1. GFCS Background
2. Background
3. NFCS-SA Priority Sectors
4. Development of NFCS-SA
5. SA’s Climate Services Landscape
6. Gaps per sector
7. Gaps per Pillar
8. NFCS-SA Benefits for the Sectors
9. Proposed NFCS-SA Model
10. Institutionalization Modalities and Options for the Implementing Structure
11. Functions of the Implementing Structure
12. NFCS-SA Governance Structure
13. Implementation Roadmap
14. Next steps
The National Framework for Climate Services for South Africa (NFCS-SA) is the country’s response to the declaration of the World Climate Conference-3 (WCC-3), held from 31 August to 4 September 2009 in Geneva, Switzerland.

It was decided through the conference declaration that a Global Framework for Climate Services (GFCS) be established to strengthen the production, availability, delivery and application of science-based climate monitoring and prediction services.

It is envisaged at the country level that the NFCS-SA will enable the country to implement the GFCS requirements, and furthermore will contribute towards the implementation of the provisions of legislation such as the South African Weather Service Act, 2001 (Act No.8 of 2001), Disaster Management Act, 2001 (No. 57 of 2002), insofar as it relates to climate services.

The 16th World Meteorological Congress (13-15 October 2011, Geneva, Switzerland) endorsed the report of the High Level Taskforce (HLT), and requested the World Meteorological Organization (WMO) to lead the development of the draft Implementation Plan (IP) of the GFCS;

The GFCS was developed with the active involvement of the relevant stakeholders, including United Nations (UN) bodies.

The High-level Taskforce (HLT) recommended that, to address the entire value chain for the production and application of climate services, the GFCS should consist of five elements or pillars namely:

- User Interface Platform (UIP)
- Climate Services Information System (CSIS)
- Observations and monitoring
- Research, modelling and prediction
- Capacity development
The NFCS-SA aims to provide climate information in a way that assists decision making by individuals and organizations. A service requires appropriate engagement along with an effective access mechanism and must respond to user needs. Climate service is climate information prepared, disseminated and delivered to meet a user’s needs (public or a specific user).

**Background**

<table>
<thead>
<tr>
<th>NFCS-SA Aim</th>
<th>To strengthen production, availability, delivery and application of science-based climate prediction and services.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The basic purpose of the NFCS-SA</strong></td>
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<tr>
<td>Need</td>
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<tr>
<td>Generation</td>
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<tr>
<td>Packaging</td>
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<td>Dissemination</td>
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<tr>
<td>Utilisation (Application)</td>
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</table>

Society will need information tools to adapt as the climate will continue to be variable and to change notwithstanding steps taken to reduce GHG emissions.

**Effective national implementation of the GFCS will realise the enhancement of:**

1. Effective adaptation responses to climate change and variability.
2. Climate observations and monitoring.
3. Transformation of climate information into sector-specific products and applications; and
4. Dissemination of those products widely;
Consultation with NFCS-SA Priority Sectors in South Africa

- Human Settlements
- Health
- Water
- Disaster Management and Reduction
- Agriculture and Food Security
- Biodiversity
- Energy
- Oceans and Coasts
Development of NFCS-SA

The development of the National Framework for Climate Services in South Africa is premised on a phased approach.

**Phase 1: Roadmap for Climate Services**

Gaps identified:
- Data quality and availability - Quality control
- Lack of data available at a micro-level - Downscaled information.
- Certain organisations supplement data from larger databases (SAWS & ARC)
- Limited understanding of range of CS and products available.
- Lack of human capacity to engage and understand climate services completely (SARVA utilisation)
- Funding availability and periodicity;
- Science policy interface - climate scientists and decision making process

**Phase 2**

Mapping the climate services landscape
- Government
- Universities
- Meteorological and related Services
- Sectors/Focus areas
  - Agriculture
  - Water
  - Energy
  - Biodiversity
  - Health
  - Disaster management
  - Organisations/Councils and Others

**Phase 3**

Gap analysis
- ID & analysis of gaps in South Africa’s climate services landscape, based on:
  - GFCS requirements for establishing a NFCS; and
  - Current vs Desired state

**Phase 4: NFCS-SA**

Framework & Implementation Plan of NFCS-SA

- Literature review.
- Roadmap.
- Interviews.
- Database detailing role players, CS service offerings, Activities, interface mechanisms. Indicative collaborative mechanisms.
### SA’s climate services landscape

<table>
<thead>
<tr>
<th>User Interface Platform</th>
<th>Climate Services Information</th>
<th>Research, Modelling and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAWS</strong></td>
<td>There are a number of players within South Africa who are collating climate/weather data into different products for different user requirements, who form part of the current ‘climate services information system’ within the country, including but not limited to -</td>
<td>Various players within South Africa’s climate services landscape are involved in research related to climate data, and climate change and the potential impacts thereof -</td>
</tr>
<tr>
<td>Website</td>
<td>CSAG</td>
<td><strong>Four main institutions active in climate modelling in South Africa</strong></td>
</tr>
<tr>
<td>Email alerts</td>
<td>SARVA</td>
<td>SAWS</td>
</tr>
<tr>
<td>SMS</td>
<td>SAWS</td>
<td>University of Pretoria</td>
</tr>
<tr>
<td>Radio</td>
<td>ARC</td>
<td>CSIR</td>
</tr>
<tr>
<td>Televised alerts</td>
<td>AgriSA</td>
<td>CSAG</td>
</tr>
</tbody>
</table>

**Department of Agriculture, Forestry and Fisheries**
- National Agro-Meteorological Committee
- Communication through Extension Officers

**SARVA**
- Newsletters
- Online portal

**Advanced Fire Information System (AFIS)**
- Television
- Twitter
- SMS
- Cell phone app

**ARC**
- Other organisations collect weather data to bolster data made available by SAWS etc., including universities, Eskom and SASRI
Observation and Monitoring

Weather data collection and monitoring is undertaken by a number of organisations within South Africa for various means. ARC and SAWS appear to have the biggest footprint in terms of observation and monitoring equipment and coverage -

- The ARC has a total of 543 weather stations across South Africa, of which 25% are GPRS enabled.
- SAWS has weather observational infrastructure in all nine provinces of the country, which includes:
  - 25 Weather Offices
  - 166 Automatic Weather Stations
  - 32 Electronic Manual Stations
  - 169 Automatic Rainfall Station
  - 1214 Manual Rainfall Stations
  - 15 Manual Climate Stations
  - 11 Upper Air Observation Stations
  - 13 Air Quality Observation Stations
  - 2 Dobson Ozone Observation Stations
  - 1 Baseline Surface Radiation Network
  - 23 Sea Surface observation Sites
  - 12 Voluntary Observation Ships (VOS)

Capacity Development

With regards to capacity development related to climate services, South Africa offers various courses/qualifications with meteorological/climatology themes, and has other means of capacity development, including, for example -

- WMO Regional Training Centre within SAWS’ operations which are considered a critical capacity building resource.
- Bridging course offered by University of Pretoria to allow a conversion from pure sciences into meteorology. Thereafter students can undertake a BSc Hons in Meteorology.
- CSAG’s two week winter schools course in climate change and adaptation.
- SAWS has a community outreach programme to raise awareness around extreme weather and build capacity with regards to weather services.
- SAEON has established a number of weather stations at schools as part of a capacity building campaign – learners and teachers are engaged and capacitated to collect and utilise the data.
# Gaps Per Sectors

## Agriculture and Food Security
- Awareness on **climate-resilient crop varieties**.
- **Forecast information and data**.
- **Onset of rain season**.
- Appropriate measures to maintain/improve yields under drought conditions (i.e., measures to maintain soil productivity, and appropriate irrigation techniques).
- **Extension officers** require capacity development related to CS & products.
- Capacity building of both **scientists and users** to improve the user interface.
- Training on the range of climate services and products presently available to the farming community.

## Health
- **Health + socio economic conditions climatic conditions**
- Climate change and weather data are a new area of research for the MRC (mapping malaria, diarrhea using climate data and GIS).
- Successful adaptation planning dependent on **data quality** and **access**.
- DOH undertaking the first health vulnerability assessment with WHO.
- **Capacity and coordination** – implications for research quantification of the possible climate change implications for the health sector. For example, existing research does not often take into account non-climatic factors when modelling the potential impacts of a change in climate on a disease variable.

## Disaster Risk Reduction (DRR)
- South Africa needs a **national-level flood risk map**.
- **Improvements** in Early warning systems.
- **Funding models** for DRR.
- Existence of formal **district disaster management advisory forums** in municipalities.
- **Coordination** between different government departments involved in disaster management.
- **Functionality of Early Warning Committees**.

## Water
- The sector is sensitive to change with only 12% of the country’s land area accounting for 50% of available surface water resources.
- Supply-demand aspects and associated CS.
- High quality data and long-term observation is critical for modelling efforts in the water sector. A long hydrology record is imperative to meet needs for forecasting and prediction.
### Gaps Per Pillars

#### Gaps: Users and User Interface
- One main web portal to introduce all user interfaces available & data held.
- Fit for purpose:
  - Scientists/researchers are not fully aware of user requirements
  - Users are not clear on what information can be made available.
- Access mechanisms insufficient
- Language barriers

#### Gaps: Climate Services Information System
- Limited length of data records prevent robust historical trend data.
- Insufficient spatial density of data for SA’s complex micro-climates.
- Digitisation of data is required where data is not in a usable format.
- Climate data @micro-level, projections & VA implications
- Data limitations (scope & format)
  - Restricts the comparability (different data says different things).
  - The data resolution is sometimes poor.

#### Gaps: Observations and Monitoring
- Additional stations required & sustained maintenance of existing networks.
- Need standardisation of quality control mechanisms for agencies collecting data.
- Metadata (i.e. ‘data about the data’) records need enhancement
- High quality historical and real-time observations and data required climate and non-climatic variables

#### Gaps: Research, Modelling and Applications
- Seasonal forecasting challenges, including
  - uncertainties in the predictions; and
  - limitations associated with the delivery and uptake of the forecast information because users are not necessarily familiar with the data.
- Additional research required focused on the impact of meteorology/weather on socio-economic development in the country (i.e. vulnerability studies).

#### Gaps: Capacity Development
- Capacity building of meteorologists and climate scientists (data type and format)
- Contextual awareness & capacity development for providers, intermediaries and users
- Capacity building of both scientists and policy makers may be required related to policy planning for climate services.
### NFCS-SA Benefits for the Sectors

<table>
<thead>
<tr>
<th>Human Settlements</th>
<th>Health</th>
<th>Water</th>
<th>Energy</th>
<th>Disaster Management and Reduction</th>
<th>Agriculture and Food Security</th>
<th>Biodiversity</th>
<th>Oceans and Coasts</th>
</tr>
</thead>
</table>
| - Climate Services will inform National socio-economic planning and development (including poverty reduction strategies) as well as natural capital accounting, and | - Resource allocation planning for hospitals, health care centres and clinics  
- Better management and contingency plans on climate sensitive diseases such as malaria, meningitis and waterborne diseases,  
- Understanding of how environmental and climate factors influence the timing and location of increased health risk  
- Climate services will inform the integrated Water Resource Plan (i.e. Rainfall patterns) Planning within the country  
- Inform design of resilient water infrastructure such as dams, irrigation systems, flood protection systems, etc.  
- Climate services will provide the necessary tools required by ecologists to forecast climate change impacts on biodiversity species distributions, abundance and extinctions.  
- Provides for an integrated and unified framework to identify species vulnerability and adapt biodiversity management interventions  
- Climate services will inform the Integrated Resource Plan (IRP) in the country  
- Inform development of climate resilient infrastructure such as transmission and distribution networks  
- Renewable Energy Planning (Based of Wind, Solar, Rainfall forecasts)  
- Informs government Energy Efficiency policy and programmes | - Inform water supplies and disaster risk reduction. | - Climate services will inform the integrated Water Resource Plan (i.e. Rainfall patterns) Planning within the country  
- Inform design of resilient water infrastructure such as dams, irrigation systems, flood protection systems, etc.  
- Climate services will inform the Integrated Resource Plan (IRP) in the country  
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- Renewable Energy Planning (Based of Wind, Solar, Rainfall forecasts)  
- Informs government Energy Efficiency policy and programmes | - The NFCS can provides for Early Warnings and Extreme weather events to support better climate change risk preparedness.  
- Will provide for hydro-meteorological hazards forecasting to inform Disaster Management and Reduction on-time  
- Climate products and services can assist land use and city planners in developing policies and action plans that can strengthen resilience in the face of natural disasters.  
- Provides forecasts of droughts, heat waves, floods and storms which can lead to crop failure, food insecurity, ruined livelihoods, mass migration of people; and reduced national economic growth; and thus enables better climate disaster preparedness.  
- Enables farmers to make better planting, cropping and marketing decisions.  
- Climate services will provide the necessary tools required by ecologists to forecast climate change impacts on biodiversity species distributions, abundance and extinctions.  
- Provides for an integrated and unified framework to identify species vulnerability and adapt biodiversity management interventions  
- Climate services will provide information and tools that can be used to improve the safety of coastal communities and support their sustainable development through enhancing coastal inundation forecasting and warning systems that are part of the national disaster management.  
- Provide marine meteorological forecasts and warnings of coastal and open ocean conditions that are enormously essential for marine transport and operations, for the safety of life and property in coastal areas and that of operations of ports and harbours. |

**Disaster Management and Reduction**
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- Enables farmers to make better planting, cropping and marketing decisions.
Proposed NFCS-SA Model
Proposed Modalities for creating institutional mechanism

The are various options available for the establishment of the NCC, this will require political decision to be made to inform the model best suited for South Africa. There are issues that need to be carefully considered to inform the final decision, ensuring that the envisaged mandate of the NCC is strengthened.

1. Programme
   - Limits growth of NCC;
   - NCC can derive benefit from existing infrastructure and capacities;
   - Quicker to implement;
   - Need to establish new relationships with CS providers;
   - NCC has limited independence.

2. Legislated Entity
   - High levels of independence
   - Need to be legislated;
   - Might take time to implement.

3. Division or Unit in an existing entity
   - Need to operate within the legislative and policy mandate of the host entity;
   - Can derive benefits from existing infrastructure and capacity;
   - Quickest to implement.

Further investigate work require to be undertaken during the Business Case development, to enable informed decision making with regard to the hosting of the NCC.

Key issues to consider:

1. NDP proposition on the Climate Change Centre (Independent).
2. Weather Service Act provisions on climate data and information.
3. Benchmark outcome, showing how various countries have established their NCC type of entities.
4. Current climate service gaps, the model selected must help bridge these gaps.
Beyond NFCS-SA development, next steps

NFCS-SA

- Resource Mobilisation Strategy
- Capacity Building Strategy
- Communication and awareness strategy
- Information Management Plan

- NFCS Governance Structure
- National Climate Centre
- Resource requirements, Institutional arrangements
- NFCS-SA Implementation Plan
- Monitoring and Evaluation
- Risk Management Plan

NFCS-SA Next steps

1. Business Case for NCC
   a. Capital cost
   b. Operational costs
   c. Funding
   d. Governance
   e. Operating model
   f. Organisational structure
   g. Advocacy of the NCC (provincially, nationally, globally)
   h. Financial model (10 yrs)
2. Legislation of the NCC (Scheduling in terms of National Treasury)
3. Seed Finance for the NCC
4. Institutionalise the NCC
5. Operationalise the NCC (Preparation of funding proposals, implementing sector plans, fundraising Road shows, etc.)
Questions?

Thank you

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