TOPC Update

Wolfgang Wagner, Simon Eggleston
Introducing Myself

- From physics & electrical engineering to remote sensing & environmental sciences
- Professor for remote sensing and head of the Department of Geodesy and Geoinformation of TU Wien
- Co-founder of and scientist at the Earth Observation Data Centre
- Main R & D Interests
  - Physical modelling of microwave and full-waveform lidar measurements
  - Retrieval of biogeophysical variables from scatterometers and SAR data
  - Development of applications in hydrology, meteorology, climate research, ...
  - Big Data, cloud computing and collaboration in earth observations
- Several first-off data set releases
  - First single-satellite global soil moisture data set in 2002
  - First essential climate data record on soil moisture in 2012 (ESA)
- TOPC member since 2012
Renewal of TOPC Panel

- TOPC Chair
  - Konrad Steffen → Wolfgang Wagner

- TOPC Secretariat
  - Simon Eggleston

- Open call for nominations
  - Issued jointly with AOPC and OOPC in fall 2016
  - Selection process completed in January 2017

- Renewed panel will meet for first time 5-7 April 2017 at TU Wien
  - TOPC-19
**Work Plan & Timeline**

- Assessing the current state of the global observing system
- Advocating and promoting the establishment and enhancement of the systems
- Promoting the transfer and accessibility of data to the user community
- Identifying measurable key variables
- Coordinating activities with other global observing systems, panels and task groups

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- Panel Meetings
- Steering Committee
- Update new Implementation Plan
- Publish Updated Implementation Plan
- Invite suggestions & comments on requirements
- Panels to consider and prepare proposals
- Agree Proposals
- Public Review of requirements
- Revised Requirements
- Second Public Review
Consideration of Adaptation Needs

- More focus on local/regional scale
- Need to collect high-resolution data
- Puts climate change in context with other on-going pressures
  - population growth, land degradation, etc.

https://global-surface-water.appspot.com/

Proposal for Evaporation/Latent Heat Flux as ECV

- Proposal to be presented at TOPC-19
  - Coordinated by Han Dolman
- There is a high need for $\lambda E$ data but is it technically and economically feasible for systematic observation?
  - $\lambda E$ cannot be measured directly from space, requires multiple observations
    - Solar radiation, humidity, air temperature, wind speed, soil moisture, vegetation cover, stress and phenology
- Several successful intercomparison exercises

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Summary of 24 stations average $R^2$ for 3-hourly and daily tower forcing. EC denotes the model agreement with the evapotranspiration reference from eddy-covariance measurements, and ER is the model agreement with the evapotranspiration reference based on the in situ energy residual.
Carbon Budget

- Goal as stated in new GCOS Implementation Plan
  - Quantify fluxes of carbon-related greenhouse gases to +/- 10% on annual timescales
  - Quantify changes in carbon stocks to +/- 10% on decadal timescales in the ocean and on land, and to +/- 2.5 % in the atmosphere on annual timescales
- Spatio-temporal patterns of land-based carbon fluxes are not well known


Estimated average daily net ecosystem productivity (in $10^1$ g C m$^{-2}$ d$^{-1}$; thus divide by 10 to get the real value) for 1997 for Europe using the production efficiency model C-Fix. a Partially water limited model run (NEP$^{PWL}$) and b fully water limited model run (NEP$^{FWL}$).
Some Thoughts on the Monitoring of ECVs

- Our current approach to “monitoring of the adequacy ECVs” currently relies on expert judgements

- Are there more objective and quantitative ways?
  - Scientific quality
  - Uptake by the user community

- Nowadays the impact of publications is well documented. What about data and the software used for producing it?
  - Producers of data and software are often thankful for feedback on data quality and user statistics

- How may one benefit from and interact with emerging initiatives/organisation/technologies?
  - DataCite (https://www.datacite.org/)
  - Depsy for software citations (http://depsy.org/)
  - Using GitHub (https://github.com/) to store, publish, and collaborate on open, machine-readable datasets
  - Etc.