

Scientific and Organizational topics for Early Career Researchers Workshop 2015

The following topics were selected for discussion and analyses from a multi-disciplinary, international point of view during the Workshop, which are considered to be most promising and relevant to WCRP, GAW, and WWRP.

Seamless Earth system prediction

Integrating weather and climate research challenges into seamless environmental analysis/prediction systems. Through a condensed overview of ongoing activities and their motivation, early career researchers will agree on a new perspective of what open issues can be addressed by the scientific communities of WMO. Specific sub-topics include chemistry/aerosols and how they influence predictions/projections, extremes (floods, droughts, heat waves, etc.), amongst others.

Representation of scale interactions

Atmospheric circulations comprise numerous processes at a wealth of spatial and temporal scales. Their representation is crucial for adequate weather predictions and climate projections. Increasing model resolution puts the focus on the representation of smaller scale processes and error growth over different scales. How are these processes captured by models and how can we overcome difficulties in the grey zones (e.g. parameterised versus explicit convection)? Furthermore, how can the very fine-scale simulations be validated with the spatially-limited observations available?

Communication of uncertainty and sustainability of user-driven science

Both weather predictions and climate projections are affected by uncertainties. How to communicate this uncertainty based on probabilistic information is a challenge that has to be addressed to make use of the growing amount of probabilistic information available. An example of that is the information derived from ensemble prediction systems to users with different needs. A further challenge to the sustainability of Earth system science is related to ensuring that the science is not only driven by research curiosity but by urgent societal needs. Large urban areas provide the perfect example of where such two-way communication between climate scientists and users is absolutely vital.

Organization of early career networks

A global early career community that is embedded in the international research landscape requires organization and support, i.e. for:

- Outreach: based on and utilizing capabilities of existing networks, to ensure globally balanced representation and visibility
- Guidelines for national/regional and global coordination: including activities, workshops, etc., with short- and long-term plans and goals and regular reviews
- Defining the identities and visions of early career researchers' networks, individual and integrated
- Interaction, linkage with, and contribution to weather and climate research programmes of WMO, as well as with other relevant programmes
- Mechanisms for sustainable and efficient networks, including the provision of funding and resources.