Climate Services Information System

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Climate Service Information System (CSIS)

- The CSIS is the component of the GFCS most concerned with the generation and dissemination of climate information.
- It is the ‘operational centre’ of the GFCS. It will include climate data, monitoring, prediction (monthly, seasonal, decadal) and projection (centennial) activities.
- HLT report: ‘The Climate Services Information System is the system needed to collect, process and distribute climate data and information according to the needs of users and according to the procedures agreed by governments and other data providers.’
Role of CSIS within the GFCS

- The CSIS is the means of delivery of climate data and products.
- It comprises global, regional and national centres and entities that generate/process climate information (observations and predictions), and the exchange of data and products to agreed standards and protocols.
- It must be supported by observation and research programmes (e.g. GCOS, WCRP). With ‘pull through’ facilitated by strong links.
- Capacity building initiatives will increase ‘conductivity’ of data flow
- Part of the CSIS is in place, but new infrastructure is needed to fulfill the GFCS vision.
Global Producing Centres of LRF

- In 2006, WMO set up a process to designate centres making global seasonal forecasts as WMO Global Producing Centres (GPCs) of Long Range Forecasts
- GPCs adhere to commonly defined standards – aiding consistency and usability of output:
  - a fixed forecast production cycle
  - a standard set of forecast products
  - WMO-defined verification standards
- A comprehensive set of standard verification measures, with which to communicate the skill of forecasts, has been defined (the WMO Standard Verification System for Long-Range Forecasts – SVSLRF)
- 12 GPCs designated so far
- Two Lead Centres: LC-LRFMME and LC-SVSLRF
Currently Designated GPCs

Links to GPCs: [http://www.wmo.int/pages/prog/wcp/wcasp/clips/producers_forecasts.html](http://www.wmo.int/pages/prog/wcp/wcasp/clips/producers_forecasts.html)
Regional Climate Centres (RCC)

- WMO RCCs are centres of excellence that create regional climate products including long-range forecasts in support of regional and national climate activities and thereby strengthen capacity of WMO Members in a given region to deliver better climate services to national users.
- RCC users: NMHSs, other RCCs, etc.
- WMO RCC responsibilities shall be regional in nature and shall not duplicate or replace national responsibilities.
- Establishment of RCCs is initiated by WMO Regional Associations, based on regional needs and priorities.
- Formal designation through WMO Technical Regulations
- Two modes of Implementation: fully self-contained RCCs or distributed-function RCC-Networks
RCC Functions

- **Mandatory Functions:**
  - Operational Activities for LRF
  - Operational Activities for Climate Monitoring
  - Operational Data Services, to support operational LRF and climate monitoring
  - Training in the use of operational RCC products and services

- **Highly Recommended Functions:**
  - Climate prediction and projection
  - Non-operational data services
  - Coordination functions
  - Training and capacity building
  - Research and development
WMO RCC Status Worldwide
WMO Mechanisms for Guiding GPCs and RCCs

- Commission for Basic Systems (CBS)
- Commission for Climatology (CCI)
- CBS/CCI Expert Team on Operational Predictions from Sub-seasonal to Longer-time Scales (ET-OPSLS)
- CCI/CBS Expert Team on RCCs
- Global Data Processing and Forecasting System (GDPFS)
Regional Climate Outlook Forums (RCOFs)

- RCOFs provide platforms for Climate experts and climate information users to:
  - Discuss current climate status
  - Exchange views on scientific developments in climate prediction
  - Develop consensus-based regional climate outlooks that can feed into national climate outlooks produced by NMHSs
  - Engage in user-provider dialogue

- An important aspect of RCOFs is the facility to bring together experts in various fields, at regular intervals, operational climate providers and end users of forecasts in an environment that encourages interaction and learning.
Regional Climate Outlook Forums worldwide
RCOFs and Food Security Outlooks

- Regional agriculture and food security outlooks are now regularly produced based on the climate outlooks after the RCOFs in some regions.
- For example, the climate outlook in the Greater Horn of Africa from the GHACOF process is routinely used in combination with other information by the Famine Early Warning Systems Network (FEWS-NET) to prepare the food security outlooks.
NMHSs: Underpinning the CSIS at the national level

- NMHSs already provide climate services based on the historical archives of observational data collected for weather services; several of them also provide operational climate prediction products, up to seasonal time scales.
- NMHSs are mandated by the WMO Convention to observing and understanding of weather and climate and in providing meteorological (including climatological), hydrological and related services in support of relevant national needs, ensuring authenticity to their products and services.
- NMHSs are structured and trained to provide 24/7 services.
- NMHSs through collaborative mechanism have established standard practices across the globe for weather services that can be easily extended for delivering climate services.
- Users deal with weather and climate information in a seamless manner, and it greatly helps them to meet all their weather and climate information needs through a ‘single window’; NMHSs can effectively provide such a single window.
- NMHSs and their partners constitute a large pool of technical experts dealing with weather and climate.
Potential National Mechanisms

- **Frameworks for Climate Services at the national level**
  - Similar to other levels of GFCS but involves practicalities and specifics for delivery of climate services at the national level through well-coordinated arrangements between the key national institutions responsible for observations, research, tailored products and expert advice as well as the user sectors.
  - Some countries may establish coordination mechanisms appropriate to their national context, largely as integral components of the NMHSs, to support/facilitate GFCS implementation at the national level

- **National Climate Outlook Forums (NCOFs)/National Climate Forums (NCFs)**
  - Adapting the global and regional scale forecasts to the national context
  - Tailoring products and translating key messages for users (Multidisciplinary Working Groups)
  - Facilitating user-provider interaction and feedback
  - Evaluating the impact of expected conditions (with existing vulnerabilities)
CBS/CCI Workshop on Operational LRF (Brasilia, Nov. 2013)
GPC/RCC/RCOF/NMHS Perspectives: Recommendations

- Improved availability and accessibility of digital hindcast and forecast data;
- New GPC products: including SST indices and ‘extremes’;
- Longer lead-time and earlier issuance of LC-LRFMME products;
- GPC contribution to capacity development of RCCs and NMHSs;
- Development of technical guidance manuals on the use of GPC/LC forecasts;
- Establishment of a regular workshop on operational long-range forecasting
CSIS Projects (GFCS IP, CSIS Annex)

- Establish and coordinate operational support for Frameworks for Climate Services at the national level in developing countries
- Define, build and make available a Climate Services Toolkit to all countries
- Establish modern Climate System Monitoring based on improved operational monitoring products
- Implementation of Climate Watch System
- Standardize the operational CSIS products
- Promote effective CSIS-wide use of WMO Information System (WIS)
- Facilitate the effective use of GPC and other global climate products by regional and national providers (e.g. RCCs and NMHSs), including the operational provision of Global Seasonal Climate Update
- Strengthening regional systems for providing climate services
### WMO Commission for Climatology Structure
16th Intersessional Period 2014-2018

#### Management Group

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<th>President</th>
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<td>Vice-President</td>
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#### ICT on CSIS

#### OPACE 1
Climate Data Management

- 1.1 ET on CDMS
- 1.2 ET on Data Rescue
- 1.3 Rapporteurs on Climate Observational Issues (including JCOMM, volunteers)
- 1.4 Inter-Programme ET on Climate Data Modernization Programme
- 1.5 TT on Statement of Guidance on CCI Observational Needs
- 1.6 Rapporteurs on Volunteer Observing Networks

#### OPACE 2
Climate Monitoring and Assessment

- 2.1 ET on National Climate Monitoring Products
- 2.2 TT on Definition of Extreme Weather and Climate Events
- 2.3 ET on Climate Change Detection and Indices
- 2.4 TT on Homogenization
- 2.5 Rapporteur on World Weather and Climate Extreme Records
- 2.6 TT on Use of Remote Sensing Data for Climate Monitoring

#### OPACE 3
Climate Prediction, Projection & Delivery Mechanisms

- 3.1 CCI/CBS Joint ET on Regional Climate Centres
- 3.2 CBS/CCI Joint ET on Operational Prediction on Sub-seasonal to Longer-time Scales
- 3.3 TT on Global Seasonal Climate Update
- 3.4 TT on Regional Climate Outlook Forums
- 3.5 TT on Tailored Climate Information

#### OPACE 4
User Interface for Climate Adaptation & Risk Management

- 4.1 ET on Climate Risk and Sector-Specific Climate Indices
- 4.2 TT on User Interface for Climate Information
- 4.3 ET on Climate Risk Management
- 4.4 Focal Points for Disaster Risk Reduction

#### OPACE 5
Capacity Development

- 5.1 ET on Education and Training
- 5.2 ET on Quality Management
- 5.3 TT on Guide to Climatological Practices
- 5.4 Advisors on Social Media
- 5.5 ET on Infrastructural & Institutional Capabilities

#### Communications Advisors

#### High Level Advisor on GFCS
CCI-XV ET-CSIS Recommendations

- Defining minimum CSIS functions and products at the three levels: global, regional and national
- Development of a system approach to support CSIS operations
- “Seamless” provision across all time scales
- Formalized structures and mechanisms
  - Needs to work up designation criteria
- Standardization in CSIS operations and products
- Enhanced capacity development programme
CSIS Minimum Functions
(*identified by CCI-XV ET-CSIS*)

- Data services
- Monitoring services
- Climate prediction services (monthly to interannual forecasts)
- Climate projection services
- Product dissemination, quality management and Capacity Building services
CCI ICT on CSIS Terms of Reference

- Identify/coordinate potential CCI contributions to CSIS;
- Elaborate a minimum set of CSIS products;
- Establish formal structures for operational CSIS elements, and facilitate the global-regional-national linkages in the flow of climate information, including the development of a CSIS Technical Reference manual;
- Help build, implement and coordinate a Climate Services Toolkit;
- Provide guidance on user interface and capacity development aspects of CSIS.
Global Seasonal Climate Update

- **Background**: Long experience with WMO El Niño/La Niña Update based on global consensus;
- **Purpose**: International consensus on current state of climate plus outlook next for 3-4 months;
- **Addresses**: major climate modes and indices; temperature and precipitation;
- **Issued**: ahead of each conventional season (at least);
- **Target users**: Regional and national centres and entities (also globally acting users, e.g. aid agencies);
- Designed by WMO scoping meeting; Coordinated by CCI TT-GSCU;
- Draft versions of GSCU have been developed and are under review by CCI/CBS experts.
CSIS relevance to GFCS/MIC Project Matrix

- Out of about 90 projects, nearly 46 projects are relevant to the CSIS activities.
- Most projects are concerned with:
  - Data services (18 projects)
  - Product dissemination, quality management and capacity building (41 projects)

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<thead>
<tr>
<th>CSIS Functions</th>
<th>Data</th>
<th>Monitoring</th>
<th>Climate Prediction</th>
<th>Climate Projection</th>
<th>Dissemination etc.</th>
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<td>No. of projects</td>
<td>18</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>41</td>
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CSIS-relevant Project example: Data Services

- Project: Yemen Agro-biodiversity and Climate Adaptation
- Country: Yemen
- Organization: Global Environment Facility/World Bank Group
- Donor: Global Environment Facility (GEF)
- Objectives related to CSIS:
  - develop climate database
  - conduct training and enhance technical capacity
- Capacity building and interaction with the users most predominant.
- RCOF: ArabCOF (under development)
- RCCs: BCC, TCC
CSIS-relevant Project example: Product dissemination, quality management and capacity building services

- Project: Global Framework for Climate Services (GFCS) Adaptation Programme in Africa
- Country: Malawi
- Organization: World Food Programme (WFP)
- Donor: WFP
- Objectives related to CSIS:
  - provide tailored climate information
  - provide radio and cell-phone based systems
  - develop training activities to disseminate tailored, easily understandable and useful climate information to farmers and pastoralists

- RCOF: SARCOF
- RCC aspirant: SADC-CSC
CSIS-relevant Project example: Monitoring Services

- **Project:** Community Based Flood and Glacial Lake Outburst Risk Reduction
- **Country:** Nepal
- **Organization:** United Nations Development Programme (UNDP)
- **Objectives related to CSIS:**
  - create protocols for risk monitoring and maintenance of artificial drainage system
- **RCOFs:** SASCOF, FOCRAII
- **RCCs:** BCC, TCC, IMD (Demo)
CSIS-relevant Project example: Prediction Services

- **Project**: Programme for Implementing the GFCS at Regional and National Scales
- **Countries**: South Asia
- **Organization**: Environment Canada
- **Donor**: Govt. of Canada
- **Objectives related to CSIS**:  
  - RCC development and operations  
  - RCOF developments and operations  
  - National CSIS capacity development including NCOFs

- **RCOFs**: SASCOF, FOCRAII
- **RCCs**: BCC, TCC, IMD (Demo)
CSIS-relevant Project example: Projection Services

- Project: Capacitating African Smallholders with Climate Advisories and Insurance Development
- Countries: Burkina Faso, Ghana, Mali, Senegal
- Donor: CCAFS
- Objectives related to CSIS:
  - generate scenarios of extreme climate events and projected climate.
- RCOF: PRESAO
- RCCs:
  - RCC Africa (ACMAD);
  - proposed ECOWAS RCC-Network (AGRHYMET/ACMAD)
Concluding Remarks

- The Climate Services Information System is the system needed to collect, process and distribute climate data and information according to the needs of users.
- Three-tier structure: global, regional and national.
- Global elements:
  - Some elements of the CSIS are formally designated and developing to GFCS vision e.g., long-range forecasts (and Global Seasonal Climate Update).
  - Other elements need policy for formal designation e.g., data, monitoring, decadal prediction, multi-decadal projection.
- Some regional elements are also in place, but need to be further expanded and strengthened.
- National elements need to be developed to enable them to optimally utilize global and regional inputs, and meet the needs of the national users.
- National Climate Outlook Forums are proposed as an ideal mechanism for NMHSs and partnering agencies to jointly interact with users of climate services.
Thank You

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