

## PRACTICAL EDUCATION FOR DEVELOPING COUNTRY SCIENTISTS: WMO COMMISSION FOR CLIMATOLOGY EXPERIENCE AND PERSPECTIVE IMPACTS

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### 1. INTRODUCTION TO THE COMMISSION FOR CLIMATOLOGY

The World Meteorological Organization (WMO) is part of the United Nations so formal voting membership consists of 189 countries, or more accurately, 189 Member States and Territories. WMO sets standards for observing systems, coordinates the international exchange of meteorological data, and a whole host of other activities.

To help move the entire world forward in these endeavors, WMO takes capacity building very seriously. Capacity building includes any activity that increases the capacity of a national meteorological service to be able to fulfill its mandate. Naturally, a large portion of this is education (see [www.wmo.int/pages/themes/cbuilding/index\\_en.html](http://www.wmo.int/pages/themes/cbuilding/index_en.html)). Much of this consists of formal courses taught at various training centers (WMO 2007). But the Commission for Climatology's focus is somewhat different.

The WMO has eight Technical Commissions addressing topics ranging from efforts to insure aircraft safety to coordinating subsurface ocean observations. The Commission for Climatology (CCI) is one of these technical commissions and is made up, at last count, of 216 official volunteers from countries all over the world.

Being totally dependent on volunteers, CCI's focus has been to seek win/win activities:

- A win for individuals who undertake them by helping their professional or personal missions.
- A win for the institution paying that person's salary. So it has to be something that the

institution will be proud to have supported.

- A win for global climatology. Advancing global or regional climate science and understanding is often the key driving factor for getting individuals involved.
- And it has to be a win for the countries participating. Specifically, it has to increase their capacity to provide climate services to their citizens.

### 2. EDUCATION VERSUS TRAINING

The WMO collaborates and coordinates on many formal education courses. The Commission for Climatology however focuses on practical education or training. These tend to use hands-on activities and are more narrowly focused. They also don't result in awarding a formal degree or certificate. This last part is somewhat intentional as some Meteorological Services are reluctant to encourage their best employees to participate in programs that can result in them returning with a degree or certificate that would lead to them being hired away from the meteorological service.

### 3. CCI FOCI

Given these criteria, CCI has three education foci.

#### 3.1 *Written guidance documents*

The first focus is producing written information. These range from a book length *Guide to Climatological Practices* (WMO 2010) to shorter single topic guidance documents such as *Guidelines on analysis of extremes in a changing climate in support of informed decisions for adaptation* (Klein Tank et al., 2009). These documents are quite targeted. Almost like a cookbook, they tend to provide step by step instructions that are easy to follow.

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### 3.2 Single country projects

If several people need to be trained in a particular country to carry out a project, then one trainer or sometimes a small team of trainers carry out that task. Data rescue is an example of such a project. The problems are sometimes country specific and specialized equipment needs to be set up and tested. Once the training has been done the trainer often stays in contact with people he or she trained, monitoring their progress and advising when problems arise.

### 3.3 Multi-country workshops

If only a single person within a country needs to be trained, the most efficient method is to hold a workshop. These are often cases where many countries in an area face similar challenges and the camaraderie arising from working with colleagues from neighboring countries helps in the process. Calculating how extremes are changing in an area is a good example of this process. Also, cross-border verification of trends increases the confidence in the results.

## 4. SYNTHESIS

The education that scientists in a developing country meteorological service need – that CCI can provide – generally:

- Combine theory with hands-on practical experience.
- Focuses on topics directly relevant to the scientists' every day job.
- Produces immediate worthwhile results in addition to the education. The immediate results are a powerful incentive for continuing the work.

## 5. FUTURE CCI EDUCATIONAL ACTIVITIES

The Global Framework for Climate Services is likely to put additional pressure on meteorological services in developing countries to produce information they do not yet know how to accurately generate. So the WMO Commission for Climatology will actively continue the work that has already proven to be effect. In addition, however, there is movement towards CCI contributing to the climate curriculum at regional climate or training centers and helping develop standards for certified climatologists.

If you are interested in contributing to any of these efforts, please let me know.

## REFERENCES

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