



The Marine Surface Reference Dataset ICOADS: Status, Future, and IVAD

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Topics



- Current Archive Status
- Current Project Status and Activities
- ICOADS Value-Added Database (IVAD)

ICOADS => International Comprehensive Ocean-
Atmosphere Data Set

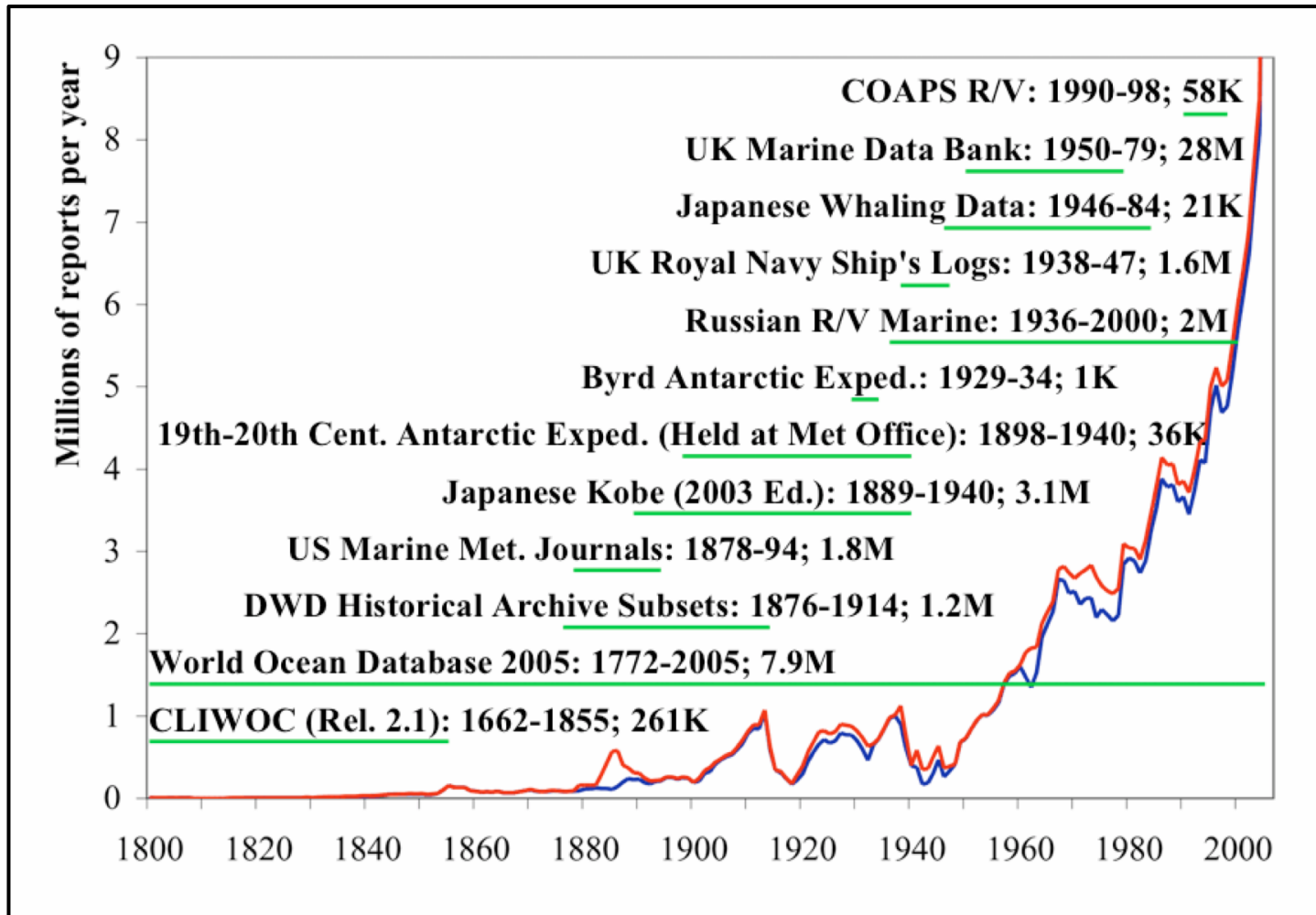
Current Archive Status



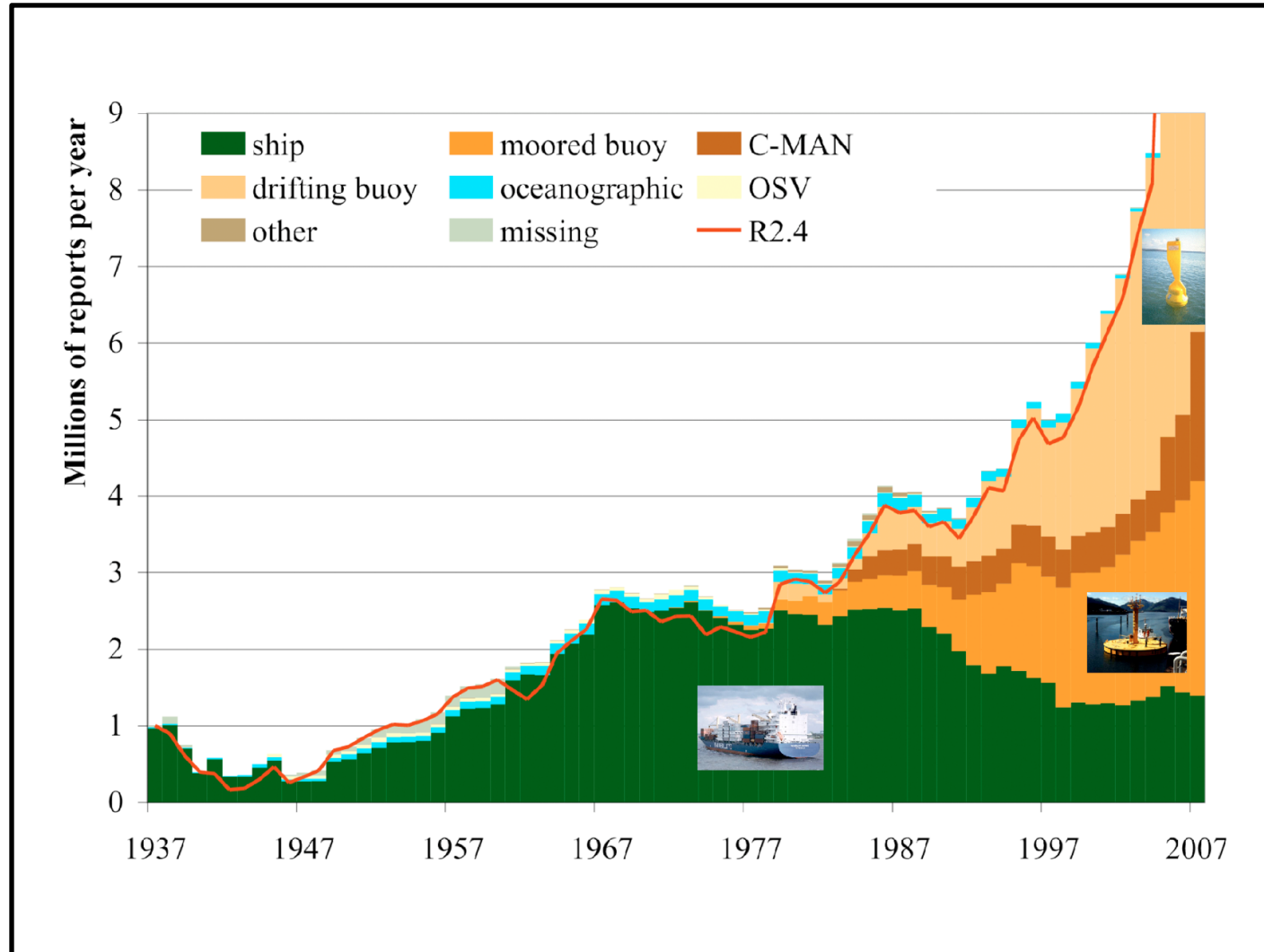
ICOADS Release 2.5

- Published 2009, temporal coverage 1662-2007
- Near real-time extension 2008 – April 2012
 - Based on NCEP acquisition and GTS decoding
 - Performed monthly
- Simple $1^{\circ} \times 1^{\circ}$ (from 1960) and $2^{\circ} \times 2^{\circ}$ (from 1800) monthly summary statistics
- Access from NCAR, NOAA ESRL, NOAA NCDC
 - See <http://icoads.noaa.gov/products.html>

New Data for ICOADS Release 2.5



Evolution of Platform Mixture



More details about Release 2.5

<http://icoads.noaa.gov/r2.5.html>



Data Characteristics

- Comparison times series plots Release 2.5 versus 2.4
- Decadal comparison maps, SST, SLP, Wind, RH
- Outstanding problems
- Duplicate elimination between decks
- Quality control results

Woodruff, S.D., S.J. Worley, S.J. Lubker, Z. Ji, J.E. Freeman, D.I. Berry, P. Brohan, E.C. Kent, R.W. Reynolds, S.R. Smith, and C. Wilkinson, 2011: ICOADS Release 2.5: Extensions and Enhancements to Sfc Marine Met. Archive. *Int. J. Climatol.*, **31**, 951-967.

Current Project Status and Activities



- Involvement at NOAA/ESRL slated to end ~June 2012
 - Major Impact!
 - Driven by large NOAA/CPO funding cuts
 - Central coordination and development hub for ~ 30 years
 - Details at <http://icoads.noaa.gov/ICOADS-notice.pdf>
- Perspective for understanding future of ICOADS
 - Three major functional areas
 1. Near real-time (NRT) extension
 2. Retrospective (full historical time period) reprocessing
 3. Service to international programs and community

Current Project Status and Activities

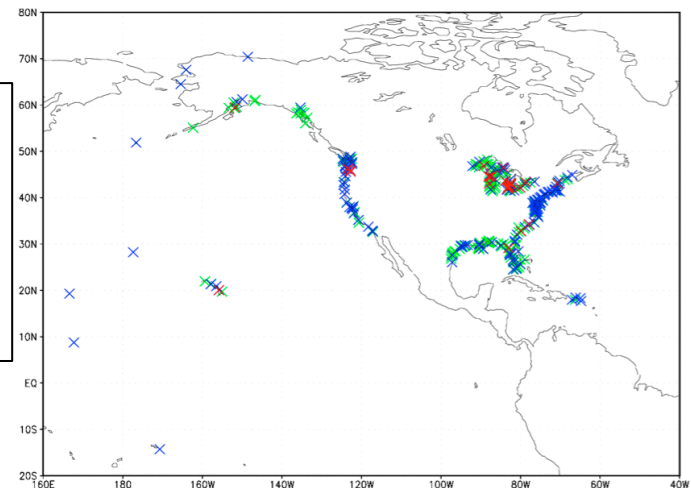


1. Near real-time (NRT) extension

- NRT extension, based on NCEP GTS, will continue
- The extension will be enhanced by blending NCEP and NCDC GTS data streams
 - Secure unique data from both, ~ 5% increase
 - Recover some ship call signs excluded from NCEP
 - Add more meteorological and sst observations from tide gauge (TG) stations

TG stations: Blue are CREX-format, green are CMAN-format (also includes CMAN stations) (red: missing from NDBC station list table)

<http://icoads.noaa.gov/merge.html>



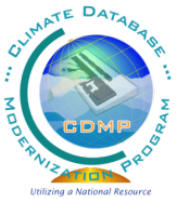
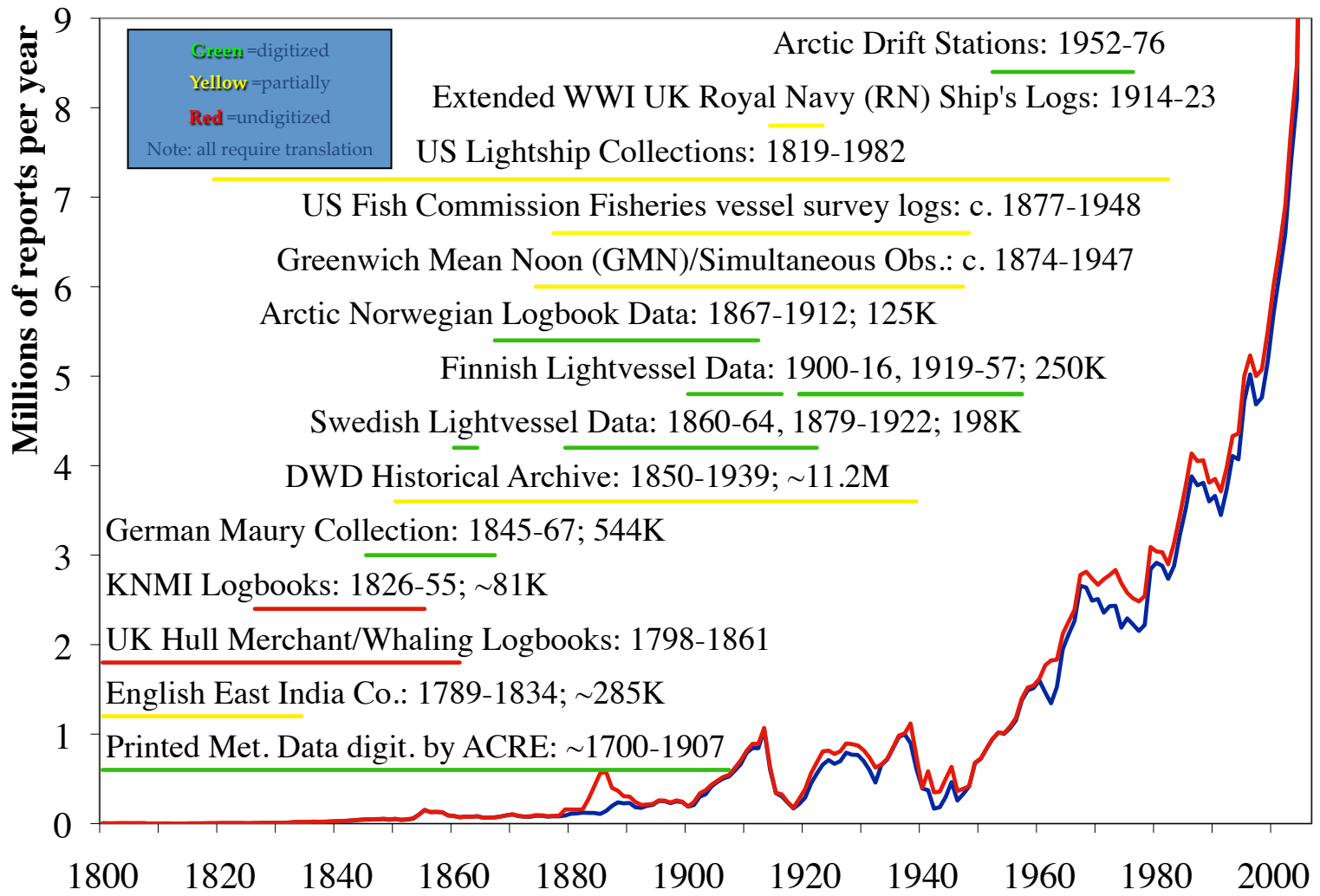
Current Project Status and Activities



2. Retrospective (full historical time period) reprocessing

- NOAA NCDC is leading discussions and planning to hopefully adopt this critical delayed-mode activity
 - Resolution and resourcing is not certain today
- Plan: bring together experienced ESRL leadership (*Woodruff and Lubker*) with new data scientists to jointly create the next (R2.6) ICOADS Release
- Effective transition of a large knowledge base to a new development team
 - Including NCDC and potentially FSU and UKMET Hadley Centre
- NCAR and NCDC will also maintain their past roles

Status of data awaiting inclusion into ICOADS





ICOADS Value-Added Database (IVAD)

Purpose:

Embed observational bias adjustments, improved uncertainty estimations, and advanced QC into ICOADS.

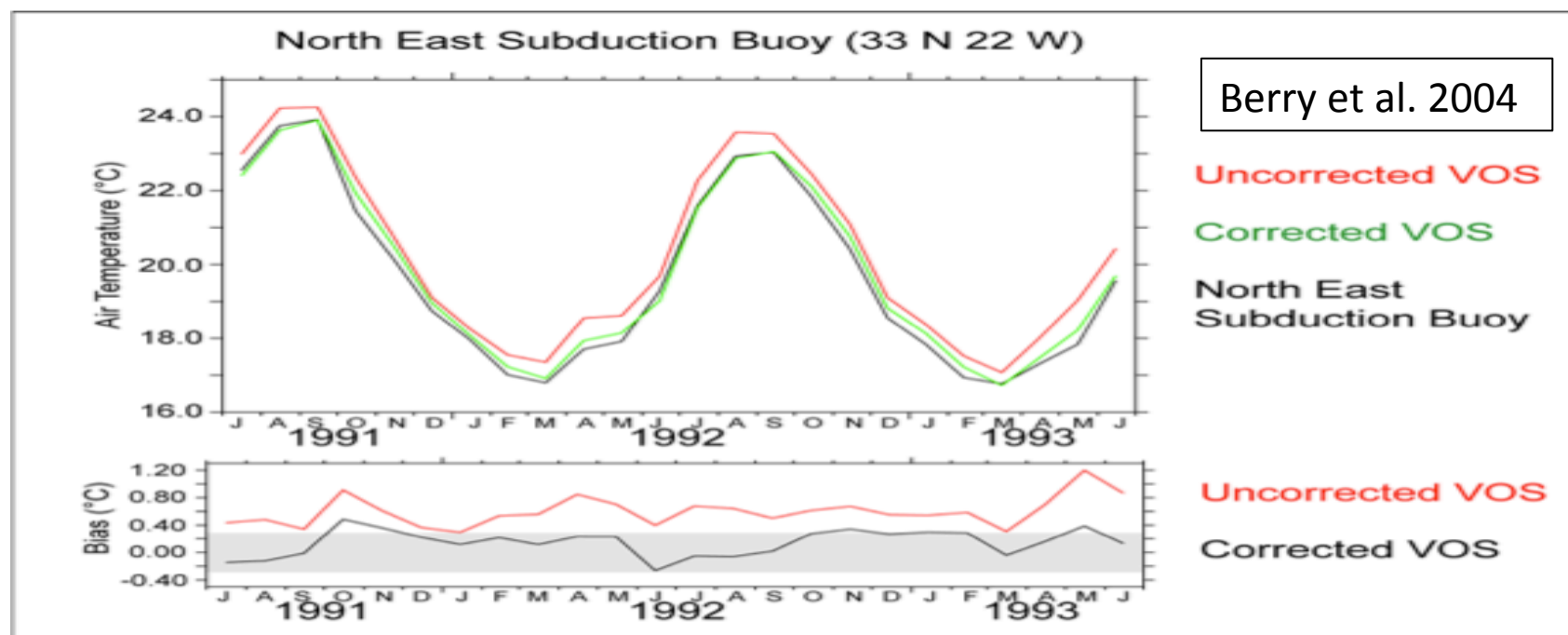
Objectives:

- Use DBMS to manage ICOADS records, add in adjustments offered by the community, and provide user access
- Modify IMMA format to have UID record tracking and capacity to hold parameter adjustments, and essential metadata
- Scientifically demonstrate the impact of value-added records on air-sea flux estimates & common climate indicators

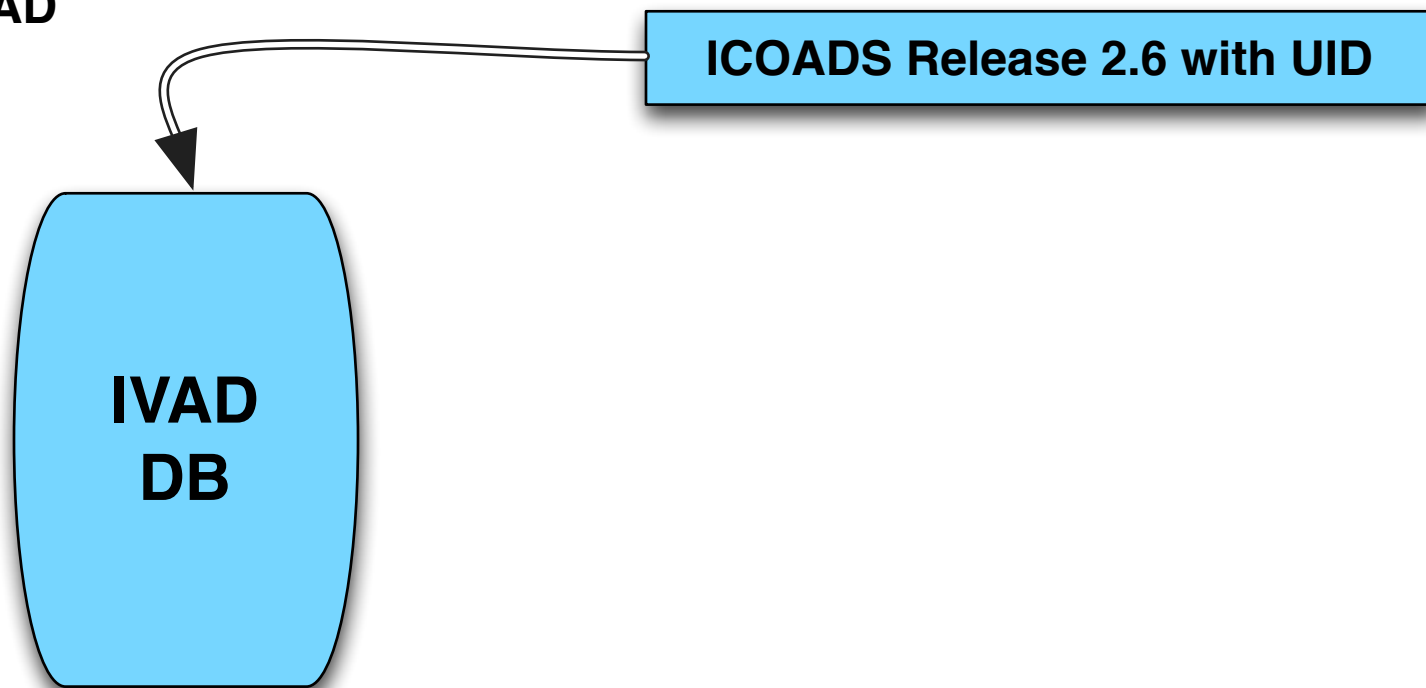
ICOADS Value-Added Database (IVAD)

A few potential adjustments:

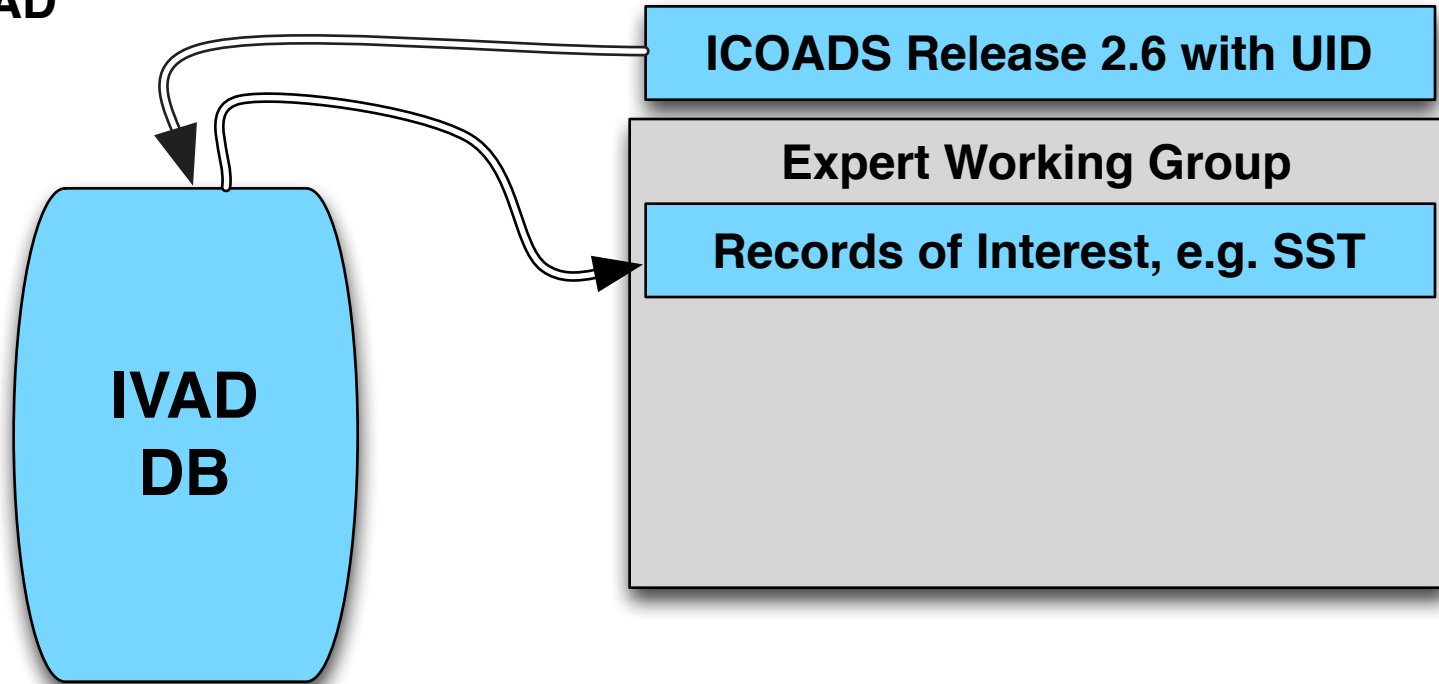
- Air temperature - ship heating
- Wind speed estimates – Beaufort code scale
- Heterogeneous instrument height – ship vs. buoy
- Observing system changes - bucket vs. intake SST



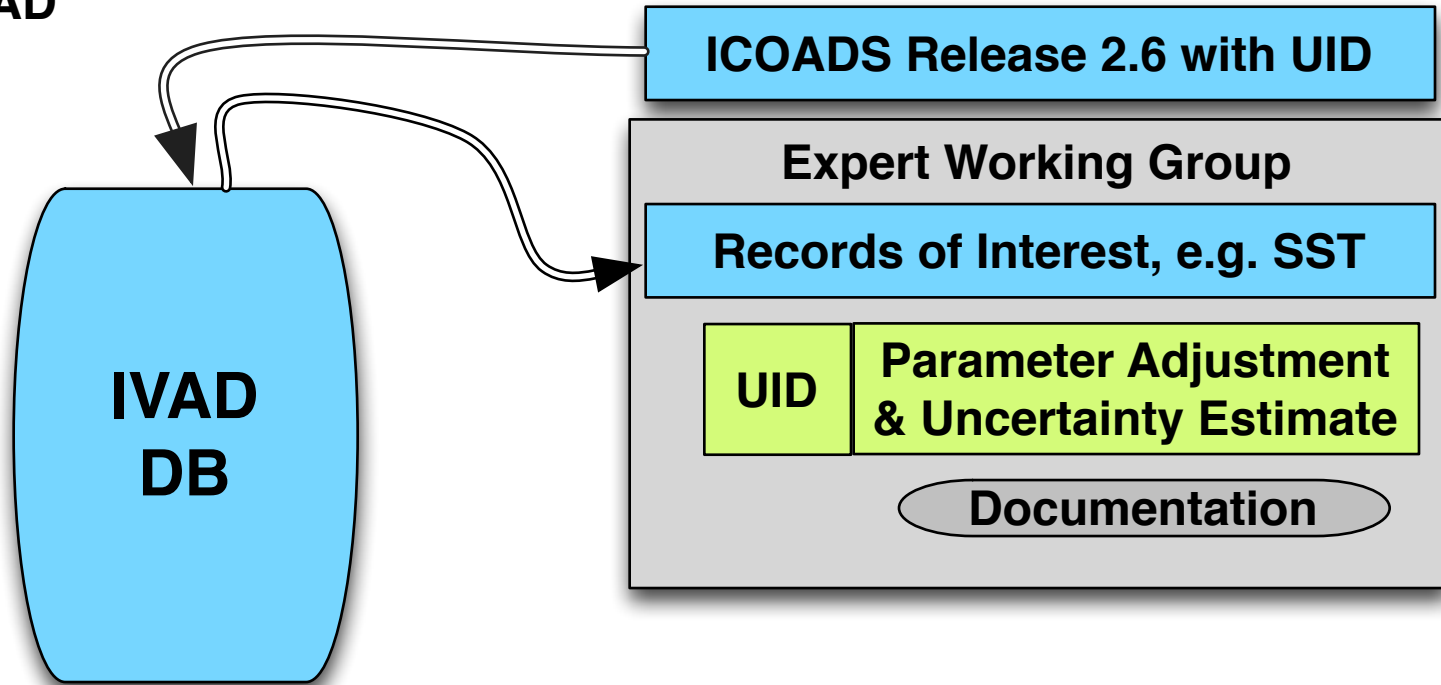
IVAD



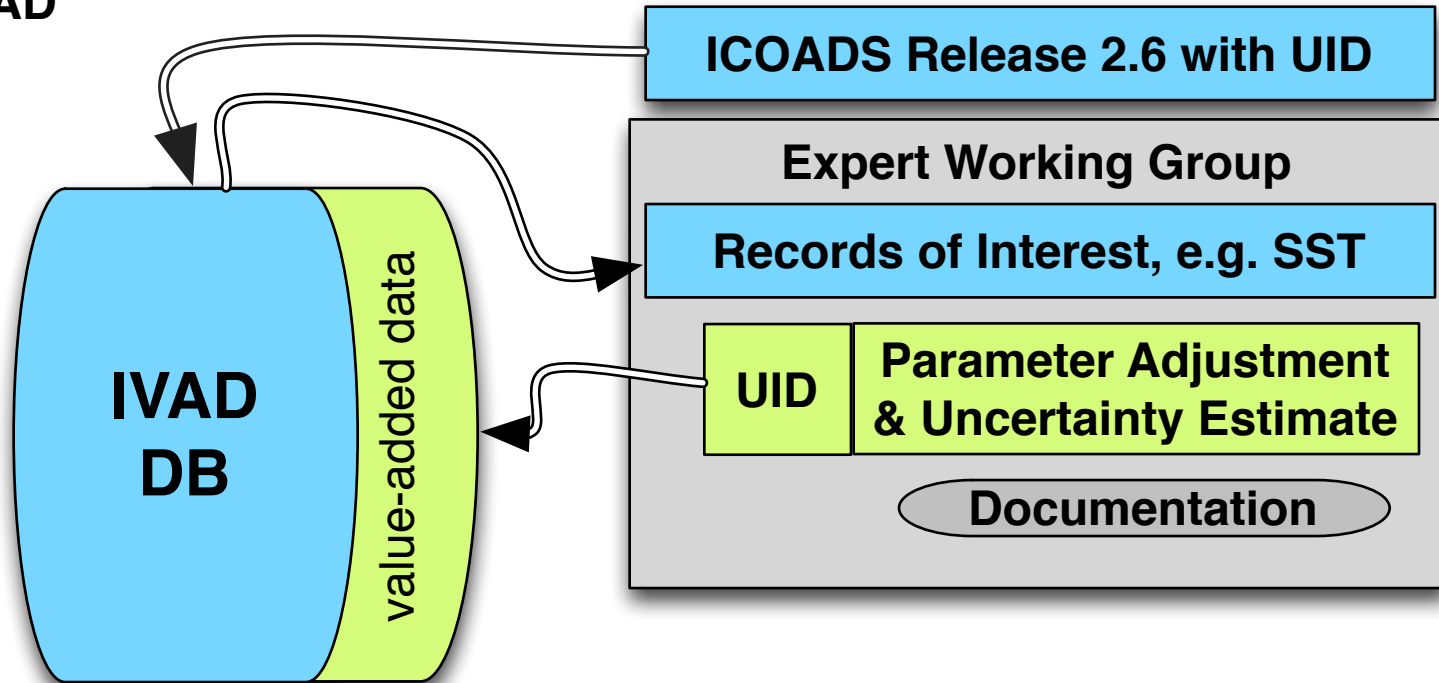
IVAD



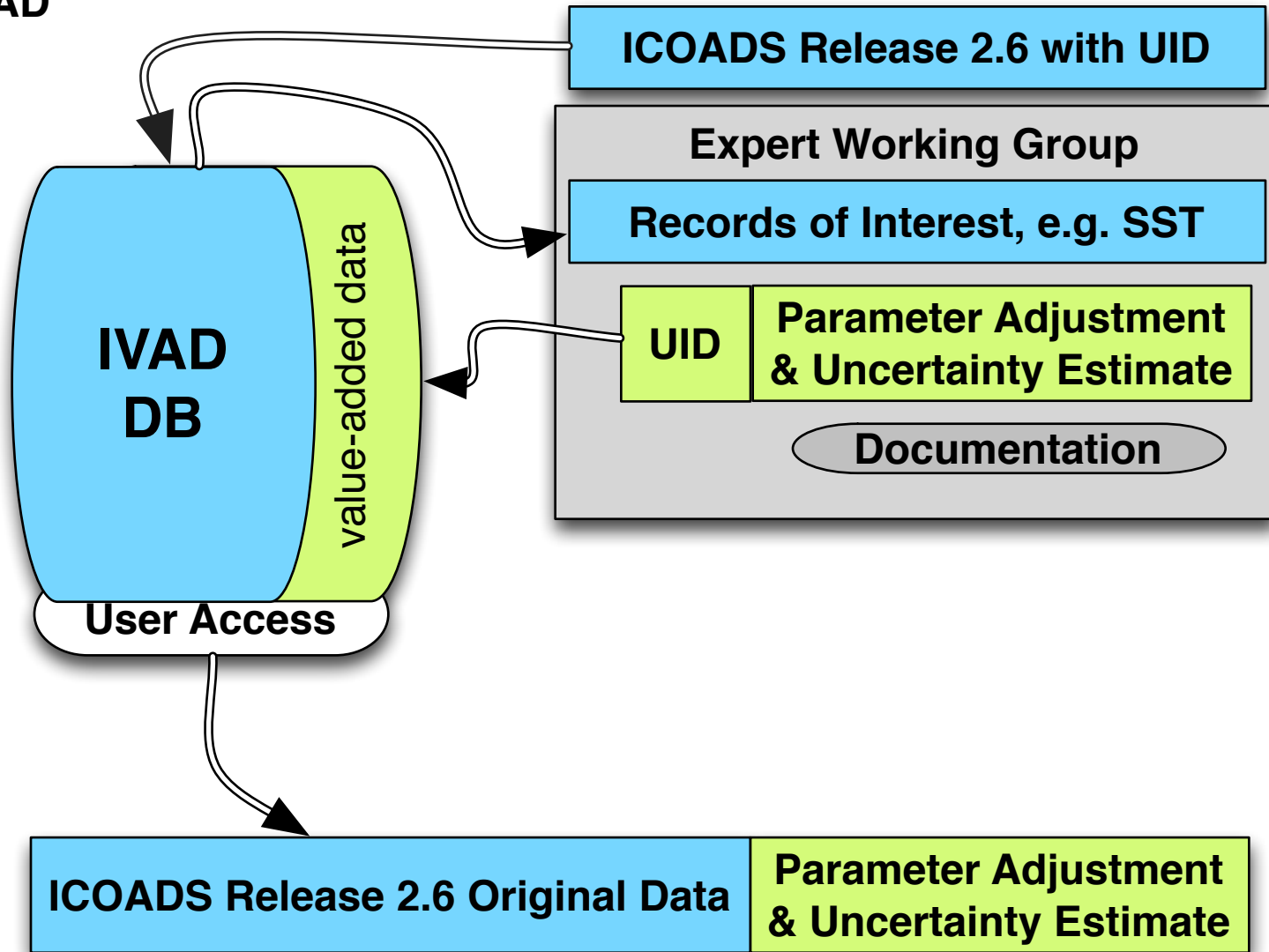
IVAD



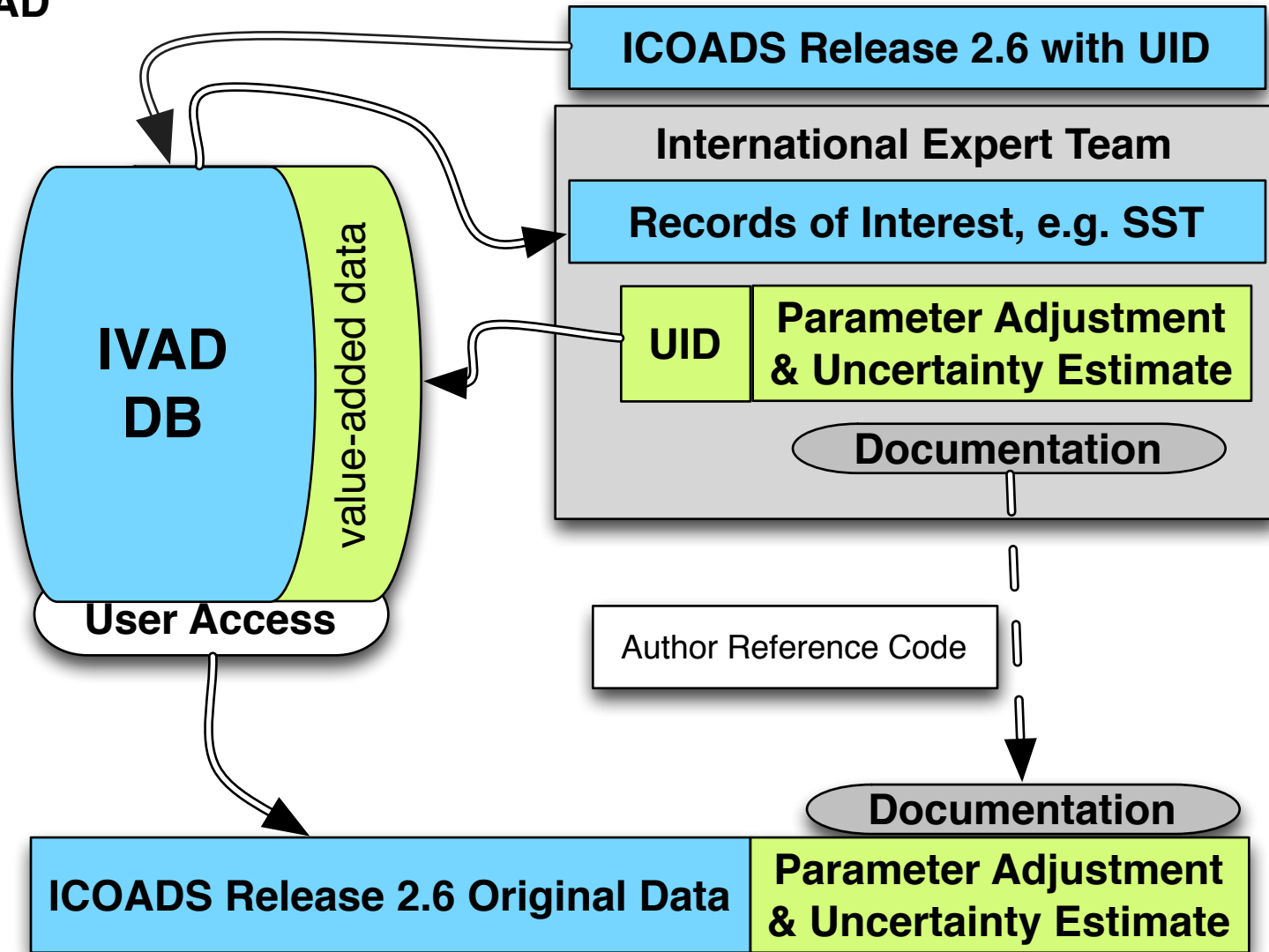
IVAD



IVAD



IVAD



IVAD - Status

- Limited NOAA CPO funding for 3 years
 - Partners: NCAR, NOAA/ESRL, NOAA/NCDC, FSU
- Design, planning, and details are 90% complete
- Project activity has been suspended
- NOAA/ESRL funding situation precludes development
 - IMMA format modifications
 - Software enhancements and testing
 - Documentation preparation and international coordination

Conclusions



- ICOADS Release 2.5 and ongoing monthly extensions will remain available
 - With improved GTS blend from NCEP plus NCDC
- New Releases of ICOADS will not be supported at NOAA ESRL
 - NOAA NCDC, possible new home for retrospective development
 - Some CPO funding is helping the transition
- IVAD has novel potential, but is currently experiencing slow or suspended development

Questions?

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ICOADS

- <http://icoads.noaa.gov/>
- <http://icoads.noaa.gov/products.html>
- <http://icoads.noaa.gov/r2.5.html>
- <http://icoads.noaa.gov/merge.html>

IVAD

- <http://icoads.noaa.gov/ivad/>

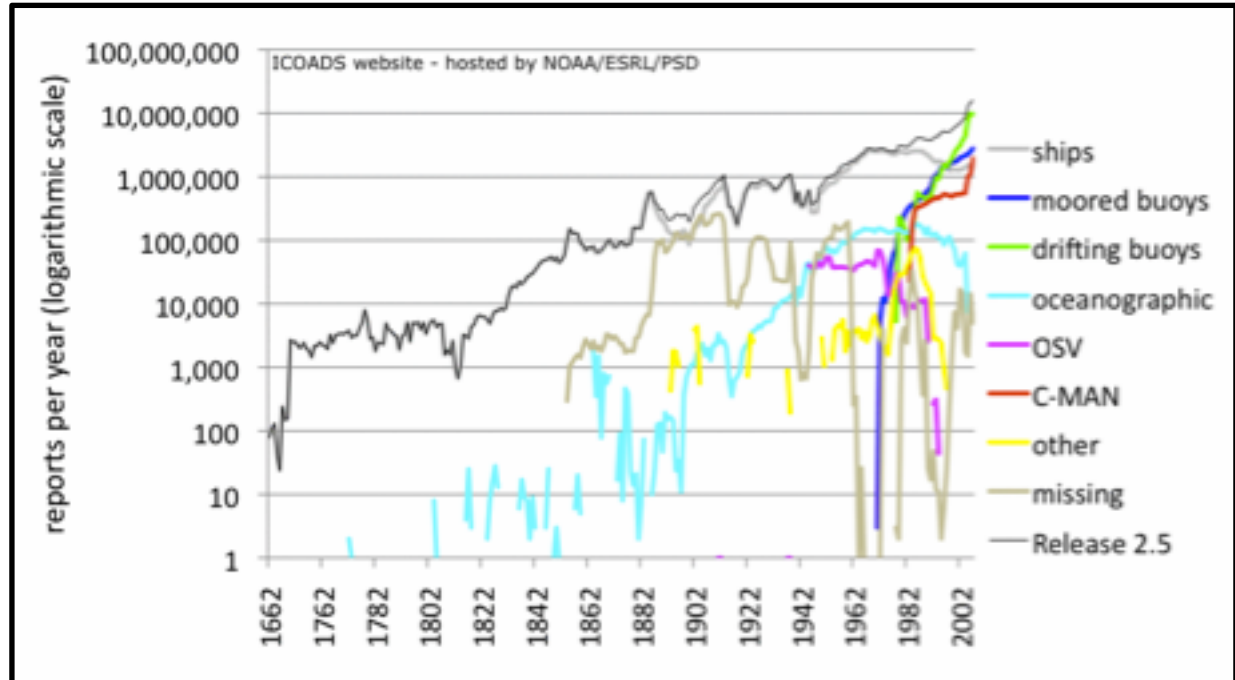
Project Status and Transition Plans

- <http://icoads.noaa.gov/ICOADS-notice.pdf>

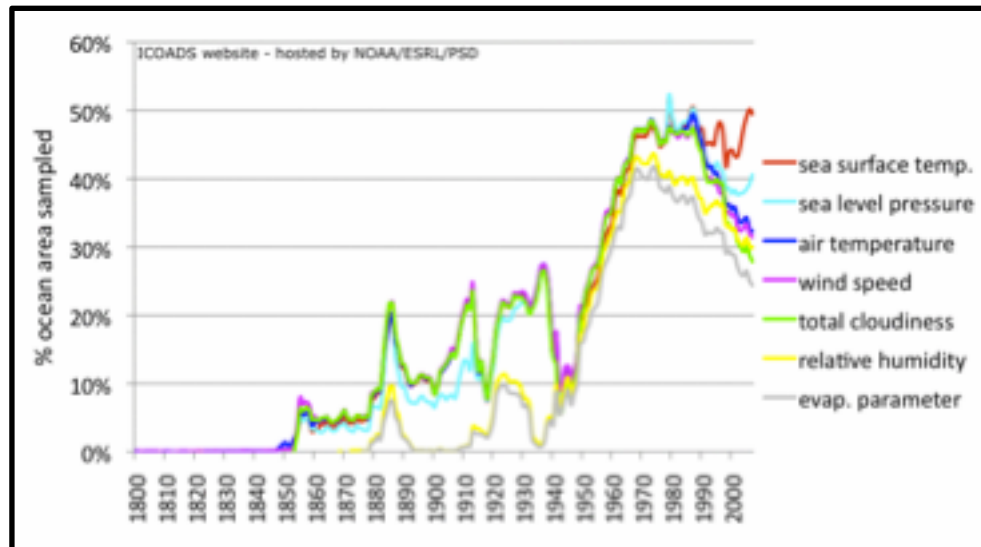
Extra Slides

Evolution of Marine Observing System

By platform mixture



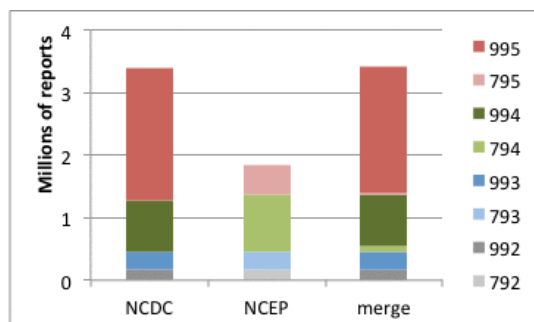
By variable



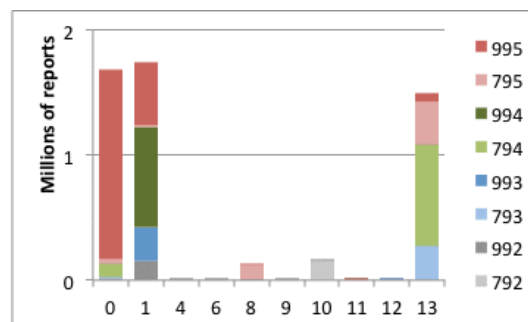
Enhancement from merging NCEP and NCDC data streams



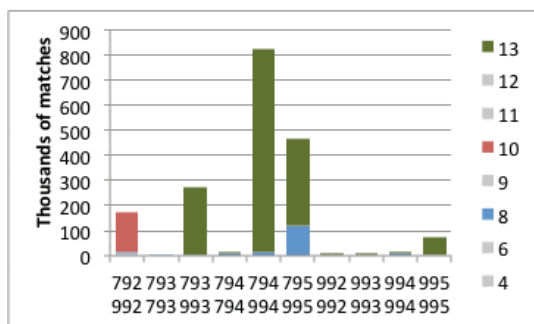
- Graphic ?



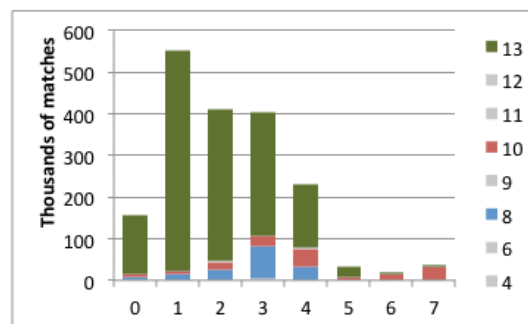
A



B



C



D

Figure 2. Dupelim skill, in combining NCDC GTS and NCEP GTS data, for March 2012 (Algorithm 2). In this test, IDs were required to match for two reports to be considered duplicates, except in the case of 792-992 matches (which cannot be required to match, due to NCEP's ship call sign masking). Input (NCDC and NCEP) and output from dupelim ("merge"). [Steve: again fr <http://icoads.noaa.gov/merge.html>, probably would need adjustment. E.g. just panel A is a fairly simple message.

Current Project Status and Activities

3. Service to international programs and community



Through JCOMM

- ICOADS proposed to be a WMO-IOC Centre for Marine Meteorological and Oceanographic Climate Data (CMOC) within a new Marine Climate Data System (MCDS)
- Benefit to ICOADS – a recognized entity under WMO-IOC
 - Trigger more international data rescue activities and formalize historical data exchange
- Highlight IVAD as a Pilot Project and create a Steering Team to help guide further international work
- Recognized major contributor to marine climate meetings
 - Advances in Marine Climatology (CLIMAR)
 - Advances In the Use of Historical Marine Climate Data (MARCDAT)