CMOC/China & its Data Processing and Sharing Service

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13-17 December 2021

OUTLINE

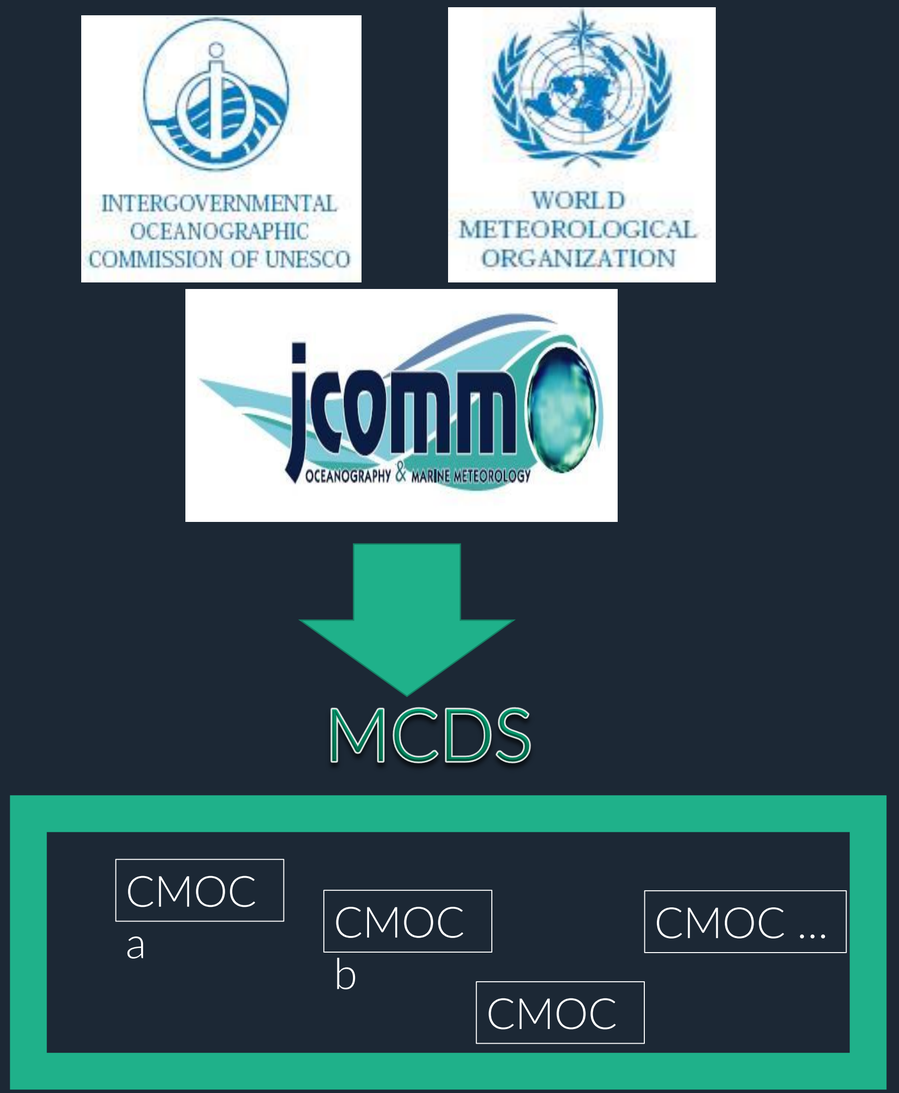
1 Background

2 Data Processing & QC

3 Data and Products Service

4 Capacity Building and International communication

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.

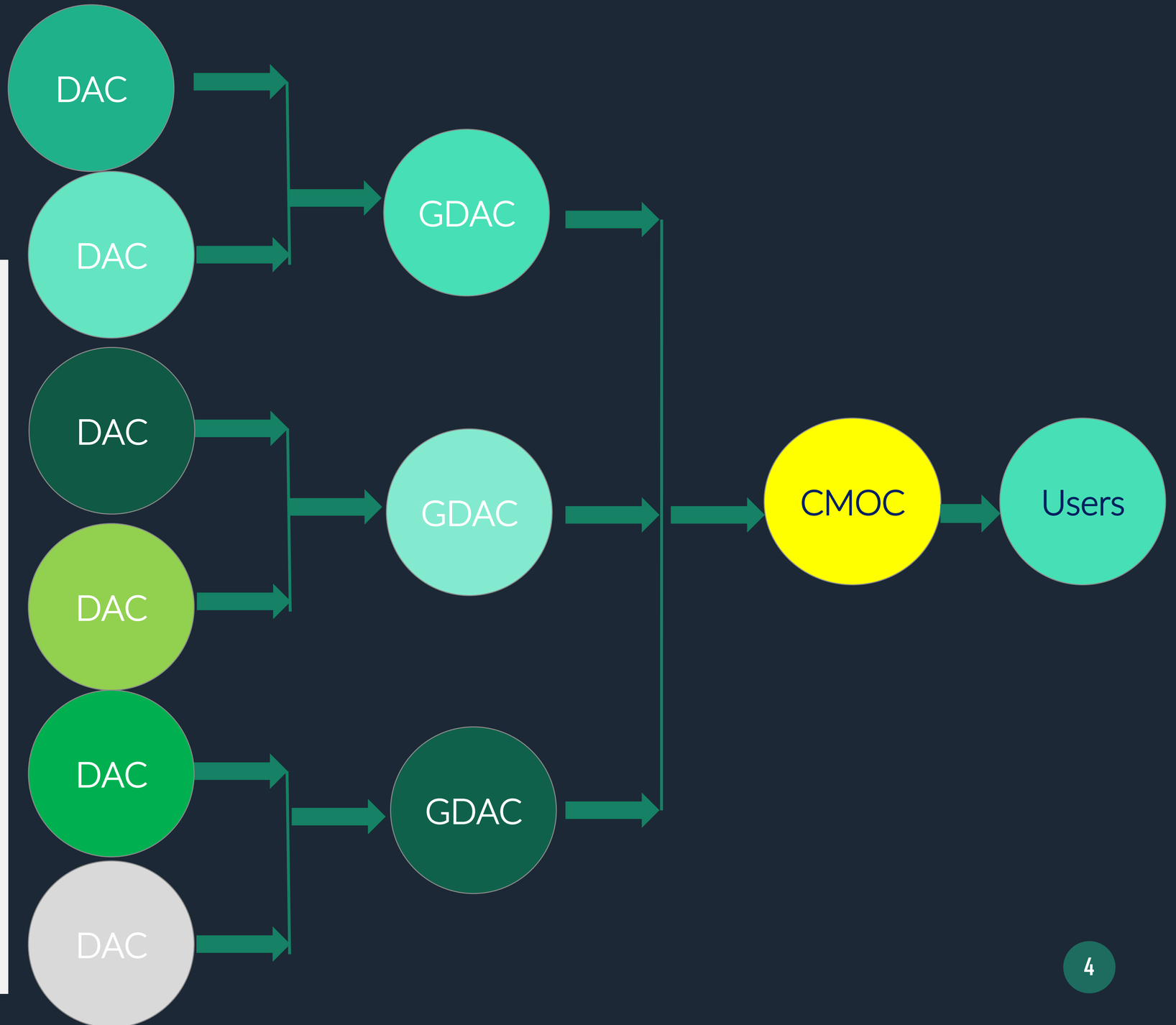
Simplified MCDS Structure

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

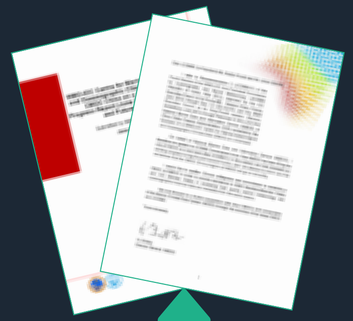


Background

2011.11 MCDS1
raise intention

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

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



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

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

2017.10
JCOMM-5
awarded CMOC
Certificate of Recognition
to NMDIS

2019.05 Attend ETMC-7

Tasks of CMOC/China

BACKGROUND

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

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

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

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

- Data and Metadata Collection and Management
- Data integration
- High level QC
- Product R&D
- Capacity Building

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 Ocean reanalysis datasets R&D

Regional capacity building support

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Data Processing

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

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

Data Processing

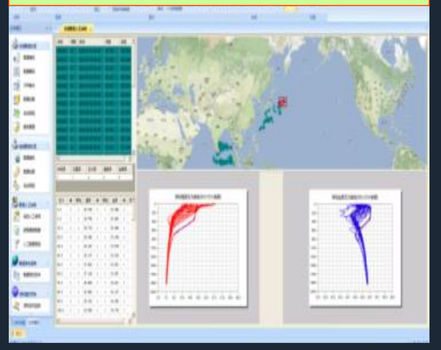
System and Software

Quality Control Software for Oceanographic Station Data

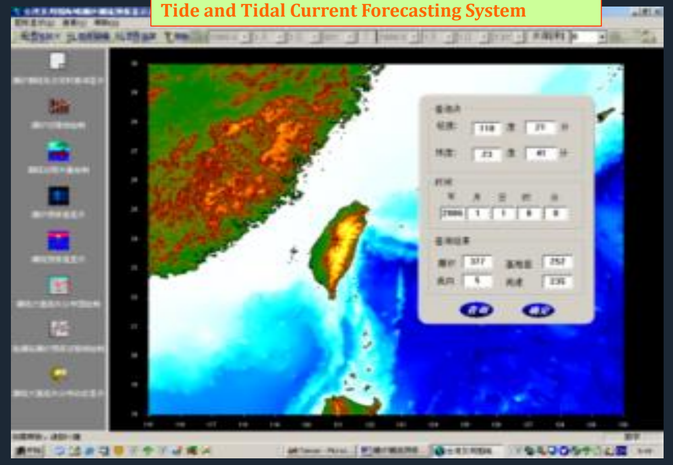
Voluntary Observing Ship Data Receiving and Processing System

Radar Data Receiving and Processing System

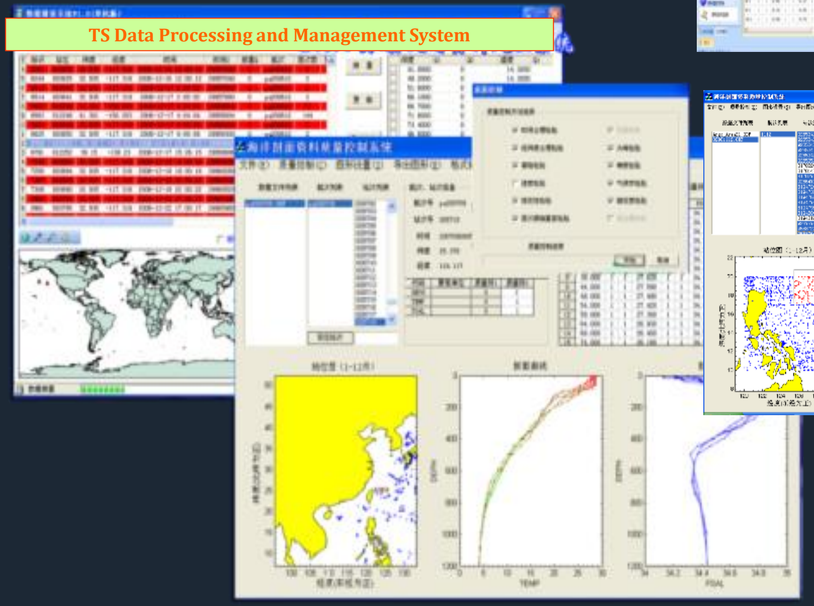
Argo Data Processing and Management System



Tide and Tidal Current Forecasting System



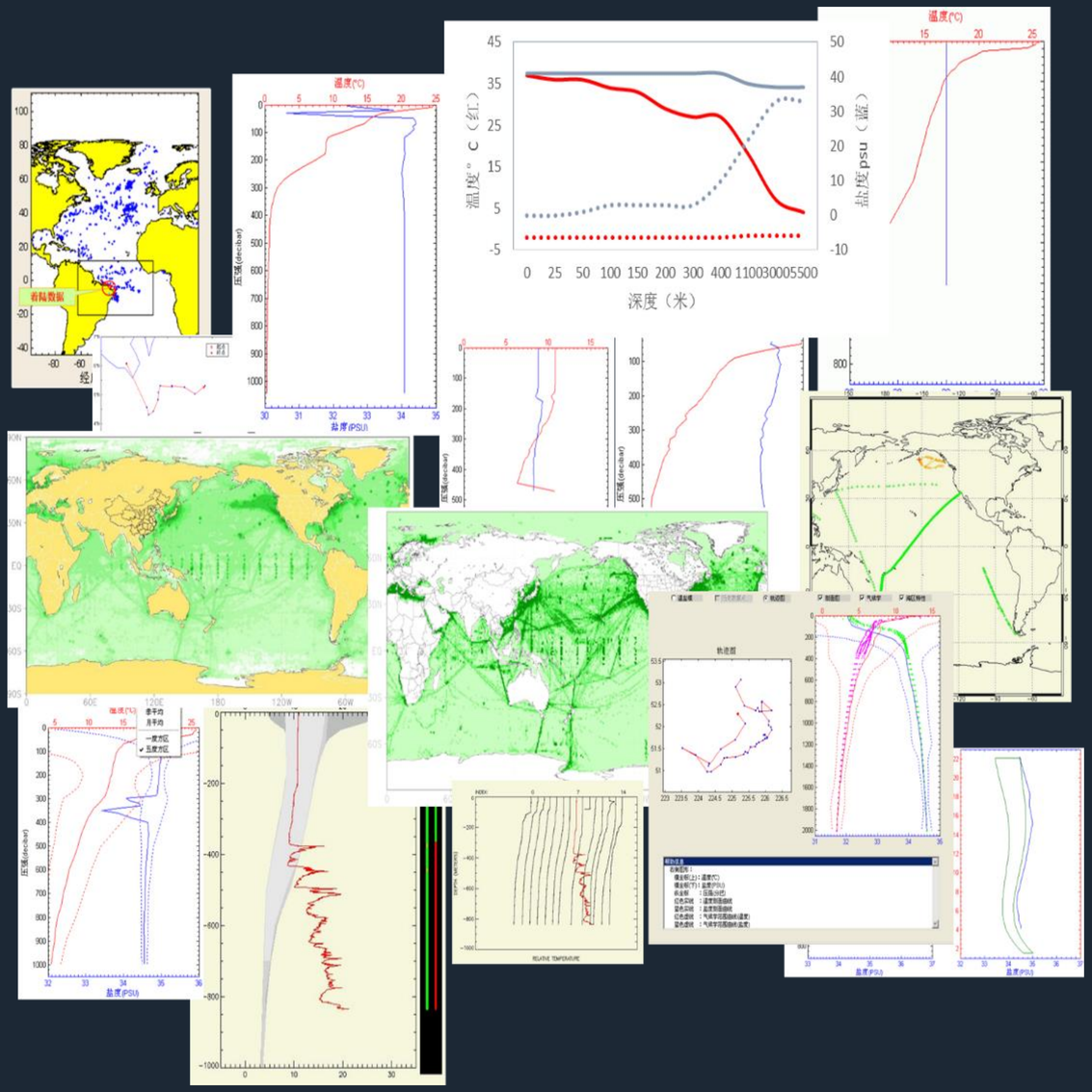
TS Data Processing and Management System



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

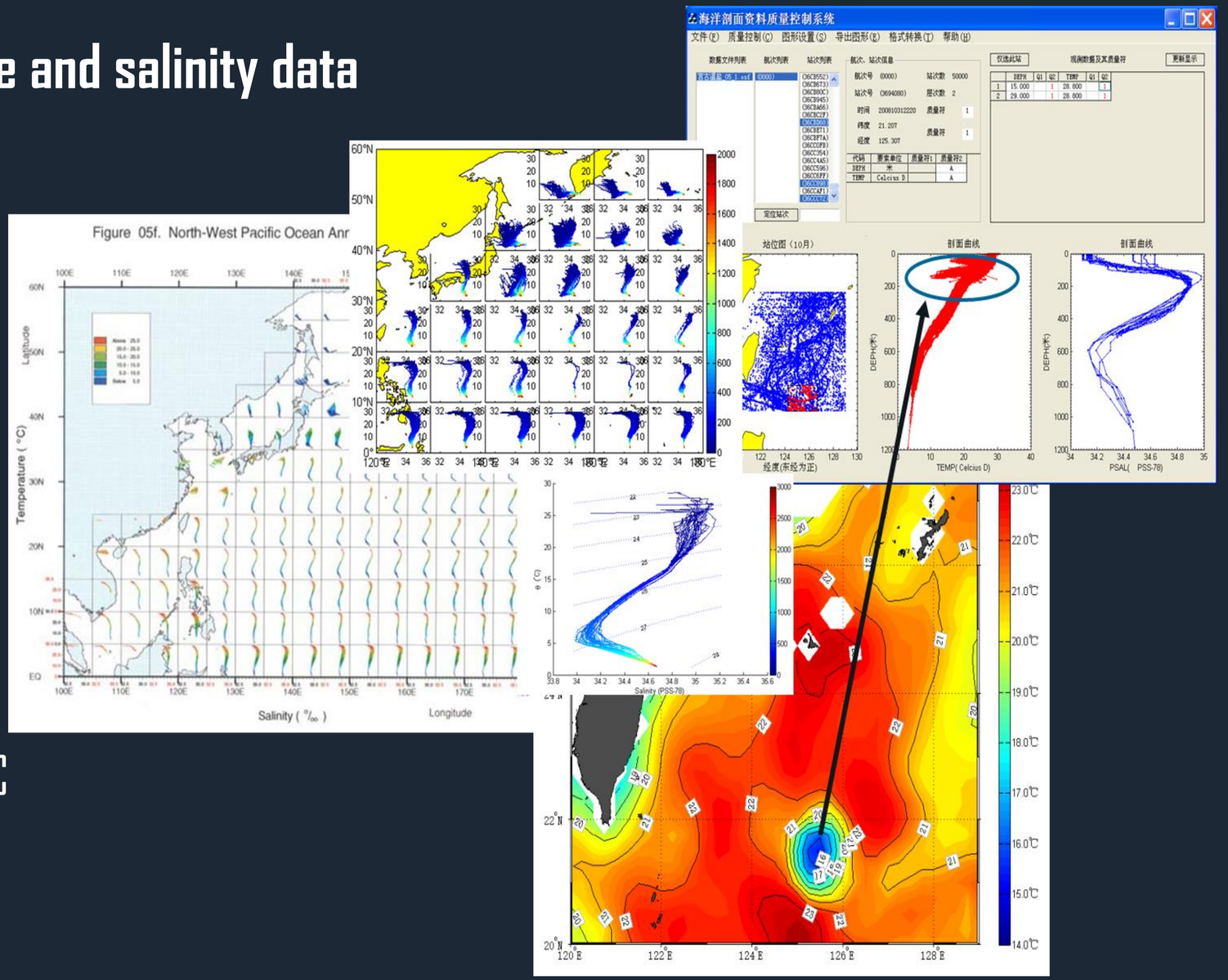


Quality control of temperature and salinity data

Improve QC and parameters in North-West Pacific

Objective Analysis Method for QC

‘Abnormal data ‘ or ‘real phenomena’ ?



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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

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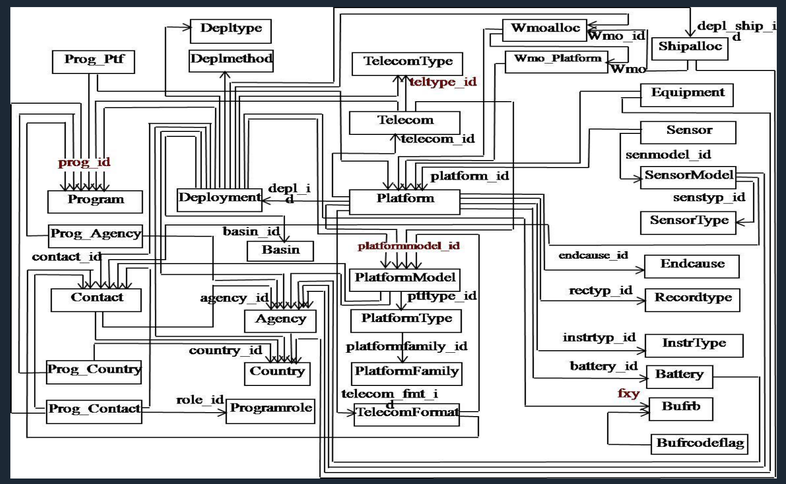
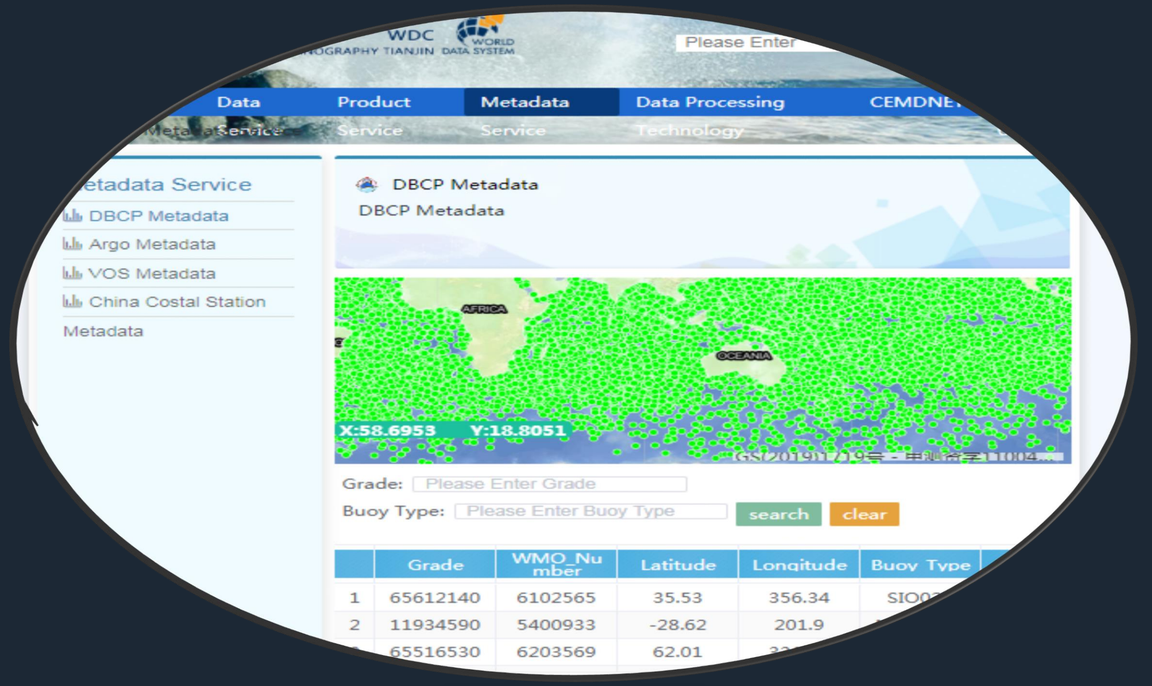


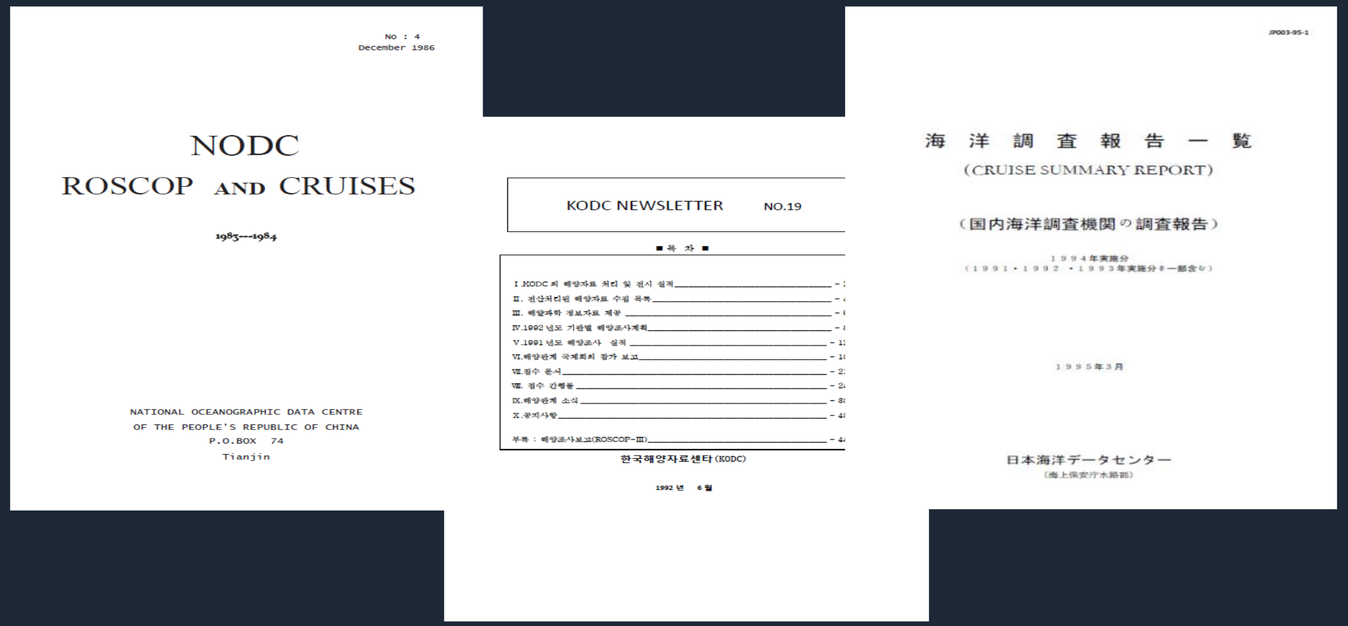


Up to November 2021, 5.09GB integration dataset which includes 10,955 drifters (from 1970 to 2020) was processed, among which 1289 were newly deployed in 2021.

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

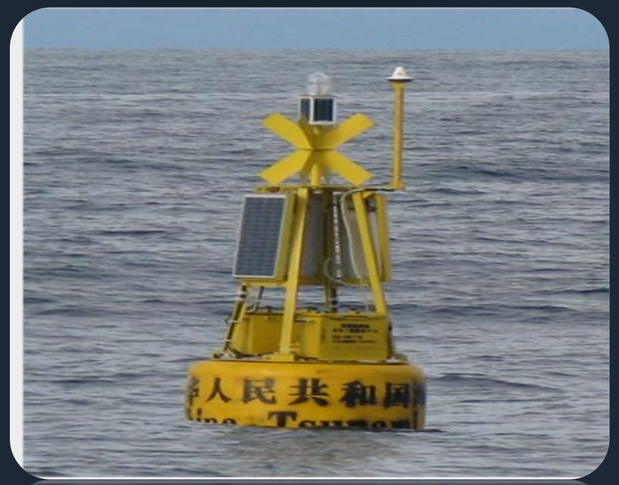
- Ship observations in Director's Report for 1892, 1894, 1895
- Observatory publication "Weather Observations From Ships (Appendix to Hong Kong Observations, 1931), by C.W. Jeffries, F.R.A.S., Director, 1932
- Ship observations listed in Daily Weather Charts

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

Oceanographic station

VOS

Observations



Tsunami buoy

China Ocean Survey

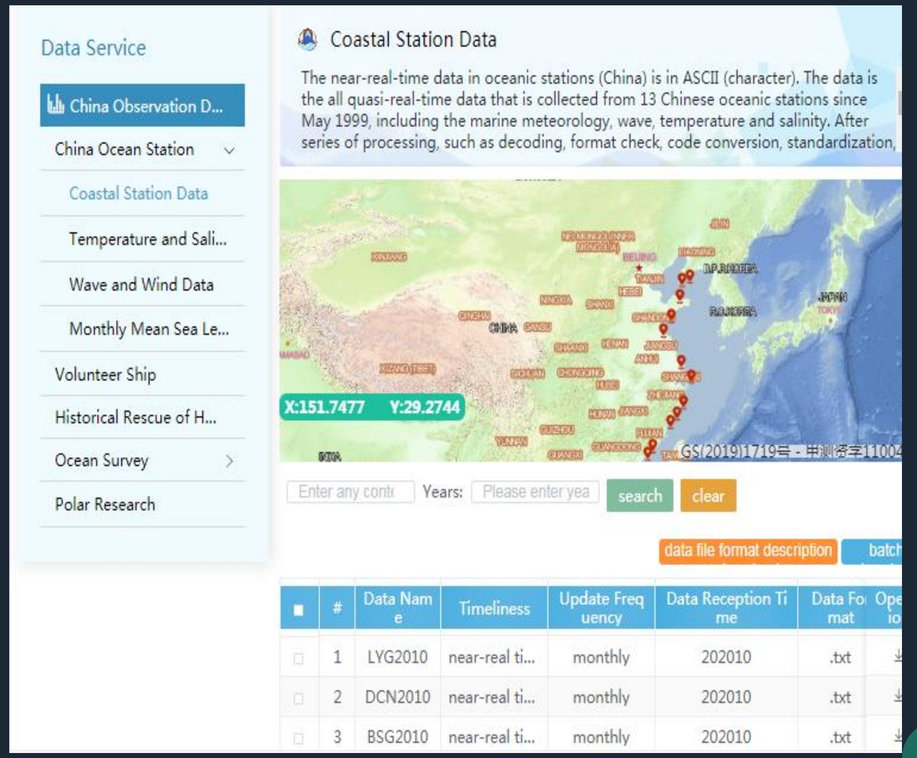
Polar investigation

Observation Data of China

No.	Name of the dataset	Temporal coverage	Total amount of data		Data update in 2020	
			Data volume(MB)	Number of files	Data volume(MB)	Number of files
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	72
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	12
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	156
Total		1996.01-2021.10	176.12	4305	19.20	240

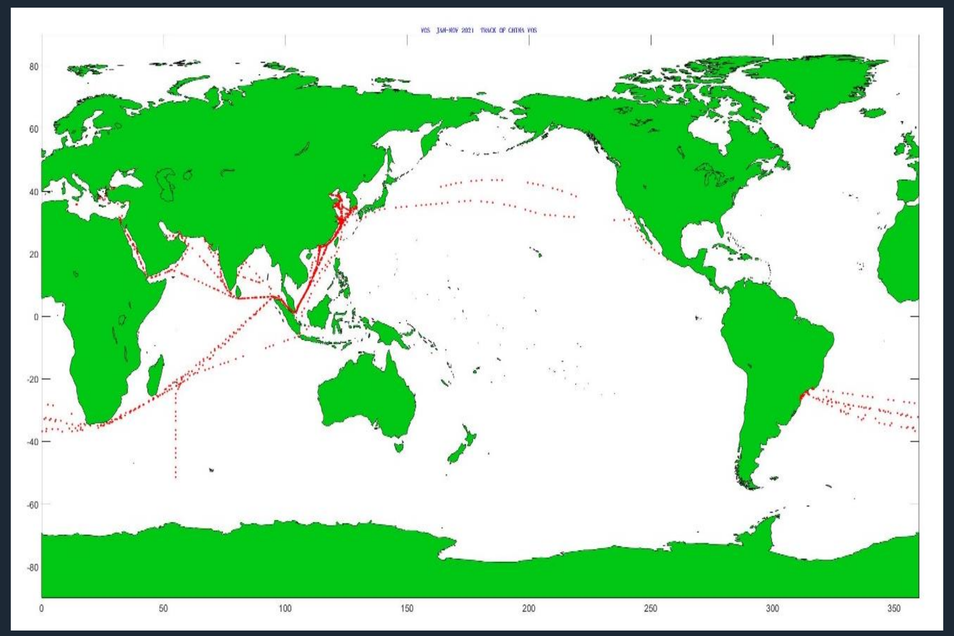
Observation data of the Chinese Oceanographic Stations

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



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.

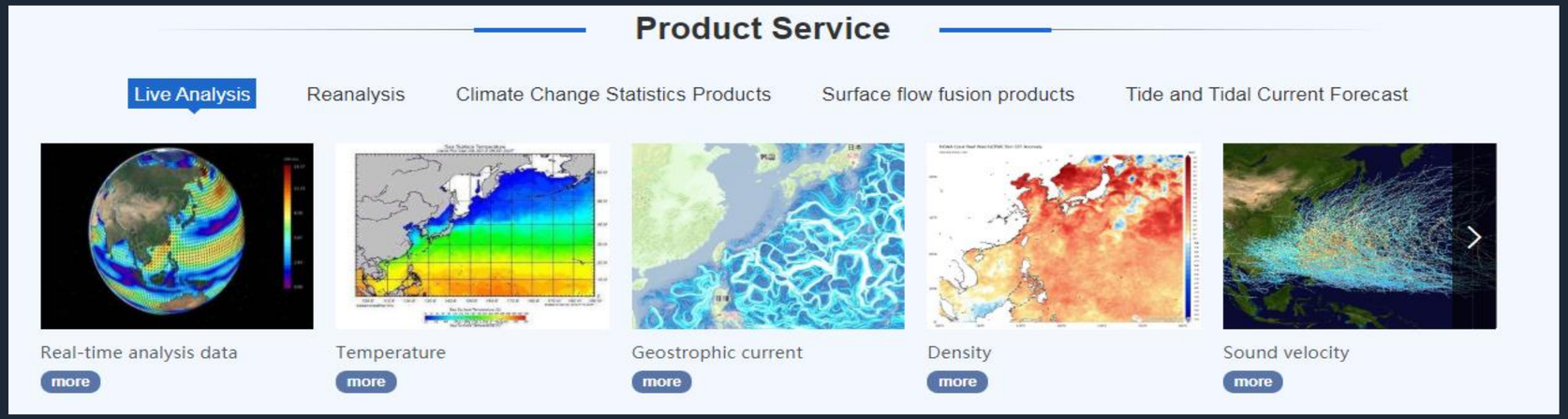
Global Oceanographic and Marine Climate Data

-Cconduct the quality control and duplicate elimination of observation data of GLOSS and COSs surveys, and prepare and release the integrated global sea level dataset;
-Carry out the quality control and duplicate elimination of Argo and GTSPP data, and prepare and release the integrated global and regional T&S datasets;
-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.
-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

Climate Statistical Products

PRODUCTS SERVICE

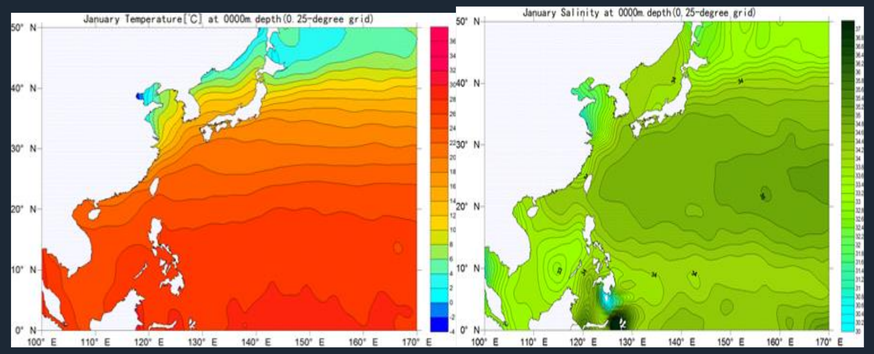


-Monthly Report of the Sea Level and Climate Change of China
-China Sea Level Bulletin
-Global and regional ocean reanalysis products
-Argo surface current inversion products

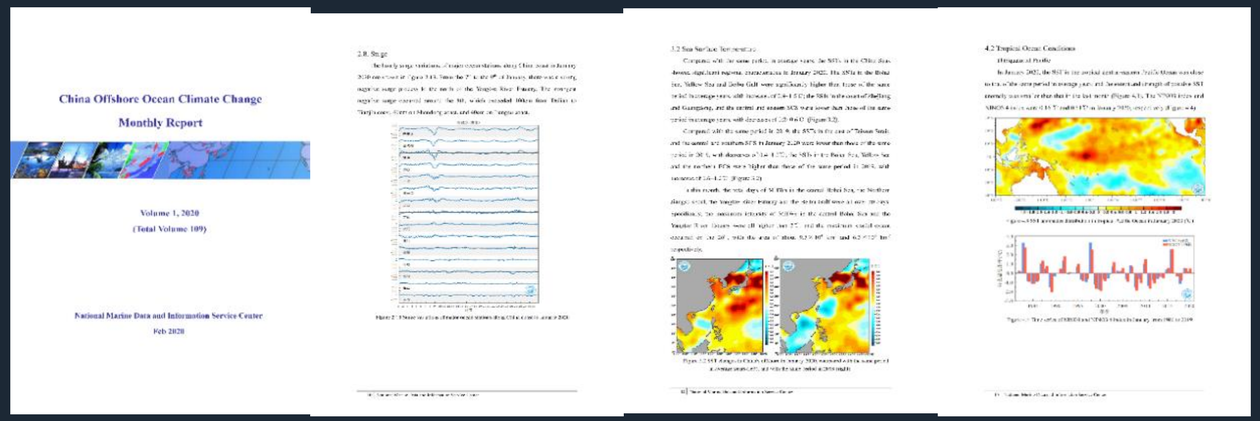
--Real-time analysis data of the Northwest Pacific Ocean
-Surface current fusion products of the Northwest Pacific Ocean
-Products of tidal current forecast of global major ports

Climate Statistical Products

PRODUCTS
SERVICE



Graphic products of temperature and salinity in Northwest Pacific



Monthly Report of Sea Level and Climate Change of China

Ocean Reanalysis Products

Improve the reanalysis ocean dynamic model

- turbulent mixing parameterization schemes
- turbulent flux parameterization schemes at the air-sea interface

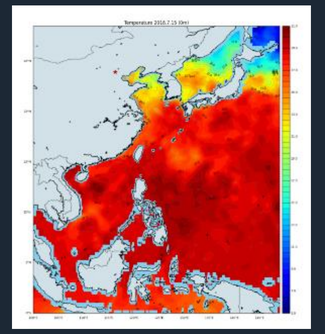
Improve the ocean data assimilation algorithms

- T-S relationship,
- the water column adjustment algorithm
- a fully conserved minimal adjustment algorithm with (T, S) coherency for stabilization of thermohaline profiles

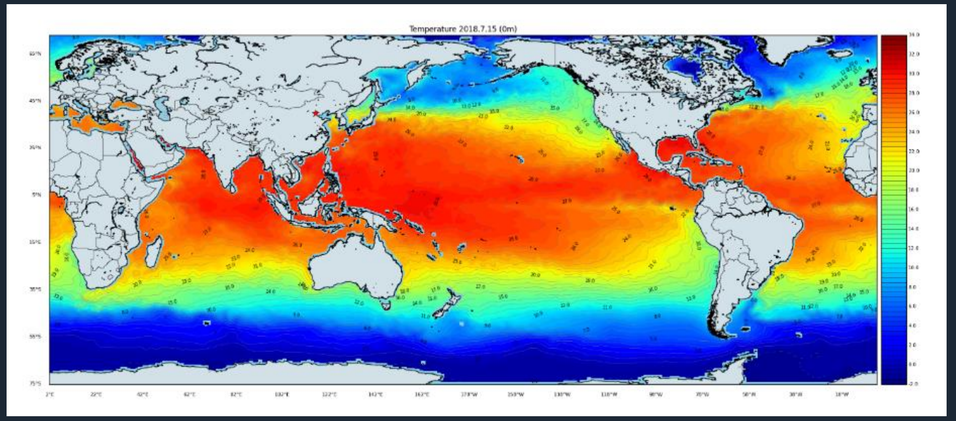
Regional and global ocean reanalysis datasets R&D

- 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



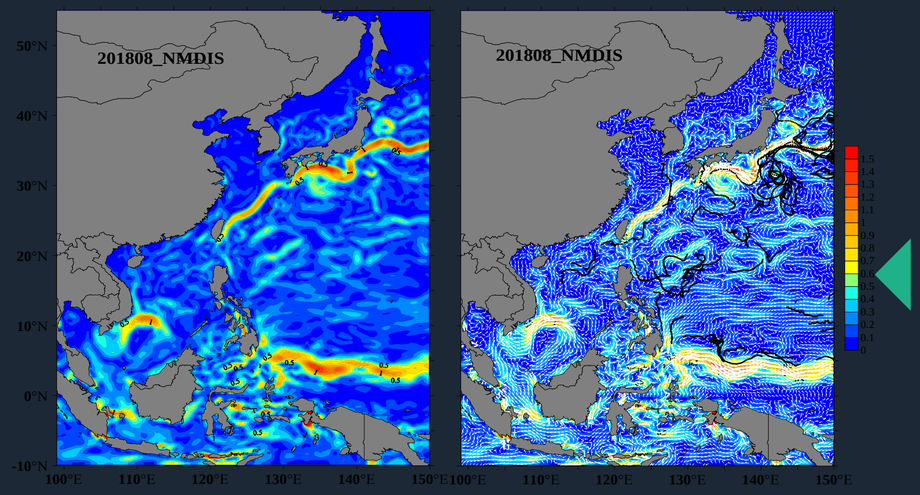
Regional reanalysis product



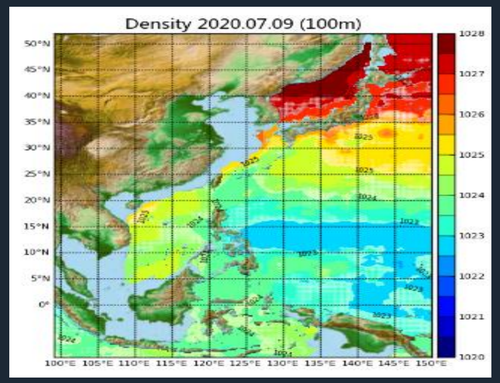
Global reanalysis product

PRODUCTS SERVICE

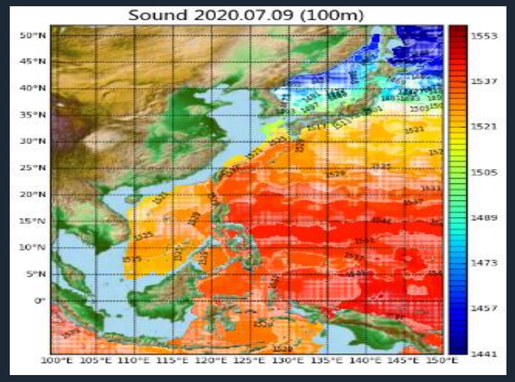
Surface current fusion products



Sea surface current fusion products in August 2018



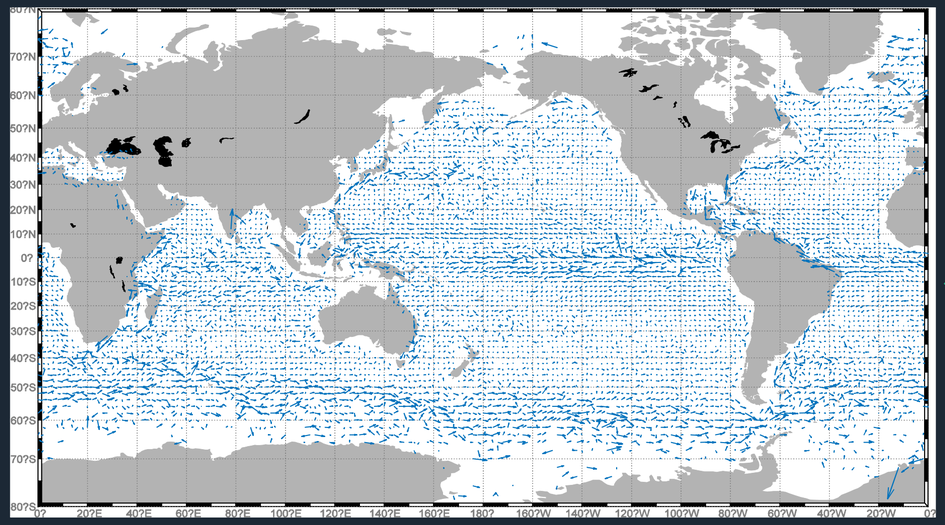
Real-time analysis on density at the depth of 100m



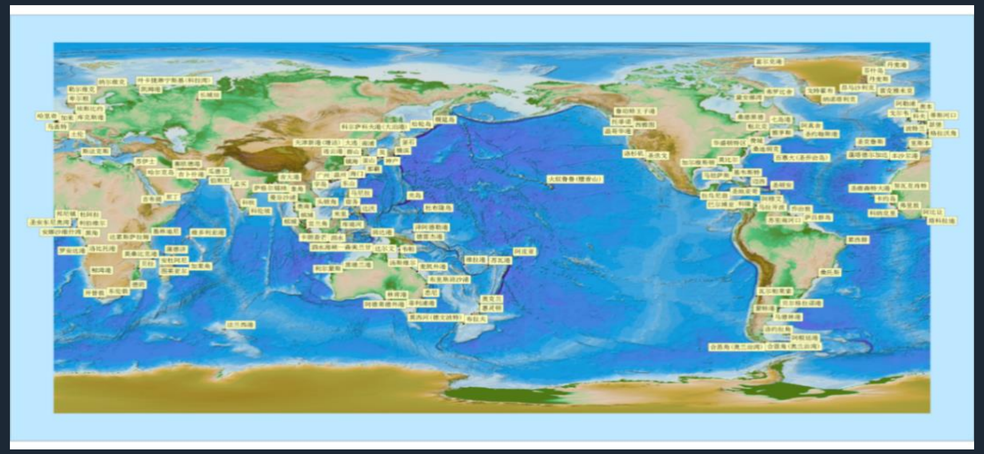
Real-time analysis on sound velocity at the depth of 100m

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, May 27 – June 14, 2019

Tianjin, China, June 25 - July 6, 2018

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

Thank you!