Environmental Conservation 25 (1): 77–82 © 1998 Foundation for Environmental Conservation

MEETING REPORTS

International Symposium on Possibilities for Sustainable Forest Management in the Neotropics

Held at the Hotel Cortez, Santa Cruz de la Sierra, Bolivia, during 15–20 July 1997

The main purpose of the symposium was to provide an opportunity for the countries in the region to exchange experiences and disseminate their knowledge of sustainable management of natural tropical forests. In this context, the use of presentations, and exchange of 'tools', to improve the implementation of sustainable development in the different countries was encouraged, as well as identification of areas or specific subjects which require more attention. One hundred and seventy people from 18 countries attended the event. Approximately 50% were Bolivians, 45% came from other countries of the Americas, and the remaining 5% were from other countries.

Santa Cruz is one of the nine departments that make up Bolivia; it is located at 416 m above sea level, 12 of the 55 protected areas of the country are within its boundaries, and it includes 14 million ha allotted to timber production. The symposium was a joint effort of the Bolivia Sustainable Forestry Project (BOLFOR-USAID-MDSMA, Bolivia), the Center for International Forestry Research (CIFOR, Indonesia), and Division 1: Silviculture and Division 3: Forest Techniques and Harvest, of the International Union of Forestry Research Organizations (IUFRO).

The symposium was divided into two main activities, namely presentation of invited and voluntary papers and working groups (2.5 days), and a field visit (2.5 days).

After the inauguration, three keynote papers were presented, one on the challenges, shortcomings, and opportunities for tropical forest management, another on the importance of low-impact logging practices, and a third on the importance of an efficient institutional and legal frame for conservation and sustainable use of forests and forest lands. The diversity in the three keynote presentations reflected the fact that forest management is not only a technical, ecological, or scientific issue, but one that requires a multidisciplinary approach.

Activities for the second and third day started with two invited papers, one on ecological aspects and the other on topics more closely related to forest management. After these presentations, the rest of the day was scheduled for two concurrent sessions, ending the daily activities with working groups in plenary to discuss key aspects that emerged during each day's presentations.

A total of 43 papers were presented, and it is worth noting that most of these were the work of young people from the region, thus reflecting its existing level of professional attainment, as well as the potential to address future and current problems.

A field visit was organized for the remaining two and a half days. Twenty-five people participated in this part of the event, which included a visit to the Lomerio Forest Management Project. This Project has been carried out during the last 10 years by approximately 25 Chiquitano indigenous communities groups around Central Indigena Comunal del Oriente de Lomerio (CICOL). The area visited is located in the sub-tropical dry forest life zone, and the visitors were able to observe different management activities and research projects.

The proceedings of the symposium, including all papers presented, are available from Dr William Cordero.

The Santa Cruz Declaration on Sustainable Forest Management was also issued: 'One hundred and seventy participants have met at the International Symposium on Possibilities for Sustainable Management in the Neotropics, in Santa Cruz de la Sierra, Bolivia, from July 15 to 20, 1997. The participants represent, jointly, roughly 2975 years of experience in tropical forest utilization, research, and management, representing 18 countries which comprise at least 75% of these forests and declare the following: A planned harvest producing the least possible impact is the first silvicultural treatment and the basis to carry out forest management and for responsible biodiversity conservation. Involvement of local communities and respect of their rights is just as important as the participation of senior management in the commitment to carry out forest management. Dissemination of research results and available experiences to those in charge of carrying out forest management at different levels, decision makers, and society as a whole, is critical to achieve the required change in attitude, towards the utilization of forest resources. Research and forest management implementation should be carried out within a multidisciplinary frame, searching to perfect upon forest management tools. Training at different levels, should be an ongoing activity at the firms or communities that undertake forest management activities. Joint efforts by Latin American countries, as well as an ongoing exchange of experiences will facilitate sustainable forest management and consequently forest conservation in the future. Based on the knowledge and expertise acquired to date, forest management activities can be undertaken in earnest at any given time. Lack of knowledge or previous experience cannot be used as excuse for not carrying out forest management activities.'

WILLIAM CORDERO
Proyecto BOLFOR
Casilla 6204
Santa Cruz, Bolivia
Tel: + 591 3 364696
Fax: + 591 3 364319
email: michell@mitai.nrs.bolnet.bo

Coastal Zone 97: Charting the Future of Coastal Zone Management

Held in Boston, Massachusetts, USA, during 19–25 July 1997

The conference was sponsored by the University of Massachusetts, National Oceanic & Atmospheric Administration (NOAA), US Army Corps of Engineers, US Environmental Protection Agency (EPA) and others. Placed under the slogan 'Charting the future for coastal zone management' the conference aimed at evaluating existing coastal and ocean resource management programmes, in an attempt to develop strategies for such management into the next century.

Three hundred and fifty papers were presented in 75 sessions to over 1250 participants. There were two keynote addresses and a

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press

forum, titled respectively, 'Rethinking integrated coastal management into the next millennium', 'Can sustainable development be achieved in coastal communities?' and 'Coastal change: what does it mean for our health?' In addition three panel plenary sessions were held.

The first plenary session was moderated by William Matureski (EPA). Past and future coastal and economic issues were reviewed, in response to world-wide development pressures on finite shoreline space. It looked back on what had been accomplished, what failed, and what lessons the experiences carry. In 1972 in the USA, the Coastal Zones Management Act established a national policy for the coasts. The Act stressed balancing our need for economic development with our desire to preserve the environment. Now 30 US states cooperate with the Federal Government attempting to keep the coastal environment and economy healthy. This was the theme of the major keynote address, by Cardinal Bernard Law, (Archbishop of Boston), on 'Rights and responsibilities of the fishing community'. The Act has led to restored fisheries, reduced pollution and improved access for recreation, but development pressures continue to threaten natural resources.

Margaret Davidson of NOAA moderated the second plenary, which was a response to the decline of fisheries. Over-fishing, pollution, antiquated infrastructures, and a lack of public funding were cited as causes. These were to be countered by 'Sustainable development' a strategy that promotes a partnership between the sometimes antagonistic concepts of environmental protection and economic revitalization. To George Woodwell (Woods Hole Research Center) it is a moral imperative for governments to strive towards conserving biodiversity and ecosystem health, just as it is their responsibility to protect public health. Space is no longer available for further major intrusions into nature and the time has come for gross efficiency improvements in the exploitation of basic earth resources. Trudy Coxe (Massachusetts Environmental Affairs Office) described local strategies to vitalize coastal communities, promoting sustainable economic growth through: a comprehensive port revitalization strategy, growth management initiatives and a landmark effort to revitalize coastal urban communities.

A former Massachusetts legislator, Barbara Gray, moderated the third plenary session. Here experts foresaw the global changes in the marine environment as likely to increase the exposure of millions of people to new diseases and health risks. Growing populations and economic activities increase pollution loads and sewage run-off in coastal regions, thus setting the stage for changing patterns of both infections and chronic diseases; the increase in toxic algal blooms. The introduction of dangerous pathogens poses pressing health problems which could be compounded by the effect of greenhouse gases in the coming decades.

Twenty-one round table sessions were held, most sparkle being provided by the World Bank panellist who listed some 'advances' of the 'Blue Team'. He suggested making water 'an economic aspect', announced a 'new World Bank' had set aside US$ 360 million for environmentally sustainable coastal zone management, and discussed 'harmful subsidies'. Among newer subjects discussed were the World Bank involvement in the marine market transfer initiative (MMTI), and alternative livelihoods (e.g., shrimp farming for a Thai-Japanese trade, live coral-reef fish trade, expansion of ecotourism).

Subject distribution was fair: five sessions covered New England in general, 15 sessions remained faithful to the coastal management theme, ecotourism had only one session but the topic spilled over into other sessions. Three sessions dealt with economics, four with oil-spills, six involved public participation and two discussed the future of coastal zones. Seven sessions were 'internationally geared' with more African than Asian topics, and covered principally, management, coastal erosion and flooding.

A novel feature was presentations on environmental justice, a timely innovation coming on the heels of the Seventh International Court of the Environment Conference (Paestum, Italy, June 1997). It provided an opportunity to illustrate the frequent opposition between public and private interests. Exception was taken to a proposed moratorium on 'sustainability', which was properly labelled in French as the equivalent of 'range dans les cartons'.

ROGER H. CHARLIER
Free University of Brussels (VUB) & HAECON NV
2 ave. du Congo (Box 23)
B-1050, Brussels
Belgium

International Conference on Transboundary Protected Areas as a Vehicle for International Cooperation

Held in Somerset West (Cape Town), South Africa, during 16–18 September 1997

There are more than 130 sites in the world where established protected areas such as nature reserves abut each other, although divided by a national boundary. Numerous additional border-straddling sites worthy of nature conservation exist in which only one or neither side of the border is presently under formal nature protection.

Attempts to link such adjacent pairs of existing or potential reserves at some level of greater or lesser formality, and to achieve some combination of environmental, economic, and political synergism, date back at least to the post World War I era. The major environmental justification for linkage is hereby to achieve protected status for an area of sufficient size to insure its ecological integrity (e.g., to maintain an adequately diverse and sufficiently large gene pool, or to encompass the range necessary for large mammals). The major economic justification for linkage is thereby to maximize efficiencies of scale (e.g., for avoiding duplication of expensive equipment or efforts, or for the development of viable ecotourism),. The major political justification for linkage is thereby to cement and reinforce confidence and security between adjacent states, thus serving as a stabilizing and conflict-prevention measure.

This conference, which was co-sponsored by the World Conservation Union (IUCN; Gland, Switzerland) and the recently-established Peace Parks Foundation (Somerset West, South Africa), brought together 72 experts from some 30 countries around the world. The fields represented included plant and animal ecology, environmental conservation, park management, law, diplomacy (both governmental and United Nations), funding, and tourism (representing a rapidly-expanding sector of the world economy).

Plenary sessions or workshops were devoted to: the role that transboundary protected areas could play in encouraging international cooperation; those factors favouring environmental cooperation across borders; environmental cross-border problems, and related means of dispute resolution; the special problems in border regions associated with armed conflict and its aftermath, and approaches to

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press

their mitigation; the development of criteria for determining the level of priority of a transfrontier protected area, and thence to the actual identification of as yet unrecognized or under-appreciated border-straddling sites; and the establishment and subsequent management of transfrontier reserves at different (and evolving) levels of formality. Questions of funding and financial sustainability surfaced frequently, with the importance of the Global Environment Facility (especially of its World Bank component), as well as of NGO and private-sector integration, being stressed.

As to case studies, among the sites that were accorded especially detailed examination were: the Virunga-Volcano Mountain area, shared by Congo, Rwanda, and Uganda, and noted for its endangered mountain gorillas (*Gorilla gorilla beringei*); the Nimule national park in Sudan on its border with Uganda; the rugged tri-border region where Cambodia, Laos, and Viet Nam meet, noted for its several recently-discovered large mammals; the demilitarized zone separating the two Koreas, noted *inter alia* for the winter range it provides to certain threatened cranes (especially *Grus japonensis* and *G. vipio*); the Meso-American biodiversity corridor traversing Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama (and including the San Juan River watershed straddling the Costa Rica-Nicaragua border); the Big Bend region of the Rio Grande on either side of the Mexico-USA border; and the Dead Sea watershed linking Israel, Jordan, and Palestine. Particular attention was also given to various of the seven high-diversity border-straddling sites each of which South Africa shares with one or more of its six neighbours (Botswana, Lesotho, Mozambique, Namibia, Swaziland, and Zimbabwe) and which the Peace Parks Foundation has taken on as its initial mission to transform into environmentally, socially, and friendly sustainable transfrontier conservation areas.

Subjects explored with some vigour (although, quite understandably, not in every instance brought to a point of satisfactory closure) included: means for minimizing environmental damage (including infrastructure destruction) resulting from the all too frequent incidence of armed conflict in transfrontier sites; the facilitation of post-war recovery from such disruption; and philosophical, ethical, and legal considerations related to transfrontier cooperation, *inter alia*, with a substantial start made on developing a code of conduct related to transfrontier protected areas applicable to both peacetime and wartime situations. The importance of local-community and indigenous-group involvement to the success of transfrontier protected areas was emphasized in various contexts. Also stressed was the importance of integrating protected areas into an overall plan for environmentally and socially sustainable development of a region. The value of involving existing regional economic integration organizations (e.g., SADC, IGAD, ASEAN) was noted on several occasions. Concern was expressed a number of times over the absence of any substantial attention being paid at the conference to the potential for transfrontier marine reserves in territorial waters.

The participants, who were convinced that the time was ripe for the spread of transfrontier protected areas in the combined interest of environmental and political security, were anxious that the momentum generated by the conference be maintained. They lauded the heroic efforts of the Peace Parks Foundation in reinforcing the new era of peace and stability in southern Africa through the promotion of transfrontier reserves. And they charged IUCN with preparing, and distributing widely, guidelines that included confidence-building and conflict-prevention measures for the establishment and management of transfrontier protected areas within the framework of the code of conduct being developed. They further suggested that the desirability be explored by IUCN of creating a body to monitor and publicize military and other threats and inroads to the integrity of key protected areas such as natural heritage sites, wetlands of international importance, and biosphere reserves (one perhaps modelled after TRAFFIC in the watchdog role it has carved out for itself regarding CITES infractions).

IUCN expects to publish the proceedings of the conference in 1998.

ARTHUR H. WESTING
Westing Associates in Environment, Security, & Education
RFD 2, Box 330 H
Putney, VT 05346
USA
e-mail: westing@together.net

Partnerships for Global Ecosystem Management: Science Economics and Law, 5th Annual World Bank Conference on Environmentally and Socially Sustainable Development

Held in Washington, DC, USA, during October 6–10 1997

The theme for the 1997 World Bank Conference on Environmentally and Socially Sustainable Development was the interplay of the scientific, legal, and economic requirements of global ecosystem management. According to the conference literature, 'Although international agreements are but one element of addressing global environmental issues such as the loss of biodiversity, climate change, desertification, ozone depletion, and water degradation, they play a crucial role. It is essential that they reflect the best available scientific knowledge, that they embody the most sensitive economic analysis to advance the most cost-effective means of achieving the desired results, and that legal arrangements responding to these agreements create a level playing field and opportunities for innovation in the market place.'

The stated conference objectives were threefold: (1) to engage external experts with Bank managers and country staff; (2) to provide a unique opportunity for major professional groups to interact on the requirements to link scientific, economic, and legal solutions for global ecosystem management at the country level; and (3) to promote understanding as to how best practice and innovations can be used for shared ecosystem management in sustainable development planning.

The conference was broadly attended by representatives from the World Bank and other international development institutions, as well as from many US and international non-governmental organizations. There was a particularly large international representation at the conference, from both developed and developing nations. The conference was free and most of it was open to the public, although there was also a series of concurrent meetings that were by invitation only. Due to the large and diverse nature of the conference, total attendance was difficult to determine, but was estimated to be well over 1000.

The events of the conference may be divided according to five categories: plenary sessions, thematic round tables, regional round tables, associated events, and invitation-only concurrent meetings.

The plenary sessions were held at Lisner Auditorium at George Washington University in Washington, DC. The Master of

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press

Ceremonies for the plenary was Ismail Serageldin (Vice President, Environmentally and Socially Sustainable Development, World Bank). The conference commenced with opening remarks from Stephen J. Trachtenberg (President, George Washington University) and James D. Wolfensohn (President, World Bank). The conference was dedicated to the memory of Jacques-Yves Cousteau. The main plenary sessions took place over the first two days of the conference. Topics addressed in the plenary speeches and panels included the following: Global challenges for managing ecosystems; The sovereignty of systems of nature and nations: challenges and opportunities; The requirements of leadership for national solutions; The big picture: linking global environmental issues and human needs; The global treaties: making connections for efficiencies, effectiveness, and equity; The role of law in the promotion of sustainable development; and Innovations and opportunities in public/private partnerships.

Some of the many important participants in the plenary sessions included Maurice Strong (Under Secretary General and Executive Coordinator for United Nations Reform), Peter Doherty (Nobel Laureate, Immunology) Robert Watson (Director, Environment Department, World Bank), Mostafa Tolba (President, International Center for Environment and Development, Cairo University), Christopher Weeramantry (Vice President, International Court of Justice, The Hague), Jose Vargas (Minister of Science & Technology, Brazil), Mohamed El-Ashry (CEO & Chairman, Global Environment Facility), and Alassane D. Ouattara (Deputy Managing Director, International Monetary Fund).

The concurrent thematic round tables, which were held within the World Bank complex, covered four topic areas: climate change; biodiversity; desertification and forests; and international water regimes. The two regional round tables discussed regional and subregional approaches toward environmentally and socially sustainable development in sub-Saharan Africa. The Latin America and the Caribbean round table included discussions of the mesoamerican biological corridor, the impact of science on conservation development, and the interplay of poverty and social development.

Associated conference events that were open to the public included the following: an all-day discussion on developing a global perspective of ethics and values which included a panel discussion entitled 'Global values: requirements for a humane figure', chaired by Herman Daly (University of Maryland); a programme on geographical information systems (GIS) and remote sensing which included an exhibition held in the main atrium of the World Bank headquarters, a training seminar in GIS for coastal management, and a series of lunchtime workshops; a seminar on El Niño as an impetus for strategic management on droughts; a seminar on the phenomenon and contributing and mitigating factors of desertification; a two-day event on biotechnology and biosafety; a forum on 'Human settlements, human solidarity, and global ecosystems'; a conference on coral reefs; a workshop on indicators for natural resource management; and a plenary programme on mainstreaming freshwater biodiversity in development projects.

There were also several concurrent meetings that were by invitation only. These included meetings on 'Organizing knowledge for environmentally and socially sustainable development'; 'Multinational finance institutions on environmental procedures'; 'Water diplomacy for the 21st century'; 'Task force on higher education and society consultation'; 'Global ecosystem strategies for the 21st century'; and 'Ethics and values for a sustainable future'.

Again according to the conference literature, 'The results of the conference presentations and workshops and group and individual dialogues should be a better understanding of the roles and relationships among global systems regarding national sustainable development plans, national legislation, and macroeconomics; access to examples of best practice and innovation processes; contributions to the content of country development strategies; and assistance to development practitioners in better assessing the "global" connections of their work.' The broad agenda of the conference generally succeeded in accomplishing these ends.

Each year the World Bank publishes a volume on the proceedings from the conference, including the plenary sessions, thematic and regional round tables, and a compilations of background papers for the various round tables and associated events.

MARC E. NORMAN
1701 North Kent Street, #1003
Arlington, VA 22209
Tel: +1 703 465 0120
email: marcnorman@igc.org

BORDOMER 97. Coastal Environment Management and Conservation

Held at the Convention Centre, Bordeaux, France, during 27–29 October 1997

Of the 463 pre-registered participants, approximately 300 attended. They came from 36 countries, but the overwhelming attendance was French. The conference was co-sponsored by the Regional Council of Aquitaine and IFREMER (Institut Français de Recherches sur la Mer). Sources of support were far fewer than for the previous meeting in 1995 and the event was conducted on a less lavish scale. Neither the academic nor the business community played a role. The only social event was by invitation only. However, more seminar rooms were available for simultaneous sessions, instead of the plenary-session-only arrangements of 1995. In contrast wtih the recent coastal zone conferences in Boston (1997) and Rimouski (1996), the general public did not participate, although perhaps some politicians and policy-makers were reached. Elected officeholders were less in evidence than in previous BORDOMERS.

A small exhibition, dominated by the stands of IFREMER, the European Commission (EC) and Ecoplage, shared the main hall space with a poster area. One hundred posters had been announced, but only slightly over half were displayed, divided into three sessions: general, case studies, and tools and technologies. In an era of great emphasis on communication where the role of environmental education is stressed, these topics were missing, except for two posters.

The opening ceremonies were confined to welcomes and comments from former Prime Minister Juppé, Region President Valade and Pierre David, Chief Executive Officer of IFREMER. This was compensated for by the first round table of department prefects, mayors and councillors, whose *interventions* often sounded like a rehearsal for the upcoming elections, including complaints about the recipients of European Union funds. Nevertheless, many constructive remarks were made. More disturbing, perhaps, were the time-consuming commentaries of 'experts' which gobbled up the time allocated for audience participation. A round table focused on challenges and perspectives of the Aquitaine coast, and encompassed physical deterioration (e.g. erosion and sedimentation).

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press

The papers were of consistently high calibre, although some focused on a terribly narrow topic or site. The impressive number of papers were grouped under the following headings: general policy, coastal zone management and information rounded off with political, legal and administrative aspects; scientific tools; marine and shoreline biology; estuaries and deltas; natural and technological risks under extreme conditions; case studies of coastal zone management; GIS; and shoreline evolution.

Four plenary sessions included a coastal management technical session, and dealt with information integration to buttress local participation (Canadian presentation on the St Laurent action plan; integrated study of the Arcachon Basin; and the Reunion Island development and planning regional scheme). Other plenaries discussed the SALMON project in the service of sustainable development, the lessons from sedimentary dynamics for shoreline evolution, and described the MARIS programme of the EC's DG 3, and the MARSOURCE programme of the EC's DG 12, both of which had an exhibition stand. Finally, coastal zone management in the Mediterranean sea, the role of the *Conservatoire du Littoral* and coastal zone environment studies of the (French) OCDE (Office pour la Coopération et le Développement) were discussed.

On the last day, the second round table dealt with the present day needs and future tools of littoral development and planning policy. Unfortunately, this was poorly attended, as a result of planes, trains and a nasty pre-announced strike.

The conference, two days shorter than its predecessors, fell short of the promises inherent in the title theme. The largely French attendance limited the exchange of ideas and knowledge promoted at more international events. There were few delegates from third world countries. The next BORDOMER is scheduled for 1999 or 2000. A greater space between conferences may be beneficial.

The *Proceedings* are bound in three volumes and a small addendum. They include extended abstracts of all papers, but, unfortunately, in contrast with BORDOMER's previous publications, the posters (many outstanding) are not included. The printing job is poor: many figures are indecipherable. No ISBN is mentioned, nor is an editor. Papers are classified according to date, time, and room of presentation, and it is difficult to locate a specific paper.

ROGER H. CHARLIER
Free University of Brussels (VUB) & HAECON NV
2 Avenue du Congo, Box 23
B–1050 Brussels
Belgium

The Global Carbon Budget: Recent Advances, 5th International Carbon Dioxide Conference

Held at the Cairns Convention Centre, Queensland, Australia, during 8–12 September 1997.

Since 1981, the international scientific community, with the support of major sponsors, has held a scientific meeting at approximately four-year intervals, to assess progress on understanding of the global carbon cycle, with particular focus on the period of industrialization and major land-use modification. Meetings were held in Berne (1981), Kandersteg (1985), Hinterzarten (1989) and Carqueiranne (1993). The earlier meetings were organized primarily by the atmospheric carbon dioxide measurement community. Increasingly, scientists from other disciplines have participated, reflecting the truly multi-disciplinary nature of global carbon budgeting. International interest in the global carbon cycle from both policy and scientific perspectives remains extraordinarily high, placing focus on our capacity to predict future levels of carbon dioxide in the atmosphere.

The fifth meeting, convened by Dr Graeme Pearman (CSIRO Division of Atmospheric Research, Aspendale, Victoria, Australia) called for papers that contributed in a substantial way to the advancement of knowledge of the global carbon cycle since Carqueiranne. The conference was advertised and organized electronically, via email and the World Wide Web. This resulted in an attendance of over 200 active researchers from a multi-disciplinary international community, to exchange information on new developments in carbon cycle. Sponsorship was primarily focused on travel expenses for graduate students, resulting in substantial support for 22 international students. Registrants came from 21 countries, primarily developed countries supporting high-level research on the global carbon budget. 40% of the participants came from Europe (10% from Scandinavian countries), 28% from the north American continent, 22% from Australasia and 9% from Asia. The major sponsorship was from the USA (the Electric Power Research Institute and National Oceanic and Atmospheric Administration), the Commonwealth Scientific and Industrial Research Organization (Australia) and the World Meteorological Organization, with six other Australian sponsors.

The programme had eight main research categories, involving both oral and poster presentations, and four talks exploring the future; Atmosphere (7 oral, 28 posters); Ocean biological and pCO_2 (5 oral, 24 posters); Ocean physical (8 oral, 17 posters); Terrestrial: land use (4 oral, 14 posters); Terrestrial: fertilization (4 oral, 5 posters); Terrestrial: ecosystems (6 oral, 20 posters); Palaeo-carbon (3 oral, 8 posters); Synthesis: global modelling (7 oral, 16 posters); Synthesis: carbon cycle (3 oral, 13 posters); Futures (4 oral). Abstracts for both the oral and poster papers are available at our web site (www.dar.csiro.au).

Preliminary abstracts for all submissions were reviewed by an international programme committee comprising experts in each category, who each proposed an invited speaker and recommended selections for oral presentation. The 50 oral presentations were limited to 30-minute slots (20 minutes presentation, 10 minutes discussion). In each session, one-minute presentation for posters in the category were included in the discussion time.

To further accommodate the many excellent poster submissions, all posters were displayed all week, and nine hours were set aside specifically for poster viewing, including two two-hour evening sessions with refreshments provided. Two $500 prizes were donated by the Australian company, BHP, for best oral presentation and best poster. In keeping with the multi-disciplinary requirements of the science, no sessions were run in parallel, and all sessions were extremely well attended.

By comparison with Carqueiranne, this conference saw the emergence of massive amounts of new data relevant to global carbon budgeting, for example on large-scale ecosystem responses and on physical and biological ocean parameters. In more established areas, such as the measurement of atmospheric CO_2, considerable progress emerged on the precision and spatial coverage of measurements, including measurements of key tracers of carbon exchange (e.g. carbon isotopes and O_2/N_2 ratios in the atmosphere). The development of

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press

modelling tools is keeping pace. For example, there is rapid progress in three-dimensional (3D) ocean general circulation modelling, and the introduction of boundary layer factors into 3D atmospheric modelling. The first time-dependent 3D atmospheric inversion model emerged, capable of spatial inversions of atmospheric tracer data over decadal time scales. The 'missing sink' of yester-year is being replaced by several genuine contenders for the 'honour'. There is a clear convergence on the partitioning of fossil fuel into terrestrial and oceanic reservoirs, however, many apparent conflicts emerged during the meeting concerning the exact location and mechanisms of exchange (for example, terrestrial ecologists are putting the large recent terrestrial sink for fossil carbon in the tropics, while atmospheric inversions are preferring high northern latitudes). The degree of natural variability in the carbon cycle also retains some mystery, and the southern oceans were proposed as a key area for detection. This meeting saw the tabling of many new developments, the next meeting should see assimilation and 'digestion' of much of the new information, and resolution of many of the interesting questions given voice in Cairns.

One half-day extra-mural activity was organized during the week of the conference, a six-hour bus tour 'The ecology of the wet tropics landscape' guided by local scientists from the CSIRO Tropical Forest Research Centre, ending at a picturesque marina setting in Port Douglas for the conference dinner. Many delegates found time immediately before or after the conference to take in the delights of the Great Barrier Reef, the varied (crocodile-inhabited) river and mangrove areas and further excursions into the magnificent primitive rain-forests.

After considerable discussion (and the development of guidelines to assist in such selections), it was decided that the 6th CO_2 Conference would be held in 2001, with Japan as the host nation (Principal convenor: Dr Takakiyo Nakazawa, Center for Atmospheric and Oceanic Studies, Tohoku University, Sendai 989-77, Japan).

Extended abstracts were invited prior to the conference, edited and presented to all attendees. All contributors were also encouraged to submit heir papers to *Tellus B*. The response was large. An initial special issue is planned to appear in late 1998, with the deadline for submission of manuscripts on 1 December 1997. Invited speakers not submitting a full paper have been invited to include one to two page summaries aimed at capturing the flavour of their topic in the context of the progress made since Carqueiranne. All manuscripts will be peer reviewed following normal *Tellus* procedures. Normal page charges will apply. A copy of the special issue(s) will be distributed free of charge to all symposium participants.

R.J. FRANCEY
CSIRO Division of Atmospheric Research
PMD# 1 *Aspendale, Victoria 3195*
Australia
Tel: +61 3 9239 4615
Fax: +61 3 9239 444
email: roger.francey@dar.csiro.au

https://doi.org/10.1017/S0376892998000113 Published online by Cambridge University Press