World Meteorological Organization

Weather • Climate • Water

# Climate Services Toolkit

## Overview and Current Status

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# What is a Climate Services Toolkit?

- A set of fit-for-purpose software products
  - Data portals, data management systems, analysis and prediction packages
- Accompanying training modules
  - Specifically designed to support the generation and use of climate information and prediction products that meet user needs
- Facilitates the production, communication, and application of climate information products.
- Maintains consistency and quality by establishing and implementing a set of standards for tools.

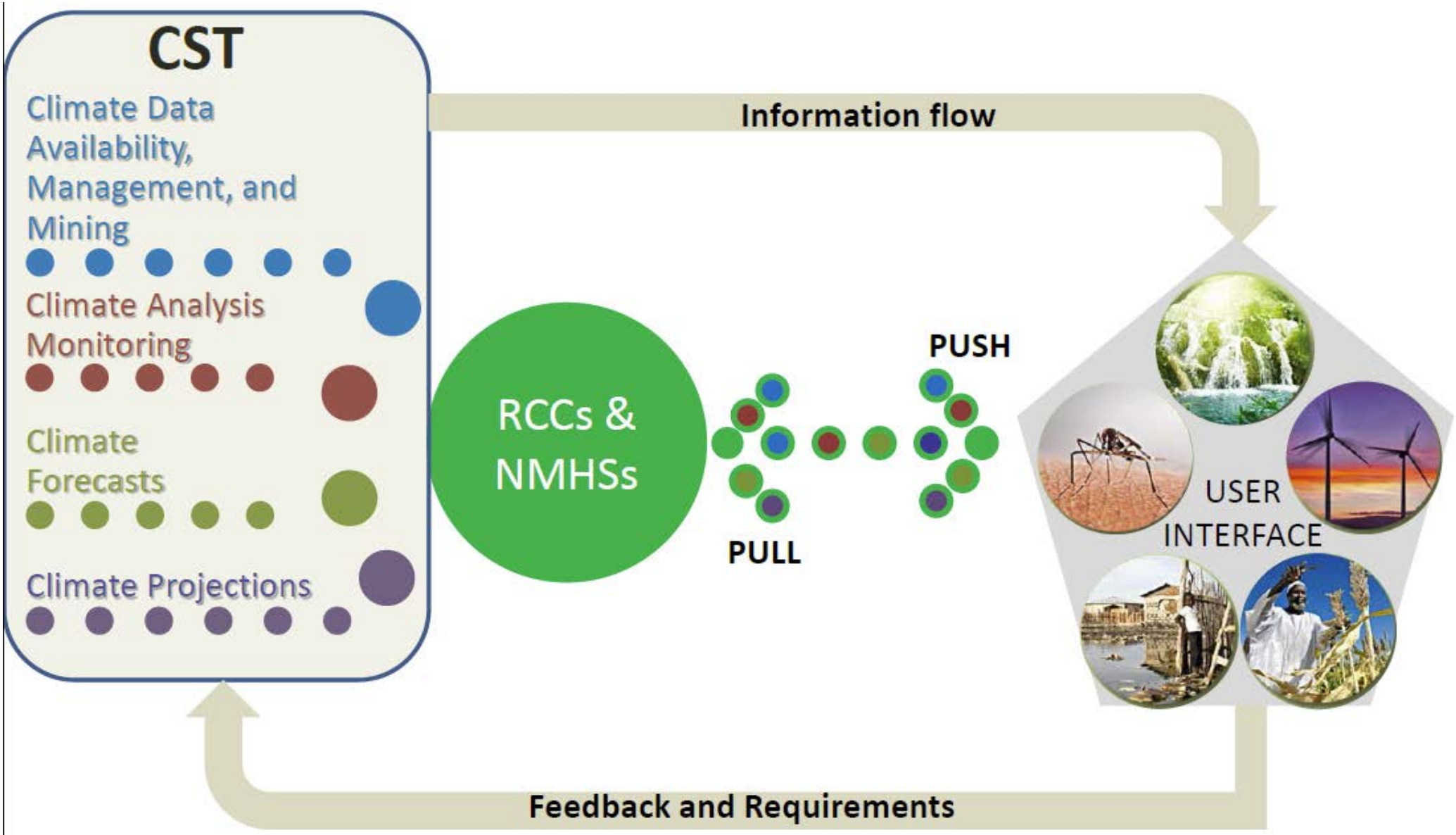
# CST Objectives

- To ensure that climate-sensitive sectors in any country have access to the most up-to-date, reliable and consistent climate information and products that meet their basic needs
- To provide a conduit for technology transfer to developing countries, enabling their access to the latest methods, techniques and information required for CSIS activities and products
- To facilitate climate services standards in effectiveness, consistency and quality for the Regional Climate Centers (RCCs) and National Meteorological and Hydrological Services (NMHSs)

# Why CST ?

- **Improve efficiency and raise capacity** of service providers by facilitating the production, communication and application of climate information products.
- Ensure that the information and products developed for and provided to end-users is **reliable**, **consistent** (through time and across regions) and of high quality.
- Share new tools, information and methods, and thereby enable all CSIS providers to **take advantage of research advances**.
- Facilitate climate services **standards and consistency** in support of NMHSs
- Enable more countries to develop their national products, and so encourage improved data sharing, and foster the interaction and shared learning between information providers through the development of a **common set of skills**.
- Reduce the need for expensive capacity building through availability of **training resources**. The Climate Services Toolkit will also make training workshops more focused, tangible and efficient in imparting the operational skills.

# Climate Services Toolkit Features and Functions



# Scope

- Data management tools – including:
  - Data portal for access to and analysis of observations and GCM outputs
  - Database management tool for quality control and simple manipulation of data
- Climate analysis tool for diagnostic analyses
- Climate monitoring tools – for calculation of anomalies, percentiles, return periods.
- Forecasting, downscaling and verification tools - for statistical and MOS Models, and with flexibility to interface to impacts models.

# Advantages

- Promotes the implementation of best practices in all countries. A toolkit would enable end-users to gain access to high-quality climate information, and would provide resource-poor service providers with access to state-of- the-science datasets and analytical procedures.
- Increases efficiency in climate service provision.
- Simplifies the learning curve required to manage and analyse data.
- Reduces the need for extensive capacity building.

# CST Requirements (1/2)

- Documented **best practices** – to ensure that tools are based upon refereed scientific principles and recognized methodologies.
- **Support** – to ensure the users of the tools need to have the expertise to operate the tools properly, and interpret the outputs correctly.
  - Training manuals and certified training programs (workshops, and remote-learning);
  - Mechanisms for providing feedback.
- **Sustainability** – to provide guarantees of on-going maintenance of the tools so that they are not made obsolete by developments in computer systems, any bugs are fixed, and new features are introduced in response to identified needs.
- **Accessibility** – the tools should be easily available from the Internet and/or available on request upon a portable electronic medium.
- **Usable** outputs – the ability to save data, analytical results, and predictions in digital and graphical publication-quality formats.

# CST Requirements (2/2)

- Multilingual user interfaces Easy-to-use
- Portable
- Offline or minimal bandwidth
- Free software or freeware
- Certification of trainers – although the tool developer is initially likely to play a primary, and possibly exclusive, role in conducting training programs, in the longer-term regional entities (e.g., RCCs) are likely to be well-placed to provide support and training for the tools.
  - Training-of-trainers programmes

# CST
## Climate Services Toolkit

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- Facilitate climate services standards and consistency in support of National Meteorological and Hydrological Services
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**Catalog of implementation resources for implementation of the results framework for WMO's contribution to the Global Framework for Climate Services**

WMO's Technical Commissions, Regional Association climate-related working groups, and programmes, including joint programmes, have generated a large number of resources for supporting the Global Framework for Climate Services (GFCS) implementation. These resources include software, guidelines and manuals, training curricula, experts, institutional assets, programme delivery capabilities and others. An initial inventory of some of these resources is below. They are organized by the five pillars of the GFCS with the last pillar, User Interface Platforms, further sub-setted into the five GFCS priority areas. These resources will be drawn upon in the course of implementing the results framework for WMO's contribution to the GFCS.

[Note to contributors: The following is initially intended as a list of examples to inform a discussion by the Presidents of Technical Commissions and Regional Associations and joint programme representatives in January 2016. Inclusion criteria include that the item identified is already operational and deployable and that the description clearly links it to an aspect of implementation of the GFCS and, ideally, specifically the draft results framework for WMO's contribution. Please note that they are categorized by GFCS pillar and priority rather than by WMO department. The initial list below is merely indicative. There is no standard format for the entries below for the moment but one can be developed subsequently.]

**Plan:**
Observations and monitoring Climate Services Information System Research Modeling and Prediction Capacity Development
User Interface Platforms

- *Disaster Risk Reduction*
- *Water resources*
- *Agriculture*
- *Health*
- *Energy*

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**Guide to Climatological Practices**
**WMO No. 100**

**All the relevant information regarding the most important practices and procedures in climatology is established in the Guide to Climatological Practices.**
**http://www.wmo.int/pages/prog/wcp/ccl/guide/guide_climat_practices.php**

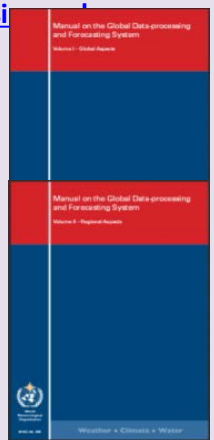
**Technical Regulations**
**Volume I: General Meteorological Standards and Recommended Practices**
**WMO No. 49**

**This volume contains the regulations of the World Weather Watch, climatology; meteorological services for marine activities, agriculture and environmental pollution; meteorological bibliography and publications; education and training; units and procedures used in international meteorological research programmes and during special observational periods.**
**http://library.wmo.int/opac/index.php?lvl=notice_display&id=14073#.VgEfHmM8qi0**

**Manual on the Global Data-Processing and Forecasting System (GDPFS)**
**WMO No. 485**

**Volume I - Global Aspects**
**(2010 Edition - Updated in 2012)**

**Volume II - Regional Aspects**
**(1992 Edition)**



**The Manual on the Global Data-Processing and Forecasting System (GDPFS) is the single source of technical regulations for all operational data- processing and forecasting systems operated by WMO Members, including their designated meteorological centres, as well as those designated in close cooperation with a WMO technical commission.**
**https://www.wmo.int/pages/prog/www/DPFS/Manual/GDPFS-Manual.html**

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| | Temperature | Precipitation | Sea Surface Temperature |
|---|---|---|---|
| Observations |  |  |  |
| Current Conditions |  |  |  |
| Forecasts |  |  |  |
| Projections |  |  |  |

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**Climate Services Tools** provide access to best practices in accessing, mining, and using information for improving climate services and supporting climate-sensitive societal challenges

Managing Data

Analyzing Climate

Monitoring Climate

Forecasting & Verification

Projecting Future

Tailoring Information

Tools Standards and Specifications

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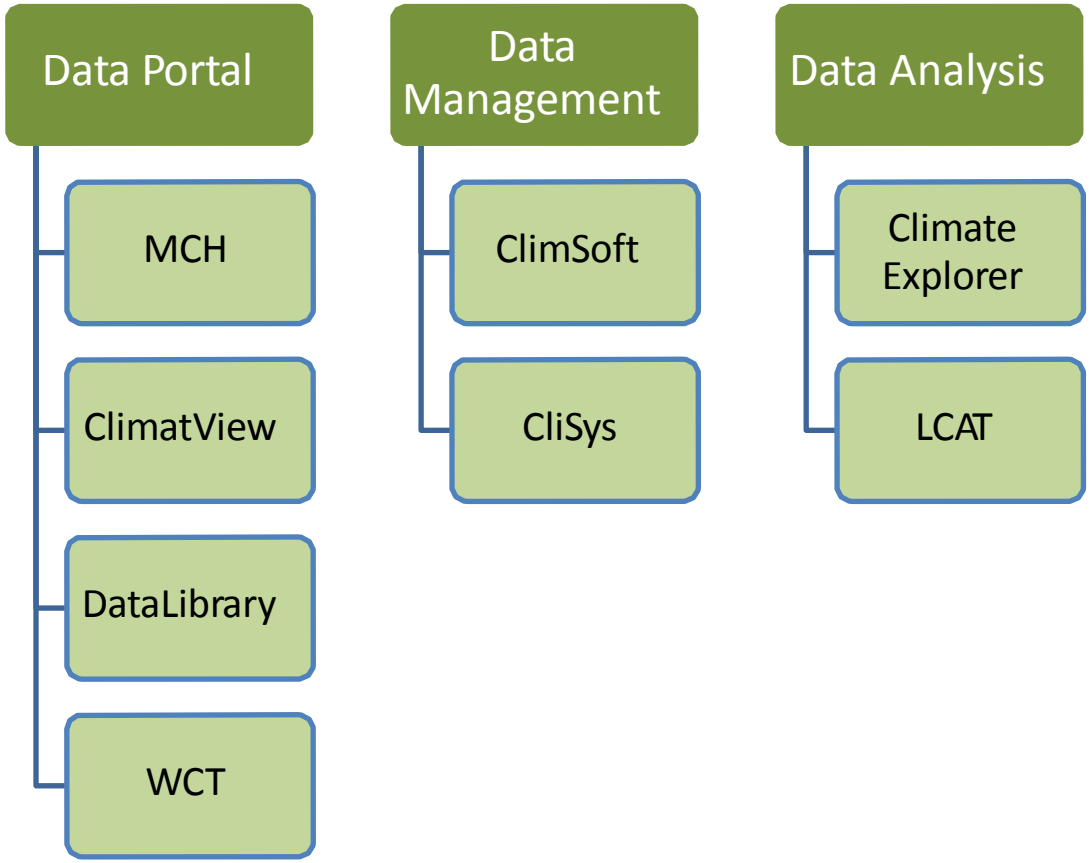
## Tools for Managing Data

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**Capacity Development** resources provide access to:

- Education and Training Resources
- Guidance on Quality Management
- Guide to Climatological Practices
- Advisors on Social Media
- Infrastructural and Institutional Capabilities

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**Education and Training Resources** provide learning progressions for staff from RCCs and NMHSs as well as technical user of climate information.

**Climate Introduction**

- Climate 101
- Climate Variability: Mechanisms, Impacts, Predictability
- Climate Change: Mechanisms, Impacts, Predictability

**Producing Actionable Climate Information**

- Climatology Products
- Climate Monitoring Products
- Intraseasonal and Seasonal Outlooks
- Assessing Future Climate

**Making Climate Sensitive Decisions**

- Tailored Climate Information
- Communication and Dissemination Practices
- Climate Adaptation Planning
- Monitoring and Evaluation of Climate Service

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**Application Exemplars** facilitate connection between climate information producers and users to enhance management of climate-related risks in the five priority areas:


Health


Water


Energy


Disaster Risk Reduction


Food Security

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**CST User Forum** fosters development of climate community including climate information users, producers, and researchers. The forum fosters usability of climate data and tools, shares information, improves climate knowledge management, and promotes ideation for climate services.

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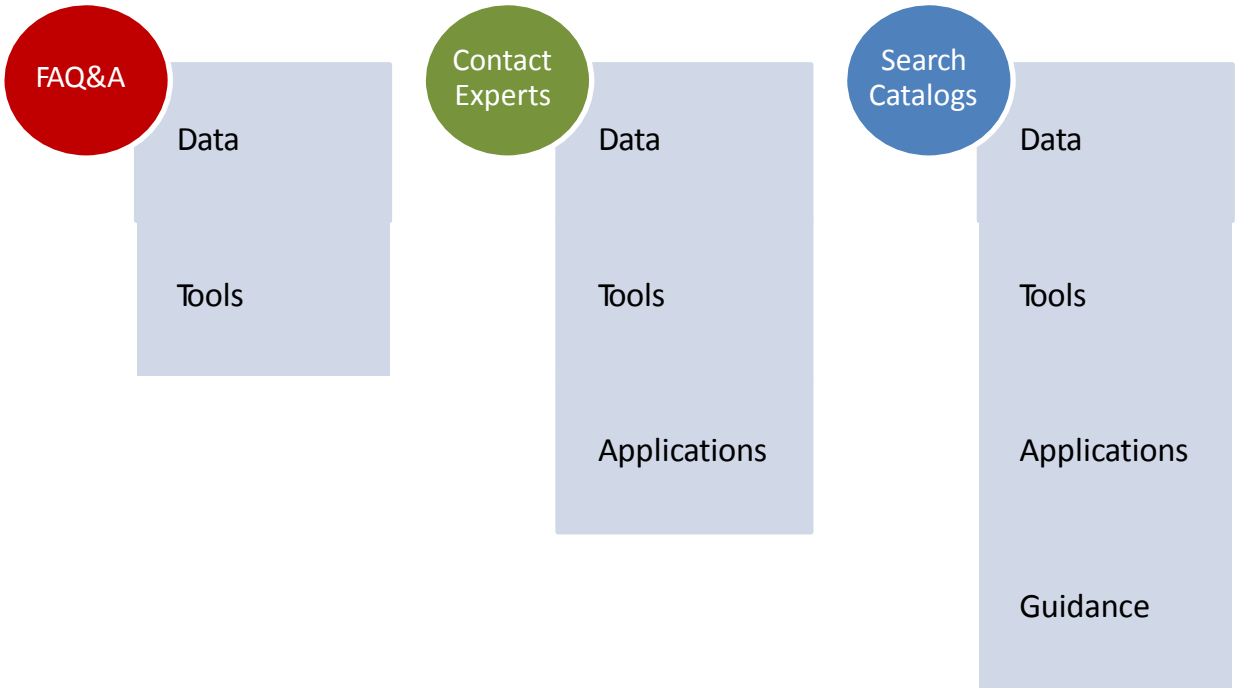
## CST Help Desk

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# CST Development and Deployment : Next Steps

- Scoping
  - Basic framing and scoping
  - Working group
  - Management process
  - Mock-up development
  - Stakeholders engagement
- Development
  - Standards and integration
  - Network of providers of climate data and tools
  - CST components coordination workshop
  - Initial integration of CST components
  - Communication strategy with stakeholders
  - Beta version of CST delivered to priority countries
- Deployment
  - CST improvement based on CST deployment in priority countries
  - Deployment of First version of CST in all countries
  - CST monitoring and evaluation process /feedback
  - Plan for CST updates
  - CST user engagement/Help Desk
- Coordination
  - Key deliverable of CCI ICT-CSIS

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# Thank You

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