CMOC/China & its Data Processing and Sharing Service

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Background

Data Processing & QC

Data and Products Service

Capacity Building and International communication





DCEANOGRAPHIC COMMISSION OF UNESCO









BACKGROUND

To provide high quality marine meteorological and/or oceanographic climate data,the Commission agreed that a limited number (less than ten) of WMO-IOC **Centres for Marine Meteorological** and Oceanographic Climate Data (CMOCs) covering specific JCOMM data domains, will form a key component of the MCDS, and will further facilitate interoperability with, and seek to internationally formalize the International **Comprehensive Ocean-Atmosphere** Data Set (ICOADS) and eventual similar existing domain-specific international archives, within the remit of JCOMM.



Simplified MCDS Structure

Three main components

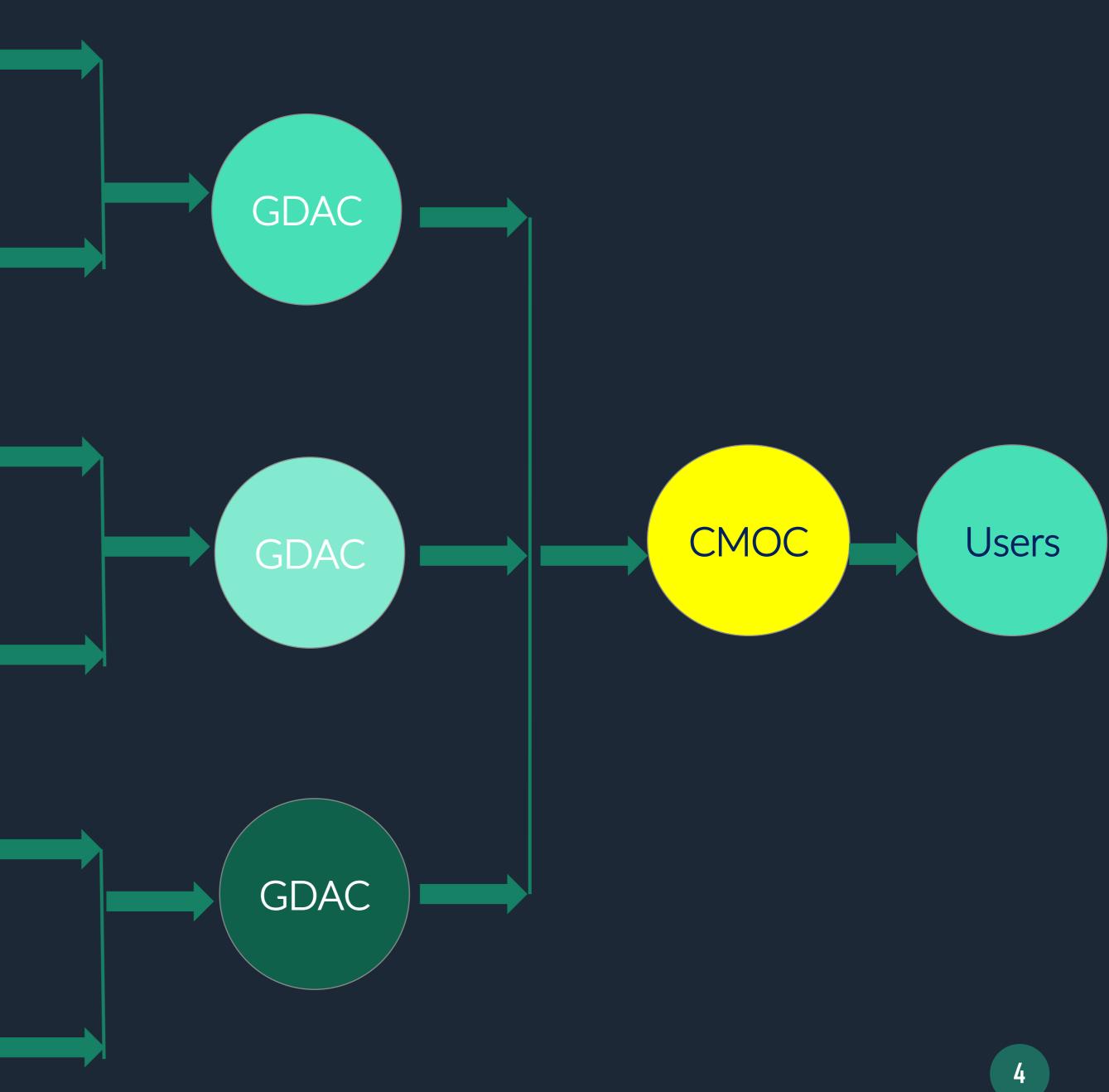
Data Acquisition Center (DAC): first line data receiver – directly from measurement source

Global Data Assembly Center (GDAC): world-wide aggregation for specific observation system

Center for Marine Meteorology and **Oceanographic Climate Data (CMOC)**: Aggregates all relevant data types for a specific set of environmental variables

DAC DAC DAC DAC

DAC





Background

2013.03 IDDE-22 submit progress report 2013.06 submit feedback on accreditation criteria

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2011.11 MCDS1 raise intention





2012.02 Submit Statement of Commitment 2012.05 JCOMM-4 operate on a trail basis



2015.01 Complete work plan for 2015-2016 2015.05 WMO cg-17 2015.06 IOC-XXVI

2019.05 Attend ETMC-7



2014.01 DMCG-5 2014.02 submit self-evaluation 2014.03 1st ODINWESTPAC planning workshop 2014.06 JCOMM expert group visiting

NMDIS

2017.10 JCOMM-5 awarded CMOC Certificate of Recognition to NMDIS



BACKGROUND

Tasks of CMOC/China

Integrate marine-meteorological and oceanographic climate data, metadata, and actively conduct HLQC and produce specialized datasets of ECVs and EOVs

Actively participate in the research and development of oceanographic and marine-meteorological products, and their related services: climate statistical products and reanalysis products

7X24 operation website to provide free services to users (www.cmoc-china.cn), mirroring with other CMOCs when possible

Provide technical training, and carry out capacity building activities for countries in the region.

CMOC/China focusing on the Asian Pacific Region Data and Metadata Collection and Management

Data integration

) High level QC

Product R&D

Capacity Building

Ocean reanalysis datasets R&D

Data and Metadata—Collection, Management and Exchange

- Integrate global drifting buoy observations and metadata
- Historical metadata and data rescue
- Improve existing metadata standards
- Develop metadata schema for integrated and specialized datasets
- Data integration demonstration project focused on the Asian-Pacific region - Chinese observation Data - Global Oceanographic and Marine Climate Data
- Regional and Global oceanographic and marine meteorological graphical products, and
 - Regional capacity building support



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Data Processing

National Ocean Observing System (NOOS-China) including oceanographic stations, buoys, shorebased radars, voluntary observing ships, GPS stations and standard sections etc.

Oceanographic and marine meteorological data by other ocean related agencies, institute, private sectors.

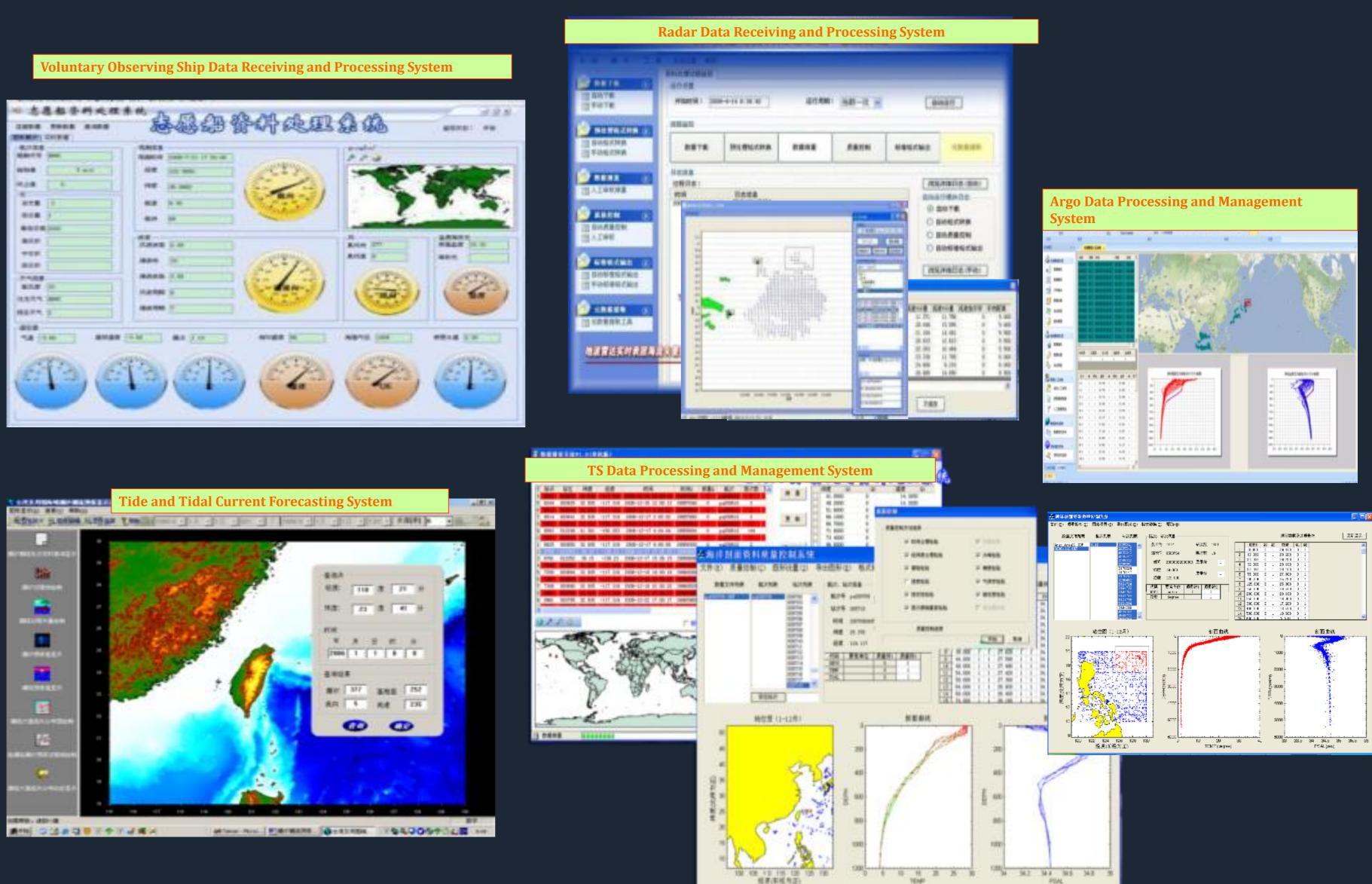


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Data Processing

System and Software





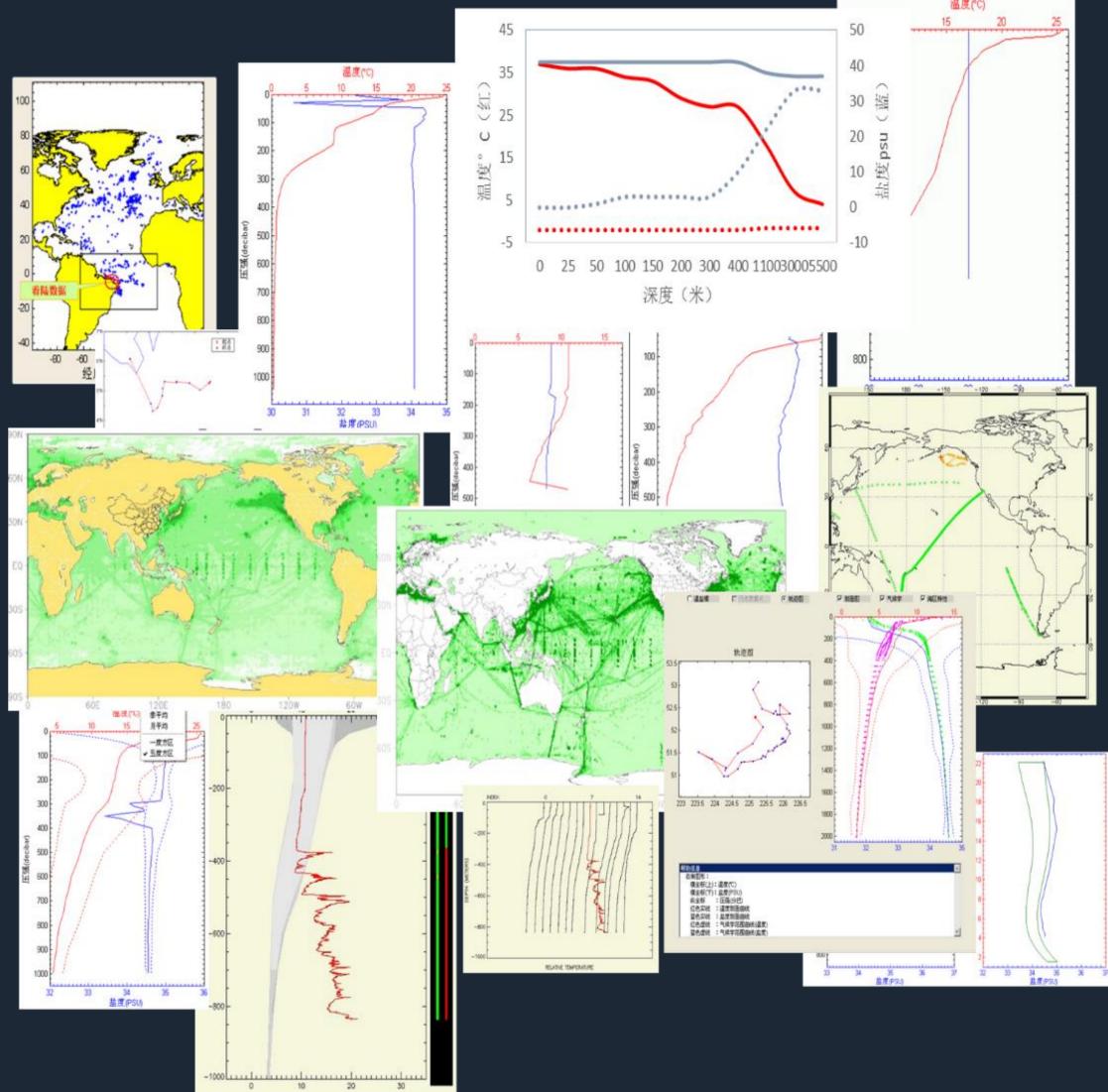






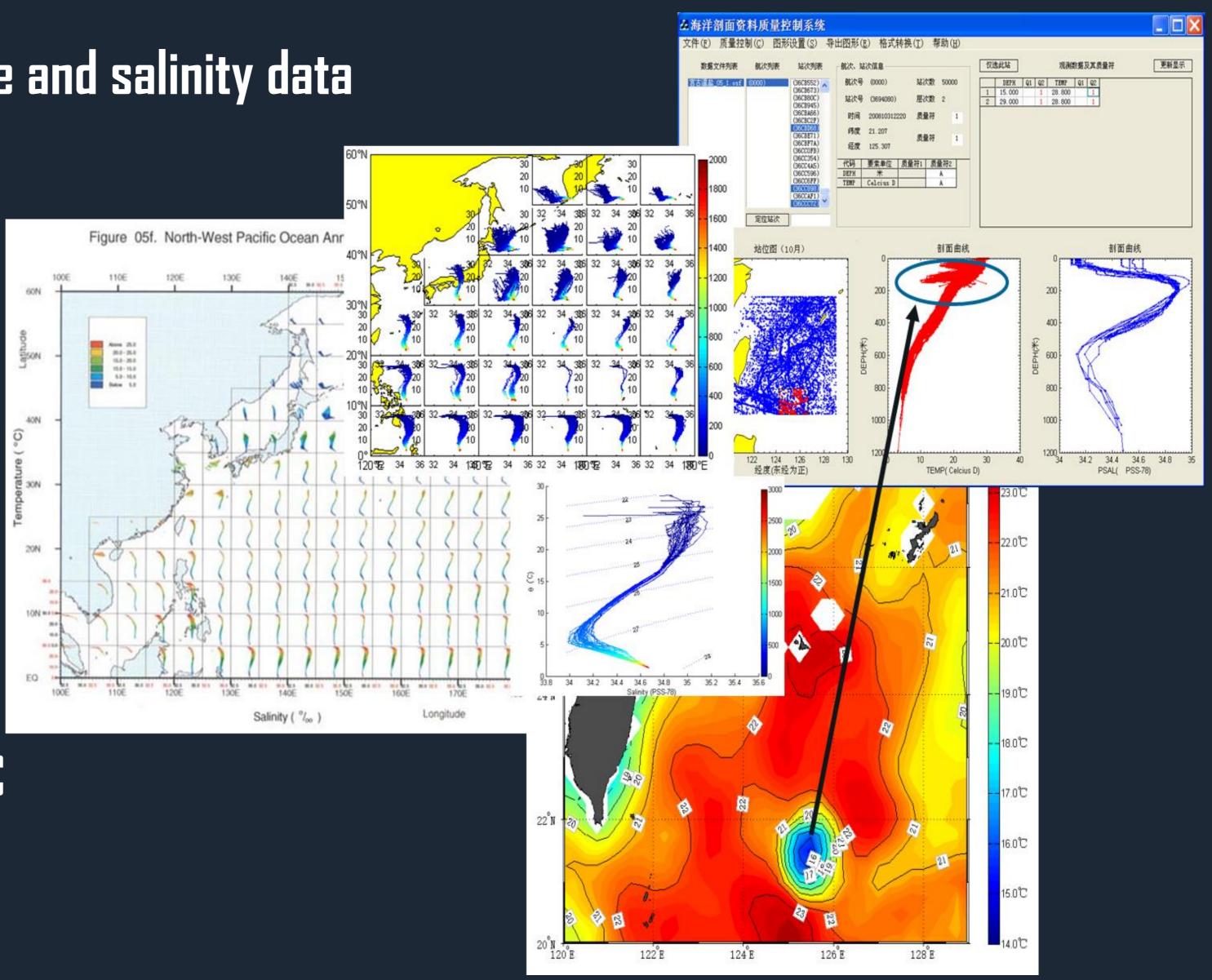
Quality Control System and Software

Quality control of temperature and salinity data time and space basic test, profile test, climatic characteristics test, profile consistency test, visual and manual examination. Among them, QC is specialized by oceanography elements and observation instruments and observation methods



Quality control of temperature and salinity data

Improve QC and parameters in North-West Pacific



Objective Analysis Method for QC 'Abnormal data ' or 'real phenomena' ?



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Background

Data Processing & QC

Data and Products Service

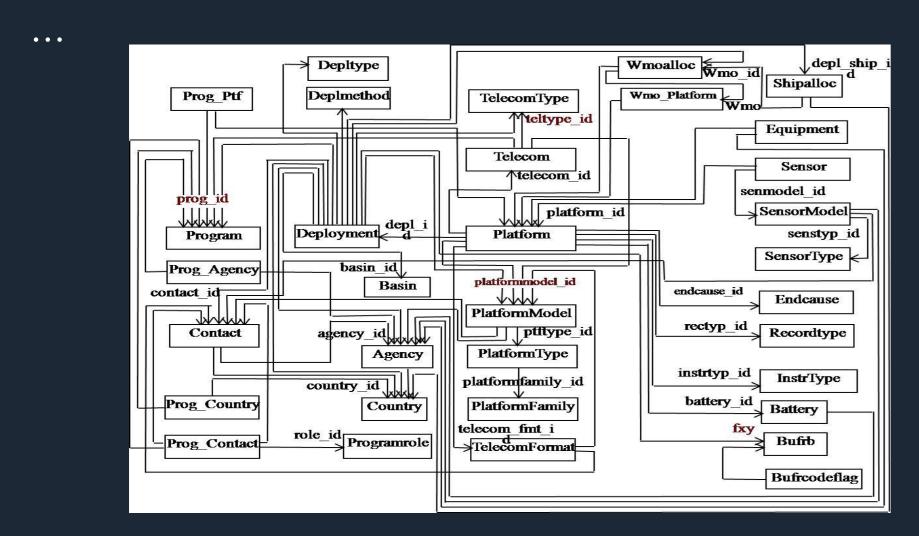
Capacity Building and International communication



Drifter data integration study

Integrate the data of each drifter from deployment to end-of-operation with corresponding metadata. To facilitate the

- Further quality control of the observations
- Tracing of a single drifter
- Ocean current study
- Preserve of buoy metadata





Up to November 2021, 5.09GB integration dataset which includes 10,955 drifters (from 1970 to 2020) was processed, among which 1289 were newly deployed in 2021.



Data rescue

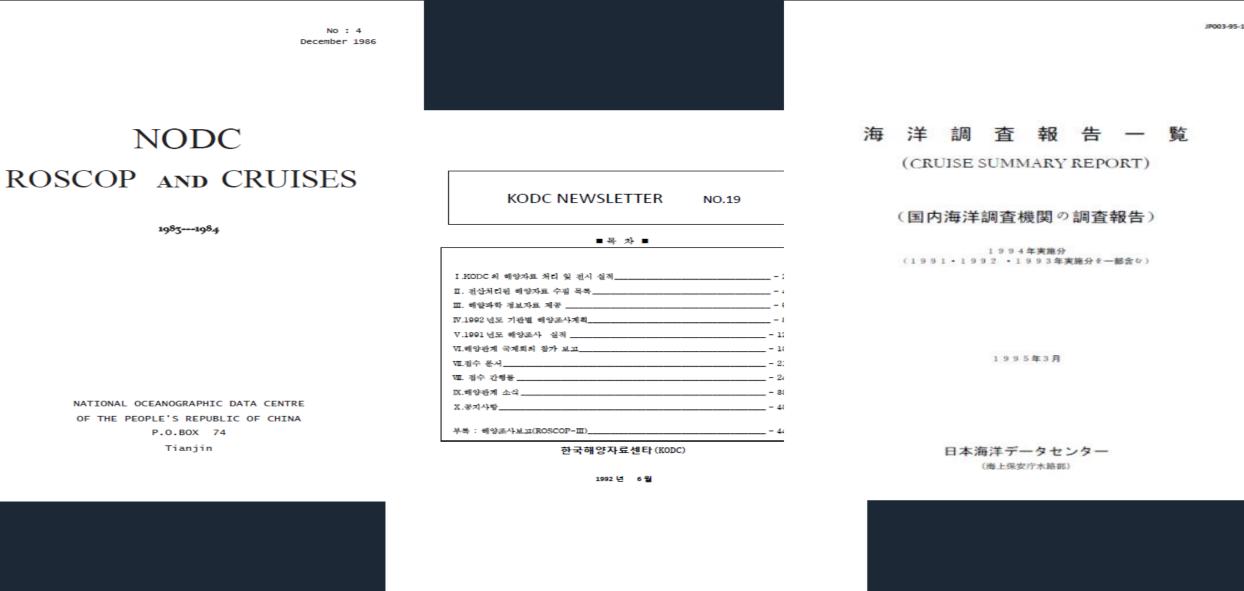
Three cruise summary reports have been digitized and made available online. The integration of rescued ROSCOP metadata with their corresponding observational data was initialized in earlier 2016.

• (Japan) Cruise Summary Report JP003-95-1; KODC Newsletter No.19; •(China) NODC ROSCOP and Cruises 1983-1984.

Cooperation with Hong Kong Observatory on the historical meteorological data rescue initiated in 2016

•Ship observations in Director's Report for 1892, 1894, 1895 •Observatory publication "Weather Observations From Ships (Appendix to Hong Kong Observations, 1931), by C.W. Jeffries, F.R.A.S., Director, 1932 •Ship observations listed in Daily Weather Charts





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Progress towards making additional marine meteorological (and oceanographic) data from China publicly available



Oceanographic station

Observations







Polar investigation

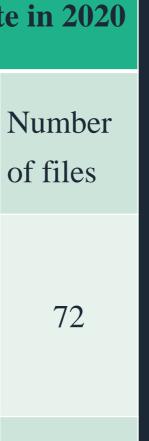
China Ocean Survey



Observation Data of China

No.		Temporal coverage	Total amount of data		Data update	
	Name of the dataset		Data volume(MB)	Number of files	Data volume(M B)	N C
1	Delayed mode surface temperature and salinity, wind-wave data from 3 COSs: Shidao, Xiaomaidao and Lianyungang	1996.01- 2021.10	56.26	1993	7.36	
2	Monthly mean sea level data from 6 COSs: Dalian, Lvsi, Kanmen, Zhapo, Xisha and Nansha	2011.04- 2021.10	26.7KB	127	2.5KB	
3	Marine meteorological, wave, sea surface temperature and salinity data from 13 COSs: Xiaochangshan, Dalian, Yantai, Xiaomaidao, Lianyungang, Lvsi, Shengshan, Zhelang, Zhenhai, Dachen, Nanji, Beishuang and Dongshan	1999.05- 2021.10	119.83	2185	11.83	
	Total	1996.01- 2021.10	176.12	4305	19.20	

Observation data of the Chinese Oceanographic Stations



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Providing data and information support to global climate change research and related policy making.

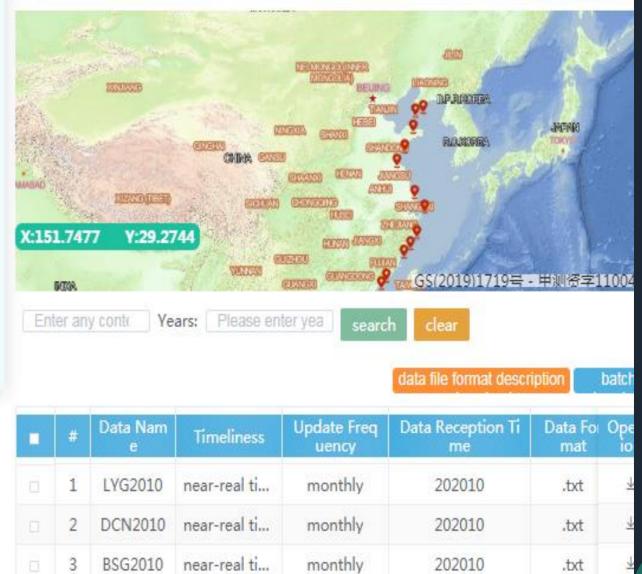
Data Service

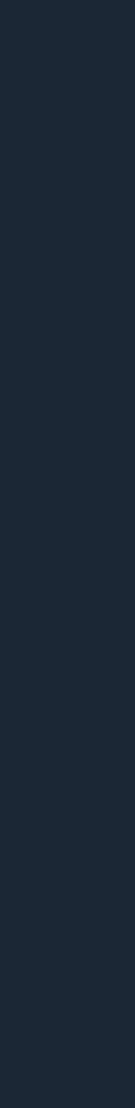


Polar Research

Coastal Station Data

The near-real-time data in oceanic stations (China) is in ASCII (character). The data is the all quasi-real-time data that is collected from 13 Chinese oceanic stations since May 1999, including the marine meteorology, wave, temperature and salinity. After series of processing, such as decoding, format check, code conversion, standardization,

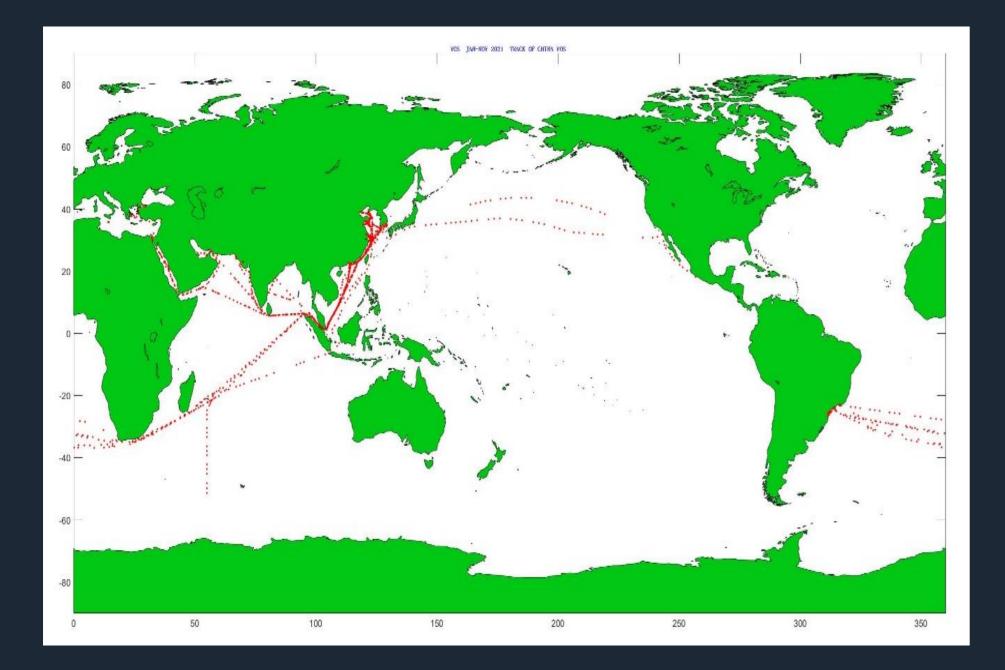




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Observation Data of China

China VOS Observation Data Sharing



Basic information of China ocean survey data

No.	Name	Voyage	Temporal coverage	Record
1	Temperature and Salinity Data	26	1992-2017	521
2	Current Data	14	2003-2017	281891
3	Meteoroidal Data	11	1995-2017	433786
	Total	51	1992-2017	716198

In 2020, partial China ocean survey data were released on CMOC/China website for the first time, including temperature and salinity data from 26 voyages, current data from 14 voyages, meteorological data from 11 voyages, time ranging from 1992 to 2017.





Global Oceanographic and Marine Climate Data

prepare and release the integrated global sea level dataset; integrated global and regional T&S datasets;

-Carry out DBCP drifter data and metadata integration

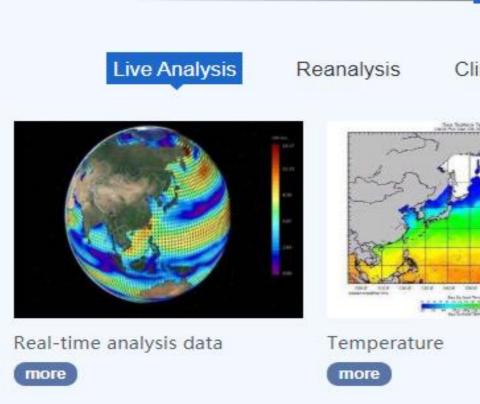
No.	Name of the dataset	Temporal coverage	Data volume(GB)	Number of files
1	Integrated global ocean current data	1994-2020	0.93	146
2	Integrated global temperature and salinity data	1773-2020	73.7	37,795
3	Integrated global meteorological data	1662-2020	102	83,570
4	Integrated global sea level data	1984-2020	2.10	31,440
5	Integrated global buoy data	1979-2020	4.6	25,036
	Total	1662-2020	183.33	177,987

- -Cconduct the quality control and duplicate elimination of observation data of GLOSS and COSs surveys, and
- -Carry out the quality control and duplicate elimination of Argo and GTSPP data, and prepare and release the
- -Conduct the duplicate elimination of sea surface meteorological data in ICOADS, VOS, DBCP and GTS datasets, and prepare and release the integrated global sea surface meteorological dataset and China VOS dataset.



Climate Statistical Products





-Monthly Report of the Sea Level and Climate Change of China -China Sea Level Bulletin -Global and regional ocean reanalysis products -Argo surface current inversion products

Product Service

Climate Change Statistics Products

Surface flow fusion products

Tide and Tidal Current Forecast

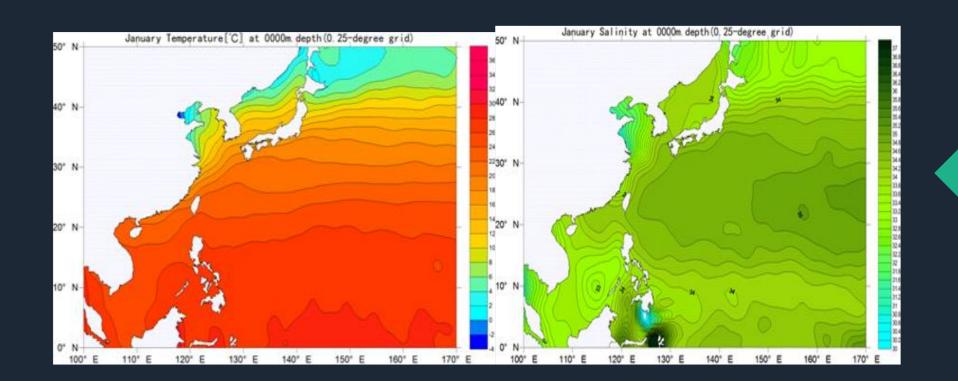


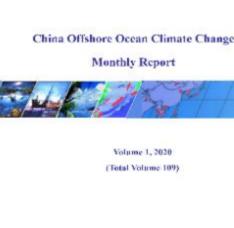
--Real-time analysis data of the Northwest Pacific Ocean -Surface current fusion products of the Northwest Pacific Ocean -Products of tidal current forecast of global major ports



Climate Statistical Products

PRODUCTS Service





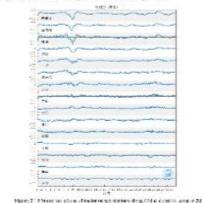
National Marine Data and Information Service Center Feb 2020

Monthly Report of Sea Level and Climate Change of China

Graphic products of temperature and salinity in Northwest Pacific

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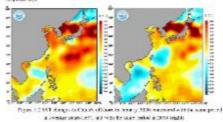
10. Second Marcol Antonio Material and Society Control

3.2 Sea Sarlace Temperature

Compared with the same parks, in course years, the SSNs in the Chine Seasdevois significant regions, contractorized in forwary 2001. The SSNs in the Bohn ber, Yulkey San and Debia Gildt were regarillennily higher than trace of the same relief homenep years, with interacts of 24+1.5 Cycle SSNs where court of Medjing and Gaungking, with the torial of sease SSNs were seen than here of the same priori memory series with interacts of 22+0.6 C. (Figure 32).

Compared with the same period in 20.4 the SNTs in the and of Toleon Social and he samed are southern STS in January 2.20 were lower than these write same period in 20.5, with descenses of 14.4 1.22, the SSIs in the Boist Soc, Nobels Soc and the numbers PCS were higher than these of the same period in 2013, with moments 1.5–1.22. (Figure 3.2)

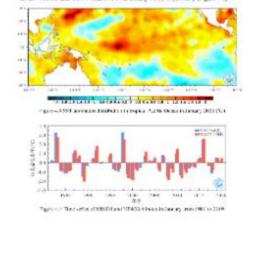
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4.2 Tropical Occur Conditions

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Ocean Reanalysis Products

Improve the reanalysis ocean dynamic model

•turbulent mixing parameterization schemes

•turbulent flux parameterization schemes at the air-sea interface

Improve the ocean data assimilation algorithms

•T-S relationship,

•the water column adjustment algorithm

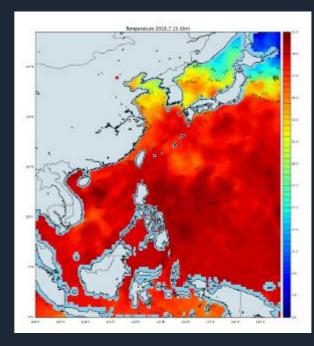
•a fully conserved minimal adjustment algorithm with (T, S) coherency for stabilization of thermohaline profiles

Regional and global ocean reanalysis datasets R&D

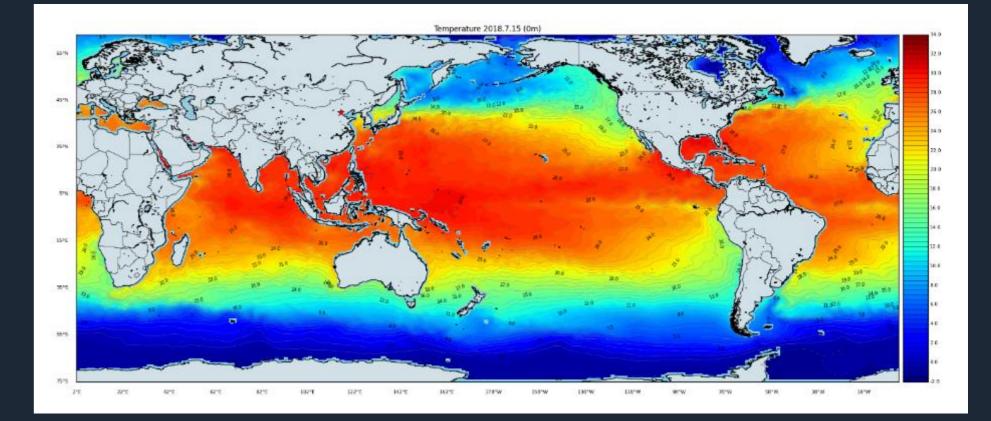
•Global ocean reanalysis datasets from 2008 to 2019

•Regional ocean reanalysis datasets from 1958 to 2019

Evaluation of the regional and global ocean reanalysis dataset



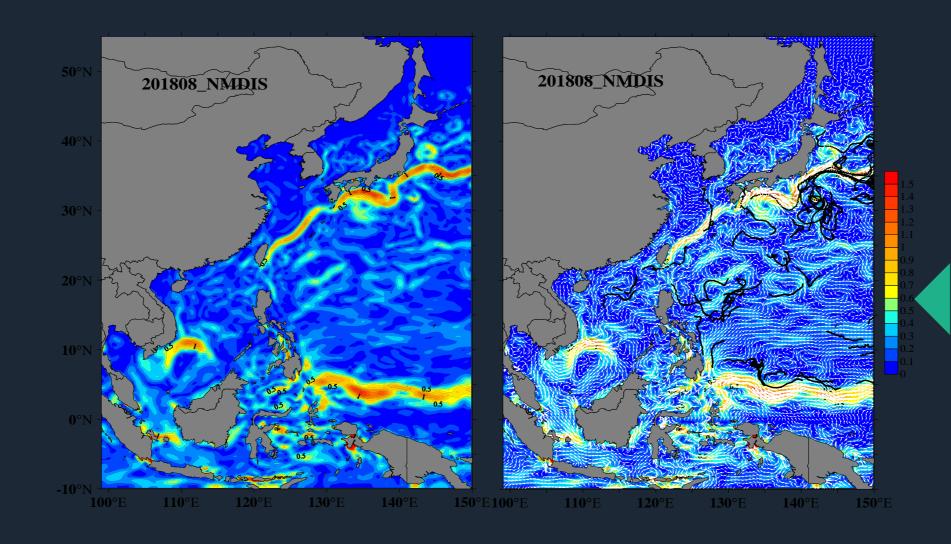
Regional reanalysis product

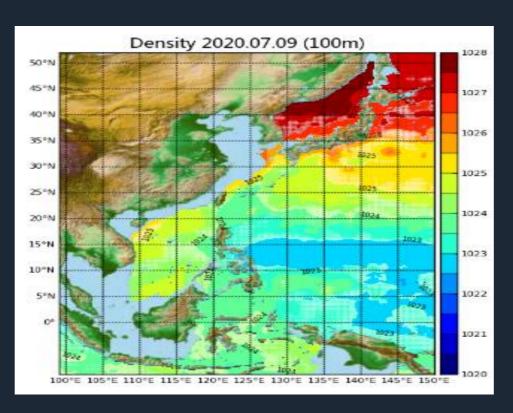


Global reanalysis product

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PRODUCTS SERVICE

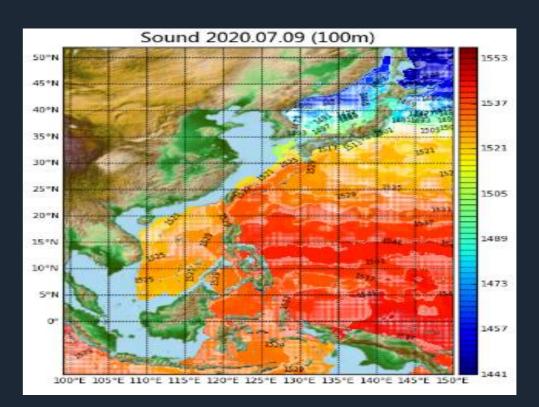




Surface current fusion products

Sea surface current fusion products in August 2018

Real-time analysis on density at the depth of 100m

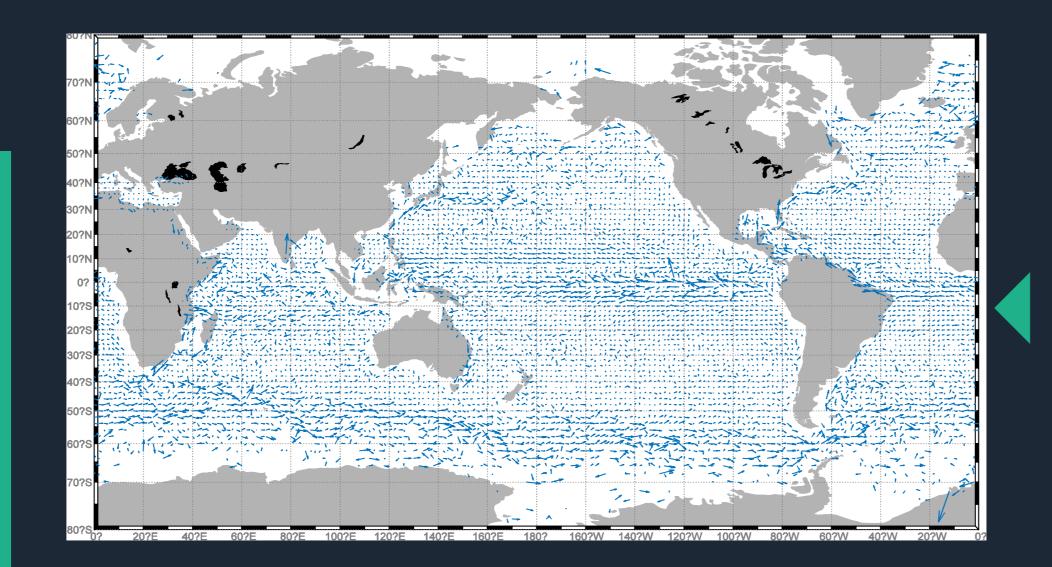


Real-time analysis on sound velocity at the depth of 100m

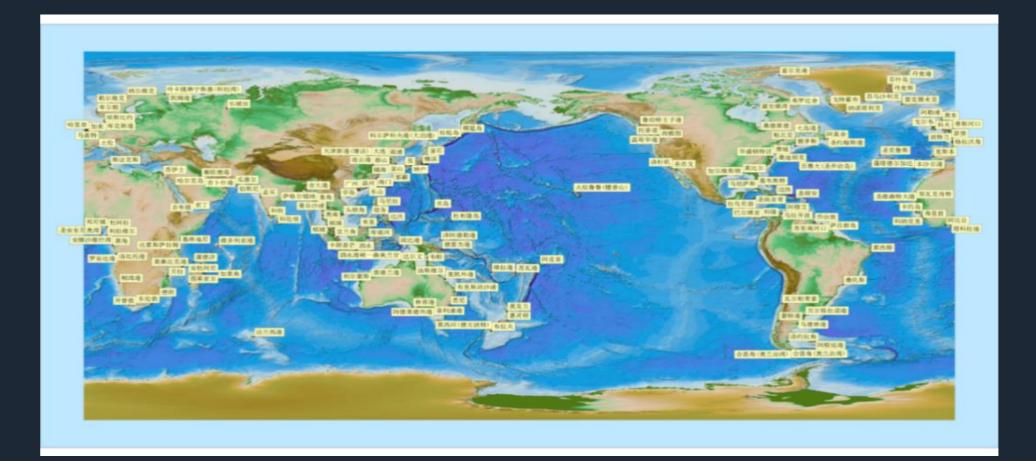
Real-time analysis data



PRODUCTS Service



Argo trajectory inversion of global ocean surface current



Global tidal forecasting stations in 2021



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DBCP PI-3



Haikou, China, July 9 - July 11, 2018

Training Course for China-ASEAN Countries on Marine information Technologies



Tianjin, China, June 25 - July 6, 2018



Tianjin, China, May 27 – June 14, 2019

Training Course for China-ASEAN Countries on Marine Data Processing and Management Technologies



Thank you!

