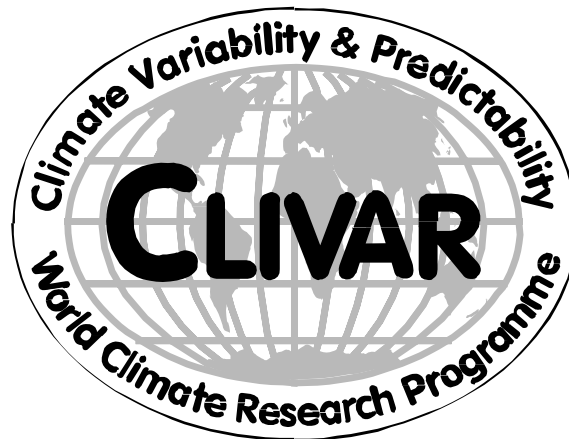


INTERNATIONAL  
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OCEANOGRAPHIC  
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WORLD  
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## WORLD CLIMATE RESEARCH PROGRAMME



**1<sup>st</sup> Session of the CLIVAR Pacific Panel**

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## **1. ACTION ITEMS**

- 1. Increase the Panel membership so that it has expertise in atmospheric and satellite observations. (ICPO and Chair)**
- 2. The international CLIVAR Pacific Panel to look to adopt an implementation and strategy closely aligned to PBECS. (Panel members)**
- 3. Establish a close working relationship between the Pacific Panel, and the WGs on Seasonal to Interannual Prediction and Ocean Model Development. (Chair)**
- 4. Look to establishing an intergovernmental resource board. (ICPO and Chair)**
- 5. To provide to JSC and CLIVAR SSG the panel view on possible future areas and mechanisms of CLIVAR Pacific interactions with biogeochemistry and carbon. (Turk)**
- 6. Produce a summary document of CLIVAR Pacific Science. (Chair)**
- 7. Explore links with AA Monsoon and Southern Ocean Panels. (Chair, Kang)**
- 8. Identify national data representatives who will provide updates on national data issues to Panel representative and ICPO (Panel members, ICPO).**
- 9. ICPO and Panel to work closely with Asia-Pacific-Data Research Center at the IPRC on both the identification of CLIVAR related data sets and on the management of ocean and atmosphere data from the Pacific sector (ICPO).**
- 10. Identify CLIVAR-relevant data sets (Cai, ICPO)**
- 11. To review the contents of SPRINT (ICPO)**
- 12. Identify data exchange problems (ICPO)**
- 13. Interact with GOOS, GCOS and GODAE to establish data requirements specific to Pacific activity (ICPO)**
- 14. Explore ways of making information on models readily available (ICPO)**
- 15. Report of PICES/CLIVAR workshop (Chair, Turk)**
- 16. Establish Pacific related issues relating to PAGES and GEWEX (Delcroix, ICPO and Chair)**
- 17. To send the comments for the improvement of the web site and to provide the updated information on ongoing and planned CLIVAR related observation in the Pacific to the ICPO (Panel members)**
- 18. To investigate the possibility of producing a Pacific panel brochure, format and funding with ICPO and CLIVAR SSG (Turk)**

## **2. INTRODUCTION**

Recognising the importance of the Pacific sector, the problems associated with its sheer size, and the need for a coordinated international effort to achieve CLIVAR objectives related to the Pacific in particular, an international CLIVAR Pacific Implementation workshop was held in Honolulu in February 2001. One of the recommendations of that workshop was the formation of a CLIVAR Pacific Panel to oversee, coordinate and facilitate CLIVAR Pacific science. The formation of the Panel was approved by the CLIVAR SSG at its next meeting, and the newly formed CLIVAR Pacific Panel held its first meeting in the East -West Centre, University of Hawaii in February 2002. The meeting was hosted by the International Pacific Research Center. The Panel chair and its members, together with the ICPO, would like thank the IPRC and local organisers for the ensuring the smooth running of the meeting. The participant list and agenda are given in Appendices 1 and 2.

Of the principal research areas of CLIVAR the two most closely related to the work of the Pacific Panel are;

G1 ENSO - extending and improving predictions of ENSO by advancing our understanding and observation of climate variability associated with ENSO and related global teleconnections;

and

D4 Pacific and Indian Ocean Decadal Variability - improving the description and understanding of the decadal variability and its predictability in the Pacific and Indian Ocean basins (and its relationship with ENSO).

The enormity of the task in making such advances should not be underestimated. The resources required will be larger than has hitherto been applied, and the need for a well coordinated international effort making best use of those resources is paramount, but there is the potential for a large step-like gain in our understanding and predictive capabilities of climate variability.

The main purpose of the first meeting was to establish the role of the Panel, to identify the major issues the Panel needs to address and to setup a framework to address these issues.

## **3. CLIVAR Overview**

John Gould gave an overview of CLIVAR objectives, programme structure, CLIVAR principal research areas (see [www.clivar.org](http://www.clivar.org)) and the relationship of the Pacific Panel to other Panels and Working Groups (in particular to Seasonal-Interannual Prediction (WGSIP), Coupled and ocean modelling (WGCM +WGOMD), Asian-Australian Monsoon (A-AMP), American Monsoon (VAMOS), and Southern Ocean). He emphasised strongly that the legacy of CLIVAR will be a better observing system, and a much more comprehensive and extended climate record, both of which are essential for understanding natural variability and human-induced change.

#### 4. TERMS OF REFERENCE

The terms of reference for the Pacific Panel agreed by the SSG are

1) To oversee and facilitate the implementation of CLIVAR in the Pacific sector in order to meet the objectives outlined in the Science and Initial Implementation Plans particularly with respect to:

- Expanding and Improving ENSO predictions
- Variability and predictability of the Asian-Australian Monsoon system
- Indo-Pacific Decadal Variability

And also on Pacific impacts on:

- Variability and predictability of the American Monsoon system
- Southern Ocean Climate variability
- Climate change prediction/detection and attribution

2) To develop broad-scale atmospheric sampling plans and processes studies to complement the oceanic observations planned for the Pacific and as an integral component of the strategy to improve atmospheric and coupled models. To work with agencies and nations to sustain broad-scale atmospheric sampling in the Pacific.

3) To coordinate the activities of the Pacific nations, facilitating cooperative efforts and coordinating work within the boundaries of the various nations as well as outside those boundaries. To provide a forum for exchange and discussion of national plans in the Pacific.

4) To organize and conduct workshops that will entrain oceanographers, atmospheric scientists, and other investigators from the Pacific nations, that will lead to formulation of plans for broad-scale sampling and for sampling locations of high interest (such as boundary currents), and will coordinate not only the field activities but also the modelling, empirical, and paleo studies in the Pacific.

5) To collaborate with WCRP WG on Coupled Modelling, the CLIVAR WG on Seasonal-Interannual Prediction and the WG on Ocean model development in order to design appropriate numerical experiments. To be aware of the requirements of these groups for data sets needed to validate models.

6) To liaise with the Ocean Observation Panel for Climate (OOPC), with the Joint Commission for Oceanography and Marine Meteorology (JCOMM), with the Atmospheric Observations Panel for Climate (AOPC), and other relevant groups to ensure that CLIVAR benefits from and contributes to observations in GOOS and GCOS

7) To advise the CLIVAR SSG of progress and obstacles toward successful implementation of CLIVAR in the Pacific.

The terms were accepted by the Panel. It was also **agreed that the terms of reference should also include the need to ensure the data collected are readily available.**

## 5. MEMBERSHIP

The members of the Pacific Implementation Panel are:

<b>Panel member</b>	<b>Affiliation</b>
Kelvin Richards (chair) Wenju Cai	Southampton Oceanography Centre, Southampton, UK CSIRO, Division of Atmospheric Research, Aspendale Australia
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In-Sik Kang	Climate Environment System Research Center, Seoul National University, Seoul, Korea
Michael McPhaden	NOAA/PMEL, Seattle, USA

### **ICPO**

Daniela Turk	Southampton Oceanography Centre, Southampton, UK
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An additional member, Magdalena Balmaseda (ECMWF), will join the Panel next year. However, it was recognised that the panel lacks expertise in certain key areas. These were atmospheric and satellite observations.

**Action1: ICPO and Chair**

## 6. REPORT ON CLIVAR IMPLEMENTATION WORKSHOP

Bob Weller gave a report of the workshop. The workshop was very well attended demonstrating the strength and depth of the research community in CLIVAR Pacific science. The workshop fulfilled its goal bringing together atmospheric and oceanic scientists from the Pacific nations to exchange information on the CLIVAR Principal Research Areas in the Pacific and to advance the process of the collaborative implementation of those plans. The written report of the meeting (obtainable from [www.clivar.org](http://www.clivar.org)) provides an excellent overview of the scientific issues, on-going and planned research of both national and international efforts, and the results from working groups charged with the task of developing descriptions of the cooperative, international approach to the broad-scale ocean and atmospheric sampling, to regional studies, and to process studies.

A number of actions items resulted from the workshop, a number of which have already been acted upon. Rather than reviewing the outstanding action items at the meeting the Panel will

first develop a statement of CLIVAR Pacific science (using the workshop report as a basis) (see Section 8) and then revisit the workshop action items in light of this.

## 7. REPORT FROM NATIONAL AND INTERNATIONAL PROGRAMMES

Panel members reported on individual national programmes (Australia, Canada, Chile, China, France, Japan, New Zealand, Russia, USA) with invited experts giving reports on sustained observations and process studies. Rather than report on national programmes here, this information will be found on regularly updated web pages ([www.clivar.org](http://www.clivar.org)). Brief reports are given on sustained observations and process studies, with again fuller information being given on relevant web pages.

### 7.1 Sustained observations

The TAO/TRITON array continues to give high quality data essential for seasonal to interannual climate research and forecasting ([www.pmel.noaa.gov/tao](http://www.pmel.noaa.gov/tao)). The readily available data are being used in ocean state estimations and predictive models. Goals in the next few years are to improve data return, introduce new technologies, and to work with the broader community to ensure TAO/TRITON is fully integrated with other elements of the global ocean observing system.

Implementation of ARGO in the Pacific is proceeding apace with increasing numbers of floats in the water. The coverage in the North and equatorial Pacific is improving. However there is serious shortfall in the South Pacific ([www.argo.ucsd.edu](http://www.argo.ucsd.edu)). This issue is expected to be priority issue of the Argo Science Panel and the Southern Ocean Panel.

There are commitments to repeat many hydrographic sections in both hemispheres (see [http://clivar-search.cms.udel.edu/hydro/hydro\\_table.asp](http://clivar-search.cms.udel.edu/hydro/hydro_table.asp) for details on future international plans and <http://www.aoml.noaa.gov/ocd/repeathydro/> for US plans). A notable commitment is from the Japanese to repeat the very long section across the S Pacific at 30°S. **Panel members were asked to review the information on the Pacific commitments listed on web sites above and provide the updated information to ICPO.**

### 7.2 Process studies

A major ongoing process study is the East Pacific Investigation of Climate (EPIC). EPIC is a five-year experiment to improve the understanding of the intertropical convergence zone (ITCZ), its interaction with the cool water that upwells along the equator in the eastern Pacific, and the physics of the stratus cloud deck that forms over the cool waters off South America (see [www.atmos.washington.edu/gcg/EPIC/](http://www.atmos.washington.edu/gcg/EPIC/) for details on science and implementation plans).

EPIC fieldwork consists of enhanced monitoring and a process study conducted in September-October 2001 (EPIC 2001). There are also modeling and empirical studies underway. Enhanced monitoring began in 1999 and was planned to continue through 2003 (see Cronin et al., 2002, EOS, in press, [www.pmel.noaa.gov/tao/epic/](http://www.pmel.noaa.gov/tao/epic/)). It included enhancements to the TAO lines along 95 and 110 W and the deployment of a surface mooring under the stratus deck at 20S, 85 W. Additional sampling is being done on the TAO cruises to 95W and 110W. The EPIC 2001 process study (<http://kestrel.nmt.edu/~raymond/epic2001/epic2001.html>) had two components: a study of the ITCZ and region from the ITCZ to the equator and a study of the stratus region from the



equator southward to the 20S, 85 W mooring and then eastward to northern Chile. Consideration is being given to keeping the 20 S, 85W mooring on station as an operational Ocean Reference Station.

A second, international study of the Chilean stratus region is being planned under VAMOS. This VAMOS-EPIC study is called VEPIC. The early EPIC findings lend support to the need for further study of this region. A VAMOS Panel meeting and VEPIC science team will develop VEPIC plans further in a meeting in Costa Rica in March 2002.

The Panel was also briefed on a number of other process studies in planning phase which include the Kuroshio Extension System Study (KESS), The Hemispheric Observing System Research (THORpex), and the Pacific Basin Extended Climate Study (PBECS). The overall goal of KESS is to identify and quantify the dynamic and thermodynamic processes governing the variability of and the interaction between the Kuroshio Extension and the recirculation gyre (<http://www.po.gso.uri.edu/kess> )

PBECS is a long-term process experiment to test and improve dynamical models of ocean processes that participate in climate variability. The project is based on the belief that the best hope for climate prediction and assessment lies in models that have sound approximations of important physics and models that are initialised with abundant and accurate observations (*Observing the Oceans in the 21<sup>st</sup> Century, Eds: Chester J. Koblinsky & Nevelle, R. Smith, Chapter 5.3, The Pacific Basin Extended Climate Study, by W. S. Kessler, R. E. Davis, k. Takeuchi, and R. Lukas, pg 473-485* )

## 8. CLIVAR Pacific Science

### 8.1 General Discussion

The presentations led into a general discussion on CLIVAR Pacific Science. Recurring themes were (a) the need for observationalists and modellers to work closely together to produce a coordinated and integrated approach at both the planning and execution stages, (b) the need to clearly identify goals which may include the system description, monitoring and prediction, (c) 'processes' and basin scale characteristics should be viewed as an integrated whole and not separately (the analogy of bricks and palaces was extensively explored) and (d) the need for milestones and measurable products that can justify funding for research (e.g. measurable improvement in coupled climate models).

Two major issues emerged. The first is coordination of national and international observational programmes. An impressive array of on-going and planned science programmes was presented to the meeting. Gaining an overview of the science, how to integrate it in some way and particularly identifying gaps proves difficult as it stands. The framework adopted by PBECS (a US CLIVAR programme) provides an effective way of integrating studies across a range of time and space scales. PBECS is at an advanced stage of planning and has considered at length the issues involved. **The international Panel agreed to look to adopt an implementation and strategy closely aligned to PBECS.** Individual Panel members were asked to review the aims and objectives of PBECS with a view to establishing how closely PBECS mirrors the aims of the international community and to identify areas not covered by PBECS, such as carbon and climate change. The adoption of such a framework makes it easier to see the relevance of individual programmes and to spot the gaps.

**Action 2: Panel members**

The second major issue was the need to assess the adequacy of the observational/modelling systems/programmes on seasonal to decadal timescales to achieve CLIVAR Pacific objectives. Is the observational system capable of ‘adequately’ capturing the season-to-interannual variability of the ocean and atmosphere? How well does a given oceanic observation improve our ability to describe the system and/or predict? Will an improvement in quantifying a given ‘process’ improve the predictive skill of a model? **A close working relationship needs to be established between the Pacific Panel, and the WGs on Seasonal to Interannual Prediction and Ocean Model Development.** The Chair will contact the chairs of these WGs to explore ways of best achieving the necessary linkages.

### Action 3: Chair

A major problem facing CLIVAR Pacific is raising the resources to undertake the science, in particular the sustained observations. **The Panel saw the benefit in establishing an intergovernmental resource board to help identify resources.** If fully adopted by the Panel, the PBECS-like framework would act as a good focus. It was agreed that setting up such a board should be explored.

### Action 4: ICPO and Chair

## 8.2 CLIVAR Pacific interaction with Biogeochemistry and Carbon

Daniela Turk (ICPO liaison for CLIVAR links with biogeochemistry and carbon) gave an overview on current interaction between CLIVAR and biogeochemical/carbon community, and showed the examples (observational, modelling and theoretical) of key science questions in the Pacific addressed in a collaboration between the two communities that contributed to better understanding of the climate phenomena in the Pacific region. She presented some possible ideas on future directions and addressed the panel on their views and feedback.

Recently there has been realization for the need and benefits for closer collaboration between CLIVAR and the biogeochemical/carbon community. Presently, there are a number activities underway with a variety of levels of interaction (from WCRP-IGBP to regional scale within the CLIVAR panels). The most active is coordination of CLIVAR/carbon repeat sections on both national and international levels. The US has established the US CLIVAR/CO<sub>2</sub> repeat hydrography working group under the leadership of R. Waninkhoff and R. Fine to implement a repeat hydrography survey. The information on US cruise plans, measurement, data etc is available on <http://www.aoml.noaa.gov/ocd/repeathydro/>. On the international level ICPO established a web site with detailed information on the planed sections <http://clivar.search.cms.udel.edu/hydro/index.htm>. These CLIVAR/carbon interactions sit within the framework of the Joint Carbon Project co-sponsored by three equal partners WCRP-IGBP-IHDP. The project is organized around three fundamental themes, which will require the cooperation from international and interdisciplinary communities. Joint Carbon Project is in the early stages of development, and will further increase the need for CLIVAR (and other WCRP projects) to interact with carbon community.

CLIVAR does not have an overall future plan/vision on these interactions. The areas and mechanisms of collaboration between the two communities need to be determined and coordinated with overall CLIVAR and WCRP perspective on the this topic. The objective of the presentation was to identify areas and mechanisms for Pacific panel interactions with biogeochemistry and to provide panel input to JSC to identify appropriate single channel oversight for joint CLIVAR/post-JGOFS work and the activities as a contribution to the WCRP/IGBP/IHDP joint carbon project.

Panel members recognized the need to improve these interactions in the Pacific. Different collaborations are already developing within the national (eg. Chile-report from Pizzaro, Japan-report from Fukasawa) or international initiatives and were mentioned during the panel members presentations. **The panel is considering to invite a carbon representative to participate in future panel meetings to ensure the efficient communication between the two communities.** The CLIVAR/carbon links in the Pacific will be further discussed in the upcoming CLIVAR/PICES workshop in October 2002 and have to be coordinated with overall CLIVAR and WCRP goals.

**Action 5: Turk**

### **8.3 Definition of CLIVAR Pacific Science**

There was discussion on what constitutes CLIVAR Pacific Science. A non-exhaustive list includes: ENSO, ENSO decadal variability, mid-latitude decadal variability, connections between the two, connections with Southern Ocean, climate change, scale interactions, interaction with ITF, Kuroshio Extension and its connection with climate variability, Arctic oscillation, connection with AA monsoon, impact of biology. It was also agreed that the Panel needs to set a series of achievable 5 year goals.

The Panel identified a number of scientific challenges in the Pacific sector. These are not necessary unique to the Pacific but include:

- Improved understanding on the controls of decadal variability and the implementation of the required observational network
- Reducing the uncertainty in the separation of natural variability and human-induced change
- Improved understanding of atmospheric boundary layer processes and clouds
- Fixing biases in coupled and ocean/atmosphere only models, such as the cold tongue
- Provide products that are useful in assessing impact on human society.

**The Chair was actioned to produce a one/two page summary, for discussion by the Panel, before being promulgated.**

**Action 6: Chair**

## **9. LINKS WITH OTHER CLIVAR PANELS AND WORKING GROUPS**

Il-Sik Kang gave a brief overview of the AA Monsoon Panel and WGSIP. It is clear there are strong overlaps with the Pacific Panel. These will be discussed in depth at the next Panel meeting.

With regard to the Southern Ocean Panel, it was recognised that at present there is little focus on the links between the Pacific and Southern Ocean. On way forward is for there to be international collaboration on deployment of ARGO floats. **The chair will contact the chairs of the Southern Ocean panel and ARGO to explore the way forward.**

**Action 7: Chair**

## 10. DATA

John Gould gave an overview of the current status of CLIVAR data policy and future challenges. CLIVAR, as a global multidisciplinary project, requires diverse data (ocean, atmos, model, paleo) in both real-time and delayed mode, and has struggled with the definition of an appropriate data structure. To provide guidelines that will allow consistency of the project's data and information-related objectives, a draft on CLIVAR data policy has been developed (see [http://www.clivar.org/data/data\\_policy.htm](http://www.clivar.org/data/data_policy.htm) for the details ). Further, John outlined to the Pacific Panel the main data issues to be addressed, which include:

- Identify CLIVAR-relevant Pacific data sets.

**Action 8: Cai, Panel members and ICPO**

- Review contents of Sprint - how complete?  
(ICPO intelligence-gathering function).

**Action 9: ICPO**

- Identify data exchange/availability problems and ask ICPO/SSG/WCRP to take action.

**Action 10: ICPO, Cai**

- For GOOS, GCOS GODAE to relay requirements specific to Pacific activities

**Action 11: ICPO**

**Wenju Cai was selected as the designated data representative** whose task is to identify to the ICPO data sets that CLIVAR will need and to highlight outstanding data issues.

Peter Hacker presented an update on the newly established Asia-Pacific-Data research Center (APDRC) at the International Pacific Research Center (IPRC). The IPRC's research effort requires easy availability to the substantial atmospheric, oceanographic, air-sea flux and satellite data sets and products. The vision of the APDRC is to link data management and preparation activities to research activities within a single center, and to provide one-stop shopping of climate data and products to local researchers and collaborators, the national climate research community, and the general public. With this vision in mind, the APDRC Mission Statement is: to increase understanding of climate variability in the Asia-Pacific region by developing the computational, data-management, and networking infrastructure necessary to make data resources readily accessible and usable by researchers, and by undertaking data-intensive research activities that will both advance knowledge and lead to improvements in data preparation and data products. The APDRC has as its main activities: Data Server System (DSS) implementation and development; data management and archive building; value-added, data-intensive research projects; and coordination and collaboration.

**The Panel welcomed the establishment of APDRC.** The ICPO and Panel will work closely with the APDRC on both the identification of CLIVAR related data sets and on the management of ocean and atmosphere data from the Pacific sector. **Peter Hacker of APDRC will join the Pacific Panel as an ex-officio member.**

**Action 12: ICPO, Hacker**

One further issue discussed was the availability of model output for analysis. A number of runs and intercomparison exercises of ocean, atmosphere and coupled models have been completed, are in progress or are planned. A compilation of such runs, and availability would be useful to the community as a whole. Ensuring the right products are available requires a two-way interaction between modeller and end user. **The IPCO should explore ways of making information on models readily available.**

**Action 13: IPCO**

## **11. RELATIONSHIP WITH OTHER PROGRAMMES**

Much progress has been made on the understanding of the biogeochemical impacts of ENSO. Hence the Pacific remains an area in which links between CLIVAR and the biogeochemical and ocean carbon community have potential for strong development. The North Pacific (PICES) ([pices.ios.bc.ca](http://pices.ios.bc.ca)) organisation that is concerned with such issues as the climatic impacts on fish stocks will hold a joint workshop with CLIVAR in October. The Pacific Panel Chair is acting as co-convenor for that workshop. The aims of the workshop are to bring together scientists interested in climate issues who would not normally communicate, identify common PICES and CLIVAR themes, and identify the need for common and complementary approaches and areas of collaboration. The workshop will help CLIVAR Pacific to establish a workable carbon related scientific programme and help identify useful products for other communities. Richards, Turk will report to the Panel on the outcome of the workshop.

**Action 14: Chair, Turk**

The Panel recognised the importance of potential links with PAGES. Contact with the CLIVAR/PAGES joint WG should be made to establish Pacific related issues.

**Action 15: Delcroix**

There are also potential links with GEWEX which should be explored.

**Action 16: ICPO and Chair**

## **12 COMMUNICATION, PUBLICITY, OUTREACH**

The importance of publicity through the web pages and other media, such as a Pacific Panel brochure was discussed as a possible way of increasing the visibility of CLIVAR Pacific research and attracting funding for the internationally coordinated efforts. The format of a 2 page brochure was suggested. Turk will propose the idea to the ICPO and explore the possibility of a common format for the brochure with other regional panels. The question of funds availability for producing the brochure was raised and will be further discussed at the upcoming ICPO meeting.

**Action: Turk**

Turk informed the panel members of the Pacific Panel web site ([www.clivar.org/organization/pacific](http://www.clivar.org/organization/pacific)). Panel members were asked to send their comments for the improvement of the web site and to provide the updated information on ongoing and planned CLIVAR related observation in the Pacific to the ICPO. It was further suggested ICPO explore ways of including information on models (see section Data for details).

**Action: Panel members**

### **13 CLOSE, FOCUS OF NEW MEETING**

The document on the scientific challenges and achievable 5 year goals of CLIVAR Pacific will be produced by correspondence. The next meeting will focus on how well we are addressing these challenges, and establish the framework to achieve them. In view of the relatively late setting up of the Panel it is highly desirable that the next meeting is held 12 months after the first, in February 2003.

## **APPENDIX 1: List of Attendees**

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## **APPENDIX 2: Agenda**

### **Thursday, February 7, 2002**

- 8:00-8:30 AM Registration, Coffee
- 8:30-8:45 AM Welcome, logistics (Richards)
- 8:45-9:15 AM CLIVAR Overview and status and relation of Pacific Panel to other CLIVAR activities and Panels/WGs (Gould)
- 9:15-9:30 AM Terms of reference and membership  
Review CLIVAR Pacific science and implementation plan
- 9:30-10:00 AM Report on CLIVAR Pacific Implementation Workshop, Feb 2001, Hawaii and review action items (Weller/Richards)
- 10:00-10:30 AM COFFEE BREAK
- 10:30-12:30 AM Updates on national and international programmes  
Australia (Cai)  
Canada (Freeland)  
Chile (Pizarro)  
China (Zhang)  
France (Delcroix)  
Japan (Fukasawa)  
Russia (Varlamov)  
USA (Weller)
- 12:30-1:30 PM LUNCH
- 1:30-2:15 PM Sustained observations  
TAO/TRITON (McPhaden)  
ARGO (Freeland)  
Time-series (Weller)  
VOS-TSG (Delcroix)  
Repeat hydrography (Gould)
- 2:15-3:00 PM Process studies  
EPIC/VEPIC (Weller)  
PBECS (Lukas)  
KESS (Qiu)
- 3:00-3:30 PM COFFEE BREAK
- 3:30- 5:00 PM Discussion – review of outstanding issues and action items
- 5:00 PM Adjourn
- 5:15-7:15 PM Reception, Garden Level, East-West Center

## Friday, February 8, 2002

- 8:30-10:30 AM Relationship with other CLIVAR panels, working groups  
AA-monsoon panel (Kang)  
WG on Seasonal and Interannual Prediction (Kang)
- 10:30-11:00 AM COFFEE BREAK
- 11:00 -12:30 PM Data availability  
CLIVAR Data policy, identify panel data rep (Richards/Gould)  
IPRC Pacific Data Center (Hacker)  
Data requirements for modelling activities (Richards/Kang, Jia)
- 12:30-1:30 PM LUNCH
- 1:30-3:00 PM Relationship to other programmes  
JGOFS/Carbon, hydro/carbon repeated sections (Turk)  
Joint PICES/CLIVAR workshop (Richards)
- 3:00-3:30 PM COFFEE BREAK
- 3:30-5:00 PM Discussion  
5:00 PM Adjourn
- 5:15 PM Departure from EWC – shuttle van departs to Waikiki Terrace Hotel

## **Saturday, February 9, 2002**

7:45 AM Shuttle departs from Waikiki Terrace Hotel  
8:00 AM Arrive at East-West Center  
8:00-8:30 AM COFFEE

8:30-9:30 AM Review of action items and workshops on specific issues  
9:30-10:00 AM Date, location and focus of next meeting

10:00-10:30 AM COFFEE BREAK

10:30-12:00 PM Report writing  
12:00 PM Adjourn meeting

12:15 PM Departure from EWC – shuttle van departs to Waikiki Terrace Hotel