



SYMET-14: Education and Training in a Period of Rapid Change  
WMO Symposium on Education and Training  
**Work Plan Template #7**

---

**Theme #7: What are the content area expertise gaps within our academic teaching staff members? How do we identify and fill these? (Chairs: Victoria Sinclair (Univ. of Helsinki))**

**Background to the theme:**

- *Meteorological and hydrological science is undergoing a revolution in approach and practice perhaps not seen since the beginning of numerical weather prediction.*
- *Increasingly, our science is a big data challenge and professionals need to computational and analytical skills to deal with the large amounts of observations and forecast data. New sets of skills in data science, machine learning, artificial intelligence and causal thinking will be needed.*
- *Linked to this challenge, open-source collaborative software development now forms the backbone of meteorological and hydrological analysis. Good practice in software development and documentation is needed for those participating in the weather and climate enterprise.*
- *Many more public and private sector forecasters now have the ability to develop and run sophisticated models on high performance computing. As cloud services become the predominant way to access such HPC, knowing how to deploy these services effectively will be critical.*
- *Ensemble forecasting is now ubiquitous across forecasts on different temporal and spatial scales. Skills in interpreting and understanding ensembles and their properties are needed.*
- *All forecasts now take place on a backdrop of the changed and changing climate. Forecasters need the ability to interpret and explain forecasts of hazardous weather in this context.*
- *The multiplicity of platforms and methods of communicating forecasts to end-users and the increasing sophistication of those same end-users means the skills and techniques needed in forecast communication have increased dramatically in the last decade.*

**Goals/Desired Outcomes (to be enhanced or adjusted by the Working Group):**



- *The myriad challenges imposed and new knowledge and skill requirements created by rapid changes in scientific methods and operational requirements are met for both learners and the education and training the staff who teach them.*
- *Institutional systems and policies are in place that help to address the ongoing requirements to respond to such fundamental changes to educational requirements.*
- *WMO Members work together to ensure that gaps between opportunities for capacity development in these growing new areas are minimized*

**Questions to consider in discussing workplans (challenges to address, barriers to action, tasks to complete, resources required, etc.) Groups are encouraged to explore further:**

- *How do we ensure that staff can develop their own expertise to prepare professionals better for the work place?*
- *For the challenges discussed above, are current teaching staff equipped to deal with them? Where is greater training needed?*
- *How do teaching staff make time and space to develop new skills – particularly if these are far from their prior experience?*
- *Where can teaching staff go to gain the skills and training they need? Which providers are running train-the-trainer courses on these and other topics?*
- *Are there other challenges which have been missed or can be foreseen?*

### **Group Discussion Prompts**

Challenges (What barriers exist to achieving goals?):

Opportunities (From what examples can we learn? What existing initiatives can be drawn from?):

Collaboration (How can collaborative action contribute?):

What steps might be required?:



Who is willing to take responsibility to contribute? What contributions they can offer):

**Recommended Actions (Which recommendations does the group propose that could meet the chosen goals and contribute to the SYMET Statement?):**