

GHRSSST RDAC

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION



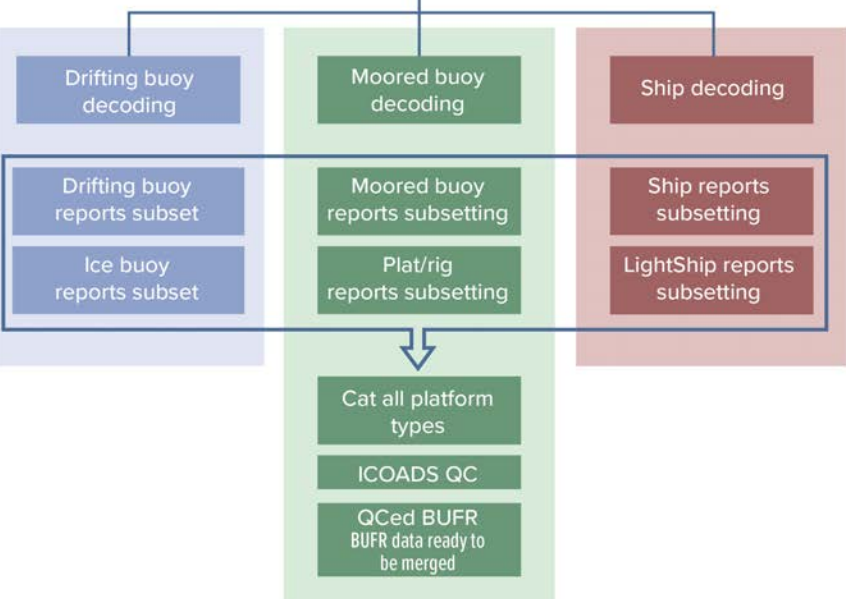
GHRSSST_RDAC_NCEI: Update on NOAA/NCEI Surface Marine Datasets and Services

Huai-Min Zhang, Eric Freeman, Garrett Graham, Boyin Huang, Chunying Liu, Korak Saha, Zhankun Wang, Yongsheng Zhang, and Xuepeng Zhao

Introduction: NOAA National Centers for Environmental Information (NCEI) provides scientific stewardship for climate and oceanographic data. Marine surface datasets include the historical in-situ observation based foundational datasets [e.g. the International Comprehensive Ocean-Atmosphere Data Set (ICOADS), the Surface Underway Marine Database (SUMD), the centennial scale (1854-present) Extended Reconstructed SST (ERSST), the satellite era Pathfinder SST and Optimum Interpolation blended SST (OISST), satellite blended sea surface winds, and the stewardship of NOAA and international oceanographic datasets. Recent progress includes new versions of these datasets, such as ICOADS R3.0.2 and OISST v2.1, which utilize the combined GTS data from the traditional TAC and new BUFR formats, resulting OISST global bias being reduced from -0.09C to -0.01C against GMPE benchmark.

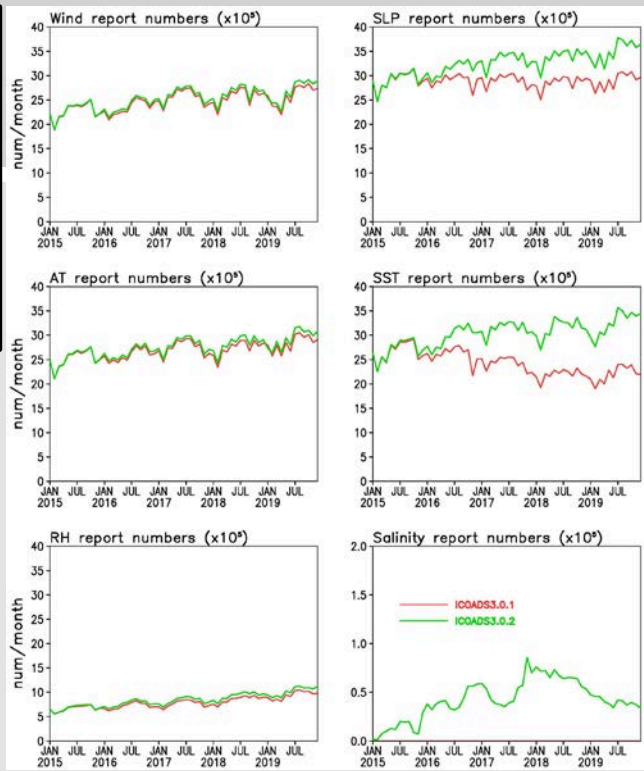
Monthly ICOADS R3.0.2 process

Monthly BUFR data

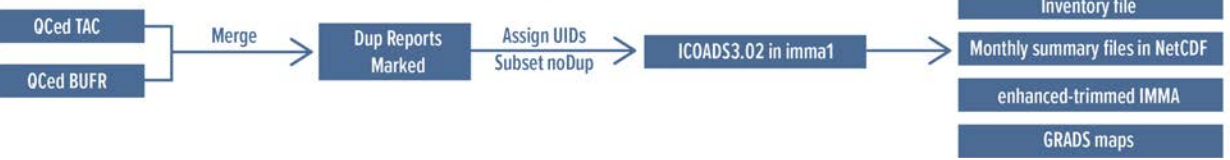


NCEI NCEP TAC

- Add C98
- Fill missing PT
- Fix id indicator ii
- Fix same ID different platform issue
- Define ice buoy from drifting and moored buoys
- Fix ship ID: 9500392 to 9V5392
- Convert 5 digit buoy ID to 7 digit buoy ID
- Delete invalid data reports
- QCed TAC
- TAC data ready to be merged



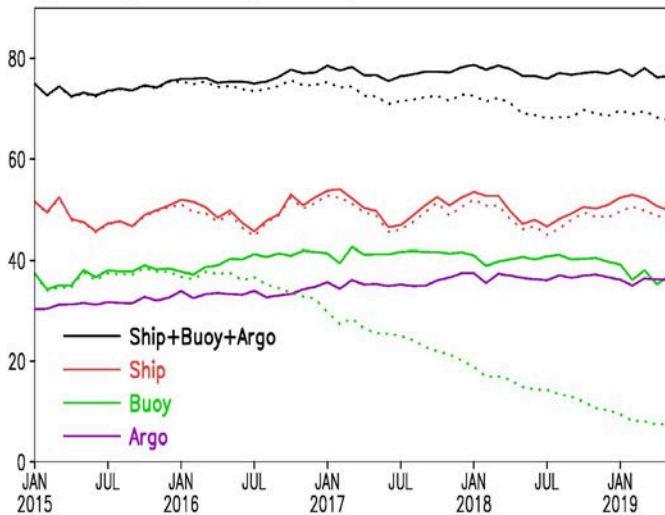
Number of essential climate variables (ECVs) reports in ICOADS R3.0.2 (green) and ICOADS R3.0.1 (red).



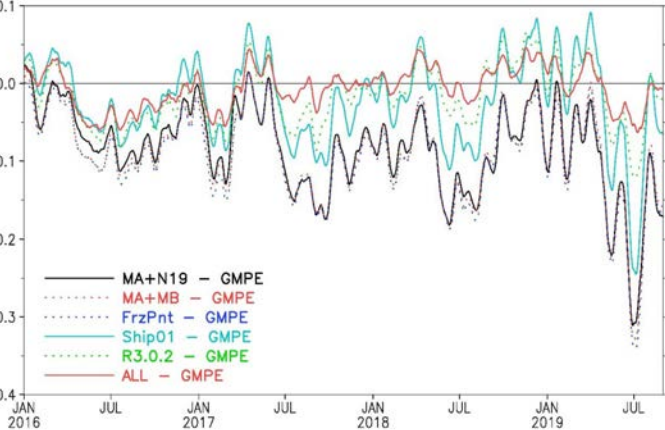
Schematic diagram for the IOCADS R3.0.2 BUFR + TAC merge procedure

New Version - OISST v2.1: Using merged TAC+BUFR ship, buoy and Argo float data and recent satellites. Global mean bias is reduced from -0.09C to -0.01C

(a) Monthly SST coverage, with Argo



(a) Globally AVE SST difference, daily 0.25x0.25, 15-day running filter



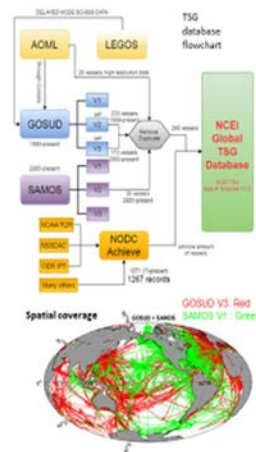
Surface Underway Marine Database (SUMD): TSG extended to include other platforms

Goal of the project: Stewardship, archive, distribution and quality controlling of in situ underway TSG sea surface salinity and temperature data.

Purpose: To gather all available TSG data, quality control, and make them available to the public in a uniform format, with granule subsetting tools.

Usages: (1) validation, calibration and matchup of satellite SSS/SST; (2) Air-sea interaction and variability; (3) Climate water cycles; ...

Temporal Coverage: 1971-present



In-Situ data based, Centennial Scale SST Dataset: The Extended Reconstructed Sea Surface Temperature (ERSST), v5

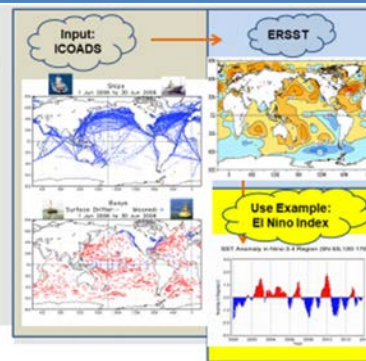
Scope: Authoritative centennial global sea surface temperature dataset for climate change research, assessment & monitoring (Monthly from Jan 1854 – present)

Objective: Monthly production & dissemination: development to remain state-of-the-science & authoritative

Version update history:

- v1 - 2003; v2 - 2004;
- v3 - 2008; v4 - 2015;
- v5: 2017 (J. Climate)

Use & public interests: Used for climate reports and assessments. New bias corrections starting from v4 showing no recent warming hiatus



Contact: Huai-Min.Zhang@noaa.gov
www.ncei.noaa.gov

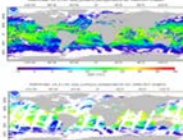
Pathfinder Sea Surface Temperature Climate Data Record

Goal: High resolution (~4km), long-term (1981 onward) satellite AVHRR SST as a Climate Data Record (CDR).

Usage: A *foundational dataset* for marine climate and ecosystem research and applications (e.g., for CoRTAD and higher level SST products such as OISST); a component of GHRSSST (<https://www.ghrssst.org/>)

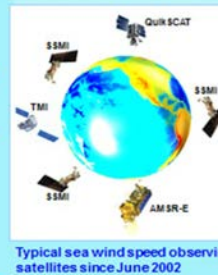
Ongoing Improvements:

- Production capacity transitioned from RSMAS/U. Miami to NOAA/NCEI
- V5.3 has been released, and forward quarterly update will start in Spring 2018!



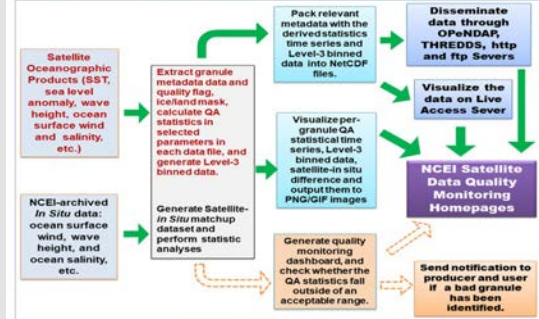
Blended Sea Surface Winds: To include new satellite data

- Satellite Retrievals: RSS (NASA Pathfinder)
- 6-hourly & 1/4° global sea winds, blended from multiple (up to 6) satellites
- Daily & Monthly means are also archived & served to the community
- Blended Winds available from July '87 onward
- Climatological monthlies were computed for base period 1995 - 2005 (with obs of ≥ 3 satellites)



Typical sea wind speed observation satellites since June 2002

Long-term stewardship of NOAA and partner satellite data





NOAA ACSPO* SST Products

*ACSPO = Advanced Clear-Sky Processor for Ocean, NOAA enterprise SST system

Alexander Ignatov

Olafur Jonasson, Irina Gladkova, Yury Kihai,
Boris Petrenko, Victor Pryamitsyn, Lars Hunger

NOAA; GST Inc; CCNY

ACSPO supported by NOAA JPSS and GOES-R Programs

ACSPO data are archived in

- (1) PO.DAAC in close partnership with Ed Armstrong, Wen-Hao Li, Tim McKinght*
- (2) NCEI in partnership with Yongsheng Zhang, John Relph, and Tom Zhao*



ACSPO Data Products, Sizes (GB/Sensor/Day) and Access

ACSPO Data Access

Dataset/source	NASA PO.DAAC	NOAA NCEI
NPP VIIRS L2P	10.5067/GHVRS-2PO61	10.7289/v5pr7sx5
NPP VIIRS L3U	10.5067/GHVRS-3UO61	10.7289/v5kk98s8
N20 VIIRS L2P	10.5067/GHV20-2PO61	10.25921/sfs7-9688
N20 VIIRS L3U	10.5067/GHV20-3UO61	10.25921/7c1m-rw73
GOES-16 ABI L2P	10.5067/GHG16-2PO27	10.25921/ayf6-c438
GOES-16 ABI L3C	10.5067/GHG16-3UO27	10.25921/rtf0-q898
GOES-17 ABI L2P	10.5067/GHG17-2PO71	In Progress
GOES-17 ABI L3C	10.5067/GHG17-3UO71	In Progress
Himawari-8 AHI L2P	10.5067/GHH08-2PO27	In Progress
Himawari-8 AHI L3C	10.5067/GHH08-3CO27	In Progress

Next in pipeline:

- Reprocess full AVHRR FRAC, GAC (and eventually, MODIS) records
- Reprocess L3S-LEO HR SST 2000-on. Generate L3S-GEO SST
- Generate GOES-U/18, MTSAT, J2/N21, Metop-SG SSTs

Polar: 10-min granules (144/day)

Satellites	Sensor	L2P	0.02° L3U
NPP/N20/N21	VIIRS	26.0	0.5 (x58)
Metop-A/B/C	AVHRR FRAC	8.0	0.5 (x16)
NOAA-7 to -19	AVHRR GAC	0.7	0.5 (x1.5)
Terra/Aqua	MODIS	7.5	0.5 (x16)
Metop-SG	MetImage	~8.0	0.5 (x16)

LEO Super-Collated (L3S-LEO): 4 files/24hr (AM/PM, Day/Night)

Satellites	Sensor	L3S
NPP/N20/N21/Aqua	L3S-LEO/PM	~0.5
Metop-A/B/C/SG/Terra	L3S-LEO/AM	~0.5

Geo: 1-hr FD granules (24/day)

Satellites	Sensor	L2C	0.02° L3C
G16/G17/G18	ABI	1.0	0.6 (x1.6)
H08	AHI	1.0	0.6 (x1.6)
MTG	FCI	1.0	0.6 (x1.6)

GEO Super-Collated (L3S): 1-hr Global granules (24/day)

Satellites	Sensor	L3S
G16/G17/G18/H08/MTG	L3S-GEO	~0.5



More ACSPO Resources at GHRSSST-XXI

- Status of JPSS VIIRS SST Products at NOAA, Olafir Jonasson, Poster
- Towards Global L3S-LEO Products at NOAA, Olafir Jonasson, Poster
- Towards 2nd Reanalysis of NOAA AVHRR GAC Data (RAN2): Methodology, Boris Petrenko, Poster
- Towards 2nd Reanalysis of NOAA AVHRR GAC Data (RAN2): Evaluation, Victor Pryamitsyn, Poster
- Status of Metop First Generation SST Products at NOAA, Victor Pryamitsyn, Poster