

CIRDA NEWS

A monthly newsletter brought to you by UNDP-GEF's CIRDA Team

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*Empowered lives.
Resilient nations.*

2014 CIRDA Annual Work Plan and Budget Approved by CIRDA Project Board

With the objective of reviewing the CIRDA Programme's 2014 Annual Workplan (AWP) and Budget, the CIRDA Project Board met on 8 of July 2014.

During this first meeting, the Project Board Members were provided with a brief overview of the CIRDA Programme including its overall objectives, geographic scope and areas of intervention. The 2014 AWP included, among other things, two workshops, a technology exposition, support to countries on procurement, deployment of highly specialized experts to partner countries, a private sectors partnership strategy and a survey on data digitization needs. The Board approved both the 2014 CIRDA AWP and Budget, praising the workplan as clear, realistic and its management cost reasonable.

The CIRDA Project Board forms part of the CIRDA Programme's Organisation Structure and is tasked with helping oversee the implementation of the CIRDA Programme and provide general guidance and direction to the CIRDA Manager.

The CIRDA Programme Board Members are Stephen Gold, Principal Policy and Technical Advisor and Head of Green LECRDS, UNDP ;Carolyn Richter, Director of GCOS/WMO; Juan Carlos Villagran, Head of UN-SPIDER Bonn Office; Jo Scheurer, Coordinator of the Disaster Risk Reduction and Recovery, UNDP; Isidore Agbokou, UNDP Country Officer Benin; Mariatu Swaray, UNDP Country Officer Sierra Leone; Onesimus Muhwezi, UNDP Country Officer Uganda.

To access the documentation presented and approved by the Board as well as the minutes from the meeting check out the CIRDA Webpage at www.undp-alm.org/project/cirda/monitoring-and-evaluation.

CIRDA Workshop on Data Analysis and Interpretation

The CIRDA Programme will organize a three-day interactive workshop from 14- 16 of October, 2014 in Dar-Es-Salaam, Tanzania. The CIRDA training workshop is focused at representatives from national Hydro Met Agencies and will provide a systems perspective on observing networks to monitor weather and climate. The agenda for this event, is being curated by the CIRDA Experts on Meteorology, Technology and Private Sector.

Discussion will begin with an introduction to the increasing importance of data from observing networks in a world where climate change is well underway. The approach to backwards planning will also be presented as a way to ensure that an observing network produces the desired outcome. Several examples focused on support to utilities, aviation, farmers and other weather sensitive businesses will be provided and used to make the workshop discussions more concrete. Participants will be asked to discuss the observing networks in their countries and how the ideas presented in this workshop can assist them in the future.

The training workshop, will prove to be an enriching experience to participants interested in using climate data for analysis and interpretation ready to meet the needs of end users. Topics to be discussed are: the role of weather observations and measurements in day-to-day forecasting, to include verification and validation of forecasts; acceptable levels of accuracy and precision in measurements; QA/QC processes for data streams; archiving to build a climate data base; designing of observing systems, to include best practices and telecommunication strategies.

For any questions regarding this event please email CIRDA Manager, Bonizella Biagini, at bonizella.biagini@undp.org. Information such as meeting agenda and venue will be forthcoming.

CIRDA is the Multi Country Programme to Strengthen Climate Information for Resilient Development and Adaptation to Climate Change in Africa. Funded by the GEF and implemented by the UNDP, CIRDA is working with 11 countries in Africa (Benin, Burkina Faso, Gambia, Liberia, Sierra Leone, Sao Tome and Principe, Ethiopia, Uganda, Tanzania, Malawi and Zambia) to support national climate services in their efforts to collect, analyse and disseminate climate information as a key tool in long term planning and adaptation.

bonizella.biagini@undp.org

www.undp-alm.org/projects/cirda
www.undp-cirda.blogspot.com

Communicating Climate and Hazardous Weather Information through Mobile Telephones



Collecting climate information is only the first step in adaptation. For climate information to be useful it must be communicated in a timely and appropriate manner to end users.

Mobile telephones are widely used in the developing world with Africa in the midst of a mobile revolution. In the past 10 years, Africa has become the world's second most connected region by mobile subscription and is on track to hit one billion mobile subscriptions by 2015 (as quoted in a recent article by CNN).

With this rapid rate of absorption, efforts are being made to develop techniques to reach end users with critical information through mobile phones.

For example, in Botswana the International Finance Corporation (IFC) has made efforts in engaging mobile phone companies to communicate early warning of extreme events. The use of unstructured supplementary services data (USSD) has shown potential in supporting post-disaster relief operations, particularly as it does not require the use of data or smart phones.

USSD works in a similar fashion to short message service (SMS) text messaging. However, USSD has a key difference from SMS messaging in that it offers a real time connection with a mobile operator. In this sense it is a session-oriented service that can provide a sequence of exchanged information that can be initiated by a customer (push) or by a service provided (pull) allowing for interactive services between a MS and applications hosted by the mobile operator. A USSD message can be up to 182 alphanumeric characters in length and can be composed of digits and #, * keys to allow users to easily and quickly get information/access services from the Operator.

Furthermore, USSD messages are simple to form and easy to send. A user can directly enter the USSD string and press call to send the message. A typical USSD message starts with a * followed by digits which indicate an action to be performed or parameters. Each group of numbers is separated by a *, and the message is terminated with a #. The USSD gateway in turn can interact with external applications based on the USSD command. This allows access to a number of value-added services via USSD.

USSD is currently being used by most mobile operators in services like checking your mobile phone balance. Wikipedia has also begun to use it to provide free Wikipedia access to 230 million mobile users in 31 countries. As mentioned, in the case of Botswana IFC is working to provide tools so that disaster-impacted communities can communicate their basic needs to relief agencies. The CIRDA Programme aims to look into these initiatives in order to provide ideas on the best ways to communicate climate and hazardous weather information to end users.

Communicating Climate Information: Graphics

A CIRDA Team Member recently posed an excellent question regarding reaching communities through climate information, particularly when trying to reach a predominantly illiterate population.

An expert available to the CIRDA Team quickly provided real life experience of ongoing efforts in the Philippines to devise a simple and clear scheme that not only communicates climate information but that can also motivate appropriate action.

An example that has been effective to educate communities that live along the rivers in the Philippines has been the use of graphic imaging. For instance, comparing flood levels to the height of popular Philippine boxer Manny Pacquiao. Graphic imaging is able to translate easily to a population familiar with this national sports hero. While people may not know much about hydrology, most will know everything about this world class boxer.

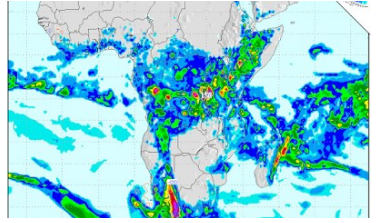
However our expert was clear in stating that research has shown that one of the complicating factors in having early warning information lead to action is that individuals usually will not take action upon receiving climate and early warning information from just one source. They seek confirmation from other sources, relatives, and local leaders (government officials, police and religious leaders) about the warning and on what actions should be taken.

Thus although it is certainly possible to devise communications that would be suitable for non-literate individuals, communities still need to be trained on what the warning means and appropriate actions to take when it is received. In these cases it has been found that training school children has had a positive effect on teaching parents not only on the use of the iconography, but also on its real life appropriate action.



On Different Types of Weather Observations

Meteorologists and others make many types of weather observations for a wide variety of purposes. Unfortunately, the diversity of types of observations often leads to confusion in discussions about how, where, and when weather observations should be made. With this in mind we decided to write a few posts with a brief description of the types of observations- as noted by a CIR-DA Meteorology Expert.



Synoptic Observations

Usually when meteorologists speak of observations, unless they qualify their comments, they are referring to what are termed “synoptic observations”. The term “synoptic” means “affording a general view of the whole”. Thus synoptic observations are made to characterize and quantify the weather over a large region at particular moments in time (usually periodically at 3-hour or 6-hour intervals). Each such observation includes data on sky cover, state of the sky, cloud height, atmospheric pressure reduced to sea level, temperature, dew point, wind speed and direction, amount of types of precipitation, and other information on observed atmospheric phenomena. Synoptic observations are reported to the Global Telecommunication System managed by WMO to be shared with meteorologists around the world.

When synoptic observations from across a continent are collected and analyzed, they provide meteorologists a picture of surface weather events occurring on spatial scales of several hundreds to a few thousand kilometers and time scales of a few hours; these are termed synoptic scale events. The large low and high pressure systems and accompanying frontal systems found in mid- and high-latitudes are examples of synoptic scale weather phenomena.

Synoptic surface weather observations are made by trained observers of National Hydro Meteorological Services (NHMS) in accordance with guidelines established by the World Meteorological Organization (WMO) [see WMO Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8 (2008 edition, updated in 2010) with Corrigenda Table (dated Sept. 2012, published October 2012)]. The Guide specifies in detail how, where, and when synoptic observations are to be made. Given the purpose of synoptic observations, the WMO Guide discusses in detail aspects of the locations where synoptic observations are to be made and how instruments are to be exposed so as to ensure that the observations are comparable and representative of a wide region.

Aviation/Hourly Observations

In addition to observations at the synoptic intervals, many NHMS collect hourly observations at their synoptic sites. In addition, “aviation/hourly observations”, a subset of the synoptic quantities plus other aviation-specific quantities, are made hourly at airfields and at other locations. “Special observations” may also be made when atmospheric conditions change rapidly between hours in ways that may impact aviation or other operations.

For aviation observations, the guidance of both the WMO and the International Civil Aviation Organization (ICAO) apply. In accordance with such guidance, the instruments used to make such observations are normally exposed so as to provide data representative of runway conditions, which may be quite different from those observed by a synoptic observation site. users it becomes easier to envision ways of reaching them and creating innovative partnerships.

If the spatial density of locations making aviation/hourly observations is sufficiently high, then when such observations are collected and analyzed by the NHMS, these hourly observations can provide a provide meteorologists with a picture of weather events occurring on spatial scales of a hundred to a thousand kilometers and time scales of about one hour; these are termed sub-synoptic (in the sense of “edge of the synoptic”) or meso-alpha scale events. Phenomena like squall lines, mesoscale convective clusters, and tropical waves occur on this scale. (However, tropical and sub-tropical cyclones are classified by the U.S. National Hurricane Center as synoptic-scale phenomena).

Smaller scale observations

In recent years driven by the demands of users and advances in research, operational meteorologists have become interested in monitoring weather events at a smaller scale. Users interested in this type of weather information include farmers, agricultural insurers (agricultural meteorology); drivers of all sorts and traffic managers (road weather); electrical utilities and power grid managers (watershed hydrometeorology and air quality meteorology)

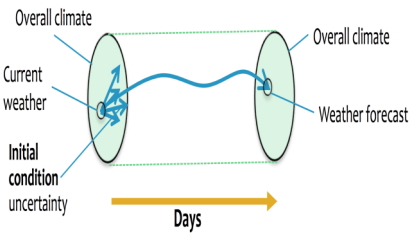
Small scale observations include those conducted at a meso-beta scale of 20 to 200 kilometers. Observations at this scale include phenomena like sea breezes, and lake effect snow storms. Small scale observations can also be made at a meso-gamma scale of 2-20 kilometers. Phenomena at this scale include thunderstorms (also known as the storm scale), large wildfires, pyrocumulonimbus clouds, fire storms as well as complex terrain flows over or around mountains and urban heat islands.

In contrast to the detailed guidance provided for synoptic and aviation observations, only general guidance is available for observations on these smaller scales. The quantities to be observed, the spatial distribution of the several observing systems (an “observing network”) necessary to capture essential details of the phenomena of interest, the frequency at which observations are to be reported and how they are processed and displayed for use vary significantly from application to application.

As an example, support to agriculture may require observations on a variety of scales from sub-synoptic (regional drought monitoring) to meso-gamma (forecasting pest emergence in fields in a small region). This requires the meteorologist planning observing systems to be creative in terms of instrument selection and exposure as well as in observing network design. Thus, some agro meteorological observations may be at the heights of the plant canopy and taken every hour to monitor crop conditions. Other measurements, such as daily maximum and minimum temperature to estimate growing degree days, may need to be taken only once per day.

In developing observing systems and networks to monitor events on any of these mesoscales a basic principle- that the observations must be representative for the spatial and time scales of interest- will always apply. In addition, quality assurance measures become extremely important to ensure that the data have the characteristics required for the application. Similarly, continually updated metadata documenting the who, what, when, where, why and how of data collection for each observing site in the network are essential for users to understand the measurements being made.

Weather Observations. Climate Observations. What is the Difference?



This is a question that pops up regularly, often times because 30 years ago most experts might have stated that, except for a few important exceptions such as the NOAA NWS Cooperative Observer Program, there was essentially little difference. However, today the answer is somewhat more complicated.

As most of us know, weather describes the evolving state of the atmosphere over short periods of time (from a few minutes to two weeks at most) while climate describes the behaviour of the Earth's climate system over long periods of time (from the order of seasons out to years to decades or even longer). In fact the "gap" from two weeks and three months (length of a season) has become a hot topic of current research (but more on that in a future post).

Whereas weather forecasts have only recently come to be expressed in probabilistic terms, climate descriptions have always been in terms of means values (normal's) and probabilities of departure from those normal's (natural variability). Until the last few decades, climatology was largely about analysis to reveal the different types of climate to be found on Earth and research to resolve and understand the often subtle changes in climatic patterns on various time scales in the past and at present.

A major change came with the arrival of computing capabilities sufficient to support numeric global-scale climate models, the appearance of both satellite and in-situ ocean observation as well as the finding that the greenhouse gas content of the atmosphere was increasing. A new generation of climatologists became interested in puzzling out the contributions of anthropogenic (man made) activities to climate change and to using numerical models to simulate past climates and predict likely future ones.

Today, observations from over 11,000 observing stations support operational weather forecasting, air pollution modeling and emergency and military operations, as well as a whole host of industrial and financial applications. Additional data flow in from observations made from balloons and aircraft, buoys and ships at sea, special monitoring systems and a host of satellites.

Many of the stations making primary 3- or 6- hour weather observations (temperature, pressure, humidity, wind speed and direction, precipitation, etc.) are located at airports or in meteorological observatories operated by National Hydro Meteorological Services. Such measurements- particularly where supplemented by hourly observations from airports and other locations- are highly useful for resolving synoptic (continental) and sub-synoptic scale events in the atmosphere. In the past, climate information has been extracted from the data produced by these weather observation networks. However, that has now changed.

While modern-day climatologists still use the above mentioned weather observations for many traditional applications, they now need climate-specific observations that provide a much broader range of data (including chemical constituents) to more completely describe Earth's climate. Further, much more extensive observations of the Earth's oceans are required. Such climate observations are in demand not only to monitor the evolution of Earth's climate in a more precise way, but also to validate and verify the numerical models used to predict how Earth's climate system is likely to evolve.

In addition, not all climate observations are the same. The signals that climatologists are trying to tease out of the observational data are quite small and often buried in environmental and sensor noise. Thus, climatologists have developed requirements for climate measurements that are more stringent than those required for weather observations.

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