# Database of Observations: Ocean/Marine perspectives

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As time permits, effort must be made to gather inputs from other JCSDA - JEDI stakeholders

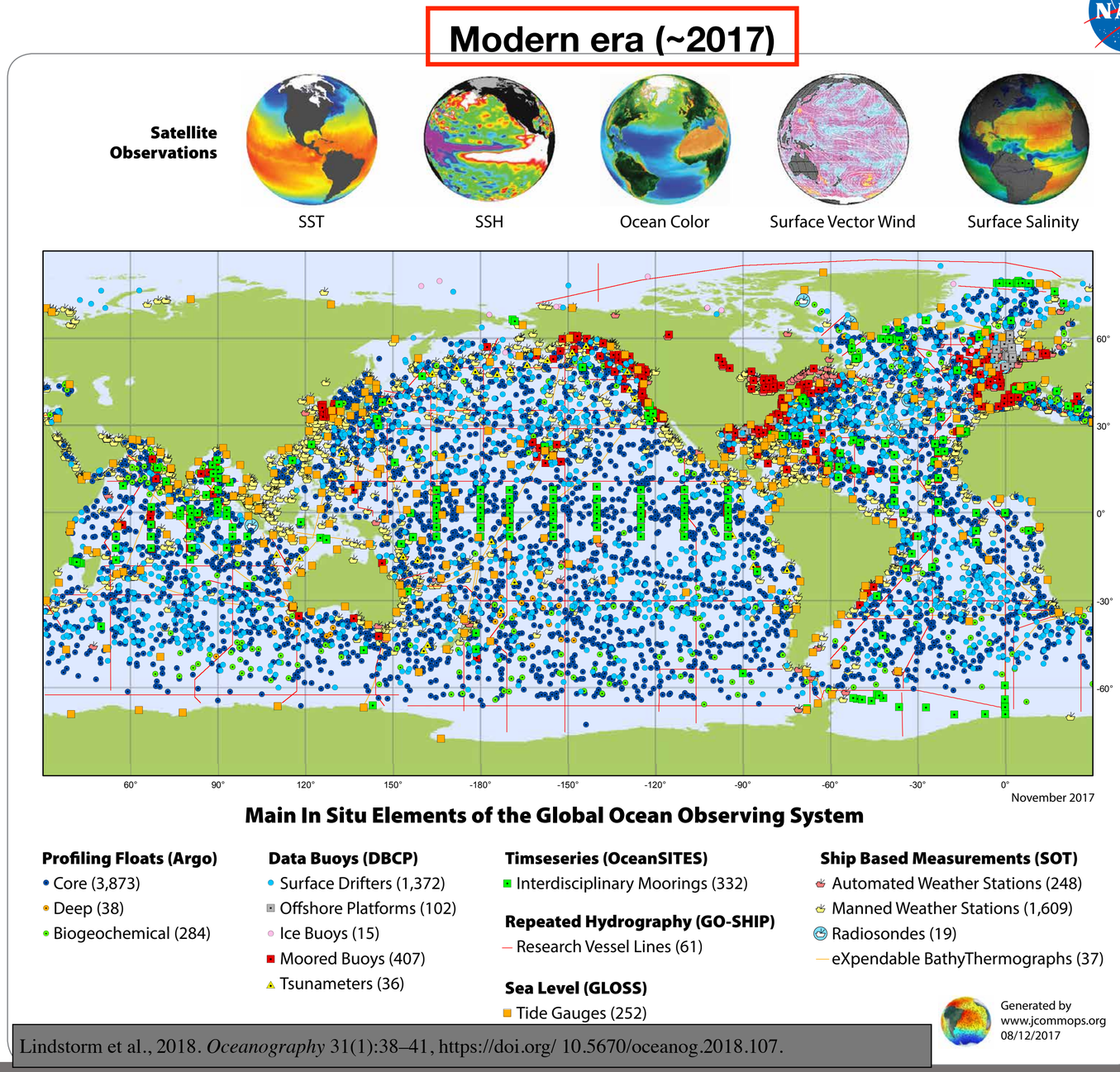
# Observation Network

★In Situ

★Satellite

- Radiances are handled by atmospheric obs network- via *coupling*
- Derived (retrievals)
  - along-track (L2P)
  - gridded (L3/L4)

★Coverage (sampling) and observation type vary over decades (reanalysis)



# Considerations

★Support all the observations types (in situ, satellite)- past, present and future…

- ◉ Readers/converters for different types (csv, nc4, bufr, etc)
- ◉ Flexibility to choose different types (add new types, exclude certain types, *single-obs or simulated obs*)

★Used in assimilation, off-line model diagnostics (call observer), obs-impact studies

- ◉ Information for QC (details follow)

★Be able to write innovations (assimilation output) in the “same” format (e.g., ERA-5)

★Ability to write to disk (preferably nc4- NASA format requirements, be able to trace: metadata, external partnerships, …)

- ◉ Questions:
  - ➡ Contents of the database?
  - ➡ How are they organized?
  - ➡ How many files/day?

**Not in this talk!**

# Contents of the database

## Generic to <u>all</u> observation types (fill UNDEF if not available)

- Position (lat, lon, depth/pressure), Time (yyyymmddhhss or offset from a *ref*)
- Variable, Error estimate $(\sigma^{o}_{i,i})$ - *think* of cross correlations (future SWOT Mission)
- WMO ID (*station* ID; satellite ID for satellite derived data), instrument ID (e.g., barometer, thermometer, …)
- Bottom pressure (if not available or otherwise distance from bottom)
- Difference from climatological values (every center may prefer a different clim(s) )
- Distance from coastline or nearest land-point (every center may prefer a different topography/bathymetry)

Must have

Good to have

May have

# Contents of the database

**Specific to <u>satellite</u> derived data (fill UNDEF if not available)**

- Ascending/ Descending
- Distance from center of track
- Local Time (or solar zenith angle)
- Altimeter (Sea Level Anomaly/Dynamic Topography)
  - ➡ Include geoid height, cross-calibration bias (correction due to atmosphere), tide info; this may expand in future
- Radiometer, Laser Altimeter, etc (Sea ice concentration/thickness/freeboard)
  - ➡ Include water temperature and salinity, meteorology *should* be handled by other (atmosphere) database(s)- collocation should be thought of…

Must have

Good to have

May have

# Not Covered

- How is the database organized in memory?
- If stored on disk - how many files/day? Naming convention (variables, file names, …)
- Efficiency (memory footprint, ease of access, …)
- Connections with other observations (atmosphere, land- run off, land-ice, waves, bio, chem, …)
- Operational requirements (NOAA, NAVY, … other JCSDA - JEDI partners)
- Converters to handle data from GTS (real-time ARGO, drifters, …)
- Software to derive error estimate