

# **Report to the 16th Session of IOC Group of Experts on the Global Sea Level Observing System (GLOSS) China National Sea Level Network**

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## **1. The China National Network of Sea Level Observation**

The China national network to observe sea level was maintained by State Oceanic Administration, Ministry of Natural Resources (SOA, MNR). It consists of many stations which include the thirteen key stations (Laohutan, Qinhuangdao, Tanggu, Yantai, Shijiusuo, Lianyungang, Lusi, Kanmen, Shanwei, Zhapo, Beihai, Haikou and Dongfang) and other basic stations around China. Floating operated gauges are installed in each station. Six stations of them have been registered in GLOSS Core Network and the detailed information about them is showed in Table 1.

## **2. Data Processing**

Data is collected, banked and updated by National Marine Data and Information Service (NMDIS), which maintains the quality controlled data output from these stations for use in tidal analysis, prediction, service and research. Data retrieved is subject to extensive quality control procedures on a regular basis, which reformat from old data formats, check for timing errors, remove spikes, identify data gaps, compile benchmark details and datum information, etc. All observed and derived data output from these stations is provided by NMDIS based on some special regulation.

## **3. In recent years, SOA focuses on the following aspects about sea level:**

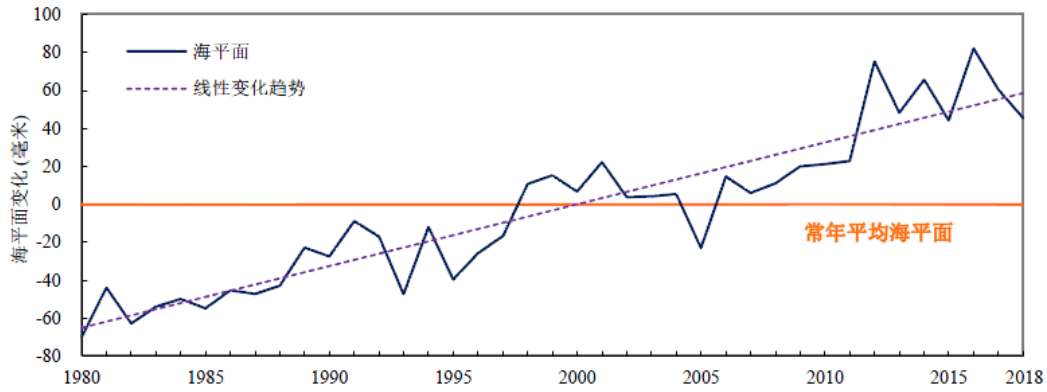
- Modifying the China sea level observed network
- Observing the vertical land motion at each tide gauge location of the China sea level observation network

- Checking the historical variation of benchmark at every tide gauge
- Participating in international cooperation planning in marine field actively such as GLOSS, NEARGOOS, and ODINWESTPAC and so on. Established China NEARGOOS database website, ODINWESTPAC service website and CMOC-CHINA service website. Published China coastal observation data and other data processed by NMDIS. The website linkage: <http://near-goos.coi.gov.cn>, <http://www.odinwestpac.org.cn> and <http://www.cmoc-china.cn>.
- Setting up the system of impact assessment upon sea level rise (SLR)
- Conducting sea level change and variation study

SOA has released the “China Sea Level Bulletin” every year since 2006 which shows that SOA reinforced the work with regard to the sea level, modified the China sea level monitoring network and started the impact assessment of sea level rise, as well as the operational system construction.

#### **4. China Coastal Sea Level Rise**

In March 2019, SOA released the “China Sea Level Bulletin, 2018”. The results indicate that, from 1980 to 2018 the sea level of China showed a general trend of continuous rising (Fig.1), with an average SLR rate of 3.3 mm/year. It’s higher than the average global sea level rise rate. In 2018, the China costal annual average sea level is the sixth high since 1980, 48 mm higher than the average sea level from 1993 to 2011, and 10 mm lower than that in 2017. The sea level along China coast in recent 7 years ranked number 1 to 7 in the late 40 years. Regional characteristics indicate obvious SLR in the coastal areas of the Bohai Sea, the Pearl River Delta and western of Hainan Province are higher than the average sea level from 1993 to 2011. Under the background of the global SLR caused by global warming, local land subsidence and abnormal climatic events contribute to the sea level change of the China coastal area in 2018, while anomalous variation. SLR intensifies the marine disasters such as storm surge, coast erosion, sea water intrusion, soil salinization and salty tide, coastal city flood, etc. The Yangtze River Delta, the Pearl River Delta, the Yellow River Delta and coastal area of Tianjin will still be the main fragile zones under SLR influence.



**Figure 1 Sea level anomaly of China from 1980 to 2018 (from China Sea Level Bulletin, 2018)**

**Table 1: Status of GLOSS Stations in China**

Code	Location	Status
723	Laohutan 38° 53'N, 121° 41' E	<ul style="list-style-type: none"> <li>• Ongoing, currently using a digital gauge.</li> <li>• The period of record spans from Jan 1980 till now.</li> <li>• Hourly height data from Jan 1975 to Dec 1999 has been sent to UHSLC and PSMSL.</li> <li>• Monthly MSL data from Jan 1991 to Dec 2018 has been sent to PSMSL.</li> </ul>
933	Zhapo 21°35'N, 111° 50' E	<ul style="list-style-type: none"> <li>• Ongoing, currently using a digital gauge.</li> <li>• The period of record spans from Oct 1957 till now.</li> <li>• Hourly height data from Jan 1975 to Dec 1999 has been sent to UHSLC and PSMSL.</li> <li>• Monthly MSL data up to Dec 2018 has been sent to PSMSL.</li> </ul>
934	Kanmen 28° 05'N, 121° 17' E	<ul style="list-style-type: none"> <li>• Ongoing, currently using a digital gauge.</li> <li>• The period of record spans from Oct 1959 till now.</li> <li>• Hourly height data from Jan 1975 to Dec 1999 has been sent to UHSLC and PSMSL.</li> <li>• Monthly MSL data up to Dec 2018 has been sent to PSMSL.</li> </ul>
979	Lusi 32° 08'N, 121° 37' E	<ul style="list-style-type: none"> <li>• Ongoing, currently using a digital gauge.</li> <li>• The period of record spans from Oct 1959 till now.</li> <li>• Hourly height data from Jan 1975 to Dec 1999 has been sent to UHSLC and PSMSL.</li> <li>• Monthly MSL data up to Dec 2018 has been sent to PSMSL.</li> </ul>
1730	Nansha 9°33'N, 112° 53' E	<ul style="list-style-type: none"> <li>• Ongoing, currently using a digital gauge.</li> <li>• The period of record spans from June 1990 to July 2002.</li> <li>• No hourly height data in CNODC.</li> <li>• Monthly MSL data up to Dec 2018 has been sent to</li> </ul>

		PSMSL.
1745	Xisha 16°50'N,112° 20'E	<ul style="list-style-type: none"><li>• Ongoing, currently using a digital gauge.</li><li>• The period of record spans from July 1990 till now.</li><li>• Hourly height data from Jan 1975 to Dec 1999 has been sent to UHSLC and PSMSL.</li><li>• Monthly MSL data up to Dec 2018 has been sent to PSMSL.</li></ul>