

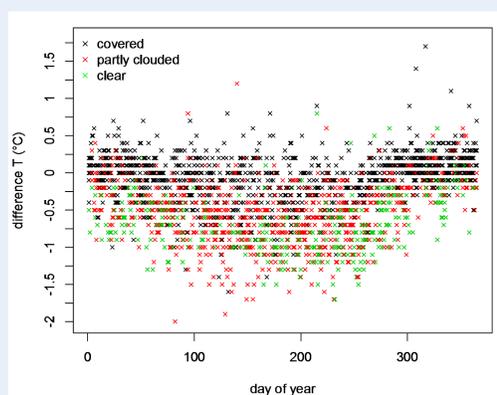


EU Surface Temperature for All Corners of Earth (EUSTACE)

EUSTACE will give publicly available daily estimates of surface air temperature since 1850 across the globe for the first time by combining surface and satellite data using novel statistical techniques

Determine homogeneity of daily station data

- Discontinuities show in the distribution as well as the mean
- Use multiple break-detection methods
- Estimate uncertainties – likely to be more uncertain where few stations

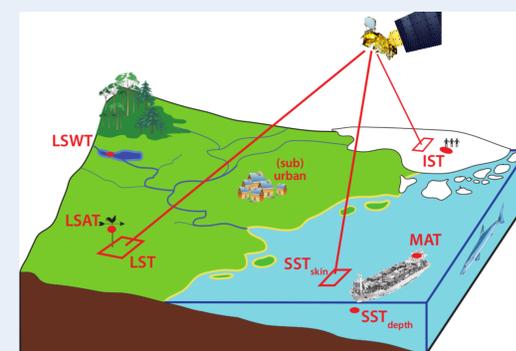


Understand relationships between satellite skin and air temperature

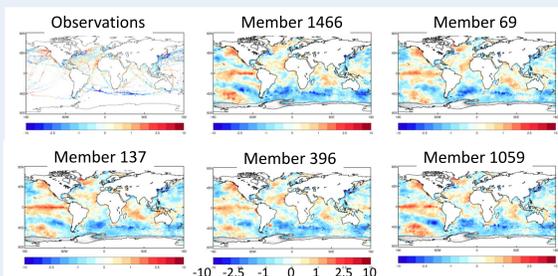
- Relationships vary over land, ocean, ice and lakes
- Relationships vary with season
- Need to account for differences in diurnal cycle, especially over land
- Tmax and Tmin over land, Tmean elsewhere

Estimate consistent retrieval uncertainties across all domains

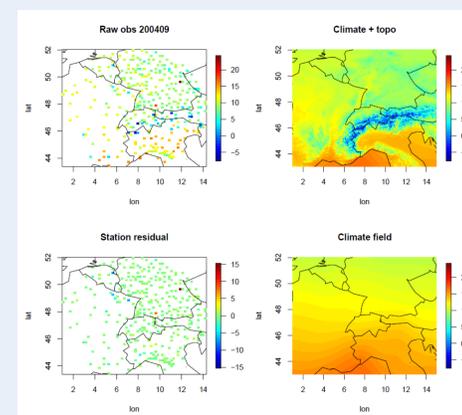
- Components of uncertainty have different correlation structures
- Adapt method of ESA CCI SST project to estimate these components



Use of air temperature measurements together with estimates from satellite data to create complete fields



- Use statistical modelling to propagate information on covariances between locations
- Fill in detail between the measurements
- Develop new analysis techniques; use a model of different random processes on different scales
- Likely to express the uncertainty in reconstruction using ensemble; less constrained where data provide less support



Validate

- SI-traceable measurements withheld
- Newly digitised observations used for early fields
- Uncertainty information as well as temperature
- Compare to other surface temperature data sets

Acknowledgments

The following people supplied figures for this presentation (clockwise from top left): Renate Auchmann; Merchant et al (2013), Geosci. Instrum. Method. Data Syst., 2, 305-321, 2013, doi:10.5194/gi-2-305-2013; Finn Lindgren; and John Kennedy

How you can become involved

- Significant user engagement, including user workshops.
- Small number of trail blazer users; early access to sample products and involved directly in their design.
- Interested in EUSTACE as a user? Contact Janette Bessembinder (KNMI, janette.bessembinder@knmi.nl)

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