13, October 2004*
- InterRidge Steering Committee Report, *October 2004*
- Abstract Volume - *IR Workshop Tectonic and Oceanic Processes along the Indian Ridge System, January 2005*
- Meeting Report - *IR Workshop Tectonic and Oceanic Processes along the Indian Ridge System, February 2005*
- Abstract Volume – *III MOMAR Workshop, April 2005*;
- Meeting Report - *Long-Term Monitoring of the Mid-Atlantic Ridge Proceedings of the III MOMAR Workshop, May 2005*

Publications planned for 2005

InterRidge Steering Committee Report, June 2005;

Code of Good Scientific Practice for Research at Hydrothermal Vents;

InterRidge News, vol. 14, September 2005.

Education and Outreach (E&O)

InterRidge has a major role to play in educating the public and policy-makers about the global significance of ridges. In its second decade plan, InterRidge pledged for the first time to spearhead an education outreach program. The goal is to ensure that InterRidge's message of responsible exploration and discovery of the world's deep ocean actively engages students, policy-makers, and other members of the general public. The hope is that educating and motivating people to learn more about the mysteries of the deep sea will engender a healthier respect for the Earth system at large.

InterRidge has designed and undertaken two main E&O initiatives to help achieve its goals: a Deep Ocean Video Series and a Science Writer-At-Sea program. It is currently seeking funding for each and welcomes potential partners. A pilot test of the Writer-At-Sea program will take place this summer (July – August 2005) on a cruise co-led by Rolf Pedersen (Norway). For more information on InterRidge's E&O plans please contact Kristen Kusek (kristenkusek@aol.com).

InterRidge contacts with other programs

IR has links with the following programs

- SCOR (Scientific Committee on Oceanic Research) – the InterRidge Chair and coordinator attended the SCOR Executive Committee Meeting, Italy, September 2004.
- ISA (International Seabed Authority) – InterRidge Chair attended a meeting in Jamaica, August 2004.
- SOPAC (South Pacific Geosciences Applied Commission) – coordinator is in contact with Cristelle Pratt, who will distribute InterRidge fliers and *IR News* at SOPAC meetings.
- IODP (International Ocean Drilling Program) – one of the InterRidge working groups (Deep Earth Sampling) works closely with IODP.
- ILP (International Lithosphere Program) – no contact in 2004.

Benefits of affiliation to SCOR

The prime objective of InterRidge is to facilitate collaborative research at an international level and thereby maximize the use of resources. For InterRidge to live up to its goal of facilitating international/multidisciplinary collaboration it needs to be able to interact with scientists from many nations and organize meetings to create opportunities for scientists to get together. Countries without the capacity to carry out ridge research independently most often also have difficulty in raising funds to send representatives to InterRidge meetings and workshops.

There are many benefits that InterRidge gains through its affiliation to SCOR and vice versa. At present, InterRidge has no resources to provide financial support to scientists, so support from SCOR to assist scientists from developing nations to participate in InterRidge meetings is enormously important to help our efforts to reach and involve these nations. Also, the advice provided by the SCOR Executive Committee about the possible liaisons of InterRidge to other international projects such as IODP is invaluable. The InterRidge deep earth sampling working

group will, among other issues, focus on submitting “project-type” proposals to IODP (as opposed to individual-type drilling proposals).

The success of InterRidge is measured by the benefit of the program to the international ridge community. InterRidge therefore benefits from an affiliation with SCOR in that the international profile and impact of InterRidge on ridge research worldwide is increased. This enhances its support and the facilitation of international collaborations and development of new research projects. Closer ties between InterRidge and SCOR will definitely be beneficial to both programs. InterRidge can benefit by receiving support and advice from SCOR, and SCOR will definitely benefit by giving a boost to this internationally successful program.

7.3.6 International Ocean Colour Coordinating Group (IOCCG) (Affiliated in 1997)

IOCCG is an international group of experts in the field of satellite ocean colour that acts as a liaison and communication channel between users, managers, and agencies in the ocean colour arena.

Terms of Reference:

- To serve as a communication and coordination channel between data providers and the global user community of satellite ocean-colour data, and so to maximize the benefits that accumulate from international investments in ocean-colour science and technology.
- To construct a partnership, at the international level, between the space agencies and the users of satellite ocean-colour data to develop and coordinate data utilization.
- To work closely with the appropriate international bodies (including CEOS, IOC and SCOR), international scientific programs (such as IGBP and GOOS), satellite ocean-colour mission offices and other agencies (such as environmental and fishing agencies) to harmonize the international effort and advance ocean-colour science and its applications.
- To develop a collective voice for the community of users of ocean-colour data and to articulate this voice to the appropriate international bodies, international scientific programs and space agencies.
- To promote the long-term continuity of satellite ocean-colour data sets; the development of operational, ocean-colour data services and new generations of ocean-colour sensors; and the integration of data from complementary ocean sensors.

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Membership:

Huang Ahn	KOREA	Vivian Lutz	ARGENTINA
David Antoine	FRANCE	Mervyn Lynch	AUSTRALIA
Ichio Asanuma	JAPAN/NASDA	Trevor Platt	CANADA
Ray Barlow	SOUTH AFRICA	Michael Rast	ESA
Paula Bontempi	USA/NASA	Ian Robinson	UK
Christopher Brown	USA/NOAA	Heidi Sosik	USA
Curtiss Davis	USA/Naval Res. Lab	Tasuku Tanaka	JAPAN
Pan Delu	CHINA	Eric Thouvenot	FRANCE/CNES
Roland Doerffer	GERMANY	Ron Zanefield	USA
Nicolas Hoepffner	ITALY/JRC		

Executive Committee Reporter: Bjørn Sundby

SCOR AFFILIATED PROGRAM

International Ocean-Colour Co-ordinating Group (IOCCG) Report of Activities for 2004 - 2005

Venetia Stuart (IOCCG Project Scientist)

Introduction

The International Ocean-Colour Coordinating Group (IOCCG) was established in 1996 to encourage communication between Space Agencies that possess ocean-colour missions and the users of ocean-colour data, such as scientists, researchers and program managers. The group aims to promote international co-operation in many aspects of ocean-colour science and technology. Ocean-colour data is critical for the study of ocean primary production and global biogeochemistry, and is also used in the study of ocean ecosystems as well as monitoring and management of the coastal zone.

One of the Terms of Reference of the IOCCG is to promote the long-term continuity of ocean-colour data sets by building a multi-sensor, multi-year ocean-colour archive to examine mid- to long-term changes in phytoplankton biomass. A number of issues need to be addressed before this can be done, including the calibration of each sensor, inter-calibration between different instruments, algorithm differences and also data-binning issues. Many of these issues are currently being addressed by scientific working groups established by the IOCCG (see below).

The IOCCG also has a strong interest in education, especially in developing countries, and has conducted and sponsored a number of advanced training courses on applications of ocean-colour data. These courses have been in high demand and have helped to broaden the ocean-colour user community as well as advocate the importance of ocean-colour data.

Activities of the IOCCG are dependent upon financial contributions from national Space Agencies and other organisations, and upon infrastructure support from SCOR.

Organizational Structure of the IOCCG

The IOCCG consists of an international committee of experts in the field of satellite ocean colour, with representatives from various Space Agencies as well as the scientific user communities. The group is currently chaired by Dr. Trevor Platt of the Bedford Institute of Oceanography (Canada) who will be replaced by Dr. James Yoder (University of Rhode Island, USA) at the next Committee meeting (January 2006). The IOCCG is an Associate Member of the Committee on Earth Observation Satellites (CEOS), and was accorded status as a SCOR Affiliated Program in 1998. The IOCCG Secretariat is hosted by the Bedford Institute of Oceanography (Department of Fisheries and Oceans, Canada), and is staffed by Project Scientist, Dr. Venetia Stuart.

Current Activities of the Scientific Working Groups

A number of specialised scientific working groups have been set up by IOCCG to investigate various aspects of ocean-colour technology and its applications. Many of the working groups are examining issues that need to be addressed before data from different sensors can be merged. The end product of these working groups is usually the publication of an IOCCG report, or a recommendation to Space Agencies or to CEOS. To date, four such reports have been published by the IOCCG, a recommendation has been endorsed by CEOS, and numerous letters have been written to various Space Agencies providing advice on technical matters. Last year, the IOCCG published a report from the data-binning working group which was chaired by Dr. David Antoine (Laboratoire d' Oceanographie de Villefranche). The working group examined the diversity in current binning schemes used for ocean-colour data, and assessed the impact of different schemes being used by various Agencies. Their report was published in the IOCCG Report Series (IOCCG Report 4, 2004), and is entitled "**Guide to the Creation and Use of Ocean-Colour, Level-3, Binned Data Products**". The authors noted that it was important to avoid introducing artefacts when merging data sets from different ocean-colour sensors as a result of incompatibilities in time or space scales. They recommended a basic approach that could be used across Agencies.

Currently, there are six active IOCCG working groups in various stages of progress, many of which are nearing completion and are expected to publish reports in the year ahead, and a seventh working group was formed at the last IOCCG Committee meeting (January 2005). A summary of the progress and achievements of each working group is given below.

- **IOCCG Working Group on Comparison of Atmospheric Correction Algorithms**
Chair: Dr. Menghua Wang, University of Maryland

The main objective of this group is to quantify the performance of atmospheric correction algorithms used by the SeaWiFS, MODIS, OCTS, GLI and MERIS missions, so that derived products from these ocean-colour missions can be meaningfully compared and possibly merged. Outputs from individual algorithms have been analyzed using a simulated data set, but the working group still needs to carry out further detailed analyses to understand differences in the algorithm performance. A workshop is planned for early 2006 to discuss the results and to work on the draft report.

- **IOCCG Working Group on Operational Ocean-Colour**
Chair: Dr. Christopher Brown, NOAA

The goals of this working group are to promote the use of near-real-time, ocean-colour products, to facilitate the exchange of ocean-colour applications, and to assist in the exchange of ideas and approaches among Agencies that currently possess, or will establish, an operational ocean-colour mission. This year, the group will focus on writing a report entitled "Why Ocean Colour: A Case for Visible Oceanography of the Ocean". The group plans to hold a workshop in September/October 2005 to finalise the draft report.

- **IOCCG Working Group on Radiometric Calibration of Satellite Ocean-Colour Sensors**
Chair: Dr. Robert Frouin, Scripps Institution of Oceanography, USA

This working group is examining the various approaches used for pre- and post-launch calibration of different ocean-colour sensors. The group held a meeting in October 2004 (Fremantle, Australia), to discuss definitions and requirements, various calibration techniques, and the selection of final calibration coefficients. Various chapters of the report were outlined, and a draft report should be submitted to IOCCG by fall 2005.

- **IOCCG Working Group on Ocean-Colour Algorithms**
Chair: Dr. ZhongPing Lee, Naval Research Laboratory, USA

The objectives of this working group are to perform algorithm cross-comparisons, to recommend certain algorithms and to report on the progress of algorithm development. Two large data sets of Hydrolight-simulated data (with and without the contribution of inelastic scattering) have been synthesised for algorithm comparison, and a large data set of *in situ* measurements (chl, remote sensing reflectance and phytoplankton absorption) has also been compiled. Various empirical and semi-analytical algorithms have been applied to the data sets to test their performances. The results of these tests will be included in an IOCCG report, tentatively entitled “Data and Remote-Sensing Algorithms for Inherent Optical Properties”. A working group meeting will take place in July 2005, in Hamburg, to finalise the report, which will be sent to the IOCCG for review.

- **IOCCG Working Group on Global Ecological Provinces**
Co-Chairs: Mark Dowell, JRC, Italy and Trevor Platt, BIO, Canada.

The aim of this working group is to review the utility of ocean partitions as a tool for the interpretation and application of ocean-colour data. The group will also examine the use of ocean colour as a tool for delineation of dynamic boundaries in these partitions, and will review the application of ocean-colour partitions to oceanographic problems such as the ocean carbon cycle, climate change and resource management. This working group has already held two working group meetings: one in Villefranche (October 2003), which focussed on methodological aspects such as defining boundaries and making use of ocean colour and ancillary data, and the second in Ispra, Italy (September 2004), which focussed on looking at how existing methods and partitions could be put to use with ocean-colour data. The final draft of the report should be ready by the end of 2005.

- **IOCCG Working Group on Co-ordination of Merged Data-Sets**
Co-chairs: Watson Gregg and Paula Bontempi (NASA HQ, USA)

The objectives of this working group are to develop a procedure to be used by Agencies to merge ocean-colour data from various ocean-colour sensors in order to produce a self-consistent, long-term time series of satellite-derived ocean biogeochemical observations. While the IOCCG does not have the resources to produce a large, merged, data set, it could help implement a strategy to achieve this.

This group will work with various Agencies to ensure that similar data are being archived, and they will make recommendations regarding data-merging techniques. The group held a very successful workshop in Washington D.C. in May 2005, with participants from various Agencies and

institutions. During the workshop data and knowledge requirements were defined, various methodologies were assessed, and possible approaches for merging coincident ocean-colour data from multiple sensors were discussed. The group plans to draft an IOCCG report by the end of 2005, which will include the benefits of merging data, a survey of available missions, products to be merged, a survey of possible methodologies, and what is needed to achieve success that is not being done.

- **IOCCG Working Group on Requirements for an Ocean-Colour Sensor in the Coastal Zone**
Co-chairs: Curtiss Davis (NRL, USA) and Christopher Brown (NOAA, USA)

This new working group was established at the 10th IOCCG Committee meeting in Venezuela (January 2005). Its goals are to define the optimal sensor, or suite of sensors, to characterize the coastal ocean for oceanographic and societal applications. This will include assessing current capabilities, recommending optimal sensor characteristics (including spectral channels, SNR, frequency of sampling) and considering combinations of sensors and platforms (polar orbiters and geostationary sensors). The group plans to form an international committee which will include experts on all key topics (sensor design, calibration, atmospheric correction, applications, products and product validation) with a maximum of 12 people. A workshop will be held in the fall of 2005 to create the first draft of the report. The working group will also address retrieval of properties other than chlorophyll.

Capacity-Building Initiatives

Training and capacity building was another major focus area of the IOCCG during 2004/2005. The IOCCG has organised and financed several intensive training courses and workshops on ocean-colour related topics over the past few years, and has also established a very successful Fellowship Programme to permit young scientists from developing countries to travel to an institute outside their home country to gain valuable training experience. In addition, the IOCCG also offers scholarships for scientists from developing countries to attend conferences. Over the past year, the IOCCG has coordinated the following capacity building initiatives:

- Four IOCCG Fellowships were offered this year, with a focus on the analysis of bio-optical data collected during the BEAGLE 2003 expedition on board the *R/V Mirai* (IOCCG also supported several students to participate in this cruise). Exchanges took place between China and the USA, Uruguay and the USA, Argentina and Chile, and Brazil and Canada. The students travelled to various centres of excellence and worked with experts in the area of remote sensing of ocean colour for periods of up to three months. The IOCCG Fellowship Programme is regarded very positively by the host scientists and institutions, and provides an invaluable training experience for the students.
- IOCCG, along with POGO and IAI, sponsored the second meeting of the ANTARES network in Venezuela (11-15 January 2005). The collaborative ANTARES bio-optical network was established in 2003 with IOCCG support, to bring together scientists working on biological time-series stations in the waters around South America. It has an ocean-colour remote-sensing

component, as well as *in-situ* and modelling components, and has been successful in raising funds from IAI for some of their activities. The goal of the network is to study long-term changes in coastal ecosystems, to distinguish changes due to natural variability from those due to external perturbations (climate change and anthropogenic effects). An integrated database of field measurements and ocean-colour satellite images from the entire South American coastal zone is being compiled by the ANTARES group, and measurements carried out at a number of existing time-series stations around South America are currently being standardized.

- IOCCG coordinated and sponsored (along with the IOC) an intensive, post-graduate training course on "Remote Sensing of Ocean Colour in Open, Coastal, and Estuarine waters", at the Facultad de Ciencias, Universidad de la República, Uruguay (4 - 15 April 2005). Fifteen students from Argentina, Brazil, Chile and Uruguay took part in the course, which also formed part of the post-graduate Uruguayan program called PEDECIBA (Programa de Desarrollo de Ciencias Básicas). The course was taught in English and Spanish by six lecturers from USA, Canada, Argentina, Chile and Uruguay. The emphasis of the course was on applications of ocean colour relevant to the South American region, and consisted of lectures, tutorials and practical sessions. The course contributed to the building of capacity in the area of ocean-colour remote sensing in South America, and in Uruguay in particular. It also provided a forum for future collaboration between students and scientists of the region. Unfortunately, funding limitations restricted the number of participants to a total of 15, but the large number of outstanding applications received from prospective students from many Latin American countries indicates the pressing need for future training of young South American scientists in the ocean-colour arena.
- IOCCG also offered a number of travel scholarships for students from developing countries to attend the 8th International Conference on Remote Sensing for Marine and Coastal Environments in Halifax, Nova Scotia, Canada from 17-19 May 2005. The selected students were actively involved in ocean-colour research and presented the findings of their research at the meeting.

IOCCG Homepage

IOCCG advocates the importance of ocean-colour data to the global community through maintaining and updating a comprehensive web page (<http://www.ioccg.org>), which provides a wealth of information on many aspects of ocean colour including sensors, publications, conferences, training opportunities, ocean-colour data and employment opportunities. In addition, the IOCCG distributes a newsletter via the Internet every 2-3 months to around 1,000 subscribers. These newsletters keep the ocean-colour community informed of important events, research activities, training initiatives and instrument news. NASA has acknowledged the importance of the IOCCG homepage by creating a prominent link from their "Ocean Color Web" page.

IOCCG Committee Meetings

The IOCCG Committee meets once a year to co-ordinate the activities of the group as a whole and to plan and discuss future activities. The Executive Committee also meets once a year to discuss financial matters. The next Committee meeting is scheduled to take place in South Korea from 11 to 14 January 2006.

Current Membership of the IOCCG

The IOCCG Committee is currently chaired by Dr. Trevor Platt of the Bedford Institute of Oceanography (Canada) who will be replaced by Dr. James Yoder from the University of Rhode Island (USA) at the next Committee meeting. The Committee consists of about 20 members drawn from Space Agencies and the ocean-colour community, selected to reflect a balance of both providers and users of ocean-colour data as well as geographical location. The term of service is usually three years except where the members' participation is governed by a Space Agency nomination. Rotation of members is being implemented according to a roster. Next year, four members (marked with an asterisk) will step down from the Committee.

IOCCG Committee Members (2005/2006)

Ahn, Yu-Hwan	-	Korea Ocean Research and Development Institute, Korea
Antoine, David	-	Laboratoire de Physique et Chimie Marines, France
Asanuma, Ichio	-	Tokyo University of Information Sciences, Japan
Barlow, Ray	-	MCM, Cape Town, South Africa
Bontempi, Paula	-	NASA HQ, USA
Brown, Chris	-	NOAA/NESDIS, USA
Davis, Curtiss*	-	Naval Research Lab, USA
Delu, Pan	-	Second Institute of Oceanography, China
Doerffer, Roland	-	GKSS, Germany
Hoepffner, Nicolas	-	Joint Research Center, Ispra, Italy
Lutz, Vivian*	-	INIDEP, Argentina
Lynch, Mervyn	-	Curtin University, Australia
Platt, Trevor (past Chair)	-	Bedford Institute of Oceanography, Canada
Rast, Michael	-	ESA/ESTEC, Netherlands
Robinson, Ian*	-	University of Southampton, UK
Sosik, Heidi	-	Woods Hole Oceanographic Institution, USA
Tanaka, Tasuku	-	EORC/NASDA, Tokyo, Japan
Thouvenot, Eric	-	CNES, France
Yoder, James (new Chair)	-	University of Rhode Island, USA
Zaneveld, Ron*	-	Oregon State University, USA

We are still waiting to hear back from a prospective new member from India.

List of Current Sponsors

- BIO (Bedford Institute of Oceanography, Canada)
- CNES (Centre National d'Etudes Spatiales, France)
- CSA (Canadian Space Agency)
- ESA (European Space Agency)
- IOC (Intergovernmental Oceanographic Commission)
- JAXA (Japanese Aerospace Exploration Agency)
- JRC (Joint Research Centre, EC)
- NASA (National Aeronautics and Space Administration)
- NOAA (National Oceanic and Atmospheric Administration)

The Bedford Institute of Oceanography provides in-kind support for the IOCCG in the form of office space, computers, informatics support, fax, phone and postage.

Benefits of the Affiliation to SCOR

SCOR currently helps IOCCG to co-ordinate its finances by motivating for, and receiving funds from NASA and NOAA, for the IOCCG. These two Agencies are not able to transfer funds outside the USA, so the funds are channelled through SCOR. The IOCCG has greatly benefited from the efficient and professional manner in which its funds have been managed by SCOR. In addition, the IOCCG has been strengthened by having visible links with one of the major international organizations in the marine sphere. The affiliation of the IOCCG with SCOR also ensures an efficient mechanism for coordination with other programs, such as the IOC.

7.4 Other Organizations

7.4.1 Partnership for Observation of the Global Ocean (POGO)

Summary Report on POGO Meeting

By JG Field

1. GEO Process:

POGO, IOC and SCOR need to collaborate to make representations to the GEO Process, which so far has given little recognition of the role of the oceans in global change or accepted little scientific input. POGO sent the "Brest communiqué" to Keith Alverson at the simultaneous GEOSS meeting in Ottawa. Keith Alverson, representing GOOS at the Ottawa meeting, will hopefully be able to report some progress. It was suggested that POGO should dedicate the equivalent of one person near full-time, to provide advocacy for ocean observations and marine science at GEO for about two years starting in 2005. POGO requests help from GOOS/IOC and SCOR for scientific and technical input into GEO. Jesse Ausubel offered to help apply for travel funds (grant from Sloan Foundation) for a marine science advocate to go to GEOSS meetings. A POGO publicity sub-group will meet in Brussels in February 2005 after the GEOSS meeting.

2. Database of research cruises:

Marieke Rietveld (NIOZ, Netherlands) spoke about international inventories of research vessels (mainly over 60m in length). Databases in operation include: ISOM, UNOLS, OFEG, OFWG, MarinERA. EUR-OCEANS has a database of planned and pre-planned cruises in Lisbon (is it working yet?). Link this with U. Delaware database?
John Gould appeals for database of research cruises for calibrating Argo salinities to .005 psu. Need CTD data within 1 month.

Should SCOR, IOC or POGO help maintain a database of cruises in pre-planning, planning stages and afterwards? Or all three jointly with one taking responsibility to co-ordinate it?

Action: POGO to contribute to a small joint POGO,/SCOR/IOC working group:

Marieke Rietveld (POGO, NIOZ, Neetherlnds), Doug White (U. Delaware), SCOR nominee (Ed Urban?), EUR-OCEANS database (Laurent D'Ozouville) (Google: EUR-OCEANS website), IOC nominee (VOS system) to meet to:

- A) Identify features needed in an ideal planned research cruise database
- B) Determine how well existing databases fit the ideal, and how they would need to be changed to be most useful for research scientists
- C) Estimate the cost of modifying an existing database or create a new one
- D) Request support from appropriate agencies to augment an existing database or create a new one.

3. Capacity Building:

POGO/SCOR/IOC studentships as before (IOC funds in doubt)

Nippon Foundation - POGO visiting professorships in developing countries with full costs for professors and courses: 3-6 months. Proposals in Jan each year. 2 awarded in 2004/5. "Eating from same bowl".

4. GOOS Structure: The GOOS Coastal implementation plan is in review. It is an ambitious but practical plan. I suggest that it be limited to 3 sub-groups and that capacity building be incorporated in all activities of Coastal GOOS. GRAs are essential for the success of Coastal GOOS. IOC cannot afford the funds or time involved in multiple meetings that the present complex structure implies. It is suggested that all GOOS sub-panels should have limited duration (e.g. deliver within 3-4 years), then disband unless a strong case is made to continue them with new TOR.

5. Next Meetings: POGO-7 will be held in Hyderabad, India in January 2006, and POGO-8 in Qingdao, China.

John Field

1 Dec 2004