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SASSCAL: Climate Services for Southern Africa

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(with contributions from SASSCAL PI's, UHH, ND's)

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Regional Challenges



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NATIONAL

Food insecurity affects 580 000 Namibians

October 27th, 2015 | by *New Era Staff Reporter*
Windhoek About 580 000 Namibians are adversely affected by the current drought and will have to rely on government assistance until at least March 2016, a crop and vulnerability assessment found. As such, Deputy Prime Minister...



Drought conditions worsen in //Karas

October 21st, 2015 | by *New Era Staff Reporter*
Keetmanshoop Farmers in //Karas Region continue to lose their livestock due to poor grazing. The acting chief agricultural scientific officer in the Ministry of Agriculture, Water and Forestry, Clarence Ihapa Tjiho, said the...



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Emergency | Drought in Angola and Namibia

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World: Southern Africa Growing Season 2016-2017: Recovery Hampered by Floods and Drought?

Feb 20, 2017

HIGHLIGHTS • Good performance of the current growing season (October 2016 - April 2017) is badly needed for Southern Africa after two consecutive El Nino induced droughts that led to unprecedented levels of food insecurity. • The growing season is now well established with favourable growing condition observed in most of Botswana, Zimbabwe, Mozambique and NE South Africa. However, ... (continue reading)

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able 'Extreme measures are needed': Namibia's battle with drought comes to its cities

Coca-Cola has had to partially relocate and small business workers are being hit hard. Yet still not enough is being done to address the water crisis



What is SASSCAL

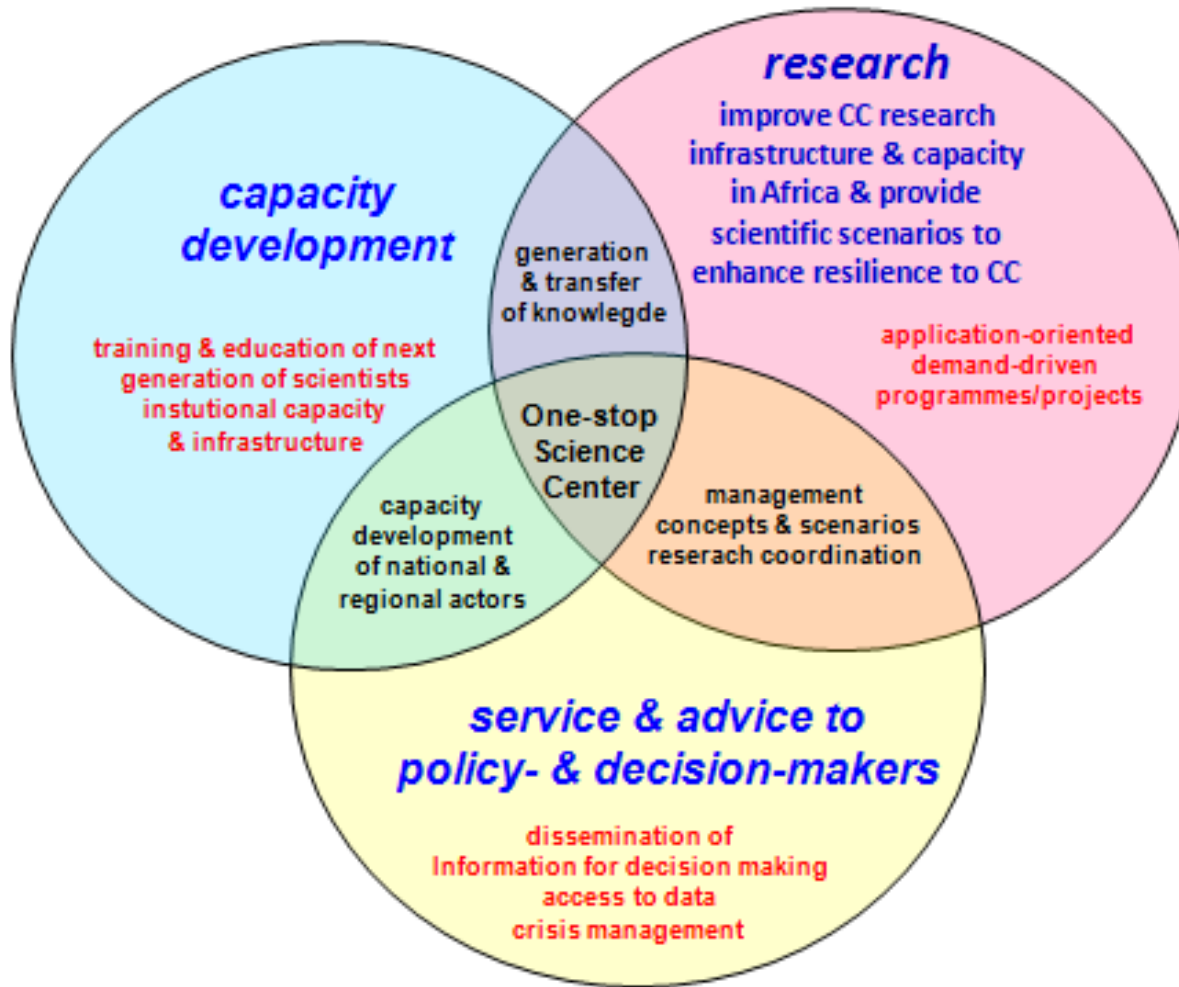


“SASSCAL* is the **REGIONAL** driver for innovation and knowledge exchange to enhance adaptive land use and sustainable economic development in a highly vulnerable region of Southern Africa under global change conditions.”

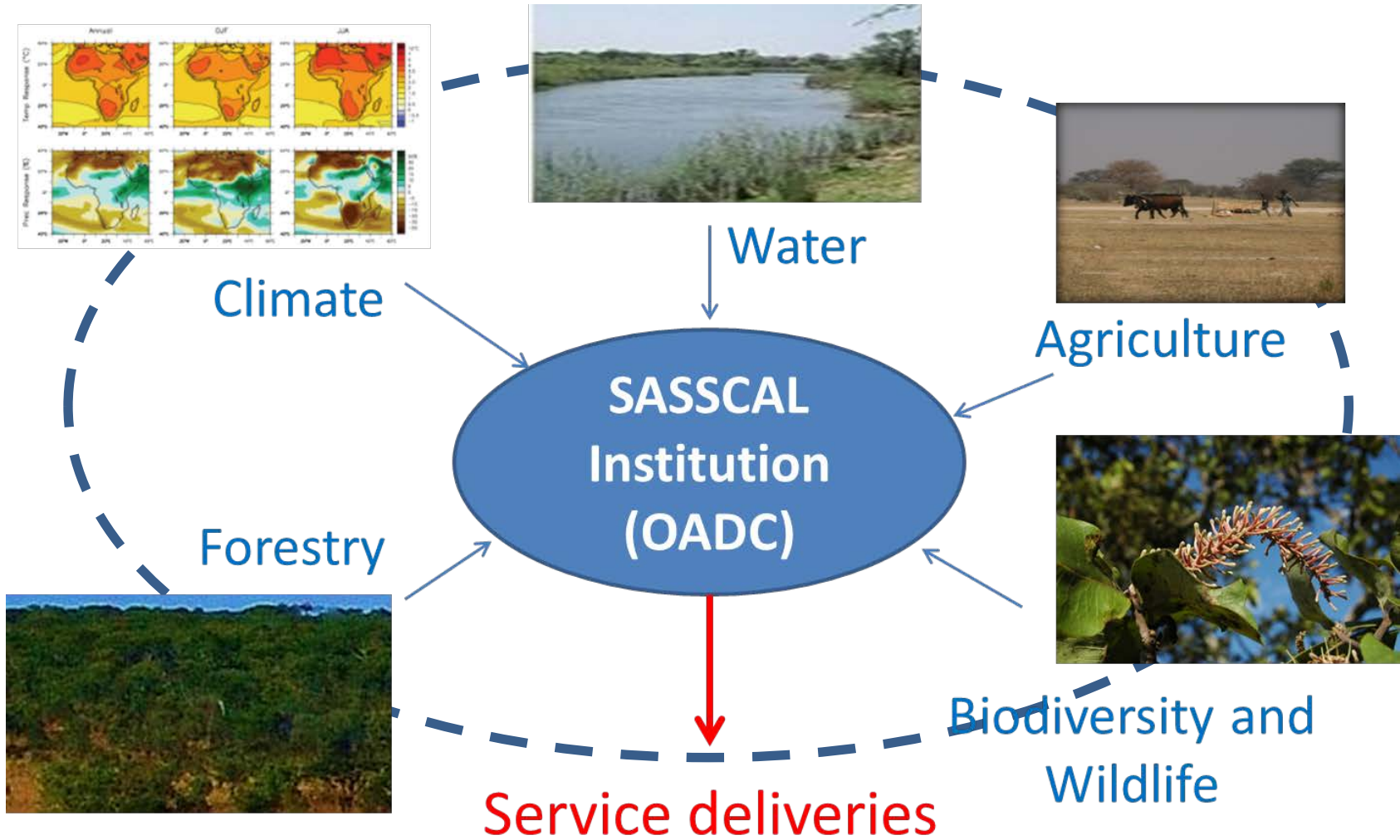


* SASSCAL is a joint initiative of Angola, Botswana, Germany, Namibia, South Africa and Zambia.

SASSCAL Pillars of Operations



SASSCAL Themes



CS needs in SASSCAL research



- Water quantity
- Wetland functioning
- Groundwater origin, recharge, quality and use
- Floods generation, modelling and forecast
- Climate/global change impacts
- Sedimentation/erosion
- Decision support

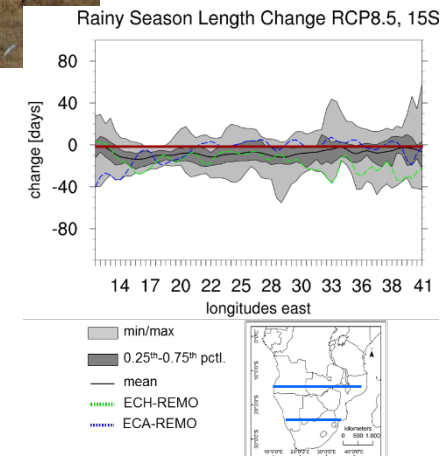
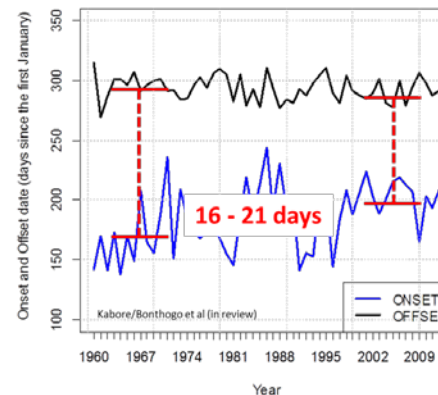
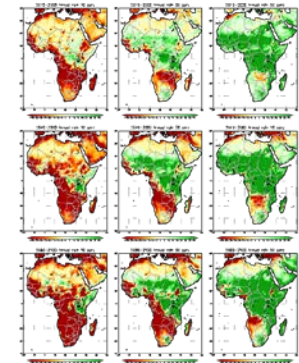
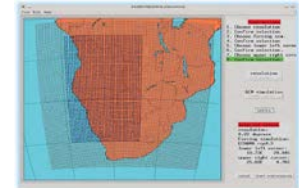
- Optimised agricultural practices (CC adaptation)
- Agricultural impact studies
- Socio-economic studies
- CC driven Wildlife/Human conflicts

- Climate and land management change assessment
- Fire monitoring & impact
- Forest regeneration and growth/deforestation rates in different forest types
- Habitat disturbance studies

- Longterm Biodiversity Monitoring
- Habitat disturbance
- Fog-driven biodiversity
- Animal biodiversity and conservation
- Fire impact

SASSCAL Climate

- Climate Observation (SASSCAL Weathernet)
- Historical and ongoing data management (incl. rescue and archiving)
- Climate extremes
- Regional downscaling and uncertainty assessments
- Development of a user-friendly regional climate model
- Climate change analysis
- Seasonal forecasting
- Fog dynamics (Namibia)

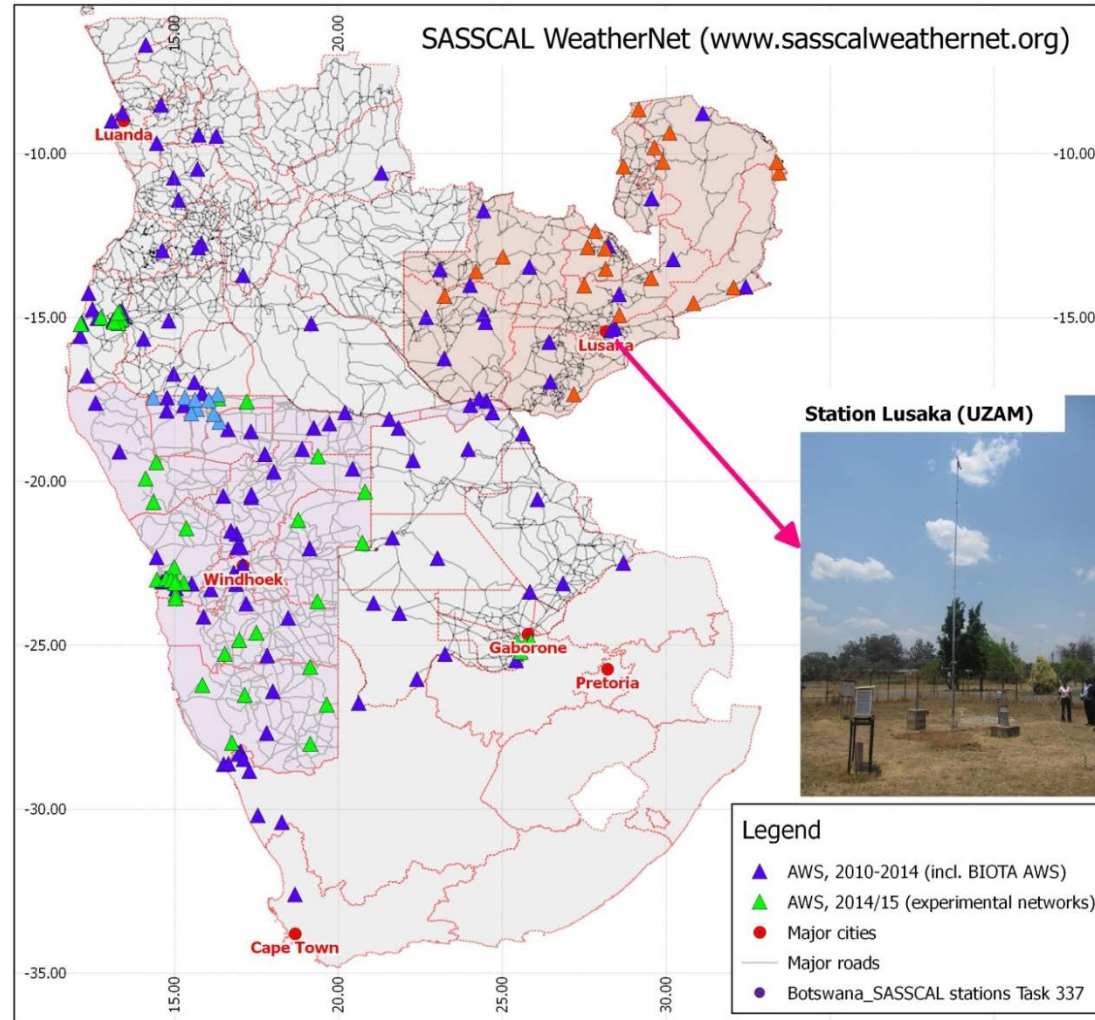


SASSCAL Observation

SASSCAL WeatherNet

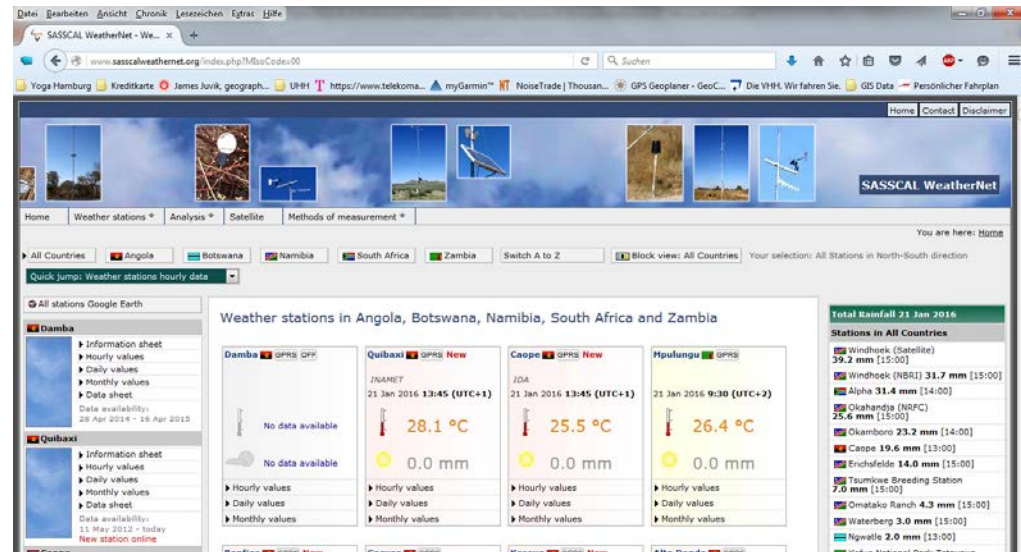
- Regional coverage
 - 161 M/AWS in operation
 - 143 online (2016)
 - Additional M/AWS on observatories
 - add. Rain/fog gauges
- 3 experimental networks
 - Rio Giraul (10 AWS+)
 - Gobabeb (10 AWS)
 - Notwane (5 AWS)

→ Detailed assessments on flash flood generation, sedimentation and fog



SASSCAL Observation

- Installation, operation and maintenance of AWS (WMO standards)
- Developing, implementing, hosting and maintaining a web-based data access facility (open access, real-time)
- Data storage, back up and provision
- Service support (Biodiversity Observation Network and others)
- Investment of > 2 Mio. € since 2012



Variables

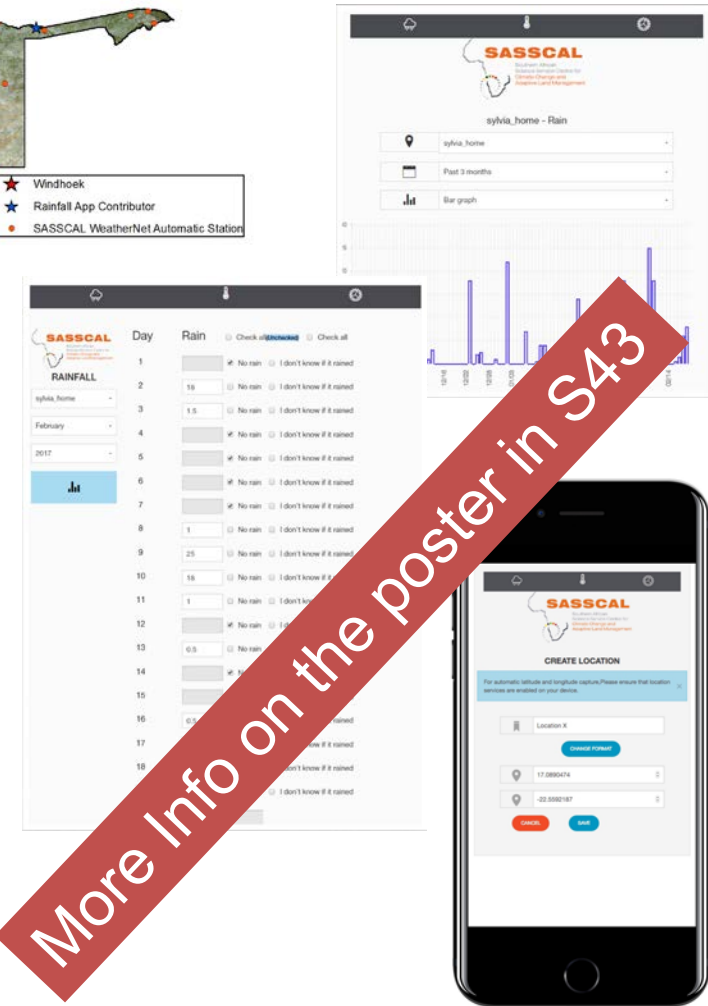
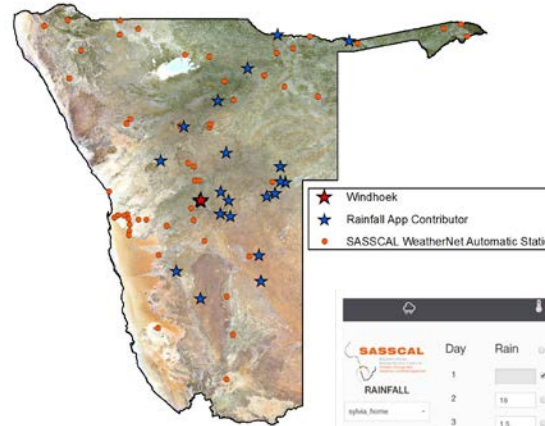
- Rainfall
- Air temperature
- Relative humidity
- Solar radiation
- Wind speed/direction
- Soil temperature
- Barometric pressure
- Optional (e.g. soil moisture, leaf wetness, fog)

More Info on the poster in S15



SASSCAL Rainfall App

- collection of rainfall data from individuals and organisations (>20)
- a device-independent, web-based data entry platform
- simple, intuitive front-end (mobile devices) -> citizen science
- comparison entries with the G-WADI satellite rainfall data product
- expansion over the SASSCAL region envisaged



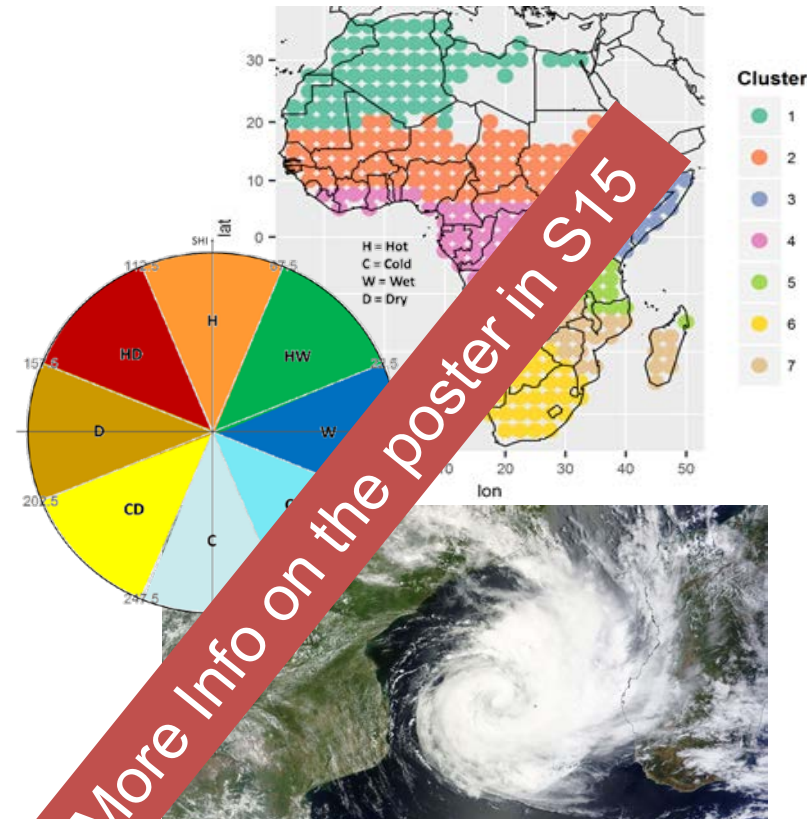
More Info on the poster in S43

SASSCAL ECI Improvement

CSIR and SASSCAL verify and further develop the ECI for application in African countries, through a project funded by ARC.

Focus on:

- Definitions of extremely wet and dry conditions
- Verification of best available datasets for ECI
- Projected trends in the ECI under climate change (with regional projections from the CSIR and CORDEX).
- Development of a web-based climate service informing African Stakeholders on climate extremes.



Tropical Cyclone Dineo heading towards southern Africa on 14 February 2017 (MODIS imagery courtesy of NASA's Distributed Active Archive Centers (DAACs)).

SASSCAL Data rescue/archiving

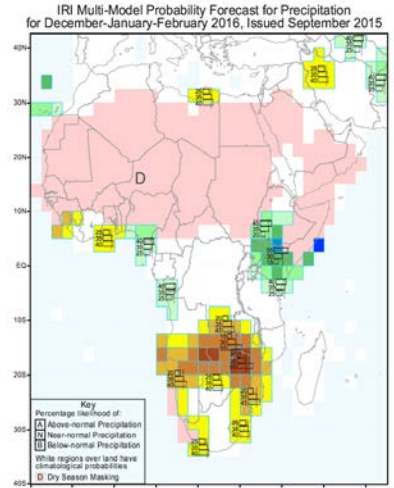
MetServ in Angola, Botswana, Germany, Zambia

- Compiling **historical climate records** of different archives, starting in the 1870s.
- Organizing and support of **inventory, archiving and digitization**
- Assisting with the **homogenization** of time series
- **Filling gaps** of existing climate records
- Combination of different datasets, e.g. colonial stations in DWD's archive with current stations in the SASSCAL region.

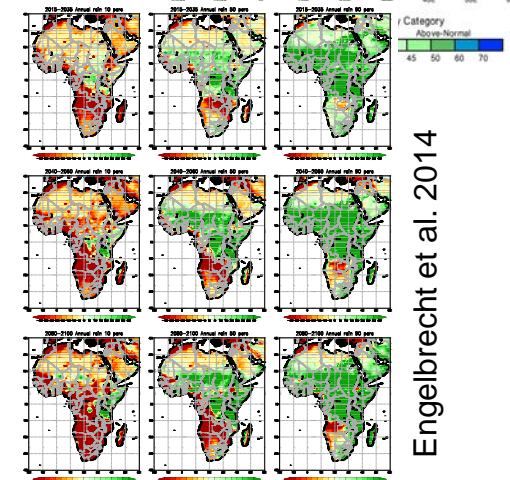


Climate Modelling

- Systematic extension of existing regional climate change projections (GERICS)
- Regional climate change assessment based on multi-model, multi-method ensemble based on the WCRP CORDEX Africa process (CSIR/UCT/GERICS)
- Seasonal forecasting (CSIR)
- Capacity building (e.g. climate modelling courses, CORDEX Africa Training Programme)



Engelbrecht et al. 2016



Engelbrecht et al. 2014

Time-slabs annual rainfall anomalies (mm) – based on six CCAM A2 SRES scenarios

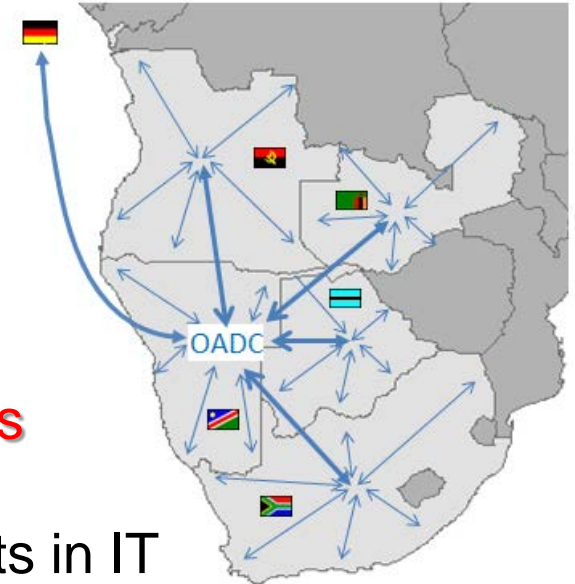
See programme for more info

SASSCAL OADC/KE

- Open Access Data Center / Knowledge Exchange (Windhoek and NNs)
- in operation since 09/2014

OADC functions

- **Archiving** of SASSCAL data and **Open Access**
- **Operating** an up-to-date SASSCAL **website**
- **Advising** and **training** of SASSCAL participants in IT
- **Service provision** in the perspective of CS and LM
- Establishing and maintaining **contacts** with IT institutions, networks and individuals outside SASSCALs (eg SADC, GBIF, WMO, FEWSNET, ARC, MN, UNDP)
- **Quality** assurance / preparation / harmonization of SASSCAL data
- **Development** and support of offline and online **software** tools



SASSCAL applications

Scientific applications (amongst others)

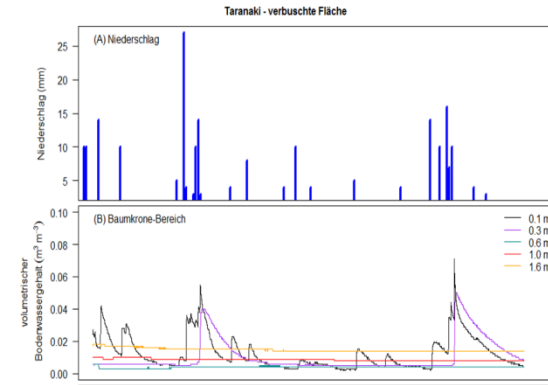
- process research (erosion, sedimentation, biodiversity, local climate effects)
- climate modelling and forecast
- fog studies
- yield forecast

Operational applications (amongst others)

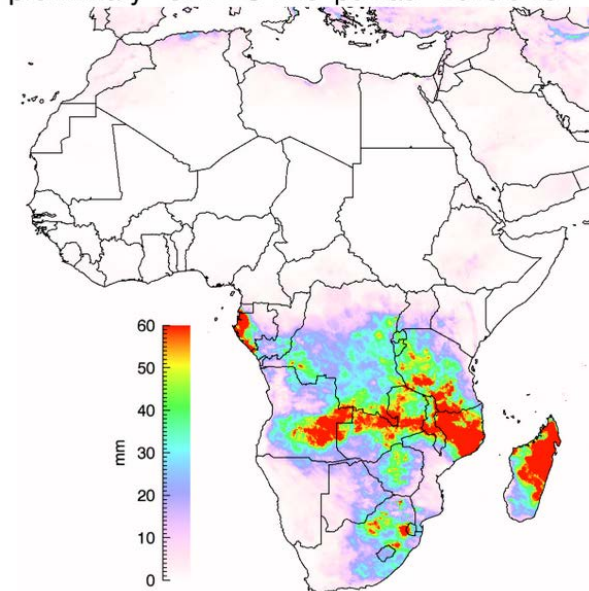
- FEWSNET/CHG/USGS
- ARC, UNDP, (WMO)
- Ministries (e.g. MAWF Namibia)
- eg weather forecast, flood warning

Public users

- radio channels, farmers, lodge owners



preliminary CHIRPS v2.0 pentad 2016.01.3



SASSCAL Outreach

SASSCAL

Southern African
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Climate Change and
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Thank you for your attention!