**Notes from the first face-to-face meeting of the Expert Team on National Climate Monitoring Products, Marrakech, Morocco, September 2015.**

These notes are a condensed version of what I wrote down in the meeting. I’ve tried to group the notes under separate titles.

**Threats to implementation of NCMPs**

A number of people noted that getting up-to-date daily data could be a problem for many countries. Possible ways of mitigating that risk were suggested, using SYNOPS was one, but there are problems with reporting times and the periods over which variables were accumulated. There is, however, a climate section in SYNOPS but this would need further investigation (climate daily data should be reported at set times for example).

Monthly CLIMAT messages were a second option proposed by Ayako. CLIMAT messages are monthly summaries and would allow the calculation of NCMPs 1,2,3 and possibly 6, though fewer countries complete the sections dealing with extreme values which would be needed for 6. This is a practical way to get NCMPs produced, but if CLIMAT messages are used, then anyone anywhere could calculate the NCMPs so there is a risk that many countries would not bother or would cede control to an RCC which would be antithetical to the capacity building aims of the ET-NCMP.

A modern base line period might coincide with a period during which many NHMSs moved to using AWS systems. There will be station breaks at these stations, or, more difficult to fix, the issuing of new station IDs. This could limit the stations that make it into NCMPs. The problem of modern station breaks will be a problem regardless of what climatology period we choose. It underlines the importance of homogeneity assessment, but this is out of scope for this ET-NCMP.

There is a possibility that NCMPs would not be widely adopted. We can work to ensure that the rationale for NCMPs is clear and that there is a capacity building aspect and that they are useful in practice.

**Guidance and specifications**

There are currently no WMO guidelines or standards for operational climate monitoring. There is some limited old guidance on missing data criteria. These are areas where the ET-NCMP might have an interest.

Owing to the possibility of large operational impacts, a thorough and careful review of the NCMPs by the members of WMO is necessary. The guidance will have to go through the WMO process anyway. We need to stress the capacity building value of what we are suggesting. The aim is to make most efficient use of limited resources as well as providing some standardised tools for climate monitoring. A “friendly” review of the document would be a good idea.

NCMP 6 – this remains difficult to balance between too much and too little information. A very basic solution was proposed – count station records of each type each month – and found agreeable by all present. If more detail is required, then the focal point can be contacted to ask for more information.

Data, metadata and auxiliary information – the NCMPs as originally conceived would contain a rather small amount of information, say:

year, month, country, NCMP ID, NCMP value, number of stations, quality flag., software version

However in the process of calculating these numbers, a good deal of additional information will be produced: additional indices, interpolated maps, consistent sets of station data, locations of extreme events etc. This information would be useful for the focal points and others within the focal points’ organisations and would be of interest to anyone using the NCMPs. What to do with that is an interesting question.

**Software**

The basic conception of the software is to combine a set of standard tools – index calculation, station formatting, interpolation, mapping and area averaging – that together are used to produce the NCMPs. The structure of the software should be sufficiently flexible that any index, or any area can be calculated. This allows for the generation of a broader range of NCMPs in the future and for users to generate RCMPs – Regional Climate Monitoring Products – as these may make more scientific and practical sense and it would be good to have a consistent way of generating all of these.

Software needs to be easy to use and reliable. R is the language currently used by ETCCDI, but while it’s great for statistical processing, it’s not ideally suited for building systems. We need a very good R programmer, or someone with experience of putting together GUIs.

Rclimdex and RHtest currently involve a lot of manual data management (renaming files, making directories, copying, manually editing etc) which we would have to automate as far as possible. John has sketched a rough form for what the software would need to do.

We need to borrow bits from ETCCDI, ETSCI and some R packages in order to build the NCMP system. Hence we need to keep in touch with these groups via informal contacts to ensure we are working with the latest versions of code and so on. ETDCI code is on Github so is open access.

Slight modifications to the ETCCDI indices would be needed: there is no monthly mean temperature and Tx90p is provided as a percentage whereas ET-NCMP needs number of days. Percent of days might be better as it is less sensitive to missing days.

**Workshops and capacity building**

Although the current focus is to establish the specifications and then produce software, this has to be guided by some thought as to the eventual use of that software and guidance. Consequently, some discussion was had on this topic.

The potential for capacity building via NCMPs was stressed a number of times. The letters, survey and guidance will be or have been adapted to reflect this. There is, of course, the opposite concern that the calculation of NCMPs would be capacity draining. We should work to ensure that they can be calculated as efficiently as possible.

Workshops are a long way off, and we would like to complete the specification and software first, but there was a good deal of discussion around Lucie and Ladislaus’ presentations.

Data quality and homogenization are a concern. The best products will have very good quality control and homogenization. However, getting data to that state could be a real problem. For a workshop where participants are often not nominated until shortly before, there might be insufficient time to get the data into shape, let alone quality controlled and homogenised. A pre-workshop period of interaction with the trainers is done for ETCCI to at least get the data into the right format, but it is hard and QC/homogenisation takes two days, sometimes yielding only a handful of usable stations.

as workshops can only accommodate a small number of people and take time and money to organise, some thought was given to how best to approach them. Training could be given to the RCCs who would then propagate that information to NHMSs (train the trainers approach). This would be an efficient way to reach all regions in one go, but might be slow to reach all countries if it was the only mechanism. It could be helped by making an on-line course, which would lead NHMSs through the procedures for making NCMPs. RCCs could then support NHMSs working through the online course.

An alternative model is to hold workshops and train the NHMSs directly. The upside is that we put the knowledge and skills directly into the heads and hands of the focal points. The focal points could then disperse their wisdom, sharing it with neighbours and other NHMSs in the region.

Online course materials should be set up so that focal points and other learners can work through them at their own pace and access them over low-bandwidth connections. e.g. make them so they can be downloaded beforehand or sent out on a USB device.

**Survey**

Thanks to Lucie’s work prior to the meeting, we were able to complete a near-final text of the survey during the second day of the workshop. It is very focused, which will hopefully be of help in getting a reasonably large number of responses. The basic format asks, effectively, how far along the chain of NCMP processing do you currently go? It will help us to gauge what the ability of countries is to produce the full suite of NCMPs.

**Focal points**

CCl recommended that NHMSs nominate focal points. Focal points will have to be prepared to respond to questions about NCMP6.

A draft letter and terms of reference were discussed in the meeting. Minor changes are expected as described by Peer.

**Dissemination**

For dissemination via GTS we need to interact with IPET-DRM once we have the specification finalised (we need to know what information needs to be transmitted). We need a way of transmitting updates (possibly including map information although that could get complex), the whole series for each NCMP, and for archiving of these. The gathering or archiving in a single location is useful for the production of the WMO annual statement, say, where one person will have to access information for a large area. The RCCs have a mandate to gather regional climate diagnostics, so we should involve them. Note that currently, there is no fully-developed global climate monitoring infrastructure. We need to be involved or at least aware as this develops over the next few years.

**Interactions with other teams**

IPET-DRM

Definition of extremes – this team is having some difficulties defining extreme events. At the moment they are cataloguing the way that this has been done in the past. We need to keep track of any recommendations they make with an eye on either keeping NCMP 6 up to date, or, justifying the current narrowness of its scope.

Rapporteurs – NCMP 6 potentially overlap with the work of the rapporteurs on records.

ETCCDI and ET-SCI – our intention to use parts of RCimdex to calculate the NCMPs means we need to work with ETCCDI (it’s also in the terms of reference). It has been suggested that there might be some value in sharing workshops.

Homogenisation – homogenisation is outside the remit of ET-NCMP work. We need to consider what the implications are for workshops and the generation of products. For the time being we can recommend that consideration be given to homogenization and suggest a solution (such as RH test). Homogenisation is less critical than basic quality control, but important. The task team on homogenisation is focused on monthly data for the time being, but that might be sufficient for what ET-NCMP hopes to achieve. If the TT-Homog recommendations provide a way to identify breaks at a monthly level, we can use that information. The demonstration Lucie gave, used monthly values to identify the breaks, we could make a similar recommendation.

CDMS – data quality and management was a concern throughout the discussions. A lot of time at ETCCDI workshops is spent getting data into shape. A good data management system, whilst outside the scope of ET-NCMP, would greatly facilitate what we are trying to achieve.