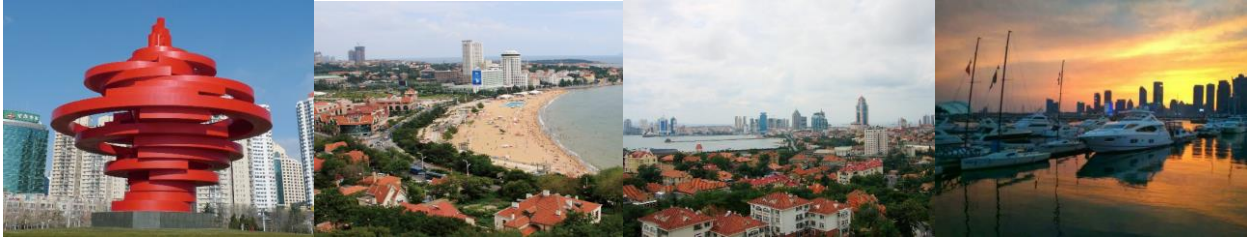




CLIVAR
Open Science Conference
Qingdao, 2016



CHARTING THE COURSE FOR CLIMATE AND OCEAN RESEARCH

18-25 SEPTEMBER 2016 QINGDAO, CHINA

18, 24-25 September: **Early Career Scientists Symposium**

19-23 September: **Open Science Conference**

Conference Handbook

www.clivar2016.org

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青岛海洋科学与技术国家实验室

Qingdao National Laboratory for Marine Science and Technology





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WELCOME

As the local host, Qingdao National Laboratory for Marine Science and Technology (QNLN) welcomes you to Qingdao and invites you to discover the many opportunities presented by this city that is leading China's marine S&T development. Ministry of Science and Technology of China, Shandong provincial government and Qingdao municipal government have jointly built QNLN, a vast modern facility in the heart of Qingdao Oceantech Valley, to foster fundamental research and develop cutting-edge technology. And we believe that the key to its success is collaboration across disciplines, between the government and the private sector and amongst nations. Therefore, we are exceptionally pleased and proud to host the WCRP CLIVAR Open Science Conference. We hope that this is just the beginning of our relationship and will lead to many future international collaborations so that, together, we can realize our common goals of sustainable development and a healthy planet Earth.



Lixin WU
Director, QNLN



Scientific Organising Committee

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Detlef Stammer	University of Hamburg, Germany
Lisa Goddard	IRI, Columbia University, USA
Lixin Wu	Qingdao National Laboratory for Marine Science and Technology / Ocean University of China, China
Fangli Qiao	FIO, SOA, China

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Tianjun Zhou	IAP CAS, China
Jiang Zhu	IAP CAS, China

FOREWORD

On behalf of the entire Scientific Organizing Committee and our host, the Qingdao National Laboratory for Marine Science and Technology (QNLN), we welcome you to Qingdao and thank you for joining us for this event. We are over 600 scientists from 35 countries, coming together in this beautiful seaside town to “chart the course of climate and ocean research”. With your support and participation, we hope to fulfil the Conference vision:

“The collective voice and expertise of the international climate community is essential in shaping the international research agenda on the coupled ocean-atmosphere system. The World Climate Research Programme’s (WCRP) Core Project on Climate and Ocean – CLIVAR - invites the international climate community to review the state of the science, to prioritize international research plans and to initiate new collaborations.”

The Scientific Organizing Committee has developed a programme designed to maximize your opportunities to share ideas, foster collaborations and develop future plans. The two hours each day devoted to poster sessions give all participants an opportunity to discuss their work with colleagues and discover the many facets of climate and science research being presented. Poster clusters and town halls have been organized from the “grass roots” to further the possibilities for exchange.

A dedicated peer review team has selected oral presenters for the parallel sessions and one for each of the plenaries from the over 900 abstracts that were submitted. One of the important aims of this conference is to engage the future generation and we are delighted that 130 students and early career scientists will participate in the ECS symposium that takes place on the weekends before and after the conference. ECS will also play important role in the OSC, as speakers, daily chairs and rapporteurs. The level of interest from ECS bodes well for future of climate and ocean science.

We thank QNLN for its generous support to the OSC and FIO for hosting the ECSS and for providing a home and support to the ICGPO that has been instrumental in organizing this conference. We recognize the important contribution from ESA in supporting the OSC website, abstract submission and review and registration processes. We thank our sponsors WCRP, USA NOAA, NSF and DOE, APN, PAGES, PICES, and EUMETSAT for providing funds to support the participation of 101 ECSS and developing country scientists, SUGAN for extra catering and SIO SOED for making possible the extra wifi bandwidth. We note with appreciation the support from the China Society for Oceanography for publication of the special 20th anniversary issue of Exchanges that you will find in your registration package.

We believe that one of the most important outcomes of the conference will be the informal exchanges that take place in the poster sessions, town halls and social events, in the hallways and on the beach. We hope that in this way, and through the formal programme, the Conference will provide you with an interesting, fruitful and enjoyable experience.

Lisa GODDARD

Fangli QIAO

Detlef STAMMER

Lixin WU

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1. VENUES

1.1 Open Science Conference (September 19-23, 2016)

September 19 (Monday)

Qingdao National Laboratory for Marine Science and Technology (QNLN)

青岛海洋科学与技术国家实验室

No.1 Wenhai Road, Ao shan wei town, Ji mo, Qingdao 青岛, 即墨市, 鳌山卫镇 问海路 1 号

September 20-23 (Tuesday - Friday)

Hyatt Regency Qingdao 青岛鲁商凯悦酒店

No. 88 DongHai Dong RD, Laoshan District,

Qingdao 青岛, 崂山区, 东海东路 88 号

1.2 Early Career Scientists Symposium (September 18, 24 and 25)

In addition to the main event, an Early Career Scientists Symposium will take place on the weekends before and after the main Conference (18th, 24th-25th September) at FIO. Participation is restricted to those selected to attend the Symposium.

The First Institute of Oceanography (FIO), State Oceanic Administration (SOA)

国家海洋局第一海洋研究所

No. 6 Xian xia ling RD, Laoshan District, Qingdao 青岛, 崂山区, 仙霞岭路 6 号

The meeting venues (including map) and facilities are detailed in page 24.

2. REGISTRATION

2.1 OSC participants

Sunday, September 18, 12:00 – 23:00 in Lobby of Hyatt Regency Qingdao

Monday, September 19, 07:00 – 19:00 in Lobby of Hyatt Regency Qingdao

Tuesday – Friday September, 20-23, at Info Desk on 3rd floor.

* Participants at Blue Horizon and Sophia hotels pick up badge and registration bag at check-in.

2.2 ECSS participants

Sunday, September 18, 08:00 – 09:00,

Venue: 6th Floor meeting room at The First Institute of Oceanography (FIO), State Oceanic Administration (SOA) (Add: No. 6 Xian xia ling RD, Laoshan District, Qingdao)

2.3 Panel/Research Foci meeting participants

Saturday, September 17, 10:30-11:00

Venue: 3rd floor, Hyatt Regency Qingdao (Add: No. 88 DongHai Dong RD, Laoshan District, Qingdao)

2.4 Badges

All participants will be required to wear their badges to board the buses that will transport participants to QNLN on Monday, September 19, and to have access to the OSC meeting rooms, reception and banquet at the Hyatt.

Badges have different colours to identify the following categories

Red: Chair

Green: Speaker

Purple: ECS Symposium

Dark blue: Participants

Orange: Exhibitors

Pink: LOC and Volunteers

Grey: Media

Light blue: Accompanying person

3. SCIENTIFIC PROGRAMME

3.1 Programme at a glance

	CLIVAR2016 Early Career Scientists Symposium	OSC Registraion	CLIVAR 2016 Main Open Science Conference					CLIVAR2016 Early Career Scientists Symposium			
			DAY 1	DAY 2	DAY 3	DAY 4	DAY 5				
Date	Sunday 18-Sep	Sunday 18-Sep	Monday 19-Sep	Tuesday 20-Sep	Wednesday 21-Sep	Thursday 22-Sep	Friday 23-Sep	Saturday 24-Sep	Sunday 25-Sep		
Venue	FIO	Hyatt	QNLN	Hyatt	Hyatt	Hyatt	Hyatt	FIO	FIO		
AM	8:00 FIO ECSS Registration		7:30 Registration & 8:30 Transport to QNLN	9:00 Plenary 2	9:00 Plenary 3	9:00 Plenary 4	9:00 Plenary 5	9:00 Plenary: CLIVAR Science frontiers	9:00 OSC Science topics panel session: interactive discussion with senior scientists		
	9:00 Opening session			Climate Variability and Predictability	Understanding Ocean and Climate Processes	The Ocean in a Warmer World	Climate Information and Sustainable Development				
	9:30 Introduction to the OSC			10:00 Opening Session	10:30 Coffee/Tea	10:30 Coffee/Tea	10:30 Coffee/Tea	10:30 Coffee/Tea	10:00 Coffee/tea	10:00 Coffee/tea	
	10:00 Coffee/Tea				11:00 Keynote	11:00 Posters Sessions 1.3 and 2	11:00 Posters Sessions 1.1 and 3	11:00 Posters Sessions 1.2 and 4, 5, 6	11:00 Plenary 6 Future of Climate and Ocean Science	10:30 Working group sessions	10:30 From research to operational –the development of an ocean & climate prediction system
	10:30 Plenary session: CLIVAR in the context of Major Climate Programmes										
	11:15 Introduction to OSC Daily Themes										
Noon	12:30 Lunch		12:00 Lunch	12:00 Lunch	12:00 Lunch	12:00 Lunch	Closing Ceremony	12:30 Lunch	12:15 Closing Ceremony		
PM	14:00 Meet and Greet - Introductory Working group sessions	12:00-23:00 Registration	14:00 Plenary 1 Ocean's Role in Climate	14:00 Parallel 2.1 Intra-seasonal to Interannual	14:00 Parallel 3.1 Mixing & Stirring	14:00 Parallel 4.1 Modes		14:00 Working group sessions – preparation of summary presentations			
				14:00 Parallel 2.2 Decadal	14:00 Parallel 3.2 Ocean & Climate Dynamics	14:00 Parallel 4.2 Sea Level					
				14:00 Parallel 2.3 Centennial to Millennial	14:00 Parallel 3.3 Upwelling	14:00 Parallel 4.3 Boundary Current Systems					
	15:30 Coffee/tea			15:30 Coffee/tea	15:30 Coffee/tea	15:30 Coffee/tea	15:30 Coffee/tea	15:00 Coffee/tea	15:30 Penary: Working group presentations and workshop summary		
	16:00 Working group sessions		16:00 Parallel 1.1 Energy	16:00 Posters Sessions 1.3 and 2	16:00 Posters of Sessions 1.1 and 3	16:00 Posters Sessions 1.2 and 4, 5, 6	16:00-17:00 Town halls 11				
			16:00 Parallel 1.2 Carbon								
			16:00 Parallel 1.3 Water								
17:45 Transport to Hyatt		17:00-17:40 Keynote	17:00-17:40 Keynote	17:00-17:40 Keynote	17:00-17:40 Keynote						
Evening		19:00-21:30 Icebreaker Reception at Hyatt	18:00-19:00 Town halls 1, 2, 3	18:00-19:00 Town halls 7, 8	19:30-22:00 Banquet at Hyatt		18:30 ECSS Banquet at Blue Horizon				
			19:00-19:30 Town hall light dinner break	19:00-19:30 Town hall light dinner break							
			19:30-20:30 Town halls 4, 5, 6	19:30-20:30 Town halls 9, 10							

3.2 OSC Daily Programme

September 19 (Monday, at QNLM): Ocean's Role in the Climate System

Time	Items		
08:30	Shuttle buses depart from Hyatt and Home Inn Hotels		
10:00	Opening Ceremony (Chair: Lixin Wu, Venue: Multifunctional Hall in the Academic Exchange Center)		
	<i>Detlef Stammer, Co-chair of CLIVAR 2016 OSC Scientific Organising Committee (SOC)</i>		
	<i>Guy Brasseur, Chair, WCRP Joint Scientific Committee</i>		
	<i>Vladimir Ryabinin, Executive Secretary, IOC of UNESCO (Video)</i>		
	<i>Congqiang Liu, Vice Director, Natural Science Foundation of China</i>		
	<i>Representative from Ministry of Science and Technology, China</i>		
	<i>Representative from State Oceanic Administration, China</i>		
	<i>Xinqi Zhang, Vice President of Qingdao National Laboratory for Marine Science and Technology (QNLM) and Mayor of Qingdao</i>		
11:00	Keynote:		
	Thomas Stocker: Anthropogenic Climate Change: Time to Focus on the Ocean		
11:45	Group photo		
12:00	Lunch and QNLM tours		
14:00	Plenary 1: (Chair: Fangli Qiao, Venue: Multifunctional Hall in the Academic Exchange Center)		
14:00	Monika Rhein: The ocean's role in the energy cycle		
14:20	Laurent Bopp: The ocean carbon sink, today and tomorrow: what we know, what we don't know		
14:40	Ray Schmitt: The Global Water Cycle		
15:00	Lijing Cheng: Historical ocean heat content estimation and the implication for assessing Earth's energy budget		
15:20	Questions and discussion		
15:30	Coffee/tea break		
16:00	Parallel sessions		
	Session 1.1 Energy	Session 1.2 Carbon	Session 1.3 Water
Chairs:	<i>Karina von Schuckmann Mathew Palmer Kevin Trenberth</i>	<i>Pedro Monteiro Curtis Deutsch</i>	<i>Paul Durack Sonia Seneviratne Olga Zolina</i>
Venue	No. 4 Meeting Room (4th floor) in the Exposition Hall	No.3 Meeting Room (3rd floor) in the Exposition Hall	Multifunctional Hall in the Academic Exchange Center
16:00	Trenberth, Kevin Insights into Earth's energy imbalance from multiple sources	Séférian, Roland Investigating the mechanisms behind the reinvigoration of the Southern ocean carbon sink	Dirmeyer, Paul Connections between oceans and continents via the atmospheric water cycle
16:15	Gulev, Sergey A new concept for space-time integration of surface turbulent heat fluxes and analysis of long-term change in basin-scale surface flux	Monteiro, Pedro Temporal and Spatial Scale-Sensitivities of Air-Sea CO ₂ Fluxes in the Southern Ocean	Greve, Peter Dry gets drier, wet gets wetter? Why ocean responses do not translate into land climate behaviour
16:30	Ponte, Rui Sea level accelerations, the recent surface warming slowdown and the planet's energy balance	Bishop, Stuart Current and Future Ocean Carbon Uptake - Carbon Hot Spot: A new field program to understand the role of eddies in carbon sequestration within the Kuroshio Extension region	Liu, Chunlei Current changes in precipitation and its extremes across wet and dry regions

16:45	Lago, Veronique An idealized 50 years decomposition of the impact changing surface conditions have on ocean subsurface temperature trends	Fay, Amanda Updated global trends in surface ocean pCO ₂ : decadal to multidecadal timescales	
17:00	Liang, Xinfeng Global ocean vertical heat flux and its bidecadal change	Rodgers, Keith Sources of uncertainties in 21st century projections of potential ocean ecosystem stressors	Zolina, Olga Changes in European extreme precipitation over the last decades
17:15	Swart, Neil Attribution of observed Southern Ocean warming and freshening using a new Super Ensemble	He, Yanchun Estimation of anthropogenic carbon in global ocean using transit time distribution and evaluation of its uncertainties based on ocean model output	Haine, Thomas Arctic Freshwater Export: Status, Mechanisms, and Prospects
17:45	Buses leave for Hyatt		
19:00	Icebreaker reception (Hyatt lawn)		

September 20 (Tuesday, Hyatt): Climate Variability and Predictability, Chair: Noel Baker

Time	Items		
09:00	Plenary 2: Hyatt Ballroom, 3rd floor		
09:00	<i>Harry Hendon: Progress in Sub-Seasonal and Seasonal Prediction</i>		
09:20	<i>Rowan Sutton: Decadal Climate Variability and Predictability</i>		
09:40	<i>Kim Cobb: Paleo-constraints on recent trends in tropical Pacific climate</i>		
10:00	<i>Iuliia Polkova: Predictive skill for regional interannual steric sea level and mechanisms for predictability</i>		
10:20	Questions and discussion		
10:30	Coffee/tea break		
11:00	Poster Sessions: 1,3, and 2 Hyatt Donghai Rooms (2 nd floor)		
14:00	Parallel sessions		
	Session 2.1 Intraseasonal to Interannual	Session 2.2 Decadal	Session 2.3 Centennial to Millennial
Chairs	<i>Aida Diongue Rodney G. Martinez Michael McPhaden</i>	<i>Paco Doblaz Reyes Yochanan Kushnir</i>	<i>Pascale Braconnot Axel Timmermann Kim Cobb</i>
Venue	Hyatt Ballroom 1 (3rd floor)	Hyatt Ballroom 2 (3rd floor)	Hyatt Ballroom 3 (3rd floor)
	14:00 Chen, Han-Ching The Role of Reversed Equatorial Zonal Transport in Terminating an ENSO Event	14:00 Newman, Matthew The Pacific decadal oscillation, revisited	14:00 Valdes, Paul Storm Tracks during the Deglaciation
	14:15 Knight, Jeff Tropical Rainfall, Rossby Waves and Regional Winter Climate Predictions	14:15 Thompson, Vikki A novel use of climate predictions to identify unprecedented climate extremes	14:15 Hu, Aixue Dependence of the AMOC stability on the background climate
	14:30 Spennemann, Pablo Characterization of soil moisture variability over South America: linkages to remote sources of variability	14:30 Ghosh, Rohit Impact of observed North Atlantic multidecadal variations to European summer climate: A linear baroclinic response to surface heating	
	14:45 Janicot, Serge The MISVA project: From a better understanding of the intraseasonal and synoptic variability toward forecast	14:45 Ruprich-Robert, Yohan The role of the Atlantic Multidecadal Variability on extreme climate conditions over North America and Europe	14:45 Shi, Xiaoxu Simulated response of the mid-Holocene Atlantic Meridional Overturning Circulation in ECHAM6-FESOM/MPIOM
	15:00 Yu, Bin Tropical atmospheric forcing of the wintertime North Atlantic Oscillation	15:00 Behrens, Erik Southern Ocean deep convection in global climate models: a driver for variability of subpolar gyres and Drake Passage transport on decadal timescales	15:00 Man, Wenmin The global monsoon response to volcanic eruptions in the CMIP5 past1000 simulations
	15:07 Li, Yuanlong Intraseasonal SST and Precipitation Variability of the Indian Summer Monsoon: Impact of Ocean Mixed Layer Depth	15:15 Danabasoglu, Gokhan Impacts of Ocean Model Parameterizations on the Atlantic Meridional Overturning Circulation (AMOC) Variability in the Community Earth System Model (CESM)	15:15 Jackson, Laura Timescales of AMOC collapse

	15:14 Yu, Yueyue Understanding and Predicting Subseasonal Extreme Events: Relationship between Warm Airmass Transport into the Upper Polar Atmosphere and Cold Air Outbreaks in Winter		
	15:21 McPhaden, Michael ENSO Diversity: Past, Present, and Future. Causes and Consequences of the 2015-16 El Niño		
15:30	Coffee/ tea break		
16:00	Poster Sessions: 1.3, and 2 Hyatt Donghai Rooms (2 nd floor)		
17:00	Keynote (Hyatt Ballroom, 3rd floor)		
	<i>Magdalena Balmaseda: Seamless Prediction and the interactions of time scales, earth system components and institutions</i>		
18:00 – 19:00	Town Hall Session 1-3		
	1. Introduction to YMC and WPOS	2. Ocean observing Satellites - future plans	3. PAGES Town Hall Meeting
Venue	Hyatt Ballroom 1, 3 rd floor	Hyatt Ballroom 2, 3 rd floor	Hyatt Ballroom 3, 3 rd floor
19:00 – 19:30	Town Hall light dinner break (Hyatt Ballroom Foyer, 3rd floor)		
19:30 – 20:30	Town Hall Session 4-6		
	4. Indo-Pacific teleconnection	5. WCRP future	6. Glacier Melt
	Hyatt Ballroom 1, 3 rd floor	Hyatt Ballroom 2, 3 rd floor	Hyatt Ballroom 3, 3 rd floor

September 21 (Wednesday. Hyatt): Understanding Ocean and Climate Processes

Chair: Jonathan Durgadoo

Time	Items		
09:00	Plenary 3 (Venue: Hyatt Ballroom 3 rd floor)		
09:00	Rym Msadek: Role of ocean dynamics in climate variability on interannual to multidecadal time scales		
09:20	Jennifer Mackinnen: Stirring and mixing in the Drake Passage		
09:40	Weidong Yu: Upwelling and Frontal Zones - Example of Complexity in the Monsoonal Indian Ocean		
10:00	Paulo Calil: Frontal Instabilities in the South Atlantic Subtropical Front and their Impact on Phytoplankton Blooms		
10:20	Questions and discussion		
10:30	Coffee/tea break		
11:00	Poster Sessions: 1.1, and 3 Hyatt Donghai Rooms (2 nd floor)		
12:30-13:30	Lunchtime Workshop for ECSS Venue: Hyatt Ballroom 1 (3 rd floor) <i>Visualising and communicating climate data (Ed Hawkins, University of Reading, UK)</i>		
14:00	Parallel Sessions		
	3.1 Mixing and Stirring	3.2 Ocean and Climate Dynamics	3.3 Upwelling and Frontal Zones
Chairs	Marina Levy Baylor Fox Kemper Sonya Legg	Shoshiro Minobe Matthew England	Enrique Curchitser Mauricio Mata
Venue	Hyatt Ballroom 1 (3rd floor)	Hyatt Ballroom 2 (3rd floor)	Hyatt Ballroom 3 (3rd floor)
	14:00 Treguier, Anne Marie Influence of mesoscale and submesoscale dynamics on the seasonal cycle of the ocean mixed layer depth	14:00 Xie, Shang-Ping Ocean-atmosphere coupling in changing climate: SST pattern dynamics	14:00 Ruan, Xiaozhou Frontal structure and transport in southern Drake Passage from ocean gliders
	14:15 Le Sommer, Julien Variability of submesoscale dynamics in the North Atlantic Ocean	14:15 Zhang, Honghai The Meridional Mode in an Idealized Aquaplanet Model: Dependence on the Mean State	14:15 Chen, Gengxin Interannual Variability of Eastern Indian Ocean Upwelling: Local versus Remote Forcing
	14:30 Liu, Zhi Liang Geographical distribution and anisotropy of the oceanic inverse kinetic energy cascade	14:30 Karumuri, Ashok Nonlinearities in the evolutionary distinctions between El Niño and La Niña flavors	14:30 Escribano, Ruben Eastern boundary Upwelling systems (EBUS): interannual variability in the eastern south Pacific and biological response
	14:45 Qiao, Fangli Wave turbulence interaction induced vertical mixing and its effects in ocean and climate models	14:45 Yuan, Dongliang Climate Variability and Predictability Over the Indo-Pacific Ocean: Indonesian Throughflow variations in the eastern Indonesian seas during the onsets of the 2014 and 2015 El Niño	14:45 Fox Kemper, Baylor Effects of ocean surface gravity waves: on turbulence, climate, and frontogenesis.
	15:00 du Plessis, Marcel Ocean-atmosphere interactions on the submesoscale field of the Southern Ocean and its associated impacts on the mixed layer variability	14:52 Wang, Kun Ocean and cryosphere interactions: Tropical Pacific Climate Response to Projected Arctic Sea Ice Loss	15:00 Kopte, Robert Eastern boundary upwelling systems (EBUS): Intraseasonal to interannual variability of the Angola Current inferred from moored and shipboard measurements

	15:15 Hallberg, Robert Internal wave driven mixing: An energetically consistent replacement for the Osborn relationship in ocean mixing parameterizations	15:00 Keenlyside, Noel Tropical Atlantic Variability and Predictability - PREFACE project	15:15 Krebs, Martin Assessing different hypotheses about the origin of Benguela upwelling warm bias
		15:07 Farneti, Riccardo Coordinated ocean-ice reference experiments (core-ii): an assessment of antarctic circumpolar current and southern ocean meridional overturning circulation during 1958-2007	
		15:14 Shoshiro Minobe , Ping Chang , Steve Griffies On Extratropical Frontal- and Meso-scale Air-Sea Interaction	
		15:21 Ganeshan, Manisha How is the atmospheric boundary layer responding to the dynamic new Arctic Ocean?	
15:30	Coffee/tea break		
16:00	Poster Sessions: 1.1, and 3 Hyatt Donghai Rooms (2 nd floor)		
17:00	Keynote (Venue: Hyatt Ballroom 3 rd floor) <i>Jennifer MacKinnon: The elephant and the mouse: multiple scales of ocean dynamic</i>		
18:00 – 19:00	Town Hall Session 7-8		
	7. HighResMIP	8. CLIVAR Science Plan	
Venue	Hyatt Ballroom 1, 3 rd floor	Hyatt Ballroom 2, 3 rd floor	
19:00-19:30	Town Hall light dinner break (Venue: Hyatt Ballroom Foyer, 3 rd floor)		
19:30 – 20:30	Town Hall Session 9-10		
	9. Future-Earth	10. Ocean and Climate Modeling	
Venue	Hyatt Ballroom 1, 3 rd floor	Hyatt Ballroom 2, 3 rd floor	

September 22 (Thursday, Hyatt): The Ocean in a Warmer World, Chair: Sarah Kang

Time	Items		
09:00	Plenary 4 (Venue: Hyatt Ballroom, 3 rd floor)		
09:00	<i>Mike Alexander: Modes of sea surface temperature variability in a warmer world</i>		
09:20	<i>Fan Wang: Multi-scale and long-term variability of the western boundary currents in the warming up oceans</i>		
09:40	<i>Seung-Ki Min: Human-caused Indo-Pacific warm pool expansion</i>		
10:00	<i>Anny Cazenave: Present-day sea level changes at global and regional scales</i>		
10:20	Questions and discussion		
10:30	Coffee/tea break		
11:00	Poster Sessions: 1.2 and 4, 5, 6 Hyatt Donghai Rooms (2 nd floor)		
14:00	Parallel Sessions		
	Session 4.1 Climate Modes	Session 4.2 Sea Level	Session 4.3 Boundary Current Systems
Chairs	<i>Krishna AchutaRao Eric Guilyardi</i>	<i>Aimee Slangen Benoit Meyssignac</i>	<i>Sabrina Speich Toshio Suga</i>
Venue	Hyatt Ballroom 1 (3rd floor)	Hyatt Ballroom 2 (3rd floor)	Hyatt Ballroom 3 (3rd floor)
14:00	Zhu, Jiang Reduced ENSO Variability at the LGM Revealed by an Isotope-enabled Earth System Model	Jérôme Vialard Dominant modes of natural decadal sea-level variability in the Indian Ocean	Sato, Olga Seasonal to interannual variability of the meridional heat fluxes in the South Atlantic
14:15	Santoso, Agus Understanding extreme El Niño: the curious case of the 2015/16 event	Domingues, Catia Motta Upper-ocean thermal expansion and contribution to sea level change since 1970: from global mean rise to regional patterns	Mogollón Aburto, Rodrigo Response of biological production to the strengthening of the upwelling-favorable Trade Winds in the Northern Humboldt Current System: A Modeling Study
14:30	Milinski, Sebastian Tropical Atlantic decadal variability and how it is affected by external forcing	Yin, Jianjun Pacific Sea Level Rise Patterns and Global Surface Temperature Variability	Polito, Paulo Simionatto Can the OFES and CESM models reproduce long Rossby waves?
14:45	Stevenson, Samantha An Ensemble Approach to Understanding ENSO Diversity and Climate Change	Sasaki, Yoshinori Sea level variability around Japan during the 20th century simulated by a regional ocean model	Feng, Ming Downscale the future changes of the Indonesian Throughflow
15:00	Lee, June-Yi Two dominant boreal summer tropical-extratropical teleconnection modes in the Northern Hemisphere in a Warmer World	Piecuch, Christopher Annual sea level changes on the north American northeast coast: influence of local winds and barotropic motions	Lina Song Semi-annually alternating exchange of intermediate waters east of the Philippines
15:15	Li, Tim What controls the divergent projection of ENSO amplitude change under global warming?	Mori, Nobuhito Future projection of ocean wave climate change: a community approach to global and regional wave downscaling	Nam, SungHyun The 2014 warm anomalies observed in the eastern boundary current system off southern California

15:30	Coffee/tea break
16:00	Poster Sessions: 1.2, and 4,5,6 Hyatt Donghai Rooms (2 nd floor)
16:00-17:00	Town Hall Session 11: Ocean Observing (Venue: Hyatt Ballroom 1, 3 rd floor)
17:00	Keynote (venue: Hyatt Ballroom, 3 rd floor)
	Wenju Cai: ENSO and greenhouse warming
19:00	Banquet (Venue: Hyatt Ballroom, 3 rd floor)

September 23 (Friday, Hyatt), Chair: Dunxin Hu

Time	Items
	Plenary 5: Climate Information and Sustainable Development (Chair: Martin Visbeck)
Venue	Hyatt Ballroom, 3 rd floor
09:00	Fei Chai: <i>Coastal and Marine Ecosystems in a Changing World</i>
09:20	Arame Tall: <i>Crafting appropriate institutional frameworks for climate services: the experience of the National frameworks for climate services in Africa</i>
09:40	Panel Discussion (Panelists: Guy Brasseur, Fei Chai, Arame Tall, Thorsten Kiefer)
10:30	Coffee/ tea break
	Plenary 6: Future of Climate and Ocean Science (Chair: Annalisa Bracco)
Venue	Hyatt Ballroom, 3 rd floor
11:00	Matt Collins: <i>The Role of Climate Dynamics in Future Climate Change</i>
11:20	Nicolas Gruber: <i>Climate, carbon and ocean biogeochemistry at a time of change: Recent insights, emerging trends, and future outlook</i>
11:40	Guy Brasseur: <i>Understanding the multi-scale dynamics of the climate system: Challenges for WCRP in the Future</i>
12:00	Panel Discussion (Panelists: In-Sik Kang, Lynne Talley, Lixin Wu, Matt Collins, Nicolas Gruber, Guy Brasseur)
12:30	Reflections on the week– Detlef Stammer
	Best Poster Awards
	Closing remarks – Detlef Stammer and Guy Brasseur
13:30	Conference ends

3.3 ECSS Programme

Day 1 (18 September 2016)

Time	Items
08:00	Registration at FIO
09:00	Opening Session <ul style="list-style-type: none"> • Welcome - FIO/SOA representative • Wenjie Dong on behalf of APN • Objectives and organization of the symposium - Noel Baker
09:30	Introduction to the OSC (<i>Detlef Stammer, Germany</i>)
10:00	Coffee/ tea break
10:30	Plenary session: "CLIVAR in the context of Major Climate Programs" (Martin Visbeck, Germany)
11:15	Introduction to OSC Daily Themes <ol style="list-style-type: none"> (1) Ocean's Role in the Climate System (Pedro Monteiro, South Africa) (2) Climate Variability and Predictability (Pascale Braconnot, France) (3) Understanding Ocean and Climate Processes (Matthew England, Australia) (4) The Ocean in a Warmer World (Eric Guilyardi, France) (5) Climate Information and Sustainable Development (Martin Visbeck, Germany)
12:30	Lunch
14:00	Meet and greet / Introductory working group sessions
15:30	Coffee break
16:00	Working groups (continued)
17:30	End of day

Day 2 (24 September 2016)

Time	Items
08:30	Arrival at FIO
09:00	Plenary session: CLIVAR Open Science Conference Science Frontiers
10:00	Coffee/ tea break
10:30	Working group sessions
12:30	Lunch
14:00	Working group sessions – preparation of summary presentations
15:00	Coffee break
15:30	Plenary session: Working group presentations and summary
17:30	End of Day
18:30	ECS Banquet

Day 3 (25 September 2016)

Time	Items
08:30	Arrival at FIO
09:00	OSC science topics panel session: interactive discussion with senior scientists
10:00	Coffee/ tea break
10:30	From research to operational – the development of an ocean and climate prediction system (Fangli Qiao - FIO)
11:15	YESS (Young Earth System Scientists) and the foundation of ECS organizations in climate science (Gaby Langendijk – WCRP)
12:15	Closing session (Annalisa Bracco, Georgia Tech, USA)
12:30	Lunch

21 September 2016

12:30-13:30	Lunchtime Workshop for ECSS Venue: Hyatt Ballroom 1 (3 rd floor) <i>Visualising and communicating climate data (Ed Hawkins, University of Reading, UK)</i>
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4. POSTERS

4.1 Overall schedule

Tuesday, 20 Sep

1.3 Water
2.1 Intraseasonal to Interannual
2.2 Decadal
2.3 Centennial to Millennial

Wednesday, 21 Sep

1.1 Energy
3.1 Mixing and Stirring
3.2 Ocean and Climate Dynamics
3.3 Upwelling and Frontal Zones

Thursday, 22 Sep

1.2 Carbon
4.1 Climate Modes
4.2 Sea Level
4.3 Boundary Current Systems
5. Climate Information and Sustainable Development
6. Future of Climate and Ocean Science
Latecomers

* Poster abstracts by session and board number are listed sequentially in the abstract book on the USB stick. A listing by presenting authors can be found at the end of this handbook.

4.2 Poster presenter guidelines

Poster Sessions: Tuesday – Thursday: 11:00 – 12:00hrs / 16:00 – 17:00hrs

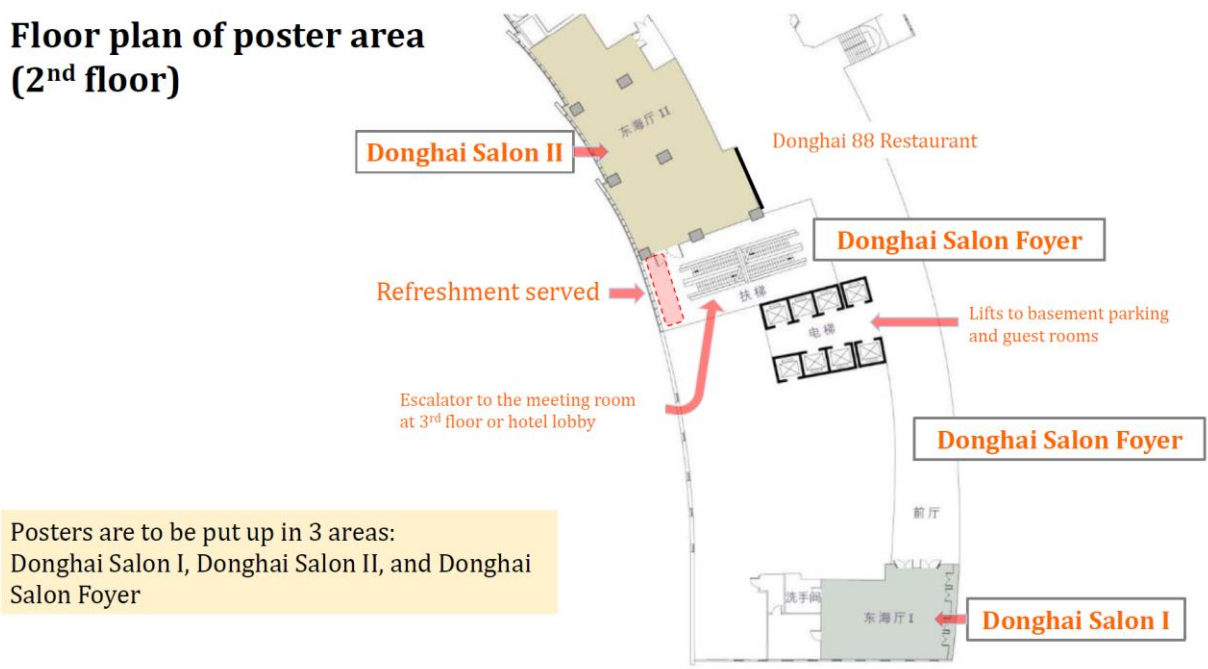
1. Poster boards are 1m wide and 1.3m high (portrait orientation). The maximum size available for posters is 0.9m wide and 1.2m high.
2. Posters will be on display on the second floor of the Hyatt.
3. Posters will rotate daily. Please check the Conference Handbook or website to know the exact date for your poster. Your poster number has the following format DDD-NNN, DDD indicates the day, and NNN indicates the board number. Example: Tue-001.
4. Posters should be hung from 7am to 9am on the day of your presentation. **Do not put your poster up the night before.**
5. Double-sided tape provided by the organisers, not tacks should be used to attach posters to the board material which is made of PVC cloth.
6. Arrive in the poster area at the beginning of both daily sessions (11:00hrs and 16:00hrs) and stand by your poster for a suitable time. It is advisable to indicate with a note when you will be available.
7. Posters must be taken down at the end of the day, no later than 20:00hrs. Any posters left on the boards after this time will be removed by the Conference organizers and disposed of.

Pico presentations

Poster presenters are invited to make a 5-minute presentation of their poster in the small presentation area of the Donghai II poster viewing room. Sign-up sheets will be posted outside the room. Participants interested in making such a presentation can sign up on a first-come, first-serve basis for any of the 6 poster sessions (Tues-Thurs, AM and PM). A total of 12 presentations can be accommodated within each hour-long poster session. A laptop and projector will be provided but participants must load their own presentations. There will be a timekeeper.

4.3 Poster Area Plans and Clusters

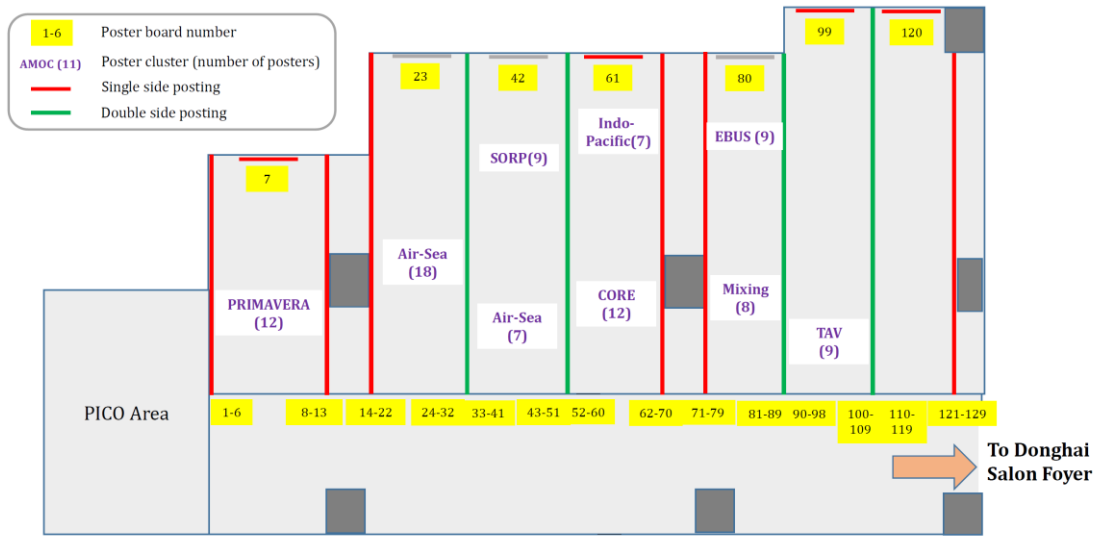
Floor plan of poster area (2nd floor)



Setup in Donghai Salon II - Tuesday



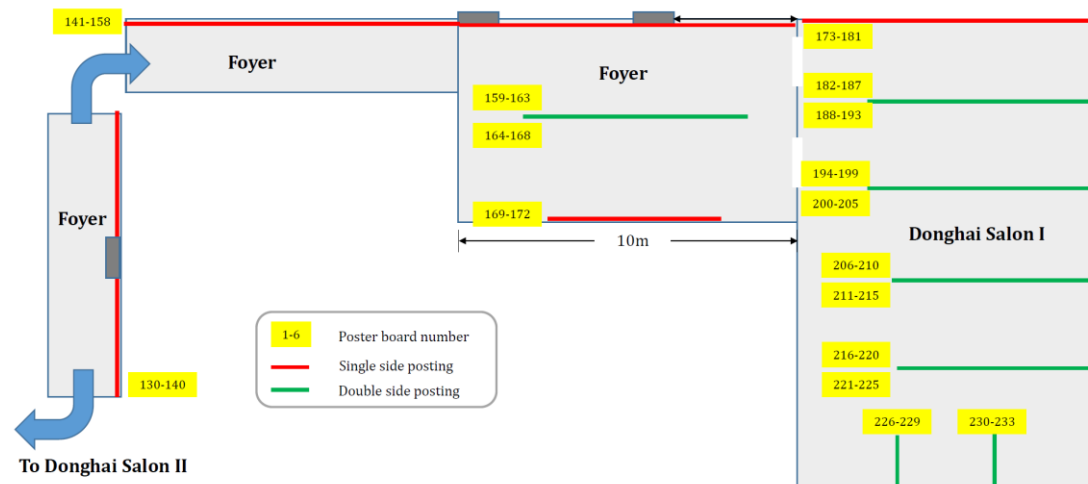
Setup in Donghai Salon II – Wednesday



Setup in Donghai Salon II – Thursday



Setup in Donghai Salon I and Foyer area (Tue-Thu)



Poster Clusters:

In order to encourage coordination and further integration of research activities within and across WCRP, and with other climate and ocean research activities, groups were encouraged to self-organize and submit clusters of posters addressing a specific research topic. See below the list of 13 poster clusters and their location. For a list of all the poster cluster abstracts please refer to the conference USB stick.

List of poster clusters

Session	Title of poster cluster	Chair	Post numbers
2.1 Intraseasonal to Interannual	Climate of the 20 th Century Plus (C20C)	Daithi Stone Jim Kinter	Tue-017 Tue-018 Tue-028
2.1 Intraseasonal to Interannual	Understanding and Predicting Subseasonal Extreme Events (Extreme)	S.-Y. Simon Wang Kathy Pegion	Tue-019 Tue-020 Tue-021 Tue-022 Tue-024 Tue-025 Tue-026 Tue-027
2.1 Intraseasonal to Interannual	ENSO Diversity: Past, Present, and Future (ENSO)	Antonietta Capotondi	Tue-035 Tue-036 Tue-037 Tue-038 Tue-039 Tue-040 Tue-041 Tue -043 Tue-044 Tue -045 Tue-046 Tue-047 Tue-048 Tue-049
2.2 Decadal	Atlantic Meridional Overturning Circulation (AMOC)	Gokhan Danabasoglu	Tue-001 Tue-002 Tue-003 Tue-004 Tue-005 Tue-006 Tue-009 Tue-010 Tue-011 Tue-012 Tue-013
3.1 Mixing and Stirring	Internal Wave Driven Mixing (Mixing)	Sonya Legg	Wed-071 Wed-072 Wed-073 Wed-074 Wed-086 Wed-087 Wed-088 Wed-089
3.2 Ocean and climate dynamics	Climate Variability and Predictability Over the Indo-Pacific Ocean (Indo-Pacific)	Dongliang Yuan	Wed-058 Wed-059 Wed-060 Wed-061 Wed-062 Wed-063 Wed-064
3.2 Ocean and climate dynamics	Coordinated Ocean-ice Reference Experiments (CORE-II) (CORE)	Gokhan Danabasoglu	Wed-052 Wed-053 Wed-054 Wed-055 Wed-056 Wed-057 Wed-065 Wed-066 Wed-067 Wed-068 Wed-069 Wed-070
3.2 Ocean and climate dynamics	Extratropical Frontal- and Meso-scale Air-Sea Interaction (Air-Sea)	Shoshiro Minobe Ping Chang Steve Griffies	Wed-014 Wed-015 Wed-016 Wed-017 Wed-018 Wed-019 Wed-020 Wed-021 Wed-022 Wed-024

Session	Title of poster cluster	Chair	Post numbers
			Wed-025 Wed-026 Wed-027 Wed-028 Wed-029 Wed-030 Wed-031 Wed-032 Wed-033 Wed-034 Wed-035 Wed-036 Wed-049 Wed-050 Wed-051
3.2 Ocean and climate dynamics	PRIMAVERA: High resolution climate processes (PRIMAVERA)	Malcolm Roberts	Wed-001 Wed-002 Wed-003 Wed-004 Wed-005 Wed-006 Wed-007 Wed-008 Wed-009 Wed-010 Wed-011 Wed-012 Wed-013
3.2 Ocean and climate dynamics	Tropical Atlantic Variability and Predictability (TAV)	Noel Keenlyside Ping Chang Peter Brandt	Wed-090 Wed-091 Wed-092 Wed-093 Wed-105 Wed-106 Wed-107 Wed-108 Wed-109
3.2 Ocean and climate dynamics	Ocean and cryosphere interactions in a warming climate (SORP)	Lynne Talley John Fyfe Inga Smith	Wed-038 Wed-039 Wed-040 Wed-041 Wed-043 Wed-044 Wed-045 Wed-046 Wed-047
3.3 Upwelling and Frontal Zones	Eastern boundary upwelling systems (EBUS)	Enrique Curchitser	Wed-075 Wed-076 Wed-077 Wed-078 Wed-079 Wed-081 Wed-082 Wed-083 Wed-084
6 Future of Climate and Ocean Science	Comparability of oceanic nutrient data (Nutrients)	Michio Aoyama Malcolm Woodward	Thu-033 Thu-034 Thu-035 Thu-036 Thu-037 Thu-038 Thu-039 Thu-040 Thu-045 Thu-046 Thu-047 Thu-048 Thu-049 Thu-050 Thu-051

4.4 ECS Poster Competition

Early career scientists and students attending the CLIVAR Conference and presenting posters are eligible to be considered for outstanding poster awards. A distinguished committee of senior and early career scientists will review and identify outstanding posters given by students and early career scientists. Awards will be presented to the best posters during the closing session of the conference on the 23rd of September.

Contest general guidelines:

- The first author of a poster should be registered as a student or ECS (if in doubt, check your registration) and be the poster presenter at the OSC;
- The presenter has to indicate that s/he wishes to participate in the competition by attaching a sticker to her/his poster; these stickers will be available in the poster session rooms;
- The presenter must be next to her/his poster during the judging period which will be indicated in the poster room;
- The poster must be formatted according to the poster guidelines in session 4.2;
- The presentation by the ECS must be original and based on recent research results;
- The prize will go to the poster presenter (who must be the first author and an ECS or student).

Contest criteria:

The posters will be reviewed based on the following criteria:

- Scientific merit and novelty
- Originality of work
- Aesthetics of display
- Clarity of the poster
- Oral presentation of the poster and responses to questions

5. TOWN HALLS

Town Halls are community- initiated and a key element of the CLIVAR 2016 Open Science Conference. Brief summaries are given below as well as a table with the schedule.

Date	Sep-20, Tuesday			Sep-21, Wednesday		Sep-22, Thursday
Session 1: 16:00-17:00						11: Ocean Observing
Session 2: 18:00-19:00	1: Introduction to YMC and WPOS	2: Ocean observing Satellites - future plans	3: PAGES	7: HighResMIP	8: CLIVAR Science Plan	
Session 3: 19:30-20:30	4: Indo-Pacific teleconnection	5: WCRP Future	6: Glacier Melt	9: Future Earth Ocean Network	10: Ocean and Climate Modeling	
Room	Hyatt Ballroom 1	Hyatt Ballroom 2	Hyatt Ballroom 3	Hyatt Ballroom 1	Hyatt Ballroom 2	Hyatt Ballroom 1

ID	Title	Lead	Affiliation
1	Introduction to YMC and WPOS	Dongxiao Wang	SCSIO/CAS, China
2	Ocean- observing satellites - future plans	Fei Chai	State Key Laboratory of Satellite Ocean Environment Dynamics, SIO/SOA
3	PAGES Town Hall Meeting	Marie-France Loutre; Pascale Braconnot	Executive Director, PAGES IPO
4	Atmospheric and Oceanic Teleconnection Across the Indo-Pacific Ocean	Dongliang Yuan; Mattieu Lengaigne	IOCAS, China LOCEAN, France
5	WCRP Future	Guy Brasseur	WCRP JSC Chair, MPI, Germany
6	Ocean Pathways of Glacier Melt: drivers, processes, impacts	Inga Monika Koszalka	GEOMAR, Germany
7	Coordinated analysis of HighResMIP	Rein Haarsma	KNMI, Netherlands
8	CLIVAR Science Plan	Detlef Stammer	CLIVAR SSG co-chair, U Hamburg, Germany
9	Future Earth Ocean Network	Thorsten Kiefer	Director Global Hub Paris, Future Earth, France
10	Ocean and Climate Modeling and CLIVAR	Gokhan Danabasoglu	CLIVAR OMDP, NCAR, USA
11	Ocean Observing	Toshio Suga	GOOS Steering Committee, Tohoku U, Japan

Town Hall 1: Introduction to Years of the Maritime Continent (YMC) and Western Pacific Ocean System: Structure, Dynamics and Consequence (WPOS),

The aim of YMC is observing the weather-climate system of the Earth's largest archipelago to improve understanding and prediction of its local variability and global impact. The science themes of YMC include atmospheric convection, ocean and air-sea interaction, stratosphere-troposphere interaction, aerosol, and prediction improvement. Program 1 of the Strategic Priority Research Program of the Chinese Academy of Sciences, WPOS, the three-dimensional structures, characteristics and dynamic mechanisms of the variability of the major currents in the tropical Western Pacific as well as the feedback mechanisms of the Warm Pool to the East Asian climate since 2013. The objective of the session is to review and discuss the YMC and WPOS research progress, coordinate planned research, as well as identify gaps. Presentations will be made by Fan Wang and Dongliang Yuan (IOCAS China), Jiang Zhu (IAPCAS China), Hans von Storch (HZG Germany), Jin-Song von Storch (CMAS, Germany), Dongxiao Wang (SCSIOCAS, China), Weidong Yu (FIO SOA China) and Ming Feng (CSIRO, Australia).

Lead: Dongxiao Wang, South China Sea Institute of Oceanology, Chinese Academy of Sciences, P. R. China

Town Hall 2: Ocean-observing satellites – progress and future plans

This session will focus on Chinese and European satellite missions and applications. Drs Xingwei Jiang and Mingsen Lin of the China National Satellite Ocean Application Service and the Key Laboratory of Space Ocean Remote Sensing and Application of the State Oceanic Administration will discuss Chinese ocean-observing satellite missions and plans, as well as applications of the data. Dr. HE Qianjiang from the State Key Laboratory of Satellite Ocean Environment Dynamics of the SOA Second Institute of Oceanography will focus on progress in ocean color remote sensing in China seas. Dr Anny Cazenave of the International Space Science Institute, Switzerland, and

Laboratoire d'Etudes en Géophysique et Océanographie Spatiales, France, will give an overview of the European Space Agency's Earth Observation Programme for Oceans.

Lead: Fei Chai, School of Marine Sciences, University of Maine, USA and State Key Laboratory of Satellite Ocean Environment Dynamics, SIO SOA, China

Town Hall 3: PAGES Town Hall meeting

The PAGES (Past Global Changes) project (<http://www.pastglobalchanges.org>) invites you to discuss common questions among the paleo, present day and future climate communities with the objective to strengthen the linkages between ongoing research in WCRP and PAGES.

PAGES is a core project of Future Earth and a scientific partner of WCRP that addresses observations, reconstructions and mechanisms of paleoenvironmental variations. PAGES deals with the physical climate system, biogeochemical cycles, ecosystem processes, biodiversity, and human dimensions, on different time scales - Pleistocene, Holocene, last millennium and the recent past. The meeting will explore how scientists working on long and short time scales (past--present--future) might interact more effectively to tackle some of WCRP's Grand Challenges and CLIVAR research foci and benefit from common model simulations, data synthesis and methodologies.

Attendees are invited to bring a one-slide presentation on their favorite subject to stimulate the discussion and also to send expressions of interest to Marie-France Loutre and Pascale Braconnot with a few key words indicating which subjects you would like to discuss, so that the final agenda will best reflect the interest and goals of participants.

Leads:

Marie-France Loutre, PAGES (Past Global Changes) – Switzerland

Pascale Braconnot, IPSL/LSCE, unité mixte CEA-CNRS-UVSQ, France

Town Hall 4: Atmospheric and Oceanic Teleconnection Across the Indo-Pacific Ocean

The variability of the Pacific and Indian Oceans is of great importance to the global and regional climate variations and predictability. Latest studies suggest that Indian Ocean plays an important role in ENSO variability and predictability. The dynamics are either teleconnected by the atmospheric bridge or through the oceanic channel of the Indonesian seas. In this session, studies about the interactions of Pacific and Indian Ocean climate variability are reviewed and compared, and the effects on the predictability of ENSO and the monsoon are discussed. Presentations will be made by Jong-Seung Kug, (U Hawaii, USA), Mattieu Lengaigne, Dongliang Yuan and Wansuo Duan (IAPCAS, China)

Leads: Dongliang Yuan, Institute of Oceanology, Chinese Academy of Sciences and Mattieu Lengaigne, Institut de Recherches pour le Développement (IRD), Laboratoire d'Océanographie - Expérimentation et Approches Numériques (LOCEAN), France

Town Hall 5: WCRP Future

The mission of the World Climate Research Programme is to facilitate analysis and prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society. The Joint Scientific Committee is charged with providing

guidance and oversight on future directions for WCRP and its activities. Several Core projects including CLIVAR contribute to the development and success of WCRP.

In this Town Hall, the JSC invites OSC participants to discuss their views on the future strategy of WCRP. A few presentations will be made by members of the JSC as well as by Prof Hui-Jun Wang, Chair of the China National Committee for the WCRP. A discussion will take place to address several questions such as: (1) What should be the novel areas and new directions in fundamental climate research? (2) What new observations do we need? – where and how else should we look? and (3) How can our communities best support science innovation?

We hope that the informal discussion will suggest novel and under-explored research directions, along with the tools and infrastructure needed to drive them. Such research will serve to enable societal preparedness for surprises emanating from within the climate system. While investigating these themes, we invite discussions on how WCRP structures and programmes can be best set up and prepared to identify and meet future challenges in climate research.

Lead: Guy Brasseur, JSC Chair, Max Planck Institute for Meteorology, Germany

Town Hall 6: Ocean Pathways of Glacier Melt: drivers, processes, impacts

This Town Hall session highlights the role of ocean circulation modulating glacier response (impact) to (on) the changing climate. The two main objectives are (1) to synthesize and share knowledge about different processes contributing to ocean-induced melting of glaciers in Greenland and Antarctica (warm water pathways to the marine-terminating glaciers and ice tongues, thermodynamics of glacier melt, circulation in the glacial fjords, ice mélange and ice bergs dynamics) and (2) their expected regional and global impacts on fresh water budgets, marine ecosystem, and sea level.

This session engages several scientific disciplines: glaciology, ocean and climate dynamics, biogeochemistry, and marine biology. It offers a possibility to explore interdisciplinary and focused collaboration in terms of regional and global modeling, sustained observations, reanalysis systems, and operational services, model validation and improvement, interdisciplinary process observing programs, assessment of impact on coastal communities and the large scale climate. The scope of this session is bi-polar, with a goal to engage scientists active in the Northern (Greenland) and Southern (Antarctica) regions.

The Town Hall addresses the WCRP Grand Challenge on "Melting Ice & Global Consequences ". It also aims to advance ocean-cryosphere interactions as one of the main themes of the new CLIVAR science plan, and possibly a new dedicated CLIVAR/CliC Research Focus.

Presentations will be made by Thomas Haine, Johns Hopkins U, USA, Matthew England, UNSW CCRC and ARCCSS, Australia, Monika Rhein, U Bremen, Germany, Karina Schuckmann (CLIVAR RF Concept Heat), Mercator-Ocean, France, Inga Smith, (CLIVAR SORP), U Otago, New Zealand and Bin Zhao (ISMIP6), NASA, USA.

Lead: Inga Monika Koszalka, GEOMAR – Helmholtz Centre for Ocean Research, Germany

Town Hall 7: Coordinated analysis of HighResMIP

The High Resolution Model Intercomparison Project (HighResMIP) (Haarsma et al. 2016) consists of a coordinated set of experiments to assess both a standard and an enhanced horizontal resolution simulation in the atmosphere and ocean. The set of HighResMIP experiments is divided into three tiers consisting of atmosphere-only and coupled runs and spanning the period 1950-2050, with the possibility to extend to 2100, together with some additional targeted experiments. Presently 19 modeling centers have promised to participate in Tier 1 and at least 6 centers participating in the European H2020 project PRIMAVERA will participate in all 3 Tiers. This provides an unique data set for coordinated analysis.

The main purpose of the Town Hall meeting is to identify a topic of coordinated analysis of HighResMIP data that will result in a joint paper in a high impact journal. Obvious topics are small scale extreme events, such as tropical cyclones, for which the added value of HighResMIP is most prominent. Regional phenomena like monsoons, or a more general assessment of the benefits of increased resolution are also possible topics. The requirements for analysis and organization on the chosen topic will be discussed as well as new approaches to coordinated analysis. Also the need for additional experiments will be discussed.

The Town Hall meeting will include presentations by Rein Haarsma (KNMI, Netherlands) and Malcolm Roberts, (UKMet Office) outlining the purpose of this meeting and suggestions for coordinated topics and analysis, discussion leading to defining the topic, organization of coordinated analysis and defining a working group and next steps. Participants will be invited to show 1-2 slides to illustrate their ideas.

Ref: Haarsma, R.J. and 25 co-authors: High Resolution Model Intercomparison Project (HighResMIP). Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-66, 2016

Lead: Rein Haarsma/KNMI/Netherlands

Town Hall 8: CLIVAR Science Plan

The CLIVAR 2016 OSC has brought together over 600 people, including scientists with diverse interests from more than 40 countries and over 150 early career scientists. The CLIVAR leadership (Scientific Steering Committee) invites all participants to join in a review of the current draft of a new CLIVAR Science Plan and to discuss what is needed in the future to help advance the science being presented at the OSC. What should be the new directions of climate research, and what should be the respective CLIVAR goals as part of WCRP? Detlef Stammer, CLIVAR SSG co-chair, will summarize the current status of the new Science Plan that will be made available to participants in draft form prior to the conference. Contributions will be made at the Town Hall by representatives of WCRP and sister programmes on how CLIVAR fits with their future plans. Participants will have an opportunity to present their own views on the future of CLIVAR science and what kind of project is needed.

Lead: Detlef Stammer, U Hamburg, Germany

Town Hall 9: Scoping out an agenda for a global Future Earth Knowledge-Action Network on sustainable oceans and solutions

Oceans, including coastal and nearshore areas, provide services essential for life on earth and to the history, culture and livelihoods of people across the globe. However, oceans are also facing multiple challenges from climate change, overfishing, acidification, de-oxygenation and pollution. Recently, an increasing concern about the health of the oceans has placed oceans prominently on several global science-policy agendas, e.g. by inclusion in the set of Sustainable Development Goals and among the upcoming IPCC special reports. Accordingly, research and information activities on ocean topics exist in abundance. Why do we wish to establish yet another ocean research network, and what do we hope to achieve with it that could not be covered by the existing structures?

The new global network intends to be an umbrella over the major existing international activities in order to coordinate research and advocacy efforts more effectively across disciplines, regions, and societal sectors. To that effect, Future Earth has recently launched an open and inclusive Knowledge-Action Network on the topic of ocean sustainability, with the objective to address societal challenges through solutions-oriented, transdisciplinary research. The network wants to build on strong fundamental research and innovative agendas of projects, organizations and communities worldwide, including WCRP, SCOR, GOOS and many others.

The network is currently scoping out its shape and agenda over the coming decade by consulting with global communities of researchers and societal actors with stakes in the generation and use of ocean knowledge. As part of this process, this townhall session solicits discussion of ideas from the CLIVAR community about the most pressing societal challenges, scientific questions and inter- and transdisciplinary opportunities to inform the framing of the agenda of this new ambitious ocean network. Presentations will be made by Thorsten Kiefer (Future Earth) and Martin Visbeck (GEOMAR, Germany)

Lead: Thorsten Kiefer, Future Earth Secretariat, Global Hub in Paris, France

Town Hall 10: Ocean and Climate Modeling and CLIVAR

The mission of CLIVAR is to understand the dynamics, the interactions, and the predictability of the coupled ocean – atmosphere system. To accomplish this mission and its related objectives, CLIVAR enables science through the collection and analysis of observations and the development and applications of models of the coupled climate system. CLIVAR modeling capabilities to advance CLIVAR science activities cover efforts primarily on ocean system models that include both forward models and ocean reanalysis frameworks. The reanalysis work is undertaken by the Global Synthesis and Observations Panel (GSOP). The forward modeling efforts occur within the Ocean Model Development Panel (OMDP) which is the only global modeling panel within CLIVAR. One of OMDP's major foci is the development of ocean models for research in climate and related fields. Another one is to promote interactions amongst the broader ocean modeling community and, in particular, within CLIVAR, noting that all other CLIVAR panels and cross-cutting Research Foci teams have vital modeling needs.

This Town Hall Session will include i) brief summaries of recent developments and efforts from the ocean and coupled climate modeling, reanalysis, and decadal prediction communities, and ii) a

discussion venue for all CLIVAR panels and Research Foci teams to discuss their modeling needs. The topics for the latter may include the next generation of ocean and climate models. The Townhall is will include representatives from the two WCRP modeling panels, WGCM and WGSIP, as well as the WCRP Modeling Advisory Council (WMAC).

Lead: Gokhan Danabasoglu, National Center for Atmospheric Research (NCAR), USA; Co-leads: Stephen M. Griffies, NOAA Geophysical Fluid Dynamics Laboratory, USA and Fangli Qiao, First Institute of Oceanography, SOA, China

Town Hall 11 – Sustained Ocean Observing: How WCRP-CLIVAR and GCOS-GOOS build strong partnerships for global and regional implementation

Sustained ocean observing is essential to document and understand decadal and longer climate variability. The recently articulated Framework for Ocean Observing has suggested to develop a concept of a set of Essential Ocean Variables (EOVs) wich can be used to guide priority setting and system implementation. In addition research programs such as WCRP-CLIVAR are expected to support the development and innovation of new observing elements as well as spearhead the regional implementation by enhancing the efficiency and overall information content of integrated ocean observing systems (OOS). Several best practice examples exist for the Atlantic (AtlantOS), the Southern Ocean (SOOS, OOI, SOCCOM), the Pacific (TPOS2020), the pan-Arctic (SAON) and the Indic (IndOOS). One of the main goals for an integrated, fit-for-purpose global OOS is to enhance the efficiency and capability of all observing networks by strengthening the international partnerships within each of the networks to cover the global ocean. This Town Hall invites participants to a discussion of observation requirements for in situ systems in the global oceans with a focus on societal drivers (which includes research) and EOVs within the context of existing national capabilities, impediments, gaps and opportunities.

Lead: Toshio Suga, Tohoku U, Japan



6. MEETING VENUES AND FACILITIES

6.1 Qingdao National Laboratory for Marine Science and Technology (QNLN)



Address: No.1 Wenhai Road, Ao shan wei town, Ji mo, Qingdao

Time: September 19, 2016 (Monday)

Facilities:

- **Plenary Session:** Multifunctional Hall in the Academic Exchange Center
- **Parallel Sessions:**

Parallel session 1.1: No. 4 Meeting Room, 4th floor in the Exposition Hall

Parallel session 1.2: No. 3 Meeting Room, 3rd floor in the Exposition Hall

Parallel session 1.3: Multifunctional Hall, in the Academic Exchange Center

Lunch Buffet: Scientist Cafeteria and Western Cafeteria in the Academic Exchange Center, and Scientist Club

6.2 Hyatt Regency Qingdao

Address: No. 88 DongHai Dong RD, Laoshan District, Qingdao

Time: Open Science Conference, September 20-23, 2016 (Tuesday - Friday)

Facilities:

a. Third floor

Hyatt Regency Ballroom: Plenary sessions, Banquet on Thursday evening.

Hyatt Regency Ballroom 1, 2, 3 (Divided Ballroom): Parallel sessions, Town Hall sessions.

Hyatt Ballroom Foyer: Coffee break, Town Hall cocktail light dinner break, exhibitor booths, Info desk (Tues-Friday); entrance to LOC office and Speaker Prep Room (far end).

Salon Rooms: CLIVAR Panel/RF meetings, CLIVAR SSG meeting

Boardroom: The boardroom will be available from Sep. 20 to 24. Requests to hold small meetings in this room will be entertained, please register at the Info desk. This room will also serve as the room for media interviews.

b. Second floor

Donghai Salon I, II and corridor: Poster sessions.

Donghai 88 restaurant: Nice local Chinese cuisine with great sea view.

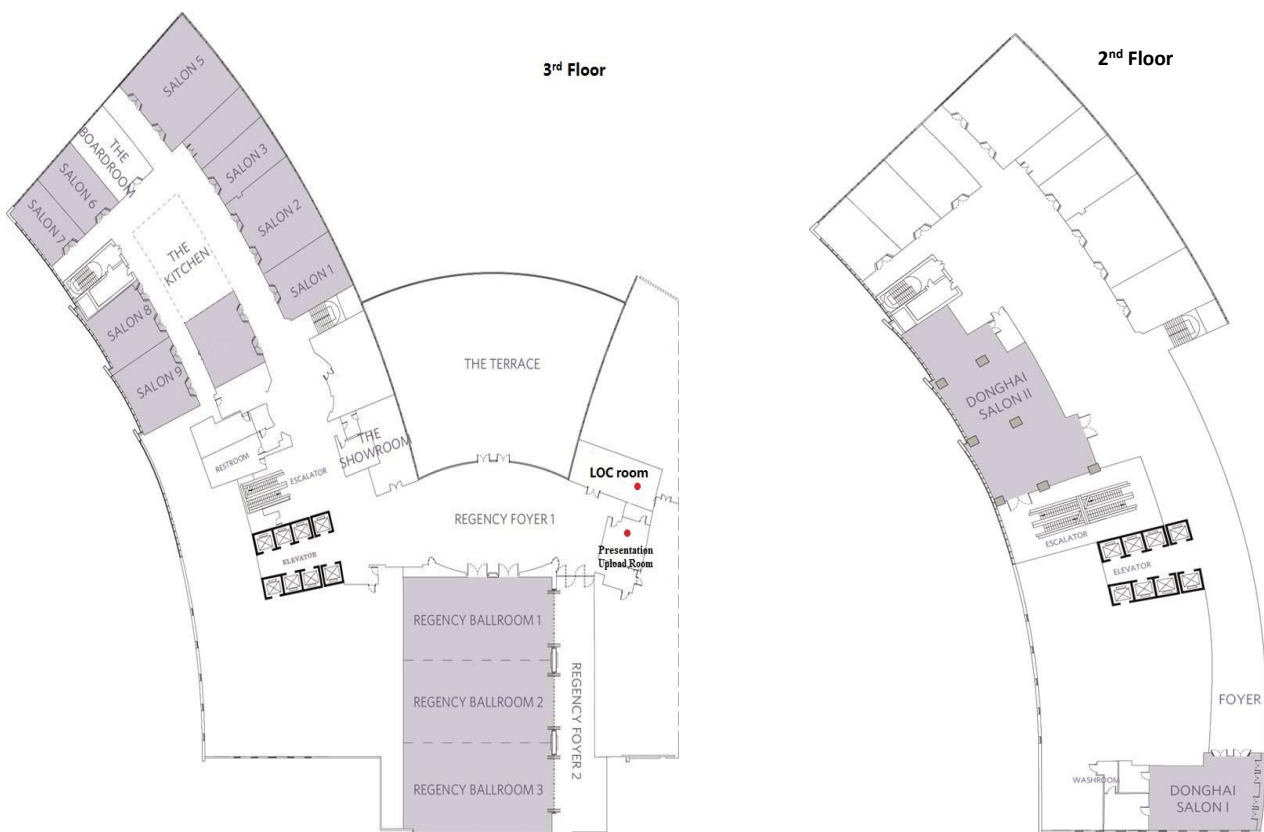
Poster sessions coffee break

c. Hyatt Lobby

Hotel check-in, registration, info desk, online onsite registration, travel agent, ATM (around the corner); buses departure area on Monday morning; Lobby bar.

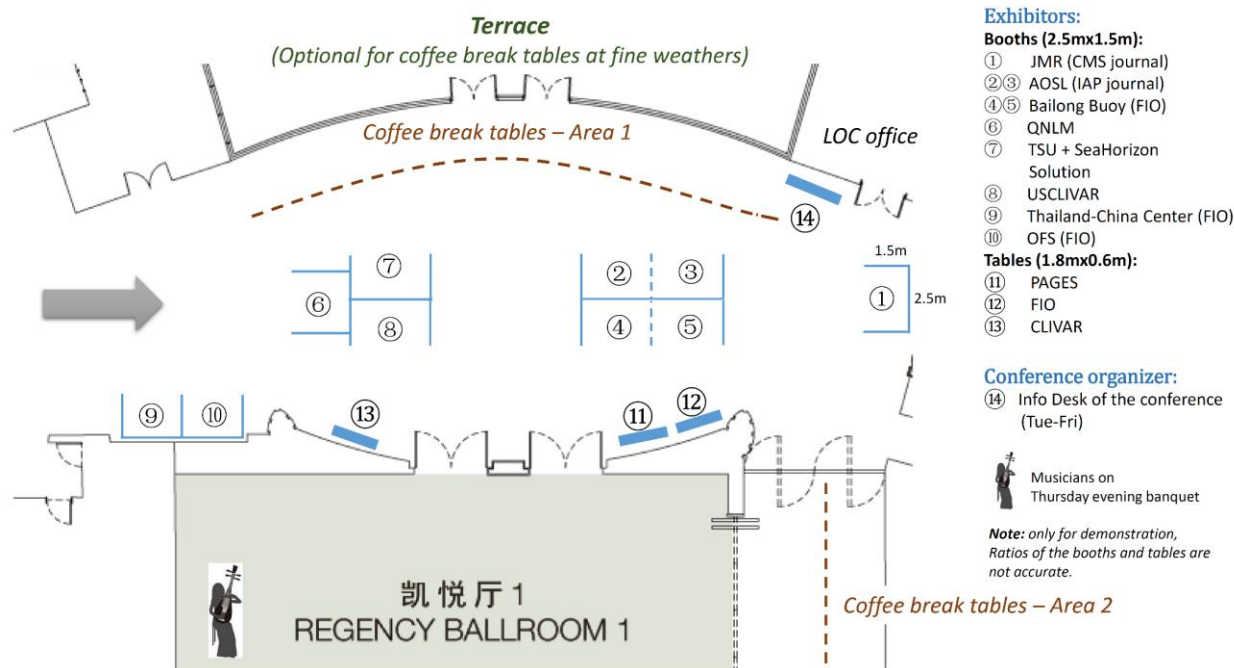
d. Hyatt Lower Lobby

Buffet restaurant (international), BEBA barbecue restaurant (open in the evenings only), Monday icebreaker; Terrace (light lunch option)



7. EXHIBITORS

7.1 Exhibition area



7.2 Exhibition Timetable

8:30-20:30	September 20-22
8:30-15:00	September 23

Exhibitors	Booth No.
Booths :	
JMR (CMS journal)	1
Atmospheric and Oceanic Science Letters (AOSL)	2&3
Bailong Buoy, FIO	4&5
Qingdao National Laboratory for Marine Science and Technology (QNLM)	6
OFS, FIO	7
USCLIVAR	8
School of Mechanical Engineering, Tianjin University and the SeaHorizon Solutions, Beijing	9
Thailand-China Joint Laboratory for Climate and Marine Ecosystem, FIO	10
Tables:	
PAGES	11
FIO	12
CLIVAR	13

8. WIFI AT HYATT

Through a generous contribution from The State Key Laboratory of Satellite Ocean Environment Dynamics (SOED) at the Second Institute of Oceanography (SIO), State Oceanic Administration (SOA), we have been able to provide a larger bandwidth to OSC participants in the Hyatt.

WIFI: CLIVAR2016

Password: SOEDHangzhou

All Google applications (Gmail, Google Drive, etc.), social media tools (Facebook, Twitter, Instagram) and application like Dropbox, are not accessible in China without a VPN (Virtual Private Network). Short-term subscriptions for VPNs can be found online for little or no cost, but we advise you to download them before coming to China.

9. TRANSPORTATION

9.1 Transportation from Hyatt to QNLM on Monday September 19

The first day of the OSC, Monday, 19 September, will be held at the Qingdao National Laboratory for Marine Science and Technology (QNLM) which is located about 40 kilometers from the Hyatt. Bus transport will be organized from the Hyatt, the Home Inns and other hotels.

Depart from Hyatt East entrance: lobby level. 08: 30 a.m.,

Depart from FIO 08: 30 a.m., 1 bus (for residence of Home Inn Haier Road)

Depart from Home Inn Hotel Convention Center Branch: 08: 30 a.m., 1 bus

Depart from Sophia Hotel: 08:20 a.m., stop at Blue Horizon Hotel: 08:30 a.m.

After the icebreaker reception, three buses will be provided to transport participants to two Home Inns, Sophia Hotel and Blue Horizon Hotel. Departure time: 21:30 p.m.

Note: ECSS and OSC participants staying in hotels other than those listed above must organize their own transport to come to the Hyatt on Monday morning before 8:30 to take the bus to QNLM

9.2 Transportation between Home Inn hotels and Hyatt: September 20-24

Complimentary shuttle bus service will be provided between the Home Inn Convention Center and FIO to Hyatt from September 20th to 24th, in order to facilitate ECSS participants to join the Open Science Conference. The bus schedule is as follows:

19 th September		20 th September		21 th September		22 nd September		23 rd September	
AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
See schedule for bus transportation to QNLM	Depart Hyatt	Depart Home Inn/FIO	Depart Hyatt	Depart Home Inn/FIO	Depart Hyatt	Depart Home Inn/FIO	Depart Hyatt	Depart Home Inn/FIO	Depart Hyatt
	21:30	08:00	20:45	08:00	20:45	08:00	21:30	08:00	14:00

10. ACCOMMODATION



Location of hotels for OSC and ECSS

- a. **Hyatt Regency Qingdao (青岛鲁商凯悦酒店)** Tel: 0532-86121234
Add: No. 88 DongHai Dong RD, Laoshan District, Qingdao (青岛市崂山区东海东路 88 号)
- b. **Himalayas Hotel Qingdao (喜马拉雅酒店)** Tel: 0532-66729999
Add: No.880 TongAn Road, Laoshan District, Qingdao (青岛市崂山区同安路 880 号)
- c. **Qingdao Blue Horizon Hotel (蓝海大饭店)** Tel: 0532-88996666
Add: No.9-2, Miaoling RD., Laoshan District, Qingdao (青岛市崂山区苗岭路 9-2 号)
- d. **Sophia International Hotel Qingdao (索菲亚大酒店)** Tel: 0532-88971111
Add: No.217 Hongkong dong Road, Laoshan District, Qingdao (青岛市崂山区香港东路 217 号)
- e. **Starway Premier Qingdao International Convention Center (海泰万丰酒店)**
Add: No.68, Shandong Tou Road, Laoshan District, Qingdao (青岛市崂山区山东头路 68 号(近青医附院东院) Tel: 0532-88956666
- f. **Orange Select Hotel (橘子酒店·精选(海尔路店))** Tel: 0532-86676088
Add: No. 75, Haier Road, Laoshan District, Qingdao (崂山区海尔路 75 号)
- g. **Home Inn Hotel Haier Road Branch (如家海尔路店)** Tel: 0532-88990000
Add: No.61, Haier Road, Laoshan District, Qingdao (崂山区海尔路 61 号(天宝国际楼下))
- h. **Home Inn Hotel Convention Center Branch (如家会展中心店)** Tel: 0532-83950888
Add: No.33, Xianxialing RD, Laoshan District, Qingdao (崂山区仙霞岭路 33 号(近会展中心北门))

11. USEFUL INFORMATION

11.1 Introduction to Qingdao

Qingdao ([tɕʰiŋt̪ɑ̀u]; also spelled Tsingtao) is one of the largest cities in Shandong province. Qīng (青) in Chinese means "cyan" or "greenish-blue", while dǎo (島) means "island".

As of 2014 Qingdao, including the urban and rural areas, had a population of 9,046,200. The city's total jurisdiction area occupies 10,654 square kilometres. In 2009, Qingdao was named China's most livable city by the Chinese Institute of City Competitiveness. Qingdao is a major seaport, naval base, and industrial centre. The world's longest sea bridge, the Jiaozhou Bay Bridge, links the main urban area of Qingdao with Huangdao district.

Economy

Shandong Province has seen substantial change in its economic landscape in recent years and much of this development has been concentrated in Qingdao. With an annual growth rate of 18.9 percent in 2006, the city's GDP ranked tenth out of China's top 20 cities. In 2006, Qingdao was ranked one of six "golden cities" by the World Bank, out of 120 Chinese cities assessed on factors including investment climate and government effectiveness.

Outside of the center of the city there is a large industrial zone that includes chemical processing, rubber and heavy manufacturing, in addition to a growing high-tech area. Numerous local and national service companies are based in the city's southern district; this, along with local wind patterns, allows Qingdao to enjoy reasonably clean, clear, air year round. Internationally, Qingdao is perhaps best known



for its Tsingtao Brewery, founded by a German-British joint venture in 1903 that produces Tsingtao beer, the best-known Chinese export beer. It is also home to Haier, a large white goods manufacturer, and Hisense, a major electronics company. In 2002 guitar manufacturer Epiphone opened a factory in Qingdao. Qingdao hosts one of the world's busiest seaports and by 2011, the port had become the world's sixth-busiest by Total Cargo Volume.

Qingdao has an estimated 50,000 acres (200 km²) of arable land producing fruits, grains and vegetables. Qingdao has a zigzagging pattern coastline, and thus possesses an invaluable stock of fish, shrimp, and other sea resources. Qingdao is also home to a variety of mineral resources. Up to thirty different kinds have been mined, including gold.

Marine science research and technology

Qingdao is an important center for marine science research and technology and home to several major ocean research institutions including: The First Institute of Oceanography (FIO) of the State Oceanic Administration (SOA), The Institute of Oceanology, Chinese Academy of Sciences (IOCAS), Ocean University of China (OUC), Chinese Academy of Fishery Science Yellow Sea

Fisheries Research Institute, and the new Qingdao National Laboratory for Marine Science and Technology (QNLN).

Climate

Qingdao has a temperate, four-season, monsoon-influenced climate that lies in the transition between the humid subtropical (Köppen Cwa) and humid continental (Köppen Dwa) regimes, but favouring the former. Winter is cool to cold and windy, but generally dry, with a January average of $-0.5\text{ }^{\circ}\text{C}$. Summer is generally hot and humid, but very hot days are rare (not true this year!), with an August average of $25.3\text{ }^{\circ}\text{C}$. Due to its proximity to the coast and being on a peninsula, it experiences a one-month delayed spring compared to most inland areas of China and the annual diurnal temperature variation is only $6.3\text{ }^{\circ}\text{C}$. Conversely, autumn is milder than inland areas in Shandong. The water temperature peaks at about $25\text{ }^{\circ}\text{C}$ in late August, with swimming possible two months on either side. The annual mean temperature is 12.6°C .

Architecture



There is a large number of German-style buildings in the old city centre, remarkable considering the German colonial period lasted only 16 years (1898–1914). The unique combination of German and Chinese architecture in the city centre, combined with a large Korean expatriate population, gives Qingdao a distinct atmosphere. An old saying described Qingdao as a city of "red tiles, green trees, blue sky and blue sea."

History

Human settlement in the area dates back 6,000 years. The Dongyi nationality, one of the important origins of the Chinese nation, lived here. In the Eastern Zhou Dynasty (770BC~256BC), the town of Jimo was established (today home to QNLM), which was then the second largest one in the Shandong region.



Administration/commercial building, harbor area, 1912

In 1891, the Qing government decided to make coastal Tsingtao (Jiao'ao) a defense base against naval attack and began to improve Qingdao's existing fortifications. German naval officials observed and reported on this Chinese activity during a formal survey of Jiaozhou Bay in May 1897. Subsequently, German troops seized and occupied the fortification. China conceded the area to Germany the following year, and the Kiautschou Bay concession, as it became known, existed from 1898 to 1914. Upon gaining control of the area, the Germans outfitted the impoverished fishing village of "Tsingtao" (Qingdao) with wide streets, solid housing areas, government buildings, electrification throughout, a sewer system and a safe drinking water supply, a rarity in large parts of Asia at that time and later. The area had the highest school density and

the highest per capita student enrollment in all of China, with primary, secondary and vocational schools funded by the Imperial German treasury and Protestant and Roman Catholic missions. Commercial interests established the Germania Brewery in 1903, which later became the world-famous Tsingtao Brewery.

After a minor British naval attack on the German colony in 1914, Japan occupied the city and the surrounding province after Japan's declaration of war on Germany in accordance with the Anglo-Japanese Alliance. China protested Japan's violation of her neutrality but did not interfere in the operations. The decision of the Paris Peace Conference not to restore Chinese rule over Qingdao after the war triggered the May Fourth Movement (commemorated by the large red "swirl" statue in May Fourth Square in downtown Qingdao and the inspiration for the CLIVAR2016 OSC logo).



The city reverted to Chinese rule in December, 1922, under control of the Republic of China. However, Japan maintained its economic dominance of the railway and the province as a whole. Japan re-occupied Qingdao in 1938 with its plans of territorial expansion into China's coast. On June 2, 1949, shortly before the founding of the People's Republic of China on October 1, 1949 the city was taken by Chairman Mao Zedong and his troops. Qingdao and the province have been under PRC control since that time.

Time Zone: GMT +0800

11.2 Getting around

Taxis in Qingdao are very inexpensive and relatively abundant. Rates start at 9 RMB for the first 3 kilometers or 12 for fancier taxis; rates are slightly higher after 11pm. You can hail a taxi in the street – if the box in the middle of the front windshield is red, the taxi is available for hire; green means it is occupied or on call. The hotel can also arrange for taxis. Qingdao has an extensive bus service – fares are 1 or 2 RMB, but the schedules are all in Chinese.

A note of caution when crossing the street: Qingdao drivers often run lights, and also, most often, will not stop for pedestrians in the cross walk (they might even honk at you). Hence be very alert when crossing and look both ways before stepping out on the street.

11.3 Transportation to/from airport:

Qingdao Liuting International Airport is the main airport serving the city of Qingdao, China. It is about 27 kilometres from the main Conference venue (Hyatt Hotel). There are two terminals at the Qingdao airport. At peak arrival times we will have OSC volunteers in green polos with signs at the airport to greet you and assist with taxis etc.

Taxis: TAXIS ARE LOCATED IN THE BASEMENT, between the two terminals. Follow the Taxi signs and take the escalator or elevator to the basement. Do not take rides from taxis or cars located outside the airport terminal; these are not licensed. A taxi ride from the airport to the Conference venue costs about 100 RMB (payment by RMB cash only). Addresses of the hotels in English and Chinese are posted on the Conference website. You can print these out to show to the taxi driver.

Cash: There are exchange bureaus in the airport terminals but their opening hours are limited. The most economical and easiest way to obtain RMB is via ATM machines. There are two ATMs at the DEPARTURE level of domestic airport terminal that accept international credit cards. In China, different bank ATMs accept different cards to withdraw cash. Hence it might be a process of trial and error. Safest would be to change at least a small amount of cash for the taxi before coming to China. There is an ATM at the Hyatt that accepts international credit cards and also several in the basement of Lion Mall. The Hyatt and most other big hotels in China accept international credit cards, but for those staying at the Home Inn on Haier Road, you will need to pay with cash on arrival.

11.4 Medical services (near Hyatt)

The nearest hospital: The Affiliated Hospital of Qingdao University

No. 59, Haier Road, Laoshan District Qingdao. Tel: 0532-96166

The nearest hospital with English-, Japanese- and Korean -speaking- doctors: The International Medical Center of Qingdao (ICQD), Qingdao Municipal Hospital (East)

Address: 5 Donghai Middle Rd, Qingdao, China

4th Floor, Main Building, Qingdao Municipal Hospital (East)

Service hours: Mon~Sat 8:00am-12:00am; 13:00pm~17:00pm

Tel: 0532-85937690/ 0532-85937678

Website <http://en.icqd.com.cn/>

11.5 Insurance and liability

The conference registration fee does not include provisions for insuring participants against injury, sickness, theft, or property damage. Participants are advised to obtain whatever insurance they consider necessary.

11.6 Dining info

a. Dining options at the Hyatt

Market Café

Located at the lower lobby level, this interactive, market-style hotel buffet, with indoor and outdoor seating overlooking the beach and ocean, offers fresh and authentic world cuisine in a stylish environment.

Breakfast: Monday to Friday: 6:30 AM - 10:00 AM; Saturday,

Sunday & Public Holidays: 6:30 AM - 10:30 AM

Lunch: 11:30 AM - 2:30 PM

Dinner: 5:30 PM - 9:30 PM

Reservations: +86 532 8612 0656

Bay Lounge

Located on the lobby level, with panoramic views over Shi Lao Ren Beach and the Yellow Sea, offering a place to relax and unwind throughout the day with homemade cakes and savoury bites

in a casual dining atmosphere. The Bay Lounge is a great venue to socialise with friends or colleagues whilst enjoying quality crafted beverages.

Hours: 8:00 AM - 10:30 PM Lobby

Reservations: +86 532 8612 0656

Dong Hai 88

Located on the lobby level, this unique “dining in the kitchen” top restaurant serves authentic Shandong and Northern Chinese cuisine, including traditional Qingdao seafood specialties and the classic Peking Duck. Indoor and outdoor dining is available in an exciting and lively ambiance.

Lunch: 11:30 AM - 2:30 PM

Dinner*: 5:30 PM - 10:00 PM

* Last order half an hour prior to closing

Reservations: +86 532 8612 0656

Dong Hai 88 Private Dining

Dong Hai 88 Private Dining is located on Level 2, a collection of 7 private dining suites offering authentic Shandong and Cantonese cuisine with personalised menus, served in a private and exclusive environment, featuring beautiful views over the beach and sea.

Lunch: 11:30 AM - 2:30 PM

Dinner: 5:30 PM - 10:00 PM

Reservations: +86 532 8612 0656

BEBA Restaurant and Bar

BEBA features a unique table-top barbecue dining experience, where guests can enjoy Asian-style marinated seafood and meat self-cooked to their liking. The restaurant later transforms itself into a casual, energetic nightspot featuring live DJ music and offering a wide selection of beers and classic cocktails.

Hours: 5:30 PM - 1:00 AM

Location: Lower lobby level, entrance located at lobby level

Reservations: +86 532 8612 0656

Special take-away light lunch options for OSC participants

Location: terrace outside the Market Café and BEBA

Hours: 11:30 -14:00

b. Dining options outside Hyatt:

Lion Mall

You can find more than 60 restaurants in Lion mall including typical Shandong and north China cuisine, as well as Cantonese, Taipei, Southeast Asia, Korean, Japanese, Muslim and also Western-style restaurants. There is also a food court in the basement which requires purchase of a prepaid card at the central kiosk; remaining balance can be reimbursed. Note that very few of

the restaurants accept international credit cards but there are several ATMs in the basement of Lion Mall that accept international credit cards.

No.195 Xiang gang East road (1 km from Hyatt hotel)

* A guide to dining options at the Lion Mall will be included in your registration package.

Meteorological Food Park

No. 87 Donghai East road, near Meteorological hotel

600m form Hyatt

Several restaurants provide Korean, sea food, Cantonese menus as well as BBQ.

* **Tipping:** In China it is not customary to tip restaurant waiters and taxi drivers.

11.7 Electricity

Voltage is 220 and most outlets accept US and European style plugs.

11.8 Currency exchange

Approximate exchange rates as of 1 September:

1 USD = 6.6798 RMB

1 Euro = 7.4453 RMB

1 JPY = 0.06465 RMB

1 KRW = 0.00596 RMB

You will need Chinese RMB to pay the taxi driver. There are exchange bureaus in the airport terminals but their opening hours are limited (8:30am to 7pm or 9pm). We advise you to change at least a small amount of cash before coming to China.

In Qingdao, the most economical and easiest way to obtain RMB is via ATM machines, but in China, different bank ATMs accept different cards to withdraw cash. Hence it might be a process of trial and error. There is an ATM with English language options that accepts international credit cards next to the Hyatt entrance, and also several in the basement of Lion Mall.

The Hyatt and most other big hotels in China accept international credit cards, but for those staying at the Home Inn on Haier Road, you will need to pay with cash on arrival.

11.9 Useful numbers

Police: 110

Fire: 119

Ambulance: 120

Free local information line: 114 (in Chinese)

Local telephone numbers: country code (+86), area code (532), telephone number (8 digits)

24-Hour duty manager, Hyatt: +86 182 5321 9708

24-Hour hotline of local organizing committee: +86 187 6300 5930

11.10 Day tours in Qingdao

A travel agent will be available in the lobby of the Hyatt from Sep. 18 to 21 to assist participants in organizing local tours.



Qingdao Olympic Center



Qingdao Zhanqiao



West of Qingdao



Shilaoren Beach

12. OSC AND ECSS SPONSORS

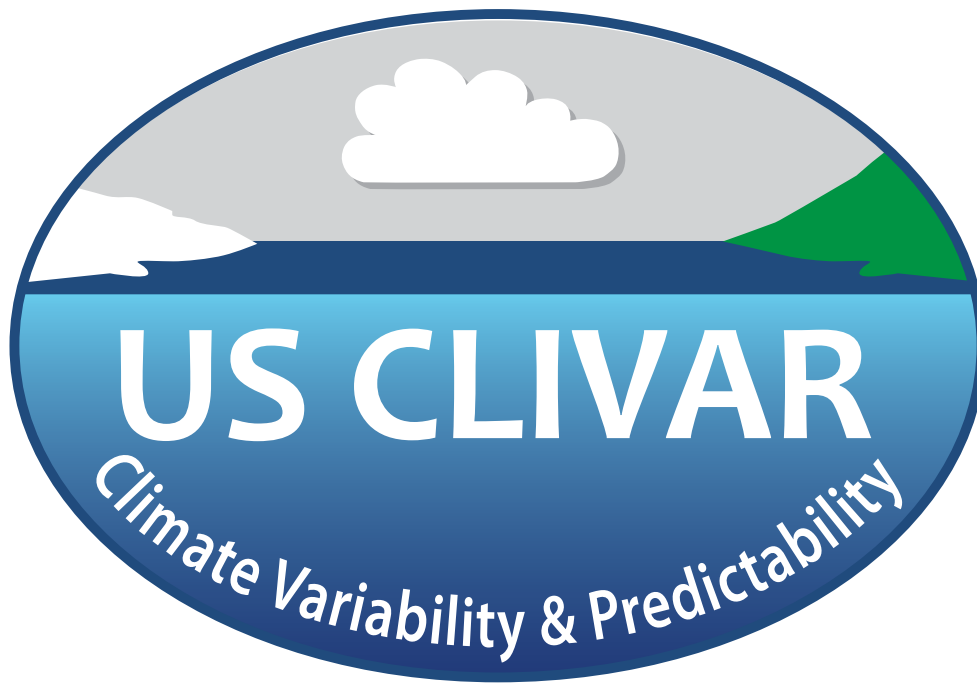
简介

INTRODUCTION to QNLM

青岛海洋科学与技术国家实验室坐落于青岛蓝色硅谷核心区，于2013年12月获得科技部正式批复，由科技部、山东省、青岛市共同建设。定位于围绕国家海洋发展战略，开展基础研究和前沿技术研究，依托青岛、服务全国、面向世界建设国际一流的综合性海洋科学中心和开放式协同创新平台，建设全球海洋科技的高地，海洋强国建设的支撑，蓝色硅谷发展的引擎。

Located in the heart of Qingdao's Oceantec Valley, Qingdao National Laboratory for Marine Science and Technology (QNLM) was officially established in December 2013 with approval of the Ministry of Science and Technology of China (MOST) and with the joint support of MOST, Shandong provincial government and Qingdao municipal government. Focusing on the national strategy for maritime development, QNLM will carry out fundamental research and develop cutting-edge technology through its position as China's most comprehensive and internationally-open marine research center and collaborative innovation platform, taking Qingdao as its base to serve the country and the world. QNLM will foster the development of Oceantec Valley, support the strengthening of China's maritime development and strive to be at the pinnacle of global marine science and technology.





JOIN OUR MAILING LIST

Stay up to date with the latest climate and ocean science news, funding opportunities, and jobs in our monthly Newsgram and read collections of research in our quarterly newsletter Variations.

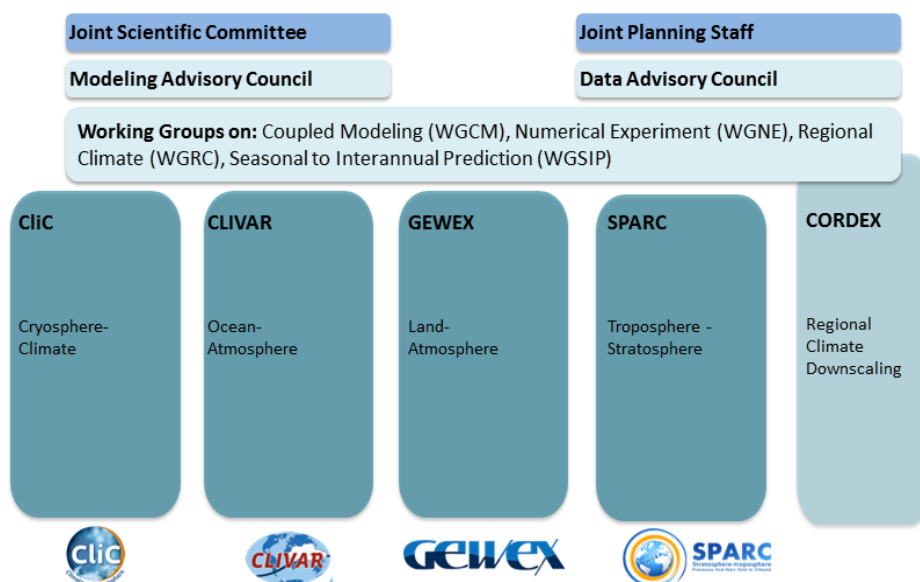
www.usclivar.org/get-involved



The WCRP mission is to facilitate analysis and prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society. The two overarching objectives of the WCRP are

- to determine the predictability of climate; and
- to determine the effect of human activities on climate

WCRP is organized as a network of core and co-sponsored projects, working groups and cross-cutting initiatives, which includes CLIVAR, the core project focused on ocean-climate linkages. See <http://www.wcrp-climate.org>.



WCRP also engages the international climate research community in a number of **Grand Science Challenges** through community organized workshops, conferences and strategic planning meetings on:

- Regional Sea-level Change & Coastal Impacts
- Melting Ice & Global Consequences
- Clouds, Circulation and Climate Sensitivity
- Understanding and Predicting Weather and Climate Extremes
- Changes in Water Availability
- Near-term Climate Prediction
- Carbon Feedbacks in the Climate System

The World Climate Research Programme is sponsored by the World Meteorological Organization (**WMO**), the International Council for Science (**ICSU**) and the Intergovernmental Oceanographic Commission (**IOC**) of UNESCO



The face of Europe is shown by this mosaic of true-colour land images taken by the Medium Resolution Imaging Spectrometer (MERIS) instrument on ESA's Envisat environmental satellite.

Since 1975 the European Space Agency, ESA, has been pooling the resources of its Member States and leading cooperation with other nations to build a European space capability, undertaking programmes and activities far beyond the scope of any single European country.



ESA develops the launchers, spacecraft and ground facilities needed to keep Europe at the forefront of global space activities. Today, it launches satellites for Earth observation, navigation, telecommunications and astronomy, sends probes to the far reaches of the Solar System and cooperates in the human exploration of space.

ESA has 22 Member States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Canada takes part in certain programmes under a cooperation agreement.

ESA has signed European Cooperating States Agreements with Slovenia, Latvia, Lithuania, Slovakia and Bulgaria and cooperation agreements with Cyprus and Malta. Discussions are under way with Croatia.

www.esa.int

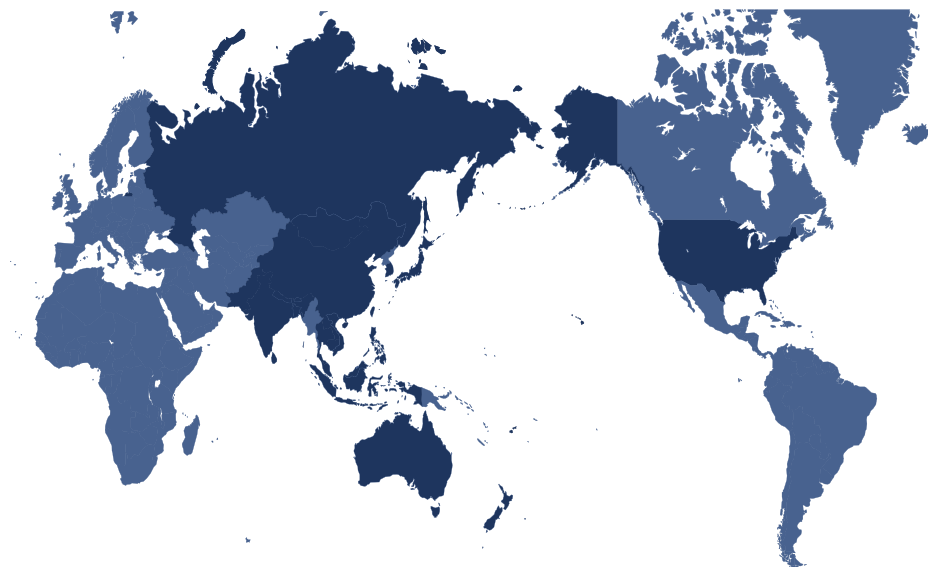
WHAT IS APN?

The Asia-Pacific Network for Global Change Research (APN) is a network of 22 member country governments that promotes global change research in the region, increases developing country involvement in that research, and strengthens interactions between the science community and policy makers.

APN was established in 1996 and its Secretariat is based in Kobe, Japan. APN supports its member countries via annual open calls for research and capacity development proposals under its core programmes and frameworks, and by organising events such as science-policy dialogues and proposal development training workshops to engage the participation of scientists and policy makers in achieving its science and policy agendas.

GOALS

-  Supporting regional cooperation in global change research on issues particularly relevant to the region
-  Enhancing capabilities to participate in global change and sustainability research and support science-based decision-making
-  Strengthening appropriate interactions among scientists and policy makers, and providing scientific input to policy decision-making and scientific knowledge to civil society and the public
-  Cooperating with other global change and sustainability networks and organisations

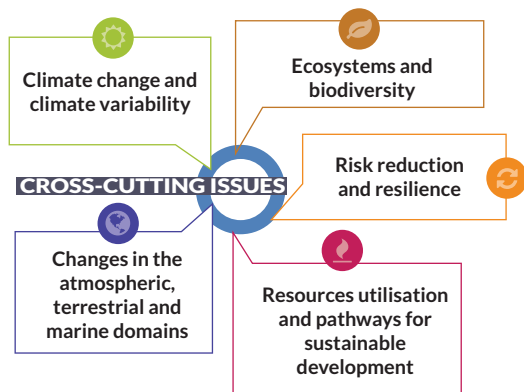


MISSION

The mission of the APN is to enable investigations of changes in the Earth's life support systems and their implications for sustainable development in the Asia-Pacific region through support for research and science-based response strategies and measures, effective linkages between science and policy, and scientific capacity development. The APN, therefore, supports investigations that will:

- 01** Identify, explain, project and predict changes in the context of both natural and anthropogenic forcing
- 02** Assess potential regional and global vulnerability of natural and human systems; and
- 03** Contribute, from the science perspective, to the development of policy options for appropriate responses to global change and sustainable development.

RESEARCH AGENDA



CORE PROGRAMMES

CRRP

APN supports regional research on global change through its Collaborative Regional Research Programme (CRRP). This is one of the scientific pillars of APN to encourage and promote global change research in the Asia-Pacific region that has potential, in addition to improving the understanding of global change and its implications in the region, to contribute to the establishment of a sound scientific basis for policy-making with regard to issues for which global change and sustainability is an important factor.

CAPaBLE

In addition to supporting capacity development under its research agenda, APN also has a focused Capacity Development Agenda (CAPaBLE). The aim of the CAPaBLE programme is to enhance the capacities of scientists, policy-makers and other relevant stakeholders in the Asia and Pacific region to identify and assess global change issues at local, national and regional levels and further identify appropriate solutions to resolve the issues and achieve sustainability.

GET INVOLVED


 Website: www.apn-gcr.org

 Email: info@apn-gcr.org

 Facebook: www.facebook.com/APNGCR

 Mailing list: www.apn-gcr.org/getmail

 Friends of APN: friends.apn-gcr.org

 Twitter: [@APN4GCR](https://twitter.com/APN4GCR)





The First Institute of Oceanography (FIO), State Oceanic Administration (SOA), China, the predecessor of the Fourth Marine Research Institute of the Chinese Navy, was first established in 1958. In 1964, the Institute was re-organized and its governing body was shifted from the Navy Department to SOA. FIO is a comprehensive research institute, it is engaged in both basic and

applied research in oceanography and marine related science and technology, supports the development of high-tech industries, advances marine science and technology, and provides technical support and research services in the areas of marine resources management, national marine protection, public service, marine economic development and marine safety.

The major research fields of FIO are s on the regularities, distributions and variations of natural environmental elements in the maritime territory of China, the adjacent oceans and the polar region, such as marine resources development, environmental geology, the mechanism, establishment, and prevention of the marine disaster, the physiochemical and biological factors affecting marine ecosystems, remote sensing oceanography, marine information system management, appraisal, protection and governance of marine environment, development of marine high-tech, and comprehensive marine management.

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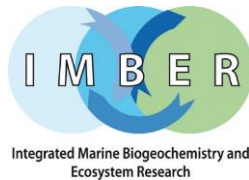
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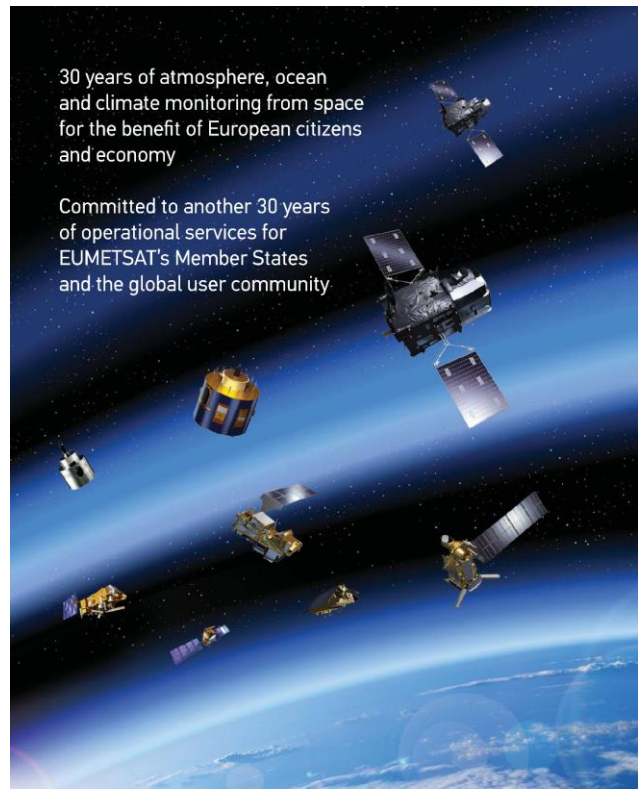
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The **State Key Laboratory of Satellite Ocean Environment Dynamics (SOED)** at the Second Institute of Oceanography (SIO), State Oceanic Administration (SOA), is one of the leading oceanography labs in China. SOED consists of 50 senior/associate level scientists and 50 supporting staff.

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Sugon Information Industry Co., Ltd (“Sugon”) is a leader in China’s HPC sector and the largest HPC manufacturer in Asia, winning the top spot on the list of China’s TOP 100 supercomputers by market share for seven years in a row from 2009 to 2015. Sugon’s hardware products, solutions and

cloud computing services have been widely used and applied in numerous fields of government, energy, internet, education, meteorology, medical services and public utilities.

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