2017 年项目通讯
2017 PROJECT HIGHLIGHTS

气候与海洋变率变化及可预测性
CLIMATE AND OCEAN: Variability, Predictability and Change
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CLIVAR (Climate and Ocean: Variability, Predictability and Change) is one of the four core projects of the World Climate Research Programme (WCRP). It was launched in 1995 building on the successes of the Tropical Ocean – Global Atmosphere Project (TOGA) and the World Ocean Circulation Experiment (WOCE).

The goal of CLIVAR is to improve understanding and prediction of ocean-atmosphere interactions and their influence on climate variability and change, to the benefit of society and the environment.

In the future CLIVAR will critical contribute to the new WCRP strategy by covering the following important topics:

- Understanding the ocean’s role in climate variability, change, and transient sensitivity;
- Understanding the role of the ocean in shaping the hydrological cycle and distribution of precipitation at global and regional scales;
- Understanding the predictive drivers of regional climate phenomena on different time scales;
- Provision of coordinated observations, analyses and predictions of changes in the Earth’s climate system;
- Detection, attribution and quantification of climate variability and change;
- Development and evaluation of climate simulations and predictive capabilities.
CLIVAR 国际项目办公室（ICPO）最初由位于德国汉堡的马克斯普朗克研究所承办，随后于1998年至2014年4月迁至位于英国南安普顿的国家海洋研究中心，由英国自然环境研究委员会和美国的相关机构共同资助。

The International CLIVAR Project Office (ICPO) was initially hosted at the Max Planck Institute in Hamburg, Germany and then moved to the National Oceanography Centre (NOC) in Southampton, UK, where it was supported by contributions from the UK Natural Environment Research Council (NERC) and US funding agencies from 1998 to April 2014.

自然资源部（国家海洋局）第一海洋研究所于2014年初与世界气候研究计划签署协议，自2014年9月起正式承办CLIVAR全球项目办公室。海洋一所承办CLIVAR全球项目办公室体现了国际社会对其在海洋和气候研究领域国际领先地位的认可，也为中国的科学家与WCRP的全球气候界的研究人员开展富有成效的合作。ICPO 现由位于中国的全球项目办公室 (ICGPO) 和位于印度的季风项目办公室 (ICMPO) 构成，ICPO 执行主任同时兼任ICGPO主任，负责 ICPO 的整体管理和协调。

With the approval of China State Oceanic Administration (SOA), The First Institute of Oceanography (FIO) of SOA signed an agreement with WCRP to host an ICPO node: The International CLIVAR Global Project Office (ICGPO) in Qingdao China from September 2014. Hosting of an ICPO node by FIO contributes to the broad recognition of FIO as an internationally leading ocean and climate research institute and is instrumental in establishing fruitful cooperation of Chinese scientists with the global community of climate researchers united under the auspices of WCRP. Based on the current CLIVAR organization, The ICPO consists of two offices, the ICGPO hosted by China and the International CLIVAR Monsoon Project Office (ICMPO) hosted by India. Overall management and coordination of the ICPO is the responsibility of the ICPO Executive Director who also acts as the ICGPO Director.
CLIVAR is a network of scientists and activities around the world that contribute to meeting the CLIVAR objectives. A subset of these scientists are members, on a rotating basis, of committees that facilitate coordination and cooperation amongst national and multinational efforts. The CLIVAR Scientific Steering Group (SSG) is appointed by the WCRP Joint Scientific Committee. The SSG provides overall guidance for CLIVAR activities, in concert with the goals of the WCRP, and establishes CLIVAR Panels and Working Groups and their terms of reference to ensure that the key objectives of the programme are met.

国际项目办公室是WCRP联合计划人员（JPS）的一部分，项目办公室的科学和技术活动由项目办公室主任向WCRP主任或其代表负责，项目办公室的管理由项目办公室主任向其所在承办机构的所长或代表负责。

The international project offices (IPOs) operate as components of the Joint Planning Staff for WCRP, and the Director of the Office is responsible to the Director of the World Climate Research Programme (D/WCRP), or his/her designee, for scientific and technical activities, and to the Director of his/her home institution, or designee, for office management issues.
CLIVAR SSG Member

Detlef Stammer  
Co-Chair  
Germany

Annalisa Bracco  
Co-Chair  
USA

Wenju Cai  
Member  
Australia

Stephen Grillies  
Member  
USA

Boris Dewitte  
Member  
France

Dake Chen  
Member  
China

Pedro Monteiro  
Member  
South Africa

Ken Takahashi Guevara  
Member  
Peru

Krishna Achuta Rao  
Member  
India

Nathan Bindoff  
Member  
Australia

Pascale Bracqonnot  
Member  
France

CLIVAR Scientific Steering Group (SSG)

Core Panels (委员会):
- Ocean Model Development Panel
- Global Synthesis and Observations Panel
- Climate Dynamics Panel
- CLIVAR/GEWEX Monsoons Panel
- Atlantic Region Panel
- Pacific Region Panel
- CLIVAR/IIOE-GOOS Indian Ocean Region Panel
- CLIVAR/CLIVAR/SCAR Southern Ocean Region Panel
- CLIVAR/CIICONC Northern Ocean Region Panel

Research Foci (研究组):
- Decadal climate variability and predictability
- Biophysical interactions and dynamics of upwelling systems
- Regional sea level change and coastal impacts (WCRP GC)
- ENSO in a changing climate
- Planetary heat balance & ocean heat storage

CLIVAR Organization Diagram (as of 2018)

CLIVAR 组织结构图（截至 2018 年）
成员 | Staff

ICPO Distributed offices

ICGPO (International CLIVAR Global Project Office): Qingdao, China

CLIVAR 全球项目办公室，中国青岛

ICMPO (International CLIVAR Monsoon Project Office): Pune, India

CLIVAR 季风项目办公室，印度普纳

José Santos  
Executive Director, ICPO

Jing Li  
Staff Scientist

LiPing Yin  
Staff Scientist

Lina Kang  
Administrative Assistant

MM. Ali  
ICMPO Director

S Mahapatra  
Senior Scientist

Ashwini Kulkardi  
Senior Scientist

Harish Borse  
D.T.P Operator
Global Partners

WCRP 项目 WCRP Core Projects
Climate and Cryosphere ( CliC )

全球气候项目

Coordinated Regional Climate Downscaling Experiment ( CORDEX )
联合区域气候降尺度实验

Global Energy and Water Exchanges ( GEWEX )
全球能量与水循环项目

Stratosphere-troposphere Processes And their Role in Climate ( SPARC )
对流层-平流层及其对气候的影响项目

The Subseasonal-to-Seasonal ( S2S ) Prediction Project
季节内到季节气候预测计划

Other global partners

ARRAY for REAL-TIME GEOSTROPHIC OCEANOGRAPHY ( ARGO )
ARGO 全球海洋观测网

CLIVAR SPAIN
西班牙 CLIVAR

Escuela Superior Politécnica del Litoral ( ESPOL )
厄瓜多尔高等理工大学

French National Centre for Scientific Research ( CNRS )
法国国家科研中心

French National Institute for Research for Sustainable Development (IRD)
法国可持续发展研究所

Future Earth
未来地球计划

Global Ocean Observing System ( GOOS )
全球海洋观测系统

Global Marine Observing System in the Indian Ocean ( IOGOOS )
印度洋全球海洋观测系统计划

Integrated Marine Biosphere Research project ( IMBeR )
海洋生物圈整合研究

International Centre for Theoretical Physics ( ICTP )
国际理论物理中心

International Surface Ocean - Lower Atmosphere Study ( SOLAS )
表层海洋-低层大气研究项目

International Ocean Carbon Coordination Project ( IOCCP )
国际海洋碳协调计划

International Research Centre on El Niño ( CI IMM )
厄尔尼诺与南方涛动国际研究中心

IOC Sub-Commission for the Western Pacific ( WESTPAC )
政府间海洋学委员会-西太平洋委员会

Sponsors

The First Institute of Oceanography ( FIO, China )
自然资源部第一海洋研究所

Indian Institute of Tropical Meteorology ( IITM )
印度热带气象研究所

National Oceanic and Atmospheric Administration of US ( NOAA )
美国国家海洋与大气局

North Pacific Marine Science Organization ( PICES )
北太平洋海洋科学组织

OceanSITES

Past Global Changes ( PAGES )

Scientific Committee on Antarctic Research ( SCAR )
南极研究科学委员会

SCOR

Southern Ocean Observing System ( SOOS )
南大洋观测系统

Tropical Pacific Observing System ( TPOS 2020 )
热带太平洋观测系统 2020

USCLIVAR

YESS

中国的合作伙伴 Partnership in China

China Meteorological Administration ( CMA )
中国气象局

Institute of Oceanology Chinese Academy of Sciences ( IOCAS )
中国科学院海洋研究所

National University of Information Science & Technology ( NUIST )
南京信息工程大学

Ocean University of China ( OUC )
中国海洋大学

Pilot National Laboratory for Marine Science and Technology ( Qingdao ) ( QNLM )
青岛海洋科学与技术试点国家实验室

The South China Sea Institute of Oceanology, CAS ( SCSIO )
中国科学院南海海洋研究所

The Second Institute of Oceanography ( SIO, CHINA )
自然资源部第二海洋研究所

The Third Institute of Oceanography ( TIO, CHINA )
自然资源部第三海洋研究所

TPOS 2020 Distributed Project Office in China

热带太平洋观测系统中国分项目办公室
CLIVAR 在中国 | Outreach in China

自然资源部（国家海洋局）第一海洋研究所：
青年科学家论坛和暑期学校

FIO on ECSS and Summer school

海洋一所于 2016 年 9 月举办了 CLIVAR 青年科学家论坛，135 名来自 34 个国家的青年科学家参加了该论坛。此次活动受到了来自世界各地的参会者和讲师的高度评价。

The CLIVAR Early Career Scientists Symposium was hosted by the First Institute of Oceanography in Qingdao, China, on September 18 and 24-25, 2016. 135 early career scientists (ECS) from 34 countries participated. The Activity was highly evaluated by both the instructors and the participants from all over the world.

为了延续这一成果，并为青年科学家和发展中国家的科研工作者提供更多的交流机会，CLIVAR 与海洋一所联合举办暑期学校签署了相关协议，第一期暑期学校将以“过去，现在和未来的海平面上升”为主题，于 2018 年 6 月 25 日 -30 日在青岛举办。

To continue the success of ECSS and provide more opportunities for young scientists and scientists from developing counties, CLIVAR and FIO signed a five-year agreement on jointly hosting summer school biennially since 2018. The first CLIVAR-FIO Joint Summer School on "Past, present and Future Sea Level changes" will be held on June 25-30, 2018 in Qingdao China.
青岛海洋科学与技术试点国家实验室

Pilot National Laboratory for Marine Science and Technology (Qingdao) (QNLM)

QNLM was the hosting organization of the CLIVAR Open Science Conference which was held in Qingdao September 19-23, 2016. More than 600 scientists from 50 countries joined the events.
The Northwestern Pacific Ocean Circulation and Climate Experiment (NPOCE) is initiated by IOCAS and endorsed by CLIVAR as an international cooperative program. NPOCE contributes to CLIVAR objectives, particularly to the notion of ocean process and ocean sustained observations. CLIVAR will support to organize the 3rd Open Science Symposium (OSS) on Western Pacific Ocean Circulation and Climate on May 8-10, 2018 in Qingdao, China.

Ocean University of China

2017年6月5日至7日，CLIVAR 边界流国际研讨会在青岛召开。本次会议由中国海洋大学物理海洋教育部重点实验室主办，活动得到了CLIVAR 的大力支持。会上，来自世界各地的200多位海洋学家和年轻学者汇聚一堂，共同讨论了在理解边界流动力学和相互作用方面的最新进展和挑战。

CLIVAR supported the Key Laboratory of Physical Oceanography, Ministry of Environment (MOE), China of Ocean University of China to organize the ‘2017 CLIVAR International Symposium on Boundary Currents’, from 5 to 7 June 2017, in Qingdao China. At the symposium, about 200 oceanographers and young scholars congregated and discussed the recent advances and challenges towards understanding of the Boundary Current dynamics and interactions.
South China Sea Institute of Oceanology, CAS (SCSIO)

2017 年 11 月 18 至 20 日，由热带海洋国家重点实验室（中国科学院南海海洋研究所）联合中山大学、广东省气象局等机构发起的“热带-亚热带天气、气候与海洋国际学术研讨会”在中国广州召开。该研讨会于 2017 年初获得 CLIVAR 科学指导委员会背书，并为来自不同学科背景的研究人员提供合作交流的平台，以加深对热带天气、气候和海洋气候的挑战的理解和认识。

The CLIVAR SSG has endorsed the “International Workshop on Tropical-subtropical Weather, Climate and Oceans”, which was co-organized by Sun Yat-sen University of China, the CAS South China Sea Institute of Oceanology and the CMA Guangdong Meteorological Service, on November 18-20, 2017 in Guangzhou, China. The main goal of this workshop is to provide a platform for researchers from various disciplines to discuss the recent advances, establish collaborations, and identify challenges toward better understanding of the topical-subtropical weather, climate, and oceans.

Nanjing University of Information Science and Technology (NUIST)

世界气候研究计划（WCRP）联合科学委员会第三十九次会议于 2018 年 4 月 16 至 20 日在南京信息工程大学召开。该会议是世界气候研究计划的年度工作会，用于指导计划的发展过程并对计划的未来整体发展做出规划。

The WMO/IOC/ICSU Joint Scientific Committee (JSC) of the World Climate Research Programme (WCRP) held its 39th session in Nanjing, China, on 16-20 April, 2018, hosted by the Nanjing University of Information Science and Technology. This is an annual meeting where the leaders of the WCRP research community discuss progress towards the Programme’s objectives and make decisions that will determine the future direction of the Programme.
全球综合观测委员会

Global Synthesis and Observations Panel (GSOP)

2017年全球综合观测委员会与欧洲科技合作计划（COST）在法国图卢兹共同举办了“海洋资料再分析和相互比较研讨会”，与会代表一致同意实施新一期 ORA-IPv 项目（ORA-IPv2），这一期项目主要目标是评估自项目一期以来海洋再分析产品的发展情况，以及对新的指标组进行比较，主要包括：同化诊断与统计；区域（洋盆尺度）研究；比较再分析资料中流场的调查结果；以及洋流和中尺度运动的具体评估等。

In 2017, the “COST/CLIVAR Workshop on ocean reanalyses and inter-comparisons” has been successfully organized by GSOP in Toulouse, France. A new coordinated intercomparison exercise called ORA-IPv2 was agreed to implement, with the main objectives to assess the advances of the ocean reanalysis products and to perform comparisons of new metrics with focus on assimilation diagnostics and statistics; regional (basin level) studies; comparisons investigating the representation of water masses in reanalyses; and specific assessment of currents and mesoscale activity.

![Example of mean sea ice thickness for the various ice-ocean reanalyses for March 2007. Also shown is a satellite estimate of sea ice thickness from ICESat.](image-url)
Two primary efforts of OMDP have been completed. The first is the Coordinated Ocean-ice Reference Experiments phase II (CORE-II) project on the documentation and benchmarking of solutions from forced global ocean–sea-ice hindcast simulations. This effort produced 9 manuscripts published in a Virtual Special Issue of Ocean Modelling. The second completed effort which was built upon the CORE-II foundations involves defining and formalizing the Ocean Model Intercomparison Project (OMIP) – an endorsed project of the Coupled Model Intercomparison Project phase 6 (CMIP6), which aims to provide a framework for evaluating, understanding, and improving the ocean and sea-ice components of global climate and earth system models.
CLIVAR Climate Dynamics Panel (CDP)

The main aim of CDP is to advance our basic understanding of atmosphere-ocean climate dynamics using observations and models and to determine the role of climate dynamics in shaping climate variability and change on seasonal to centennial time scales. Collaborations have been made with the EU PRIMAVERA project in exploiting forthcoming high-resolution climate model experiments that are being run as part of the CMIP6 (Coupled Model Intercomparison Project) HighResMIP project in 2016-2017.

How the ocean impacts human society as a core component in the climate system

GEWEX/CLIVAR Monsoons Panel (MP)

Scientific work of the Monsoons panel can be summarized as: 1) Observational field campaign and process-modelling work (mainly in the India, Africa and south China regions). Monsoons Panel members are involved in leadership of the Southern China Monsoon Rainfall Experiment. The data has been used in process modelling with the UK Met Office CRM as part of the UK/China -The Climate Science for Service Partnership China programme; 2) coordination of the Global Monsoons MIP contribution to CMIP6 the IPCC 6th Assessment Report; 3) various aspects of Climate change detection, attribution and modelling. The experiment database has been used in the detection and attribution of extreme events changes over East Asia and Africa.
CLIVAR Atlantic Region Panel (ARP)

2017 年，大西洋区域委员会通过积极参与AtlantOS项目继续努力推动泛大西洋持续观测系统，与PIRATA项目合作，天生启动了热带太平洋观测系统（TAOS）评估，并为实现Bélem声明作出了巨大贡献。同时ARP还开展了海洋中尺度涡旋与海气相互作用、海气高分辨率CMIP耦合模型分析，以及海气交换与动力学及其对全球和区域变率和能量转移的影响等研究。

In 2017, the panel continued its effort for promoting a sustained Pan-Atlantic Ocean Observation through active participation in AtlantOS (Atlantic Ocean Observing Systems) as well as leading the Tropical Atlantic Observing System (TAOS) Review in cooperated with PIRATA and making great contribution to the realization of Bélem Statement. Meanwhile, the panel also conducted community work on Ocean Eddies and Air-Sea interactions, air-sea HiRes CMIP coupled model analysis; and the ocean air-sea exchanges and dynamics and their impact on global and regional variability and energy transfers.

Pacific Region Panel (PRP)

太平洋区域委员会第 12 次会议于 2017 年 10 月 21 日在韩国釜山与ENSO复杂性研讨会同期召开，太平洋年代际变化和与古气候研究的联系是两个重点议题。PRP与ENSO工作组成员共同撰写了关于ENSO复杂性的综述。该文章拟向 Nature 投稿。此外，部分 PRP 成员参与了发展中国家的科研机构能力建设活动。PRP 未来几年的重点活动将围绕热带太平洋年代际变化和跨洋盆联系展开。2018 年 PRP 将与 ENSO 研究组联合参与组织第四届 ENSO 国际大会。

PRP held its 12th session in Busan, South Korea on 21st October 2017, back to back with the ENSO complexity workshop. The Pacific decadal variability and the connection with the paleo-community were highlighted during the meeting. PRP collaborated with ENSO RF contribution in writing a review paper on ENSO complexity, which is to be considered for publication in Nature (Timmerman et al. 2017). The panel will focus its activities on the decadal variability in the tropical Pacific, as well as trans-basin connectivity across different ranges of timescale the in next couple of years. Some PRP panel members have also been involved with capacity building activities at institutions in developing countries PRF in collaboration with ENSO RF will contribute to the organisation of 2018 ENSO Conference.
CLIVAR/IOCGOOS Indian Ocean Region Panel (IORP)

IORP is jointly sponsored by the IOC Global Ocean Observing System (GOOS) and has designed and overseen the implementation of the first-ever integrated observing system for the Indian Ocean, known as IndOOS. IORP has played an important role in the design of the International Indian Ocean Expedition-2 (IIoE-2) and implementation of the various associated activities will be a major focus for the Panel in the coming years. The IndOOS Decadal Review is a major IORP task in 2018. A first draft of 25 chapters has since been written, commented by all IORP members and lead authors from different chapters. The final draft is soliciting comments from broader CLIVAR, OOPC and IIoE-2 communities. An abstract for the IndOOS Decadal Review has been submitted to OceanObs'19 Jointly by all lead authors.

IndOOS 原始设计和现状。原始 IndOOS 设计包括 RAMA, Argo, XBT / XCTD, 表面漂流浮标和潮汐计器组件。IndOOS 原始设计和当前状态。原始 IndOOS 设计包括 RAMA, Argo, XBT/XCTD, 表面漂流浮标和潮汐计器组件。
南大洋区域委员会

CLIVAR/CliC/SCAR Southern Ocean Region Panel (SORP)

南大洋区域委员会在2017年度的主要活动包括：在美国博尔德组织第12次委员会会议；发起成立南大洋区域委员会；密切与相关国际项目的工作关系，如南大洋观测系统、海洋气候观测委员会以及国际极地预报年-南半球等。

The SORP’s main activity during 2017 was to organize the 12th session at the National Centre for Atmospheric Research (NCAR) in Boulder, Colorado, USA. The second main activity was to help instigate and support an initiative to establish a new northern panel as a natural cousin to the SORP. Extensive participation in international research coordination and collaboration has occurred with several relevant programmes, including the Southern Ocean Observing System (SOOS), the Ocean Observations Panel for Climate (OOPC), and the Year of Polar Prediction Southern Hemisphere (YOPP-SH).

北冰洋区域委员会

CLIVAR/CliC Northern Ocean Region Panel (NORP)

北冰洋区域委员会将从耦合的角度出发，协调和策划全球气候系统中的北冰洋区域的活动。该委员会还将促进新工具和方法的研究进程，用于北极地区和周边海域的观测和气候影响的研究，以实现北冰洋区域观测的标准化和归档以及与其他气候系统的耦合，所得成果将作为2019年极地预报年的经验示范。NORP第一届委员会会议将于2018年在瑞士达沃斯POLAR2018活动期间举行。

The CLIVAR/CliC Northern Oceans Panel serves as an international forum for coordinating and strategizing activities on the role of the Arctic Ocean in the context of the global climate system from a coupled perspective. In addition, this panel facilitates progress in developing new tools and methods to observe the Arctic Ocean and neighboring seas and their climate impacts, to standardize and archive observations of the Arctic Ocean and the coupling with other components of the climate system, and to extend what will be learned through activities organized for the Year of Polar Prediction (YOPP), which is organized under the World Weather Research Program (WWRP), beyond 2019. NORP plans to have its first face-to-face meeting at the POLAR2018 in Davos, ZSwitzerland, with interactions with SORP.
### Decadal Climate Variability and Predictability (DCVP RF)

DCVP 研究组在 2017 年与 PAGES 联合发布了第 72 期 Exchanges 期刊，该期刊包括了 13 篇涵盖 DCVP 各个方面和相关研究成果的文章以及一篇总结 DCVP 现状的特刊文章。此外，项目还持续为“年代际气候预报”项目和世界气候研究计划“近期气候预报”重大挑战提供支撑。2018 年 DCVP 成员将于美国博尔德组织“从次季节性到年代际预报”国际研讨会。

In 2017, the group has published a Joint issue CLIVAR Exchanges/PAGES Magazine on Decadal Climate Variability (Exchanges No. 72) containing 13 articles that cover different aspects of DCVP and the associated current research findings, and a In Box article summarizing the state of DCVP. The group members continually contribute to the activities of Decadal Climate Prediction Project and the WCRP Grand-Challenge on Near Terms Climate Prediction. Contributed to the planning of the WCRP "International workshops on subseasonal to decadal prediction" to be held 17-21 Sep 2018 at NCAR, Boulder, USA.

### Eastern Boundary Upwelling System (EBUS RF)

EBUS 研究组旨在表征和更好地理解上升流区域海洋与耦合模型的偏差，并解决提升对上升流关键物理过程的理解和模拟的迫切需求；理解变化的气候系统对上升流区域的影响。该研究组未来将加强与 SCOR 和 IMBeR 就相关领域的合作。

The Research Focus on Eastern Boundary Upwelling Systems (EBUS) aims to characterize and better understand biases in upwelling regions in ocean and coupled models and address the urgent need to advance understanding and simulation of the key physical processes that are responsible for upwelling and to understand impact on upwelling regions of a changing climate system. The EBUS RF will increase the cooperation with SCOR and IMBeR on EBUS in the future.
气候变化下的厄尔尼诺南方涛动研究组

ENS0 in a Changing Climate (ENSO RF)

ENSO 研究组制作了一个用于收集和显示 ENS0 指标的原型软件框架，以用于嵌入现有的模型评估工具，并将于 2018 年发布第一版“CLIVAR ENS0 指标”。第一次 ENS0 研究组会议暨厄尔尼诺复杂性研讨会于 2017 年 10 月在韩国釜山相继举行，研讨会的主题是厄尔尼诺的时空复杂性。在 2018 年厄尔尼诺大会后，ENS0 研究组活动将并入太平洋委员会。

The ENS0 RF has produced a prototype software framework for gathering and displaying ENS0 metrics, with the aim of eventual insertion into existing community model evaluation tools and aims to release a first version of “CLIVAR ENS0 Metric 2018”. The 1st Session of ENSO RF was held on October 2017 at Busan, Rep. of Korea, followed by the ENS0 Complexity Workshop. This 5-day workshop focused on reviewing the spatio-temporal complexity of ENS0 phenomenon. ENS0 RF activities will be incorporated into PRF after the 2018 ENS0 Conference.

行星能量平衡与海洋热增量一致性研究组

Consistency between planetary energy balance and ocean heat storage (Concept-Heat RF)

Concept-Heat 研究组主要关注地球能量不平衡以及它的最大组份——海洋热量的变化。CLIVAR 和 GEWEX 于 2017 年 10 月，在美国博尔德联合举办了联合研讨会，该会议从根本上促成了 Concept-Heat 研究组的主要目标的实现，即在气候系统中的能量流和地球能量不平衡领域建立多学科协同的共同体。下一次联合研讨会计划于 2018 年下半年召开。

The CONCEPT-HEAT is focused on the Earth's Energy Imbalance and its largest component, the changes in ocean heat content. A joint meeting of CLIVAR C-H and GEWEX GDAP has taken place on October 2017 (hosted by NCAR, Boulder) and fundamentally contributed to the main goal of C-H to build up a multidisciplinary synergy community on the energy flow through the climate system, and the Energy Imbalance. A CLIVAR/GEWEX workshop will take place during the second half of 2018.
区域海平面变化及其对海岸带的影响研究组

Regional sea level change and coastal impacts (SL Grand Challenge)

区域海平面变化及其对海岸带的影响研究组的实施方案于 2017 年 2 月发布，方案描述了项目未来十年的执行计划。研究组还于 7 月在美国成功地召开了“区域海平面变化和海岸带影响”大会，超过 300 名知名科学家和城市规划者及海岸带开发者参会。

The Science and Implementation Plan of the SL RF was finalized and published in February, 2017, depicting the organization of the RF SL and the terms of reference for its execution phase in the next 10 years (2015-2025). A successful international Conference on Regional Sea Level Changes and Coastal Impacts was organized in July, 2017, attended by over 300 participants including top scientists, city planners, coastal zone developers and managers and other stakeholders.
2017 年 WCRP/IOC 海平面大会声明
WCRP/IOC Sea Level Conference Statement 2017

该声明由大会主办方和会议主席根据海平面 2017 年大会期间广大参会者和参会组织的建议编写而成，会后有超过 270 名参会者签署了这份声明。

The WCRP/IOC Sea Level Conference Statement was prepared by conference hosts and chairs, based on input from the broad community during the Sea Level 2017 conference. It has been adopted and signed by over 270 members of the scientific community.
第71期Exchanges为CLIVAR开放科学大会特刊，内容为2016年CLIVAR开放科学大会获得的来自青年科学家的高质量研究成果和杰出海报。

第72期Exchanges为CLIVAR和PAGES的联合特刊，本期特刊主要关注十年气候变率以及可预测性问题的回顾和对相关问题的理解及解决方案。

第73期Exchanges的主题是伊比利亚半岛的气候，其中概述了CLIVAR和西班牙在此领域的科研合作。

- CLIVAR SSG成员Stephen M. Griffies博士获得2017年美国地理学联盟杰出会员称号。
  Dr. Stephen M. Griffies, a member of the CLIVAR Scientific Steering Group (SSG) has been elected a 2017 AGU Fellow.

- CLIVAR CONCEPT-HEAT联合主席Kevin Trenberth博士获得美国地理学联盟杰克·雷维尔勋章。
  Dr. Kevin Trenberth, co-chair of the CONCEPT-HEAT Research Focus was awarded AGU’s Roger Revelle medal of 2017.

- CLIVAR- GSOP委员会主持的ORA-IP项目，其成果发布于业务化海洋学期刊，并因此获得IMarEST Denny奖。
  The ORA-IP team has been awarded the IMarEST Denny Medal for the paper "The Ocean ReAnalyses Intercomparison Project (ORA-IP)" , which was published in Journal of Operational Oceanography, Volume 8, Supplement 1.
能力建设
Capacity Building

CLIVAR-FIO 暑期学校

第一期 CLIVAR-FIO 暑期学校于 2018 年 6 月 25 日至 6 月 30 日在青岛举办，同期还举办了 UNESCO/IOC 海洋动力学与气候区域培训与研究中心培训课程，两项课程学员由 ICPO 与 ODC 共同招募。课程主题如下：

1. CLIVAR-FIO 暑期学校（6 月 25 日至 30 日）
主题：过去，当下及未来的海平面变化 “Past, present and Future Sea Level changes”

2. UNESCO/IOC 海洋动力学与气候区域培训与研究中心培训课程（7 月 2 日至 7 日）
主题：海洋预报系统 “Ocean Forecast Systems”

The CLIVAR-FIO Summer School on “Past, Present and Future Sea Level Changes” was organized in Qingdao, China, from June 25 to 30, 2018, back to back with the Training course “Ocean Forecast Systems” of the UNESCO/IOC Regional Training and Research Center on Ocean Dynamics and Climate (ODC), from July 2 to 7, 2018.
第四届厄尔尼诺大会:
气候变暖下的厄尔尼诺

气候变暖下的厄尔尼诺将于2018年10月16日至18日在厄瓜多尔瓜亚基尔市举行。该会议由CLIVAR和国际厄尔尼诺研究中心共同主办，自然资源部（国家海洋局）第一海洋研究所是会议主办方之一。

IV International Conference on El Niño Southern Oscillation: ENSO in a warmer Climate will take place at Guayaquil, Ecuador from October 16-18. This conference is co-organized by CLIVAR and International ENSO Research Center. FIO is one of its sponsors.

会议将在位于厄瓜多尔瓜亚基尔市的海洋高等理工大学Gustavo Galindo校区举办

The Conference will be held at the Gustavo Galindo Campus of Escuela Superior Politecnica del Litoral (ESPOL) in Guayaquil, Ecuador.

“第四届厄尔尼诺国际会议：气候变暖下的厄尔尼诺”由6个主题会议及其相关的海报展示和国际展览共同构成。会议包括以下主题：

I ENSO 观测，包括最近事件的分析
II ENSO 动力学
III ENSO 和其他气候变率模式（季节内，年代际，百年际）
IV ENSO 建模和预测
V ENSO 影响和区域过程
VI 气候信息与气候和海洋科学的可持续发展和未来

The IV International Conference on ENSO will be organized in 6 plenary sessions, related poster sessions and an International Exhibition. The specialized sessions will emphasize the following topics:

I ENSO observations, including analysis of recent events.
II ENSO dynamics
III ENSO and other modes of climate variability (intra-seasonal, decadal, centennial)
IV ENSO modeling and prediction
V ENSO impacts and Regional processes
VI Climate Information and sustainable development and future of climate and ocean science.
海洋中尺度涡与大气相互作用研讨会

Workshop on Ocean Mesoscale Eddy Interactions with the Atmosphere

海洋中尺度涡与大气相互作用研讨会于2018年2月17日至18日在美国波特兰召开，该会议由CLIVAR大西洋工作组举办，并得到WCRP/CLIVAR和美国CLIVAR的资助。来自10个国家的50多位海洋科学家参会，以评估海洋涡流-大气相互作用的认知现状，并谋划解决该领域的突出问题，包括：
1) 处理关于涡旋尺度海-气通量的未决问题的观测要求；
2) 涡旋尺度海-气通量在仅包含海洋涡动解析模型中的表征；
3) 大气天气/气候对海洋涡流场及其变化的影响。

地球能量不平衡及其影响研讨会

2018 WCRP workshop: The Earth’s Energy Imbalance and its implications (EEI)

地球能量不平衡（EEI）是确定全球气候变化状况和持续全球变暖预期的最基本指标之一。EEI研讨会将于2018年11月13日至16日在法国图卢兹举行。该研讨会由CLIVAR Concept-Heat研究组牵头，并由CLIVAR和GEWEX共同赞助。研讨会的主要目标是启动新的WCRP活动，并通过所有WCRP核心项目和相关活动，尤其是CLIVAR与GEWEX之间的广泛讨论和参与，提升相关科研群体对地球能量不平衡的认知。

The Earth Energy Imbalance (EEI) is one of the most fundamental metrics defining the status of global climate change and expectations for continued global warming. The EEI workshop will be held on 13-16 November 2018 in Toulouse, France. This event is being led by the Concept-Heat RF with the support of CLIVAR and GEWEX. The main objective of the workshop is to initiate a new WCRP-wide activity and to thus strengthen and extend the community on the Earth’s energy imbalance through a community wide discussion on links across all the WCRP core projects and relevant activities, in particular between CLIVAR and GEWEX.
<table>
<thead>
<tr>
<th>会议名称/Name of the Meetings</th>
<th>时间/Time</th>
<th>地点 Location</th>
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</thead>
<tbody>
<tr>
<td>热带大西洋观测系统评估研讨会 Tropical Atlantic Observing System (TAOS) Review Workshop</td>
<td>2018年2月8-9日</td>
<td>美国，波特兰Portland, USA</td>
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<tr>
<td>CLIVAR 大西洋委员会第 16 次会议 The 16th Session of CLIVAR ARP</td>
<td>2018年2月10日</td>
<td>印尼，雅加达Jakarta, Indonesia</td>
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<tr>
<td>海洋中尺度涡与大气相互作用研讨会 Workshop on Ocean Mesoscale Eddy Interactions with the Atmosphere</td>
<td>2018年2月17-18日</td>
<td>瑞士，达沃斯 Davos，Switzerland</td>
</tr>
<tr>
<td>CLIVAR 印度洋委员会第 14 次会议暨第 2 次印度洋观测系统十年回顾研讨会 The 14th Session of CLIVAR/IOC-GOOS IORP and the 2nd IndOOS Review Workshop</td>
<td>2018年3月21-23日</td>
<td>美国，博尔德 Boulder, USA</td>
</tr>
<tr>
<td>CLIVAR 南大洋委员会第 13 次会议及北冰洋委员会第 1 次会议 13th Session of CLIVAR SORP and 1st Session of CLIVAR NORP</td>
<td>2018年6月14-17日</td>
<td>厄瓜多尔 Ecuador</td>
</tr>
<tr>
<td>CLIVAR 年度际气候变率与可预报性研究组第 2 次会议及季节至年代际预报国际研讨会 2nd Session of DCVP jointly with the International workshop on subseasonal to decadal prediction</td>
<td>2018年9月17-22日</td>
<td>法国，图卢兹Toulouse, France.</td>
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<td>热带太平洋十年际变化和 ENSO 十年际变化研讨会 Workshop on Tropical Pacific Decadal Variability and ENSO Decadal Variability</td>
<td>2018年10月13-14日</td>
<td>美国，华盛顿 Washington DC, USA</td>
</tr>
<tr>
<td>厄尔尼诺研究组第 2 次会议 2nd session of CLIVAR ENSO RF Meeting</td>
<td>2018年10月15日</td>
<td>美国，华盛顿 Washington DC, USA</td>
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<tr>
<td>太平洋区域委员会第 13 次会议 13th session of CLIVAR PRP Meeting</td>
<td>2018年10月15日</td>
<td>美国，华盛顿 Washington DC, USA</td>
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<tr>
<td>WCRP/CLIVAR/GEWEX 地球能量平衡联合研讨会及 CLIVAR 地球热量收支平衡研究组第 2 次会议 Joint WCRP/CLIVAR/GEWEX: “Synergy community on the Earth energy imbalance” and CONCEPT-HEAT RF 2nd meeting</td>
<td>2018年11月13-16日</td>
<td>瑞士，达沃斯 Davos，Switzerland</td>
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<tr>
<td>CLIVAR 第 24 次科学指导委员会年会 24th Session of CLIVAR Scientific Steering Committee Meeting</td>
<td>2018年11月</td>
<td>美国，华盛顿 Washington DC, USA</td>
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<tr>
<td>CLIVAR 大西洋边界上升流研究组第二次会议 2nd Session of CLIVAR Eastern Boundary Upwelling System Meeting</td>
<td>2018年12月</td>
<td>美国，华盛顿 Washington DC, USA</td>
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To make progress on the fundamental areas of climate science, respective CLIVAR activities will be framed around the following science questions.

- What is the ocean's role in determining or modulating natural climate modes of variability? How are these modes and the ocean's role altered by external forcing, particularly those arising from anthropogenic sources?
- What are the oceanic constraints on transient climate sensitivity, including air-sea exchange, ocean heat uptake and transport, and the Earth's energy budget?
- What are the regional and coastal impacts of a changing climate upon sea level, ocean heat content, ocean-cryosphere interactions and the water cycle?
- What is the ocean's role in the Earth's carbon-climate link at both global and regional scales?
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