

# GCOS Action F1.3

Blair Trewin

# GCOS IP Action F1.3

Increase temporal resolution of surface air temperature, soil moisture and precipitation to capture both climate and human-induced changes and extremes

We will consider this in three parts:

- Soil moisture
- Precipitation
- Higher-resolution data in general

# Soil moisture – mainly a TOPC responsibility

Soil moisture data sets take a number of different forms:

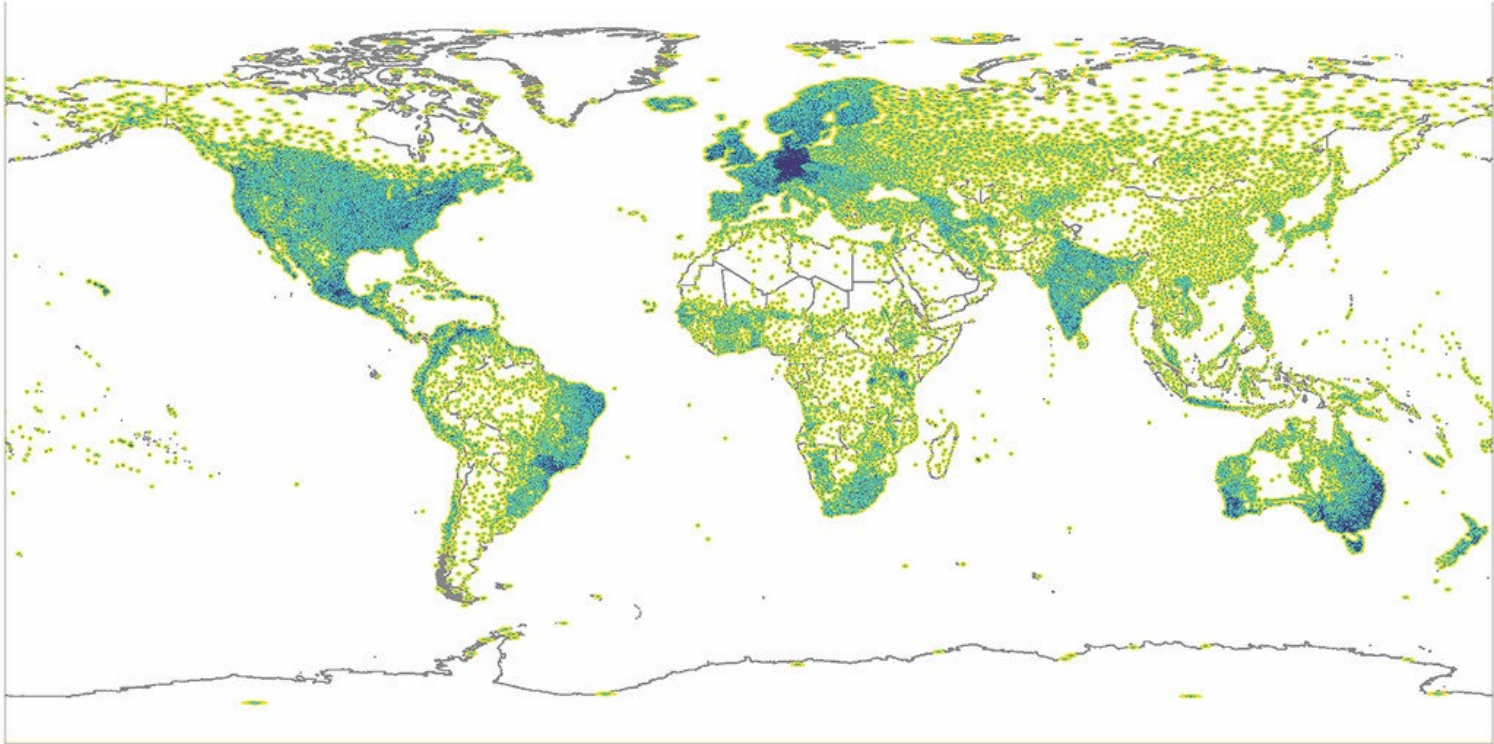
- In situ (coverage limited, often not NMHS obs)
- Satellite (restricted to surface)
- Modelled from other variables
- Reanalyses

Models and reanalyses depend on good data sets of AOPC ECVs (particularly precipitation)

# Precipitation – why is it different?

- Very large numbers of stations, many precipitation-only
- Short length scales
- Additive element, so low tolerance for missing data
- Lack of suitable WMO platforms for data exchange (no provision for precip-only stations, GTS synoptic data unsuitable)
- Extensive NMHS networks, but also very extensive non-NMHS networks (e.g. water authorities, agrometeorology, private)
- Many global data products but large systematic differences between them

# Wide variations in data coverage



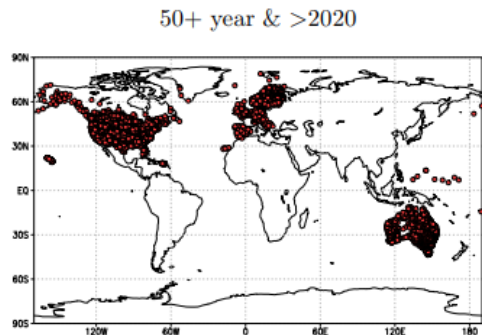
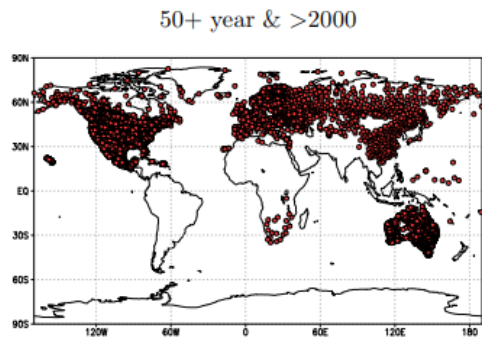
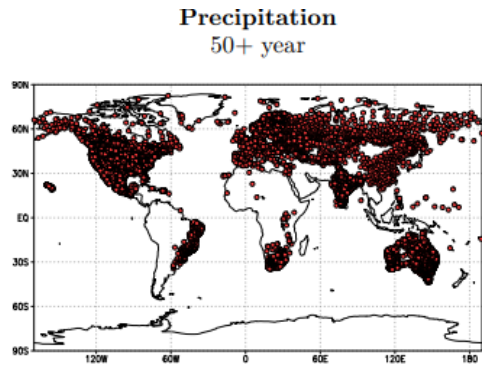
0 10 25 50 100 km  
Distance from nearest gauge

Kidd et al., BAMS, 2017

# Precipitation data archiving

- There is a dedicated centre (GPCC) – mandate is currently for monthly and daily data, but developing sub-daily
- Largely dependent on data supply from individual NMHSs on an ad hoc basis, supplemented by CLIMAT for real-time updates
- GPCC do not make station data publicly available, only grids

# Updating of daily data is a problem



These figures show availability of daily precipitation data through GHCNd if GTS data are excluded

Real-time (or even near-real time) updates are largely restricted to Europe, US/Canada, and Australia

Daily CLIMAT will be very useful here

(from Perkins-Kirkpatrick et al., in press)

# What might AOPC be able to do here?

- Encourage the development and uptake of new WMO platforms/ standards capable of handling precipitation-only stations (WIS2.0, WIGOS identifiers)
- Encourage the provision of freely available data under the WMO Unified Data Policy
- Work with GPCCC to make at least some station data publicly available



# A digression onto data policy....

WMO Unified Data Policy requires members to make some types of historical data available. Countries can be considered in different groups:

- Those which already have open data policies
- Those who will respect a WMO mandate and are willing to supply data to data centres
- Those which are positive in principle but need support to manage and transmit their data – SOFF/GBON potentially useful here
- Those which will not make data publicly available regardless of WMO mandates (sometimes because of whole-of-government policies or laws)

# Sub-daily data of all types

- GHCHh provides the key infrastructure for sub-daily data
- Remaining issues include data completeness and quality
- Real-time updates largely come through GTS, so don't pick up national-level QC
- Large historical gaps – we don't know what we don't have (also large data rescue requirements, more so than daily)
- Implementation of Unified Data Policy important here too
- Is going higher-resolution than hourly feasible? Is it of value?

# What can AOPC do here?

- Support the provision of historical data to NCEI
- Promote the benefits of improved sub-daily global data sets (e.g. improved reanalyses)