Towards In-situ SST Quality Monitor v2.1 (iQuam2.1)

Xinjia Zhou[1,2], Alexander Ignatov[1], Kai He[1,3]
[1]NOAA STAR   [2]Colorado State University/CIRA   [3]Formerly GST Inc.

Motivation and Objective

- ❑ NOAA is responsible for a wide range of satellite (polar and geo) and blended SST products, including swath (L2), gridded (L3) and L4 SSTs

- ❑ To support NOAA programs, and as a service to GHRSST, we evaluate various SST products in SQUAM www.star.nesdis.noaa.gov/sod/sst/squam/

- ❑ For consistent Cal/Val, common "in situ standard" is required which
  - Covers full satellite era (from ~1981 – on)
  - Includes all available high-quality in situ SSTs suitable for satellite Cal/Val (drifters, moorings, ARGO floats, ships)
  - Uniformly processes all in situ data using state-of-the-art QC, consistent with wider communities such as Met Office, NCEP, ICOADS
  - Provide data in community consensus, user friendly format, via web interface with minimal latency, to support NRT Cal/Val applications

- ❑ The iQuam was developed to initially support NOAA SST applications, but has evolved into a community GHRSST resource

Functionality and Data Flow

The iQuam is a web-based near-real time system. It performs 4 major functions

- Ingests various in situ SSTs
- Performs a uniform Quality Control (QC)
- Monitors QCed in situ SSTs online
- Serves reformatted in situ SST data with quality flags appended to users
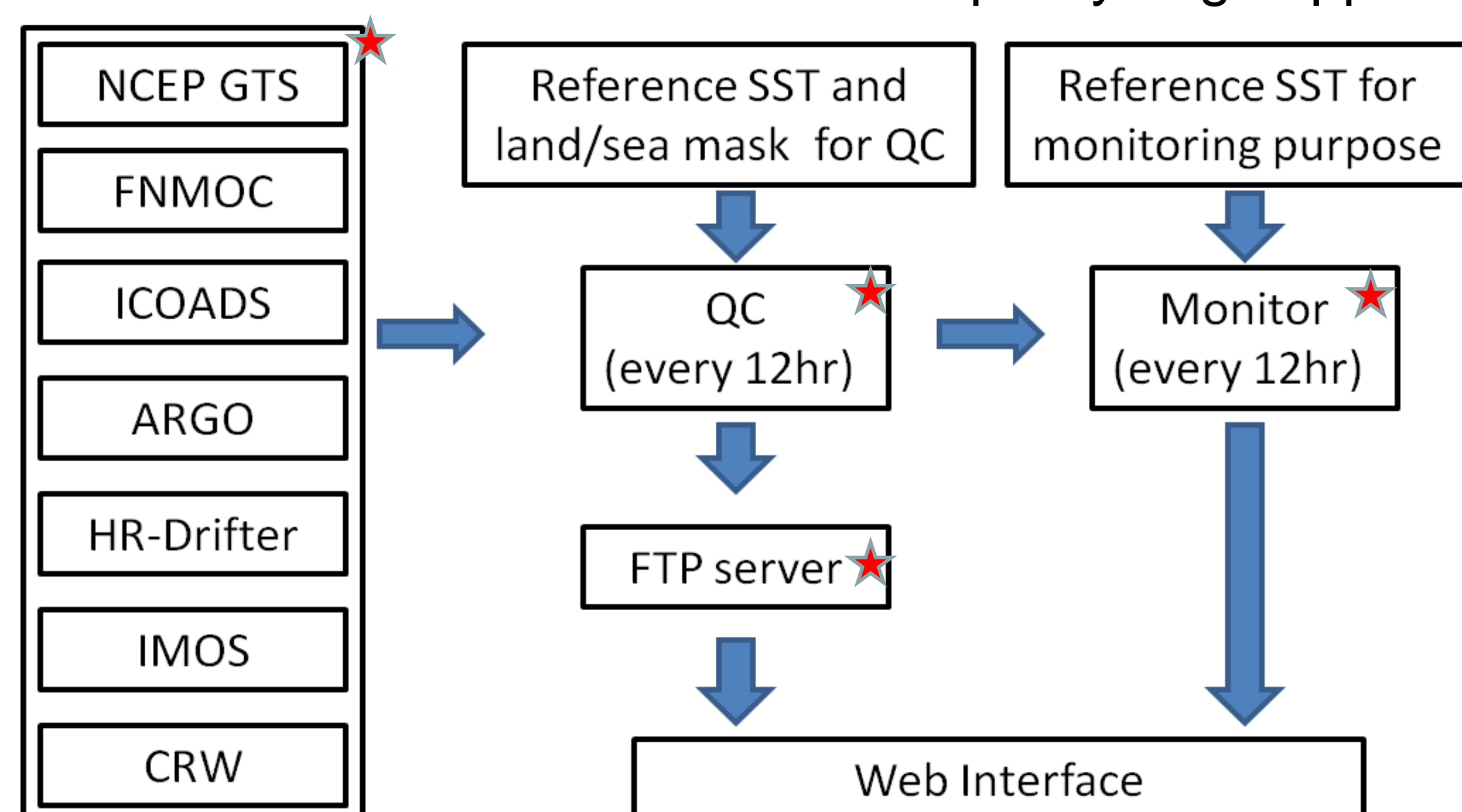
What will be new in iQuam2.1

- ❑ Merge real time GTS data from ICOADS, GTS and FNMOC to accomplish the maximum coverage (see example 1).

- ❑ ICOADS R3.0 in NetCDF format will be employed to replace ICOADS R2.5 in IMMA1 format (see example 2).

- ❑ Interactive plots on iQuam2.1 online monitor will be improved to better track individual platforms (see example 3).

- ❑ Higher-resolution maps will be employed to improve tracking individual platforms (see example 3).

- ❑ Argo floats are now downloaded from 3 sites (US GODAE, IFREMER, NOAA NCEI) to improve robustness and completeness.

- ❑ Permalink feature will be implemented on iQuam2.1 webpage.

- ❑ Better file version control. In each 15th of next month, file version is set to v1.0.

Summary & Future Work

- ❑ iQuam2.1 will use ICOADS R3.0 data and ARGO floats data from multiple sources.
- ❑ iQuam2.1 online monitor will be improved.

Future works will focus on completing 2.1 and promoting to the main slot; Working with in situ data for early years, to support Cal/Val of AVHRR RANs; and documenting iQuam2.1.
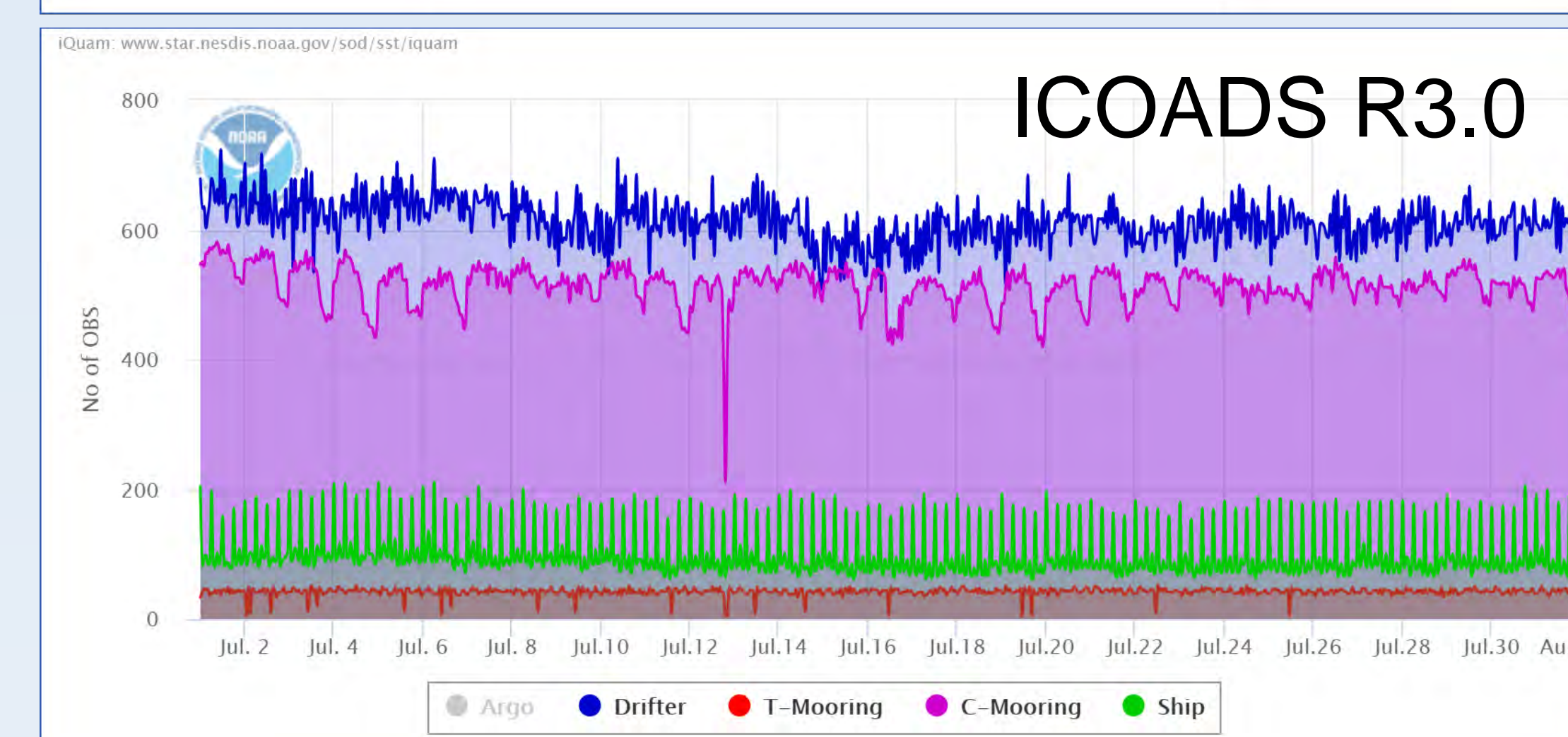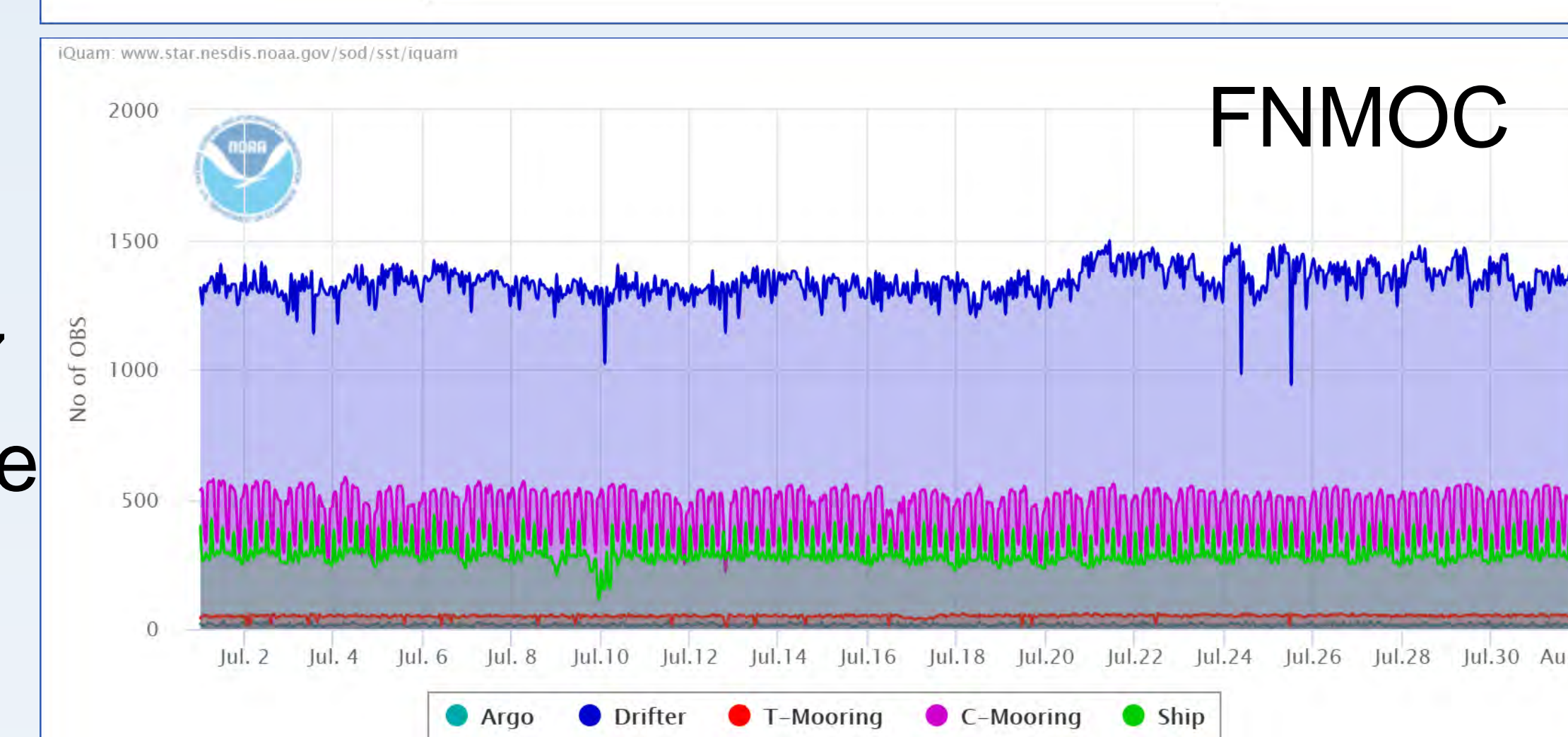
Examples

NCEP GTS

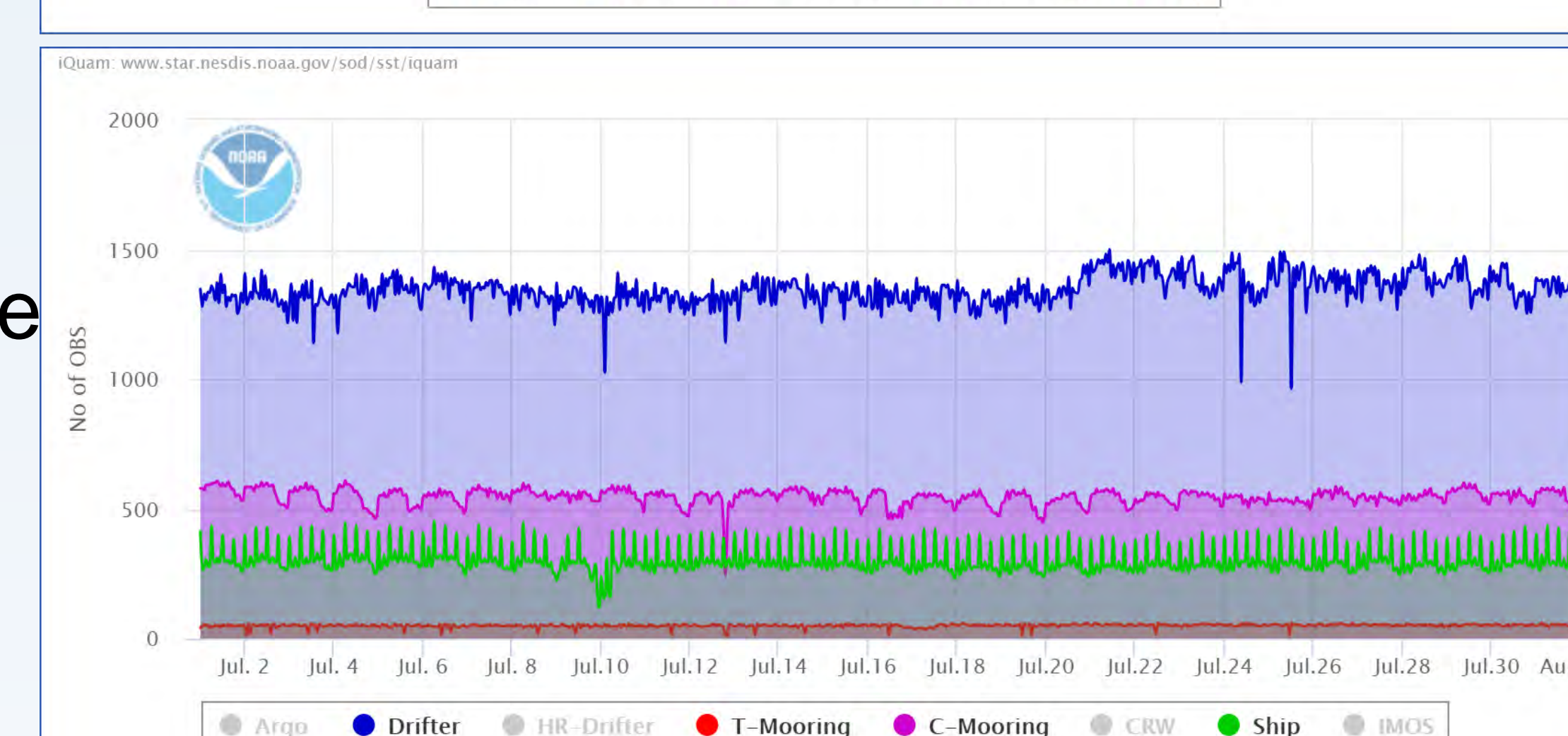Missing data for two days due to network outage
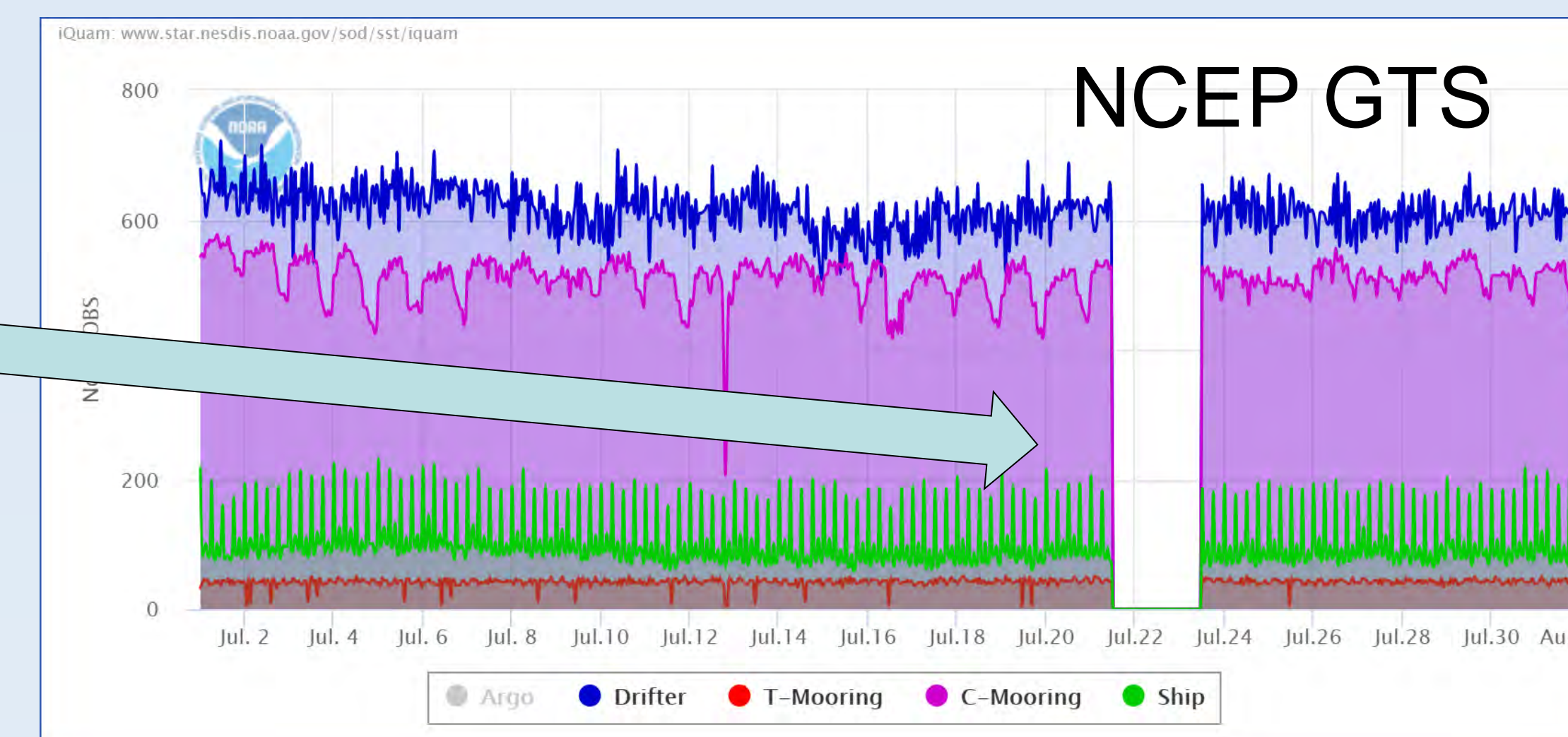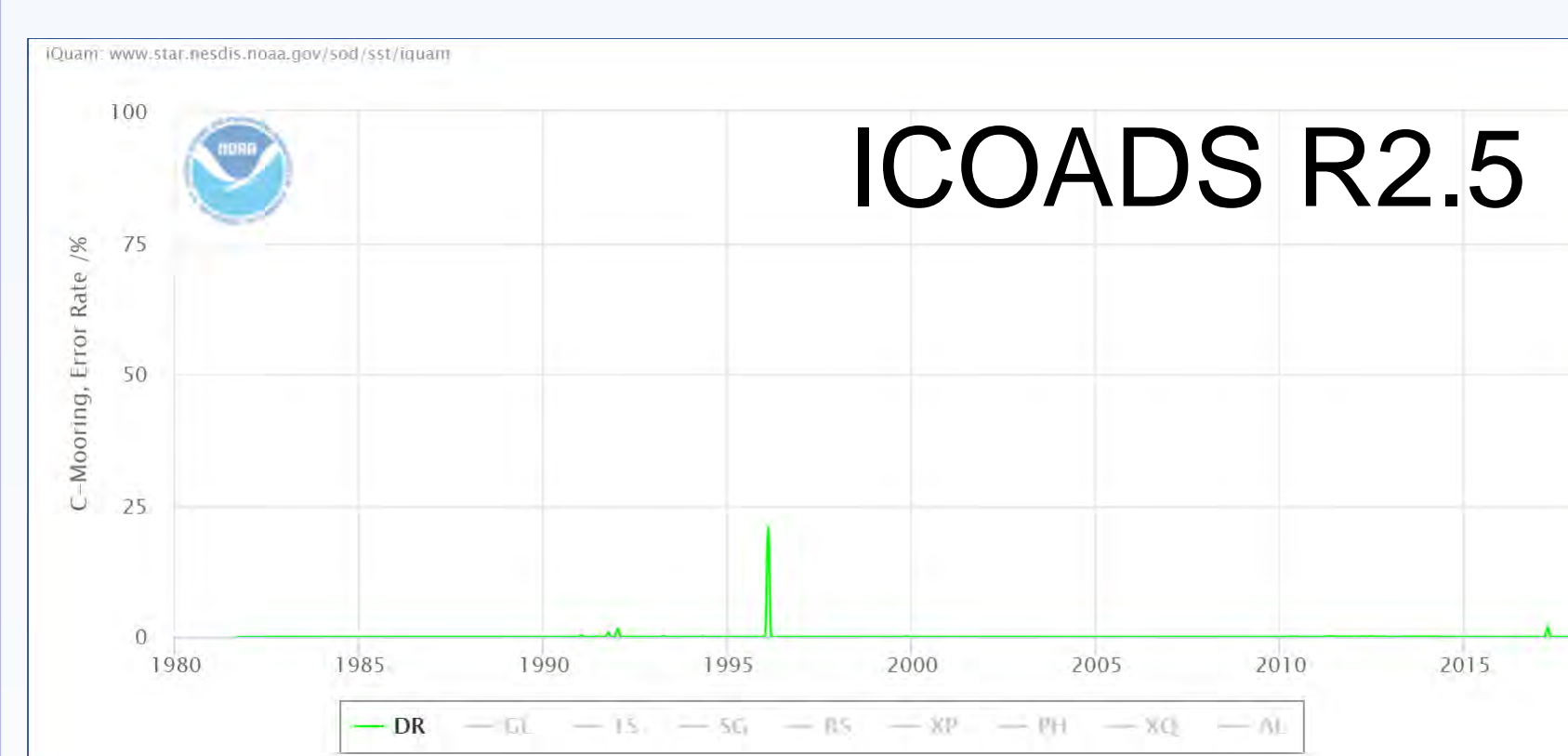
ICOADS R3.0

Gap has been filled
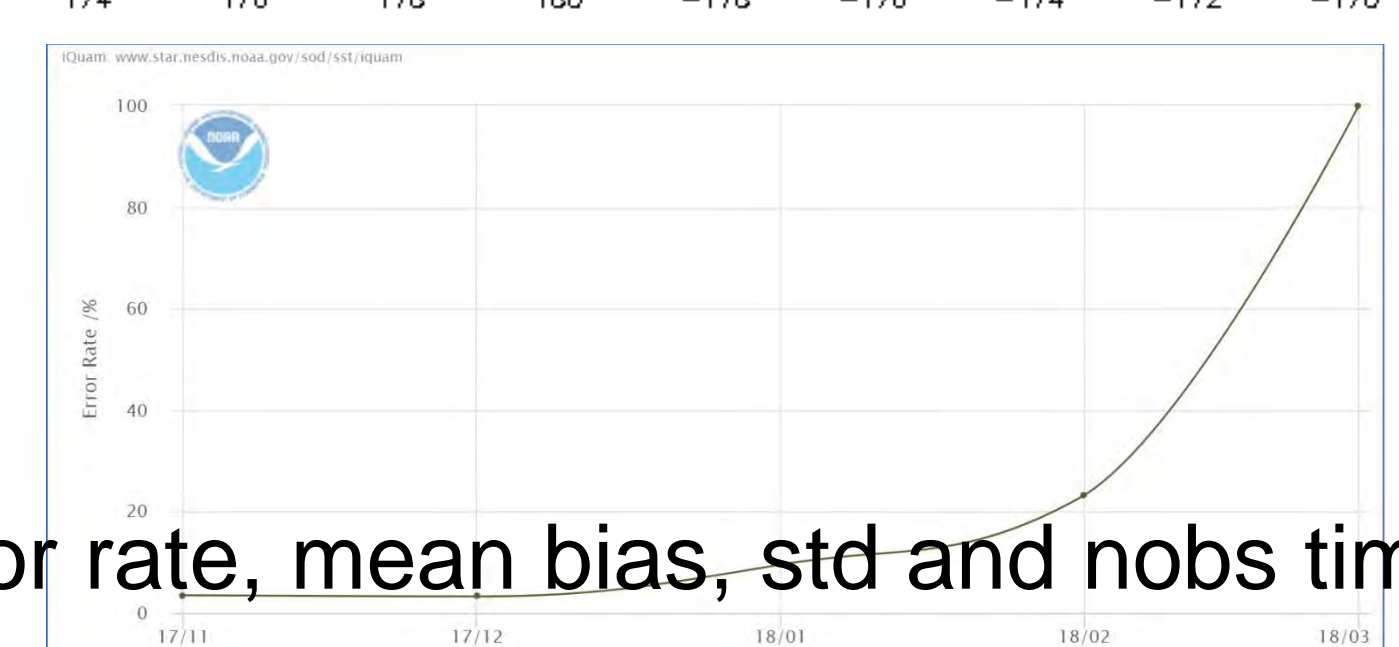
FNMOC
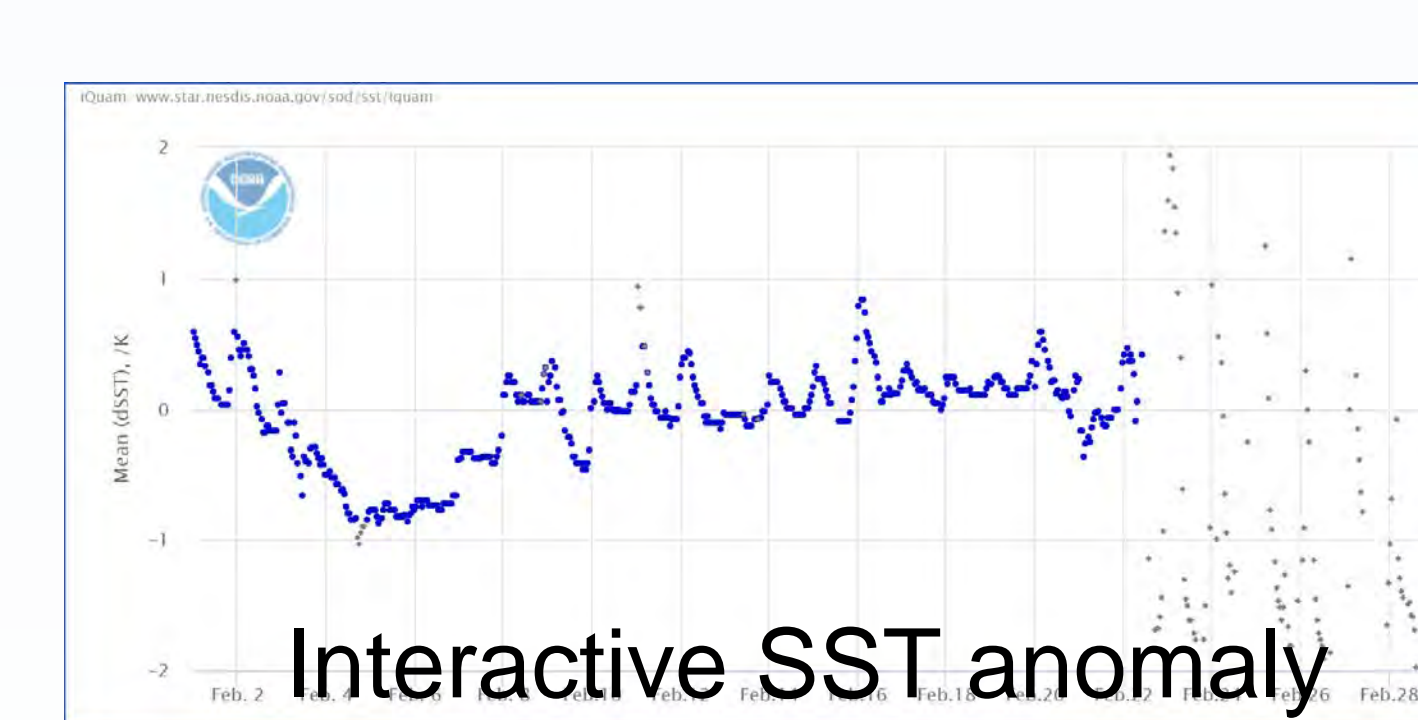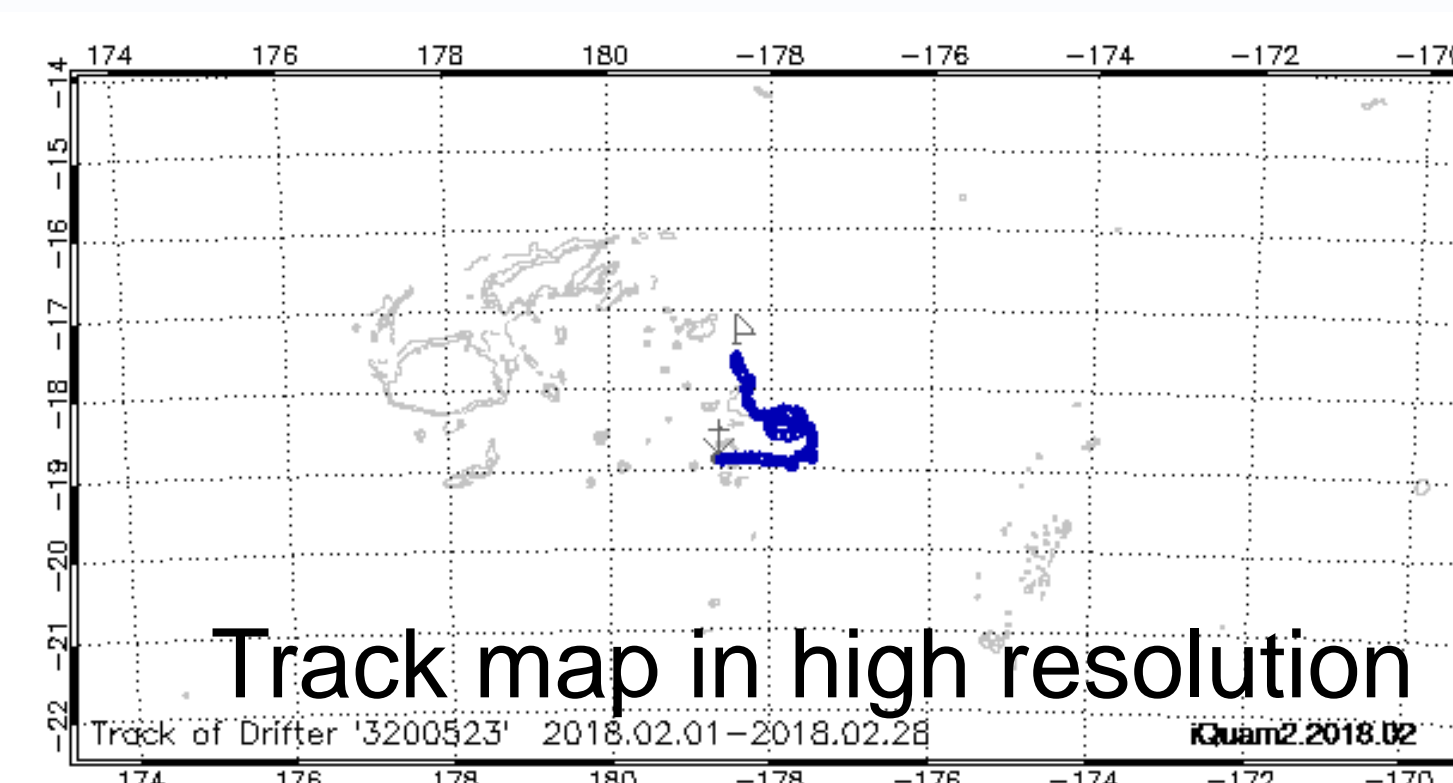
Drifting buoys with 7 digits WMO IDs have been filled

Much better coverage after merging data from 3 sources

Case. 1: Why merge ICOADS, GTS and FNMOC, example in Jul 2017.

ICOADS R2.5   ICOADS R3.0

Case. 2: One of the difference between ICOADS R2.5 and R3.0 found in iQuam2.1, e.g. coastal moorings duplicated rate.

Track map in high resolution   Interactive SST anomaly

Error rate, mean bias, std and nobs time series are available for each instrument

Case. 3: Improvements of iQuam2.1 online monitor for individual platform check.