

GCOS Update

Adrian Simmons

Chair, Steering Committee for GCOS

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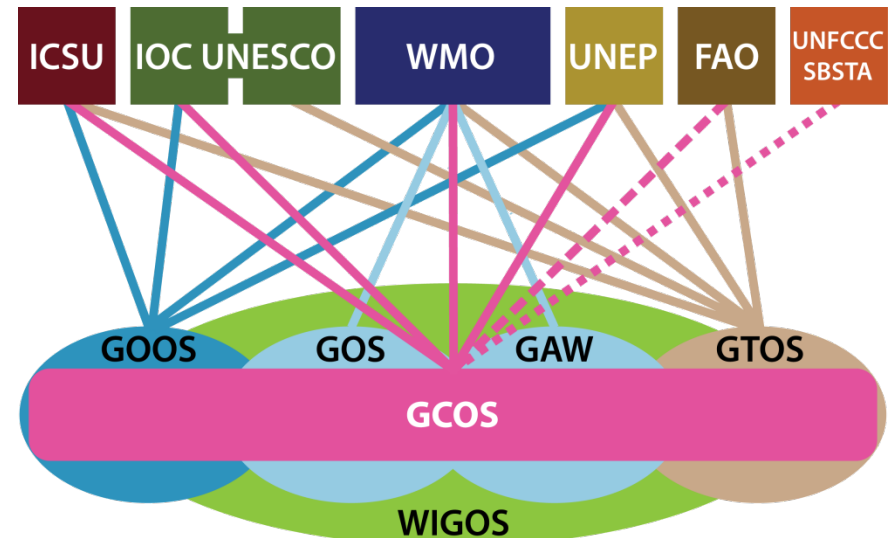
GCOS encompasses the climate components of:

- the WMO observing systems (WIGOS: GOS, GAW, WHYCOS, ...)
- the IOC-led co-sponsored Global Ocean Observing System (GOOS)
- the FAO-led co-sponsored Global Terrestrial Observing System (GTOS)
- observational elements of research programmes (WCRP, IGBP, ...)
- other systems contributing climate observations, data management or products

which together form our overall global observing system for climate, and the climate-observing component of the Group on Earth Observations System of Systems (GEOSS)

The GCOS programme:

- assesses and communicates overall requirements
- advises on implementation and reporting
- reviews and promotes progress



GCOS was set up to help ensure that observational needs are met for:

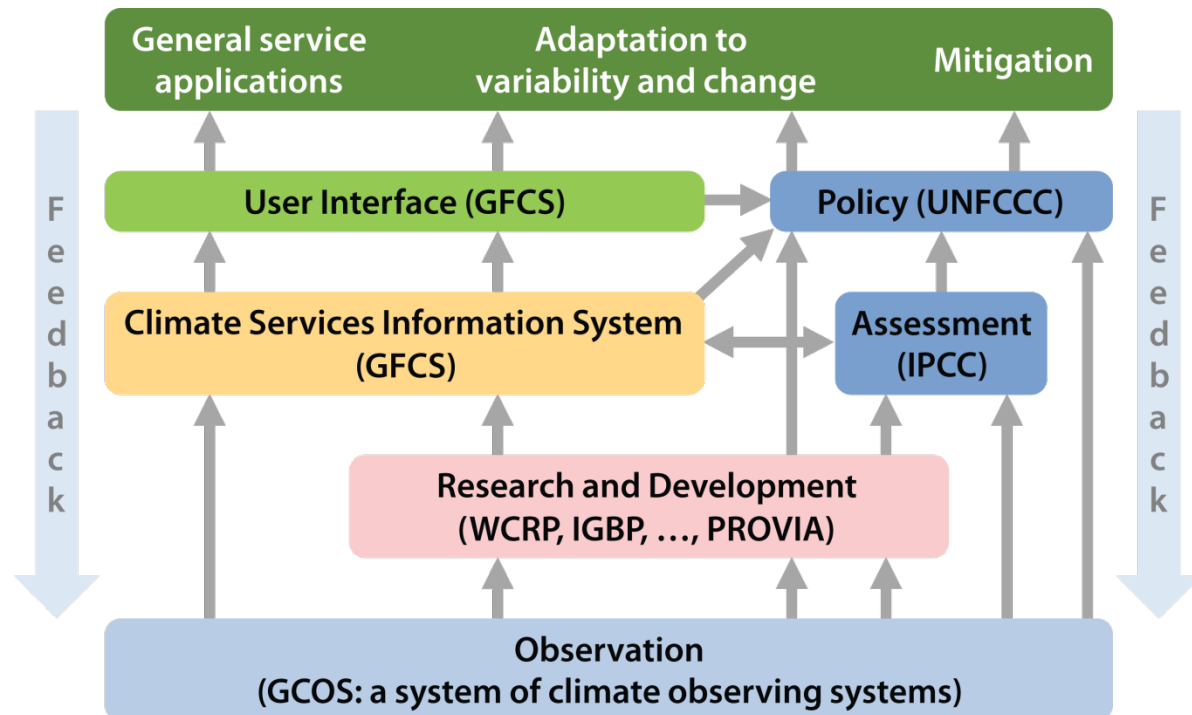
- monitoring the climate system, detecting change, determining impacts
- application to national economic development
- research for improved understanding, modelling and prediction of the climate system

GCOS supports

- assessment
- policy
- research
- services

and is concerned with

- the observations
- data management
- data rescue
- generation of data records and derived products



Atmospheric Observation Panel for Climate (AOPC)

- sponsored by GCOS and WCRP
- Chair is Adrian Simmons

Ocean Observations Panel for Climate (OOPC)

- sponsored by GCOS and WCRP (with ex-officio CLIVAR membership)
- GOOS is a former sponsor, and should return following recent re-organisation
- Eric Lindstrom is Co-chair of new GOOS SC and is handing over OOPC to Co-chairs Mark Bourassa and Toshio Suga, subject to any remaining formalities
- support is now based within the GCOS rather than the GOOS secretariat

Terrestrial Observation Panel for Climate (TOPC)

- sponsored by GCOS, WCRP and GTOS
- Han Dolman will hand over to Koni Steffen as Chair this week
- GTOS is currently disengaged (with more than TOPC) and prospect is unclear

The GCOS Steering Committee met in September 2012, and

- recommended that the WDAC-endorsed dataset inventory project proposed by the outgoing WOAP Chair and NCDC go ahead, recognizing that this depended on availability of resources at NCDC
- endorsed actions identified by WDAC-1
 - to promote harmonization with CEOS/CGMS/WMO activities on inventory
 - to promote and cater for inclusion of datasets based on *in situ* measurements
 - to link with other initiatives such as the NCAR Climate Data Guide, obs4MIPs and reanalysis.org.

GCOS participated in the “Climate from Space” week to further this

The Steering Committee in September 2012 also

- expressed concern at the number of important topics that WDAC had to consider
- asked GCOS panel chairs on the WDAC to work towards ensuring that key items were adequately covered by WDAC or other WCRP activities, through adequately resourced task teams where appropriate

The GCOS programme has started on the process of producing:

- report(s) on progress and adequacy of climate observation scheduled for 2015
- a new “Implementation Plan” scheduled for 2016, which should identify:
 - verifiable and costed actions as previously
 - specific requirements for products (but maybe again through later supplement[s])
- addressing the range of requirements for climate observation, including those for adaptation to variability and change, and for the provision of services

Content will be based on input from

- a review of actions set out in 2010 Implementation Plan, including the CEOS response
- a recent Workshop on Observations for Adaptation to Climate Variability and Change
- the fifth IPCC Assessment process, through workshop(s) that include participation of lead authors from WG1 and WG2 and other experts
- input from the panel chairs, and panel members
- writing-team meeting(s), consultations and public review

Considered sectorial and cross-cutting needs for observation, and drew conclusions concerning the need for

- infrastructure for supporting data rescue
- data sharing and accessibility
- developing and delivering indices and integrated and/or downscaled products
- improved coordination between those implementing project-based observations and operational agencies
- identifying and communicating the social and economic value of enhanced observation
- involvement of users/stakeholders (in line with GFCS user-interface planning)
- inventories showing provenance of data and products, linking to assessments that identify fitness for purpose, information content, and limits of applicability
- data must support forecasting and longer term projection, through use:
 - for validating, assessing and improving models
 - for initialising forecast models (to produce reanalyses as well as forecasts)
 - for assessing predictability and the capability of climate projection to provide information that is useful for on-the-ground decision-making on adaptation

The sponsors of GCOS have set up a Review Board

- to assess the added value of the GCOS programme, and to review the mandate and ToR of the programme
- taking into account developments since the current MoU was agreed in 1998, such as the establishment of the
 - Global Framework for Climate Services (GFCS)
 - WMO Integrated Global Observing System (WIGOS)
 - GEO System of Systems (GEOSS)
- and the evolution of requirements for climate observation and derived products

The Board will hold its first meeting 26-27 March

- agenda includes an item on views of partner programmes
- this includes WCRP (WDAC)
- Chair of Steering Committee has been invited to attend and present the SC's input
 - which itself will include reference to the interaction with WCRP

Data from NOAA, NASA and EUMETSAT polar-orbiting satellites used in ERA-Interim 1979-2012

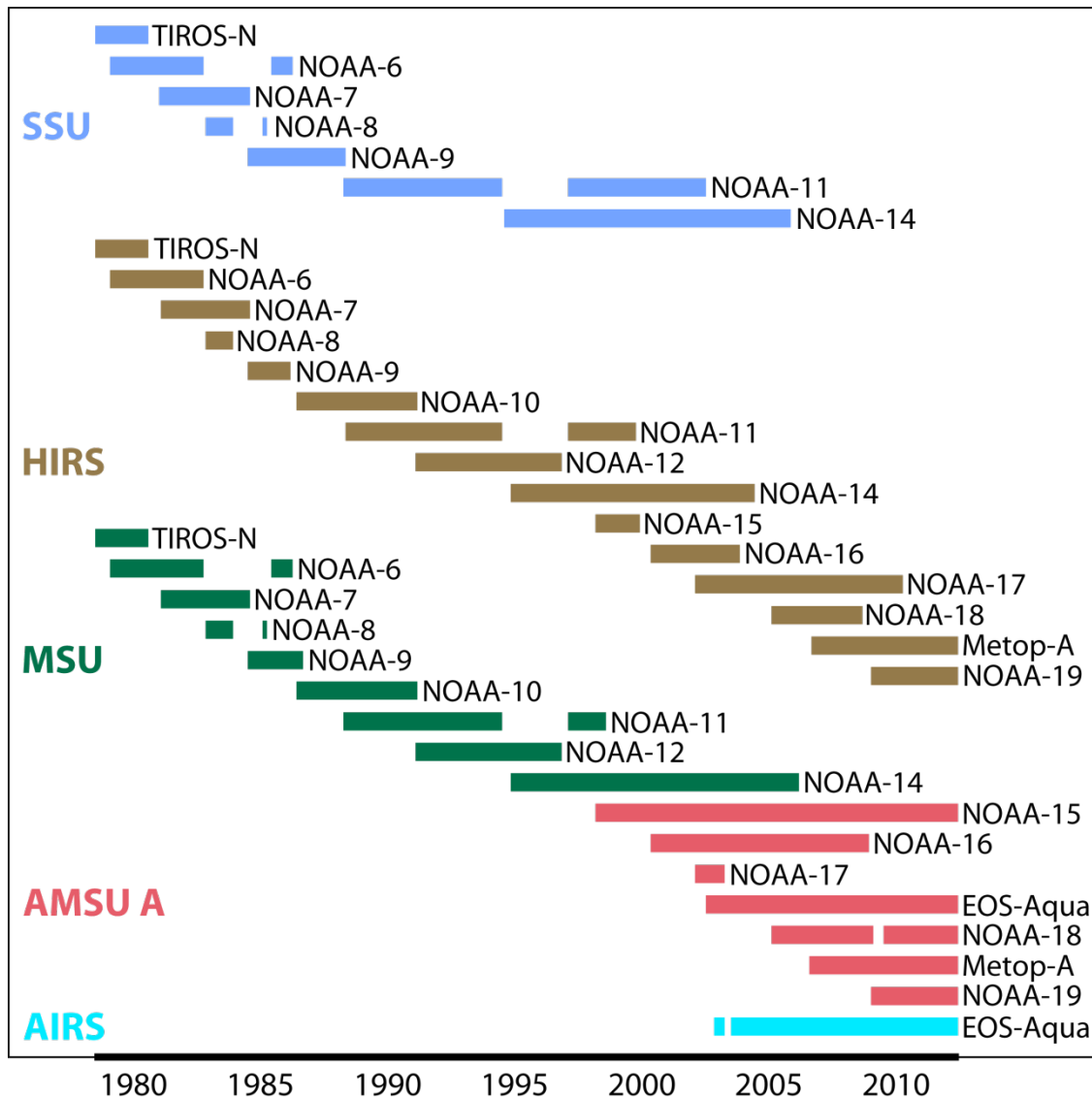
Data from IASI could not be used in 2006 version of assimilation system frozen for ERA-Interim

Same is true of data from NPP

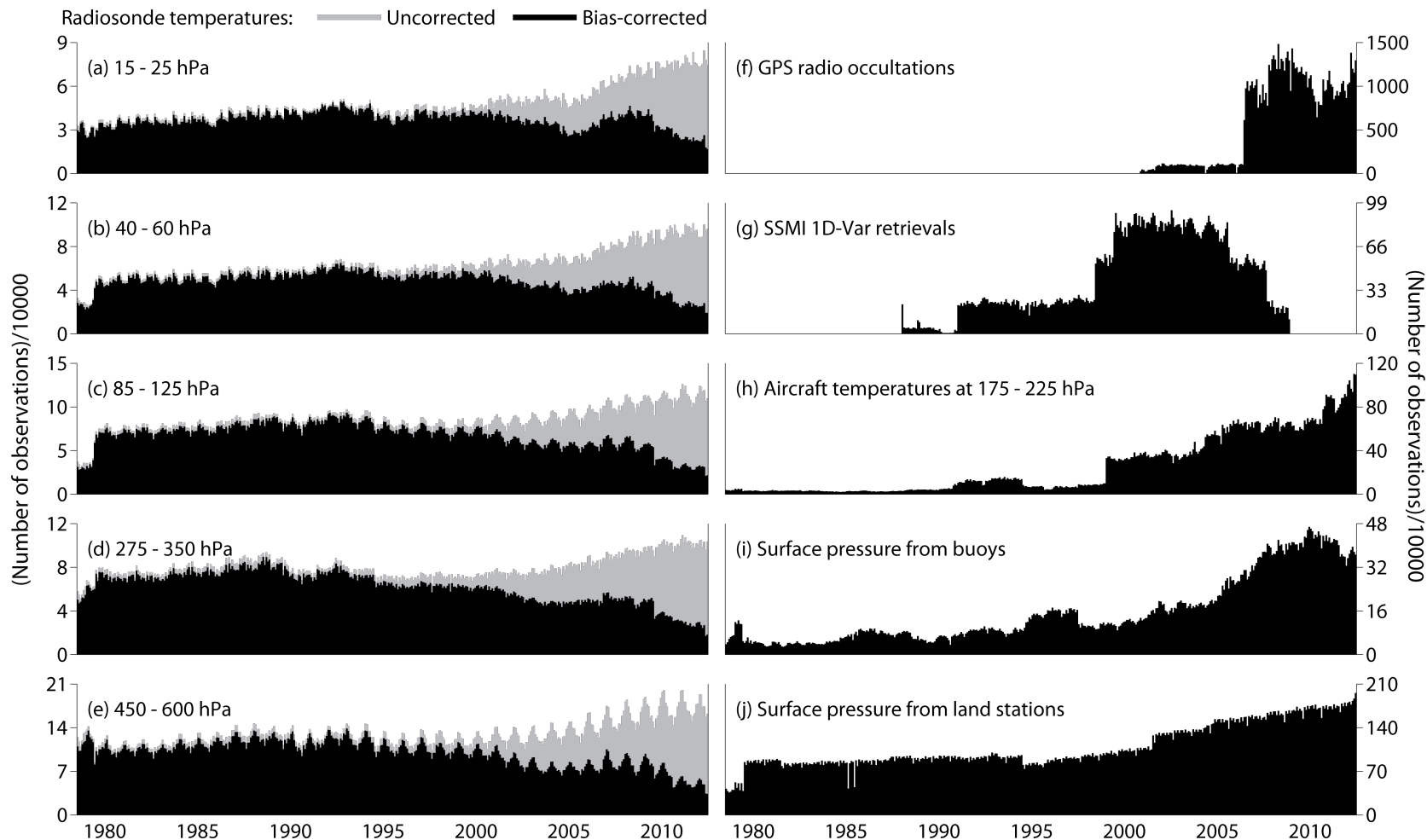
Assimilation of data from Metop-B was not activated in 2012

Data from FY-3 are also a candidate for use in future reanalyses

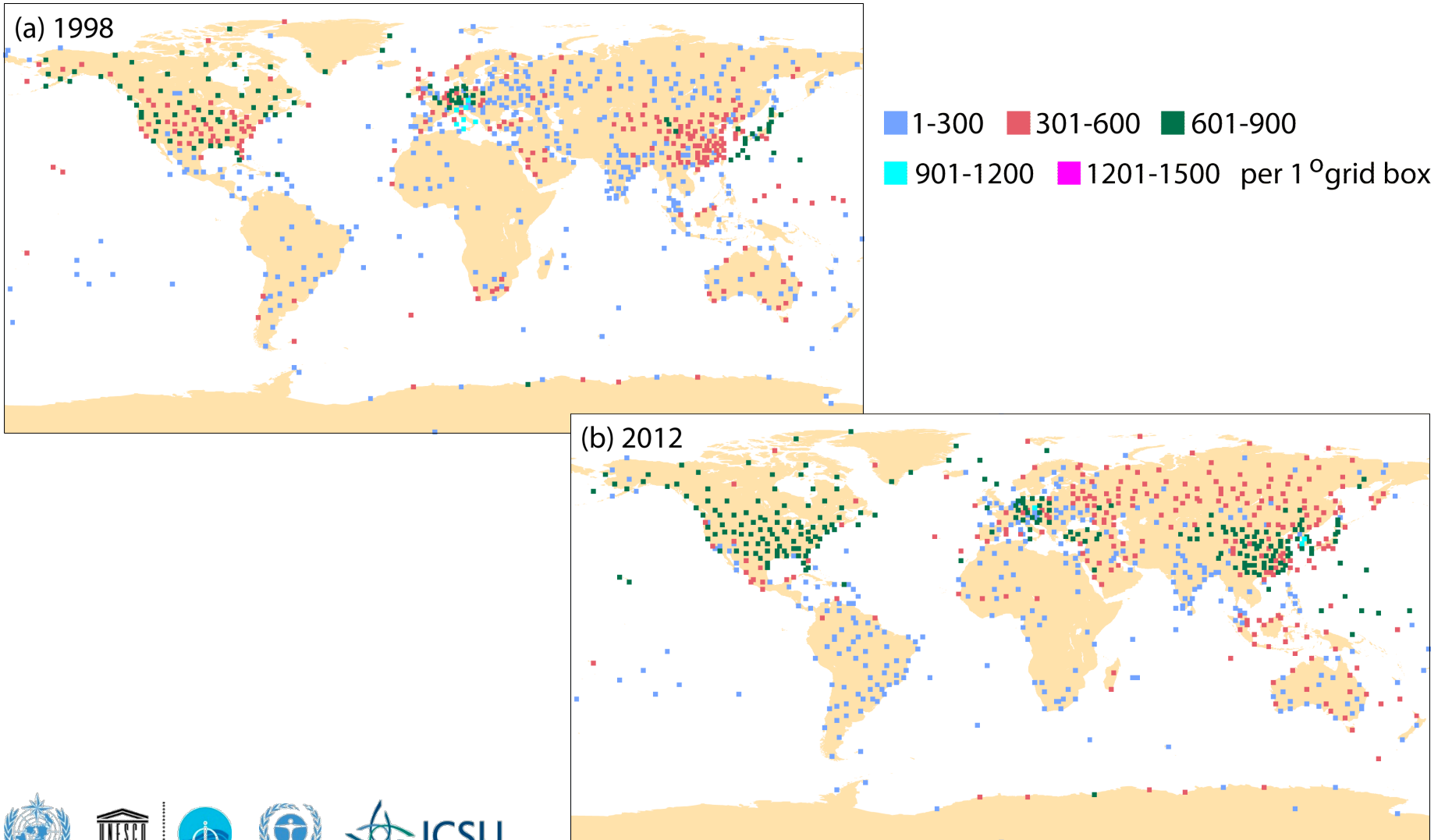
Coverage depends on channel: shown are: SSU-1, HIRS-2, MSU-4, AMSU-A10 and AIRS-40



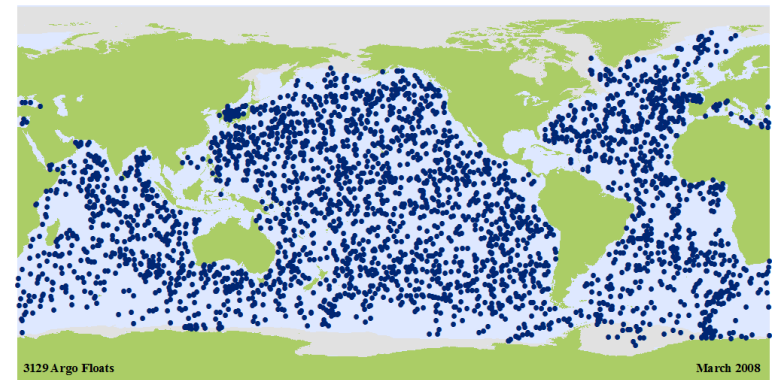
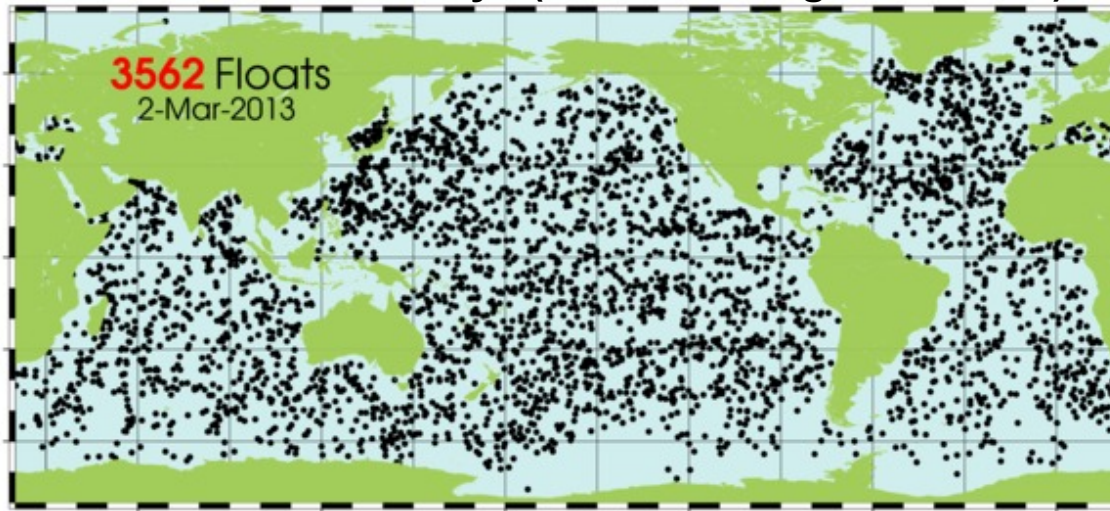
Counts per month of some other types of data used in ERA-Interim



Annual counts of radiosonde temperatures received by ECMWF for the 20hPa level

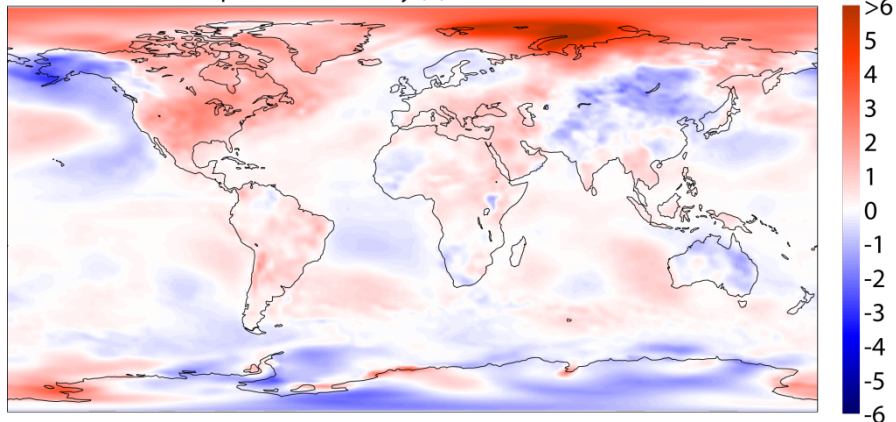


Positions of the Argo floats that have delivered data within the last 30 days (from www.argo.ucsd.edu)

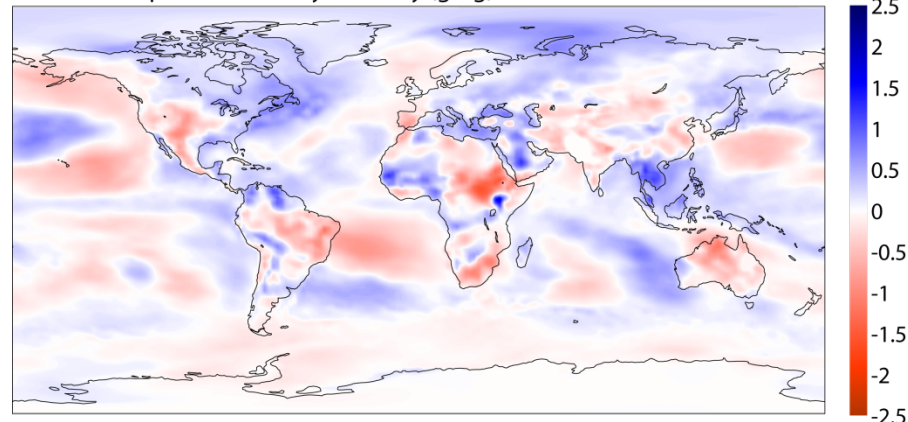


Archived maps for March 2003 (left) and March 2008 (right)
(from wo.jcommops.org)

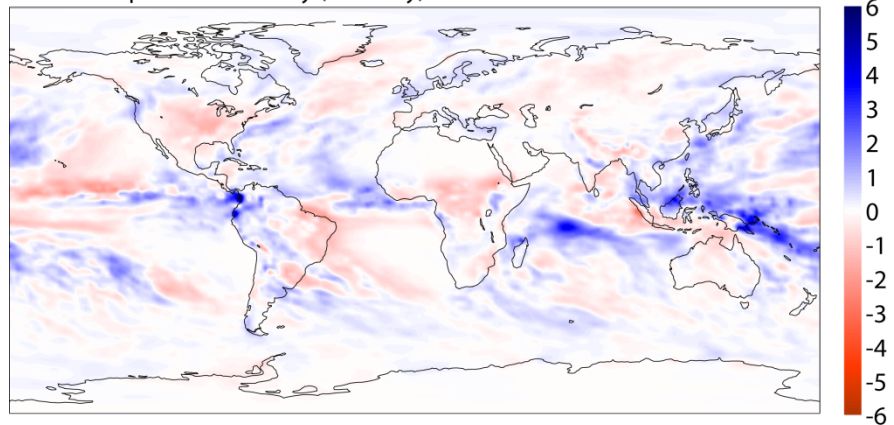
Two-metre temperature anomaly (K) for 2012 relative to 1981-2010



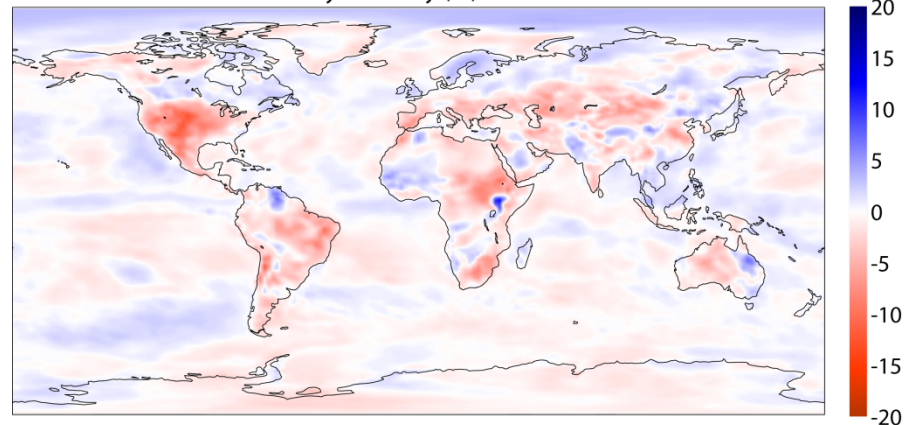
Two-metre specific humidity anomaly (g/kg) for 2012 relative to 1981-2010



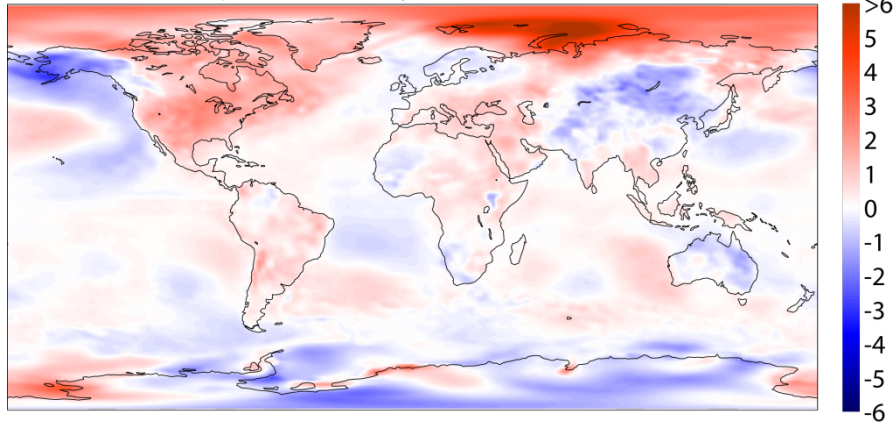
Precipitation anomaly (mm/day) for 2012 relative to 1981-2010



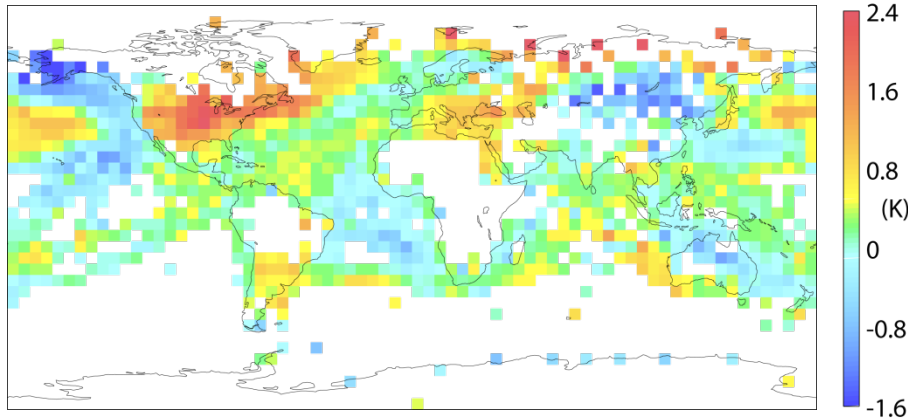
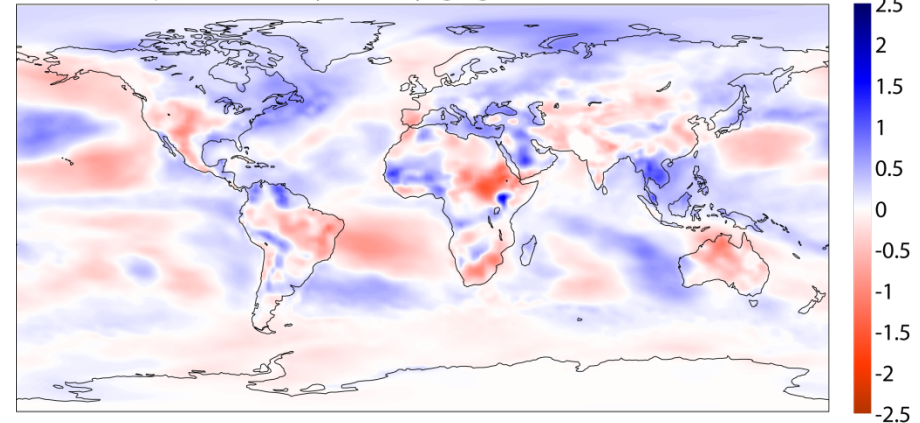
Two-metre relative humidity anomaly (%) for 2012 relative to 1981-2010



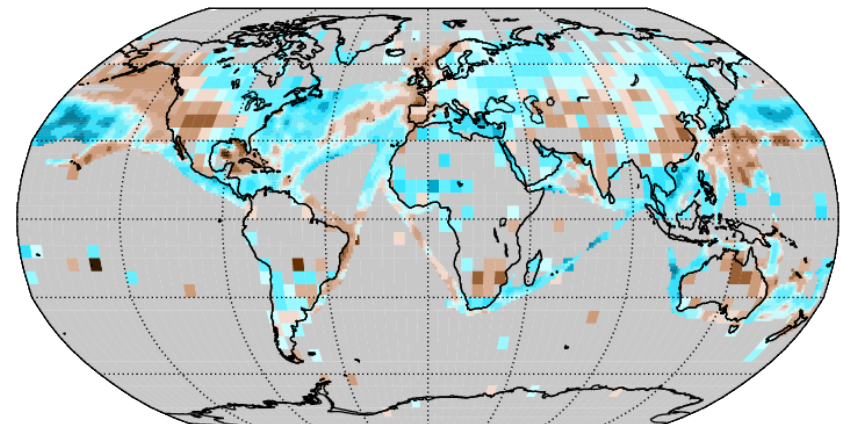
Two-metre temperature anomaly (K) for 2012 relative to 1981-2010



Two-metre specific humidity anomaly (g/kg) for 2012 relative to 1981-2010



HadCRUT4 (Morice et al., 2012)



HadISDH (Willett et al., 2013)
NOCSv2.0 (Berry and Kent, 2011)