

WMO's Severe Weather Forecasting Demonstration Project (SWFDP)

Status and Summary of Experience

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WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

WMO's Severe Weather Forecasting Demonstration Project (SWFDP)

- SWFDP was started in 2006 with its first regional subproject in Southern Africa with involvement of just 5 countries. Later, the subproject was expanded in 2009 to benefit all 16 countries in the sub-region.
- Now SWFDP covers eight sub-regions (Southern Africa, South Pacific, Eastern Africa, Southeast Asia, Bay of Bengal, Central Asia, Eastern Caribbean and West Africa) and involves over 75 developing countries including around 45 LDCs and SIDS.



Why a project on severe weather forecasting?

Basic function and Mandate of NMHSs:

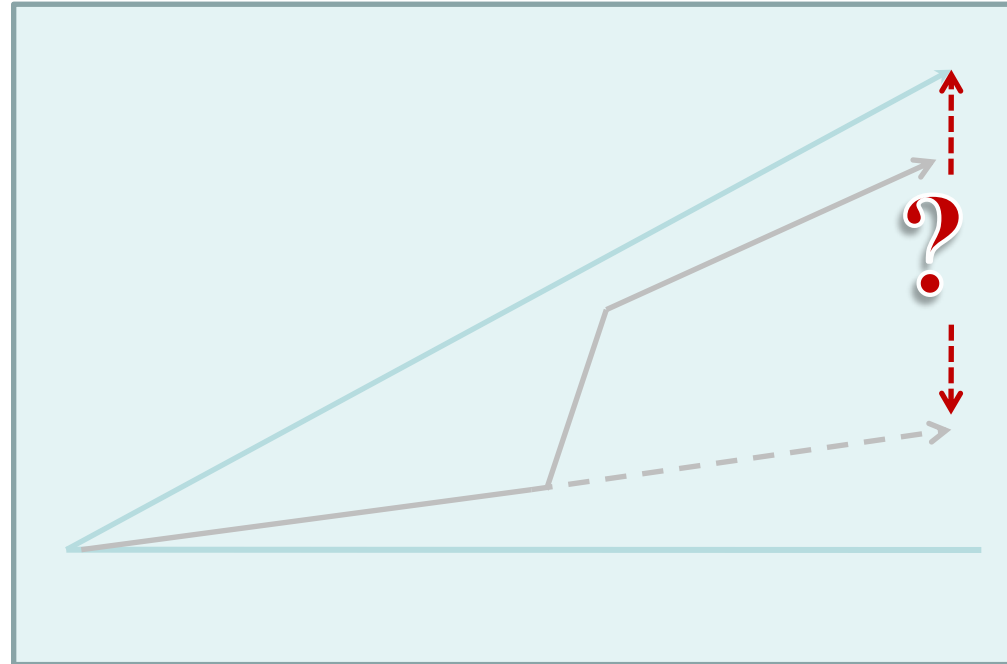
To provide weather information and services for protection of life, livelihood, property, and infrastructure, and for application sectors including conservation of environment



Severe weather events are mostly responsible for hydrometeorological hazards and disasters

Why a project on severe weather forecasting?

- Dramatic developments in weather and climate prediction science
- Leading to improved alerting of hydro-meteorological hazards, at ever-increased precision, reliability, and lead-times of warnings
- NMHSs in many developing countries (including LDCs and SIDS) are generally less resourced
- Gap in application of advanced technology in early warnings (NWP and service delivery)
- WMO SWFDP attempts to close this gap, by applying the *'Cascading Forecasting Process'* (by making efficient use of the GDPFS centres)



Vision

WM Congress provided vision on NWP strategy to improve severe weather forecasting and warning services in developing countries

“NMHSs in developing countries are able to implement and maintain reliable and effective routine forecasting and severe weather warning programmes through enhanced use of NWP products and delivery of timely and authoritative forecasts and early warnings, thereby contributing to reducing the risk of disasters from natural hazards.”

Cg-15 (2007)

Realizing the Vision

**Collaboration between GDPFS Centres and
involvement of Public Weather Services (PWS) and
other relevant WMO Programmes**

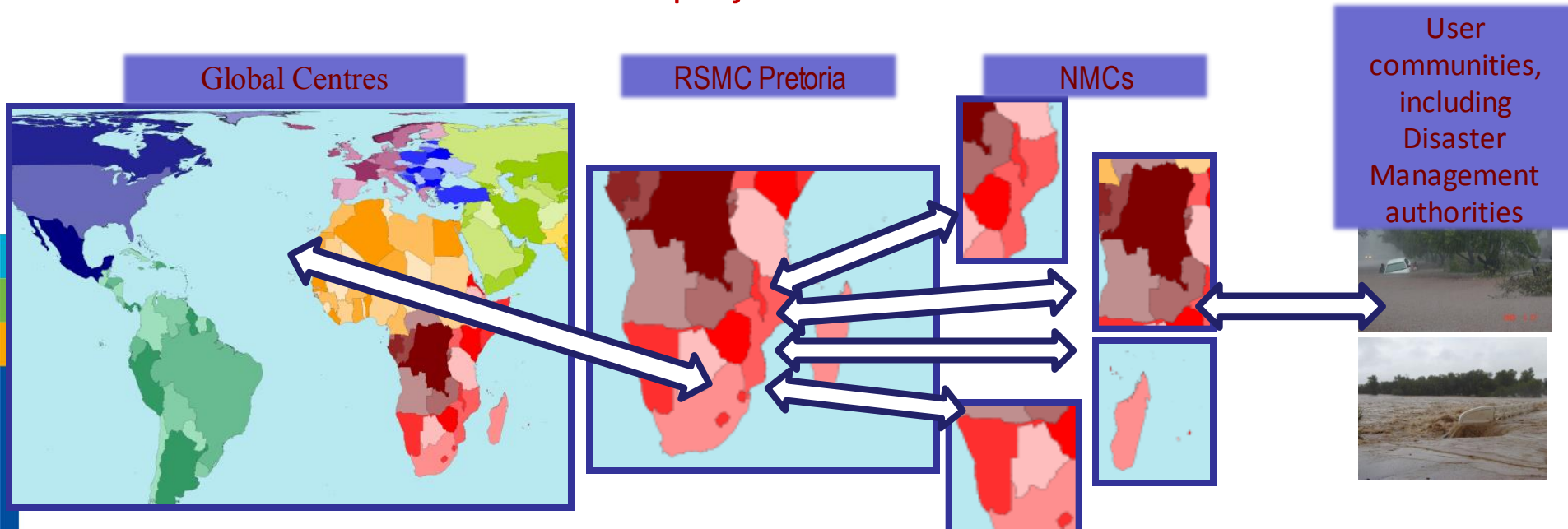
To

**Implement 'Cascading Forecasting Process'
through SWFDP**

(from Global to Regional to National)

SWFDP 'Cascading Forecasting Process'

- Global NWP centres to provide available NWP/EPS and sat-based products, including in the form of probabilities, cut to the project window frame;
- Regional centres to analyses and interpret information received from global centres, prepare daily guidance products (out to day-5) for NMCs, run limited-area model to refine products, maintain RSMC Web site, liaise with the participating NMCs;
- NMCs have access to all products, and maintained responsibility and authority over national warnings and services; to issue alerts, advisories, severe weather warnings; to liaise with user communities, and to contribute feedback and evaluation of the project.



SWFDP framework and guidance

SWFDP (started in 2006), is organized within the WMO Commission for Basic Systems (CBS) and guided by a CBS Steering Group for SWFDP

PSG has developed SWFDP Overall Project Plan and provide guidelines for developing SWFDP Regional Subprojects

- *SWFDP Guidebook for Planning Regional Subprojects*

The SWFDP Guidebook is reviewed and updated by the PSG. Recently, it was reviewed by the PSG during its meeting at WMO HQs in March 2016. Its latest version is available on WMO Website at the following link:

SWFDP Implementation process

Four Phases approach

Phase I: Overall Project Planning:

Establish regional partnerships including:

- Strong commitment by the participating Members (NMHSs) in a geographical area
- Identification & commitment of the possible Global and Regional Centres
- the types of severe weather to focus on (starting with a few top hazards)
- Preparation of products by global and regional centres

Phase II: Regional Subproject Implementation Planning and Execution:

- Establishing Regional Subproject Management Teams (RSMT)
- Regional & National Implementation Plans (RSIPs & IPs)
- Start prototype demonstration focusing on short to medium-range forecasting and warning services (1-2 years)
- Capacity development through specialized training programmes on forecasting and service delivery
- **Regular reporting:** Submission of Quarterly Progress Reports by the NMHSs (verification, feedback, tracking etc.)



SWFDP Implementation process

Four Phases approach

Phase III: Regional Subproject Evaluation

- Evaluation of the progress reports
- Tracking and analysis for further improvement
- More countries, more hazards
- Continuous evaluation, training and reporting

Phase IV: Regional Subproject Long-term Sustainability and Future Developments:

- Sustain operations and expand partnerships through continuous development, regular trainings and sharing knowledge
- Future capability and technology developments, and to foster broadening of activities in synergy with other WMO Programmes
- Responsibility of management to be taken by the concerned Regional Association



SWFDP

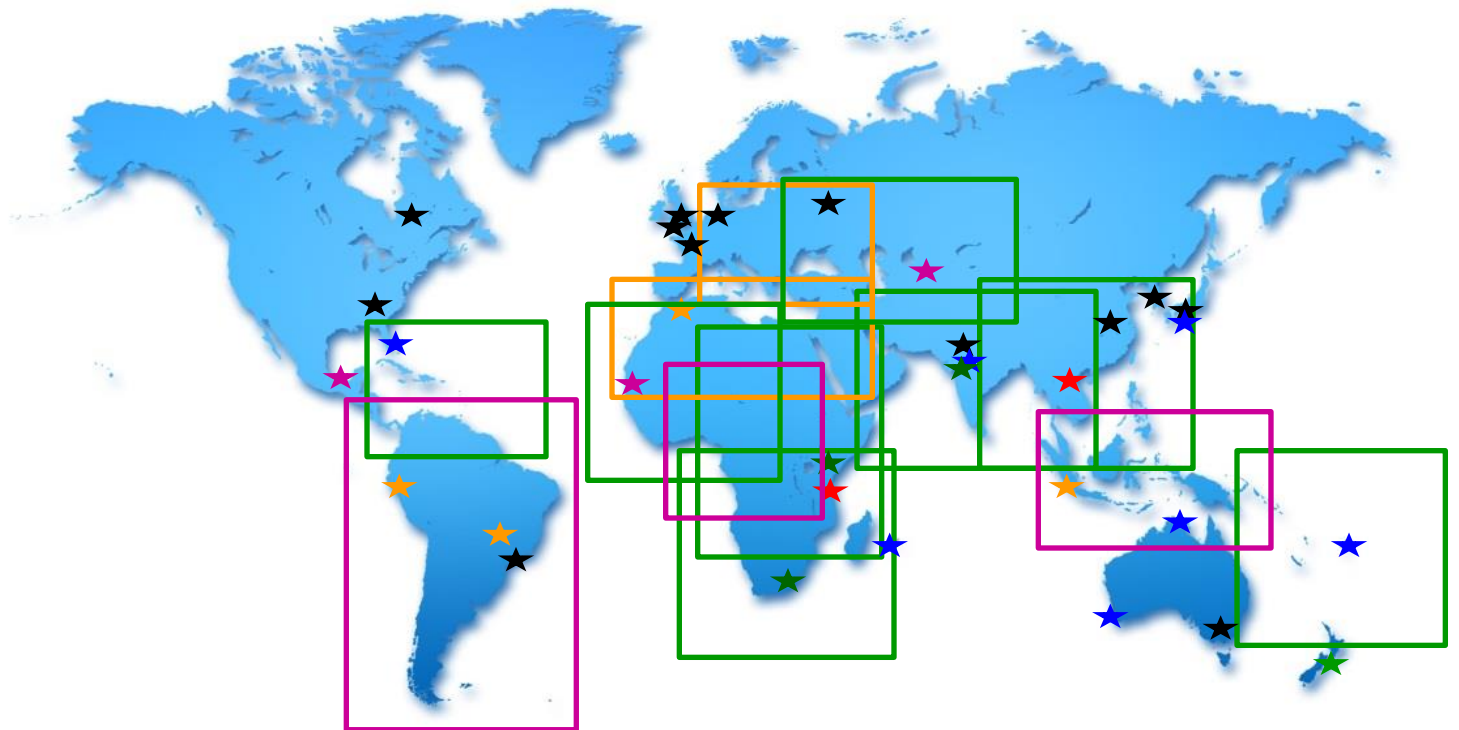
(ongoing regional subprojects and future directions)

SWFDP

Strengths

- Cost effective;
- Simplicity;
- NMHSs need internet only;
- Highly operational focus;
- Capacity development with improved forecasts and lead-time of warnings

Currently, SWFDP involves over 75 countries including around 45 LDCs and SIDS in 8 sub-regions. Subject to availability of resources, number of benefitting countries may grow to over 100 in next 2-3 years



Green color boxes - shows the existing on-going SWFDP regional subprojects.

Pink color boxes – the regional subprojects in discussion (next 1-2 years)

Orange color boxes – future SWFDP subprojects (next 3-5 years?)

SWFDP Synergies

SWFDP linkages are developed with relevant programmes and projects wherever appropriate to continue further developments, and to include more hazards to provide operational support for MHEWS

- Tropical Cyclones Programme (TCP)
- Space Programme - Nowcasting
- HWR-Flash Flood Guidance Systems (FFGS)
- MMO-Coastal Inundation Forecast Demonstration Project (CIFDP)
- WWRP



SWFDP Database

To facilitate NMCs with online reporting mechanism

<https://www.wmo.int/cpdb/>

WORLD METEOROLOGICAL ORGANIZATION
Weather • Climate • Water

Home Datasources Data About Contact FAQ Login

Select a location: [dropdown menu]

COUNTRY PROFILE DATABASE

Welcome to the WMO Country Profile Database Portal

In the portal you can access WMO information about WMO Members on a per country basis. You see a list of sources on the left hand side and you can select a country using the dropdown menu and the map. Regional Views are also available from the dropdown menu.

Click a country to show the country profile page

WMO disclaimer

News

16 June 2016: Version 2.0 implements better representation of WMO Territories, a display of the Regional Working Structure in the Dashboard and Regional Views and enhanced Focal Points. The Commissions for Aeronautical and Agricultural Meteorology were also added.

16 March 2015: Regional Centres, data disclaimers for the World Bank and National Focal Points for CPDB added to Country Profile page

01 October 2014: Version 1.0 was released today in Initial Operating Capability

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COUNTRY PROFILE DATABASE

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iWmo

Please enter your username and password

Username or Email: [input field]
Password: [input field]
Find Username For Country: [dropdown menu: select me]

LOGIN

[forgot your password?](#) [forgot your username?](#)



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COUNTRY PROFILE DATABASE

Home Datasources Data About Contact FAQ iWmo (TZA) Logout

iWmo

Welcome to iWmo

In iWmo you can manage the data sources that have been enabled to be updated through the country profile database. These sources can be updated directly in the CPDB portal.

Edit Institutional Information Severe Weather Authorization code for CBS nominations

These sources are updated online using a separate process: [Pub5](#), [CHY](#), [Surface and upper-air stations](#), [Catalogue of Meteorological Bulletins](#), [Radars](#), [GAW](#), [WIS](#), [INFOHYDRO](#), [CAP](#), [GFCS Projects](#)

SWFDP Database

To facilitate NMCs with online reporting mechanism

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COUNTRY PROFILE DATABASE

Home Datasources Data Architecture About Contact FAQ iWmo (TZA)

Welcome to the SWFDP database

Keeping the SWFDP team up to date about the severe weather forecast situation in your country is crucial for an optimal assistance in SWFDP implementation.

We kindly ask you therefore to fill out the following forms.

For questions, please contact the SWFDP team.

Please choose the period for which you want to report/update an existing report.

Reporting period
01 Oct 2014 - 31 Dec 2014

Region
Southern Africa

Start report

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COUNTRY PROFILE DATABASE

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Reporting period highlights

United Republic of Tanzania (Southern Africa), 1 Jul 2014 - 30 Sep 2014

Please describe this reporting period's highlights (in terms of severe weather). Leave blank if necessary.

The NMCs coordinated with the disaster management office and media for the dissemination of warnings to the public several hours before the occurrence of severe events.

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COUNTRY PROFILE DATABASE

Home Resources Architecture About Contact iWmo (ZMB) Logout

Severe events

Zambia (Southern Africa), 1 Mar 2014 - 31 May 2014

Please report statistics on severe events, if any, observed during the reporting period.

Heavy Rain	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Heavy Snow Fall	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Thunderstorm	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Hails	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Strong Winds	<input type="radio"/> Yes	<input checked="" type="radio"/> No

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COUNTRY PROFILE DATABASE

Home Resources Architecture About Contact iWmo (ZMB) Logout

Severe events

Zambia (Southern Africa), 1 Mar 2014 - 31 May 2014

Please report statistics on severe events, if any, observed during the reporting period.

Heavy Rain

Please provide details

Number of occurrences	7	Probability of detection (percentage)	80%
False alarm rate (percentage)	3	Average lead warning time (in minutes)	360

Notes

SWFDP Database

To facilitate NMCs with online reporting mechanism

The screenshot shows the WMO Country Profile Database website. The header includes the WMO logo and the text "WORLD METEOROLOGICAL ORGANIZATION Weather • Climate • Water". Navigation links include "Home", "Datasources", "Data", "Architecture", "About", "Contact", and "FAQ". A user is logged in as "iWmo (TZA)" with a "Logout" option. The main content area is titled "Case studies" for the "United Republic of Tanzania (Southern Africa), 1 Jul 2014 - 30 Sep 2014". It contains a text prompt: "Please enter information on case studies started during this period, if any. Please update the existing case studies upon completion. Remove only in case of error." Below this are two buttons: "Add case study" (green) and "Back" (grey).

The "New case study" modal form contains the following fields and controls:

- Case study title:** A text input field with a yellow highlight.
- Case study description:** A rich text editor with a toolbar containing icons for Bold (B), Italic (I), Underline (U), Bulleted List, Numbered List, Indent Left, Indent Right, and Undo/Redo.
- Key findings:** A rich text editor with the same toolbar as the description field.
- Buttons:** "Add" (blue) and "Cancel" (grey) buttons at the bottom.

SWFDP

Regional Subprojects



WMO OMM

SWFDP in RA I (Southern Africa)

(in operational phase, SWFDP and SARFFGS Integration since 2014)

- ✓ 16 countries
 - ✓ RSMC Pretoria
 - ✓ RSMC-TC La Réunion
 - ✓ ECMWF, NOAA/NCEP, UKMO
- RSMC analysis forecast information
 - Severe Weather Guidance for Short-range (1-2 days) and Medium-range (3-5 days)
 - Hazards: heavy rain, strong wind, high seas and swell, severe winter weather
 - Flash Flood Guidance
 - Guidance info including Global Regional NWP links made available through dedicated Webpage to NMCs
 - Links to RSMC La Réunion TC forecasting

The screenshot shows the RSMC Pretoria website interface. At the top, it features the World Meteorological Organization logo and the text 'Regional Specialised Meteorological Center (RSMC) Pretoria'. Below this, there are several sections: 'Guidance Products' (circled in red), 'Flash Flood Guidance', 'Regional and International Centers', 'SADC Countries', 'Other Services and Products', 'Nowcasting Products' (circled in red), and 'Designated to South African Weather Service'. The 'Guidance Products' section includes 'NWP & EPS Products' with sub-sections for 'Regional Models' (UM SA12, UM Africa LAM, Aladin La Reunion) and 'Global Products' (NOAA: GFS, ECMWF: EPS, Met Office: EPS, NOAA: EPS, SAWS: EPS (SAWS)). It also lists 'Training Website' (Met-eLearning), 'SWFDP Training Nov 2012', 'SWFDP Training Nov 2013', and 'SWFDP Training Nov 2014', each with links for GDPFS and PWS. The 'Nowcasting Products' section includes 'Satellite-Based Rainfall', 'Hydro-Estimator Rainfall Totals', 'Hydro-Estimator Rainfall Totals In Days', 'Hail Forecasts from UM SA12', 'Convective Thunderstorm Forecasts', 'Probability of Convective Thunderstorms', and 'Rapidly Developing Thunderstorms'. The 'Flash Flood Guidance' section includes a link to the 'SARFFG Portal'. The 'Regional and International Centers' section lists ECMWF, WMO, RSMC - Reunion, and ACMAID. The 'SADC Countries' section includes a link to 'SADC Countries National Meteorological Services'. The 'Other Services and Products' section includes links for 'Short-range' and 'Long-range (Seasonal)'. The 'Designated to South African Weather Service' logo is also present.

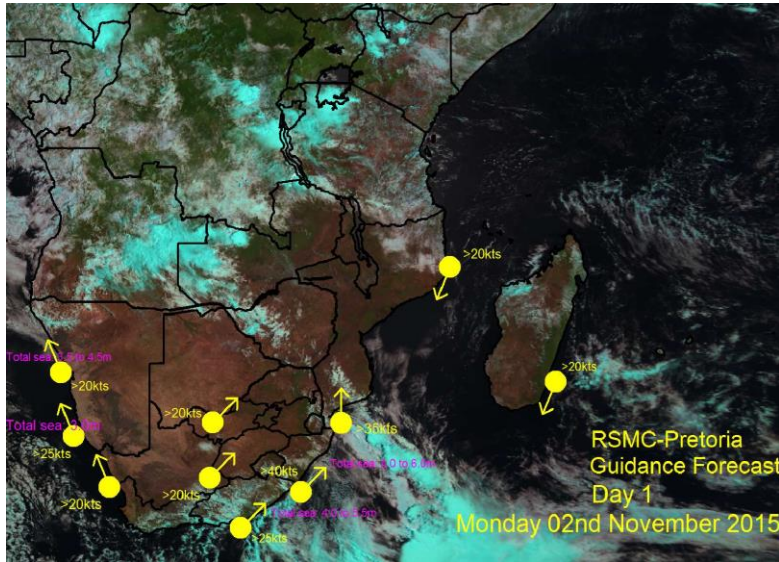
(SWFDP was supported by Norwegian funds, twinning of SWFDP and FFGS by USAID)

RSMC Pretoria Web portal since 2006

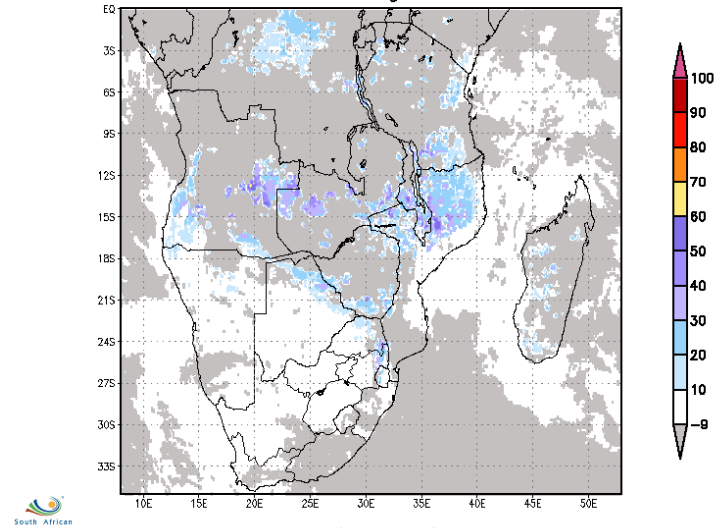


SWFDP in RA I (Southern Africa)

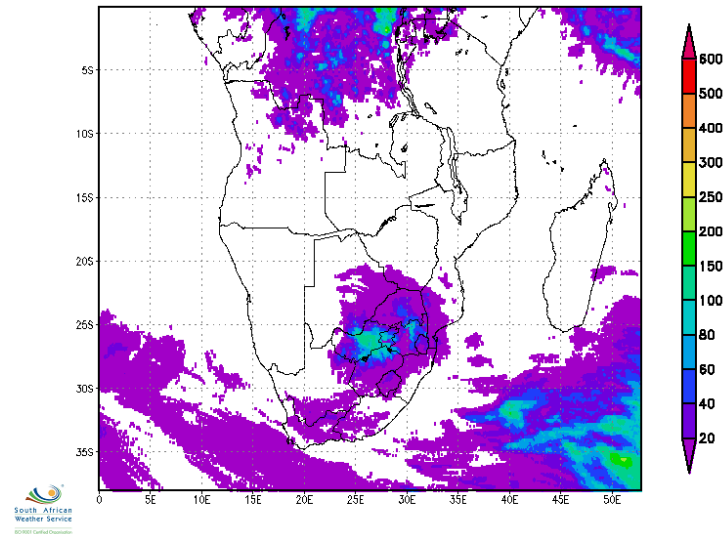
(in operational phase, SWFDP and SARFFGS Integration since 2014)



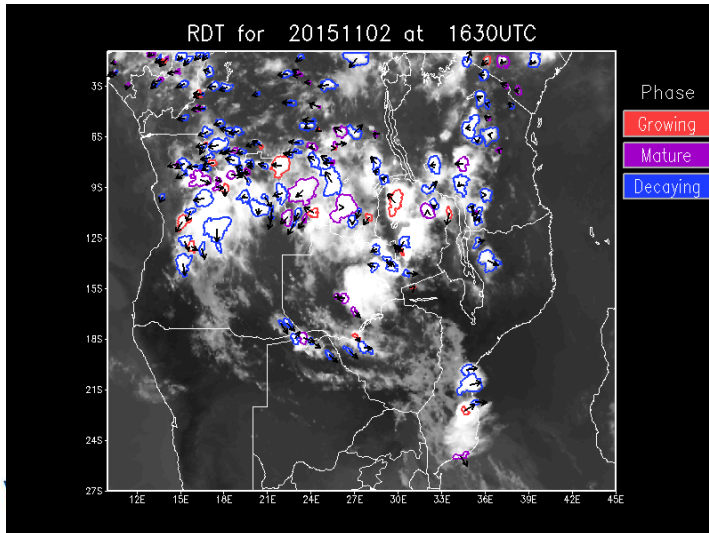
Probability for convective thunderstorms in percentages on 02NOV2015 Time average 1200–1500 UTC



10 Day Hydro-Estimator Rainfall Total mm
20150904 06:00Z – 20150914 06:00Z



RDT for 20151102 at 1630UTC



SWFDP in RA V (South Pacific)

- 9 Island States, RSMC Wellington, RSMC-TC Nadi, RSMC Darwin
- ECMWF, Met Office UK, NWS/USA, ABoM, JMA

MetConnect Pacific
SWFDDP

Global RSMC NMHS Satellite Observations Charts Links Archive Evaluation News Contact

RSMC Wellington RSMC Darwin RSMC Nadi

South Pacific Guidance
For Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP).
Issued at 03:32 12 Sep 2012 UTC
Valid at 12:00 11 Sep 2012 UTC
Early trades over most of the Southwest Pacific. A trough lies between Vanuatu and FIJ.

111200-121200UTC
Large Waves
Southwest swell
2.5-3m T=15S
Confidence Moderate

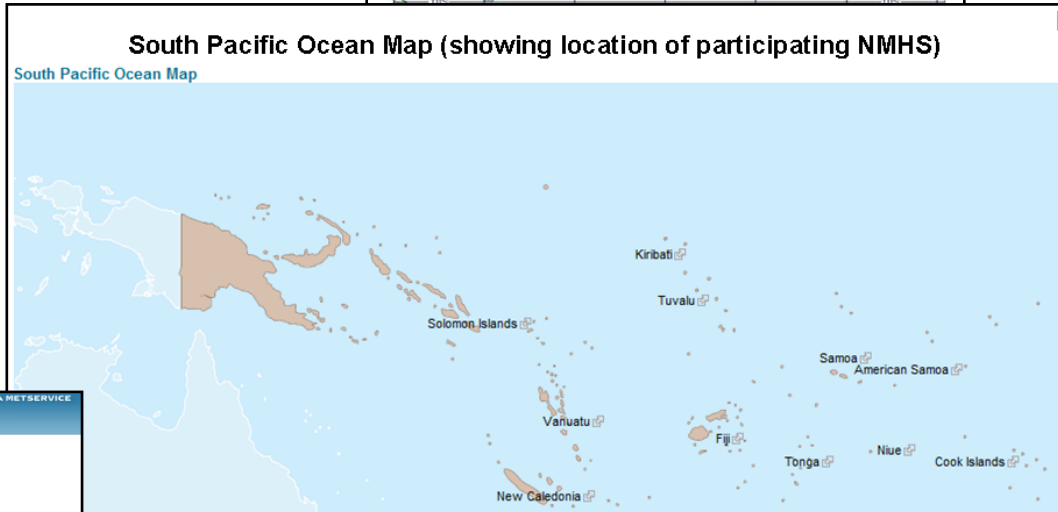
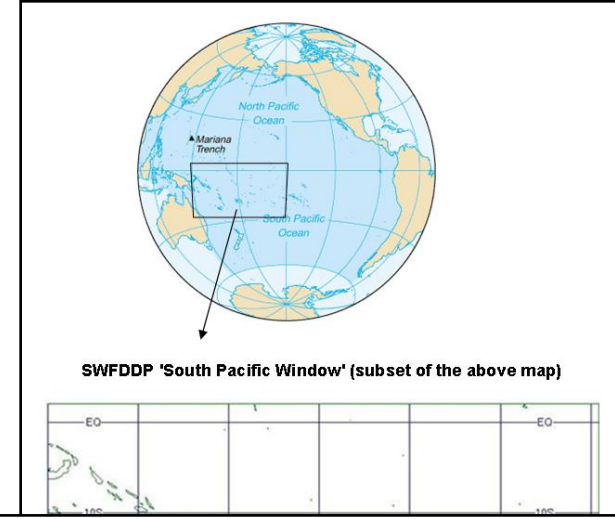
111200-121200UTC
Large Waves
Southerly swell
3.5-4m T=14s
Confidence Moderate

121200-131200UTC
Large Waves
Southerly swell
3.5-4m T=14s
Confidence Moderate

121200-131200UTC
Strong Wind
Squall SW
40kts
Confidence Moderate

RSMC Wellington Web portal since 2009

- 9 Island States:**
- Cook Islands
 - Fiji
 - Kiribati
 - Niue
 - Samoa
 - Solomon Islands
 - Tonga
 - Tuvalu
 - Vanuatu



MetConnect Pacific
SWFDDP

User account
Log in | Request user password

Remember me

Enter your MetConnect Pacific SWFDDP username

PASSWORD

Order the equipment, participate in our user survey

Log in

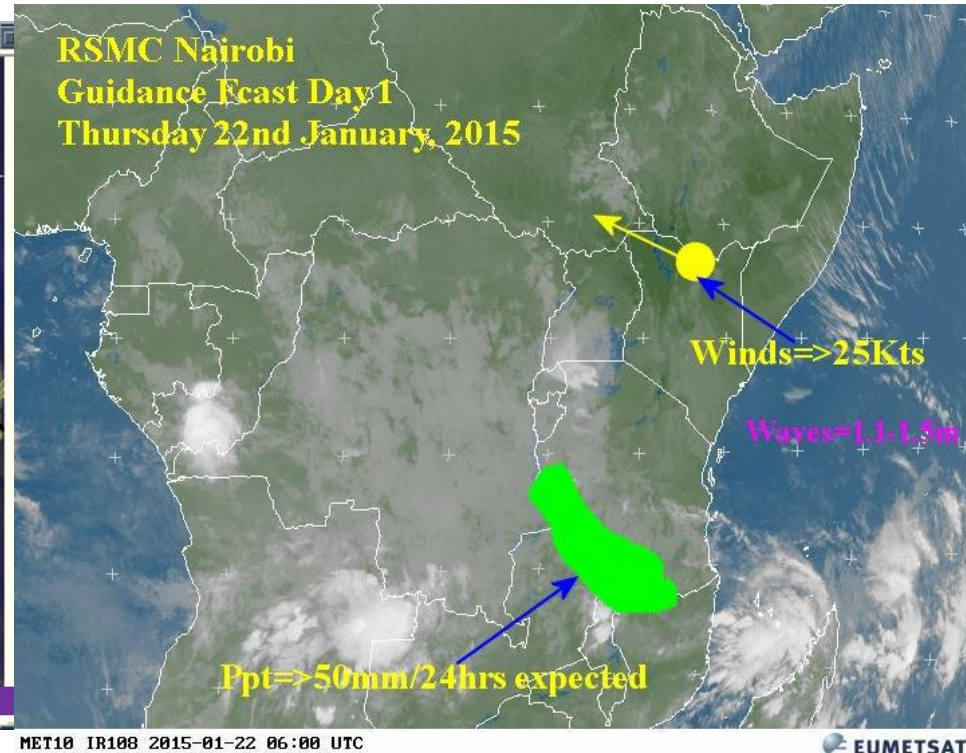
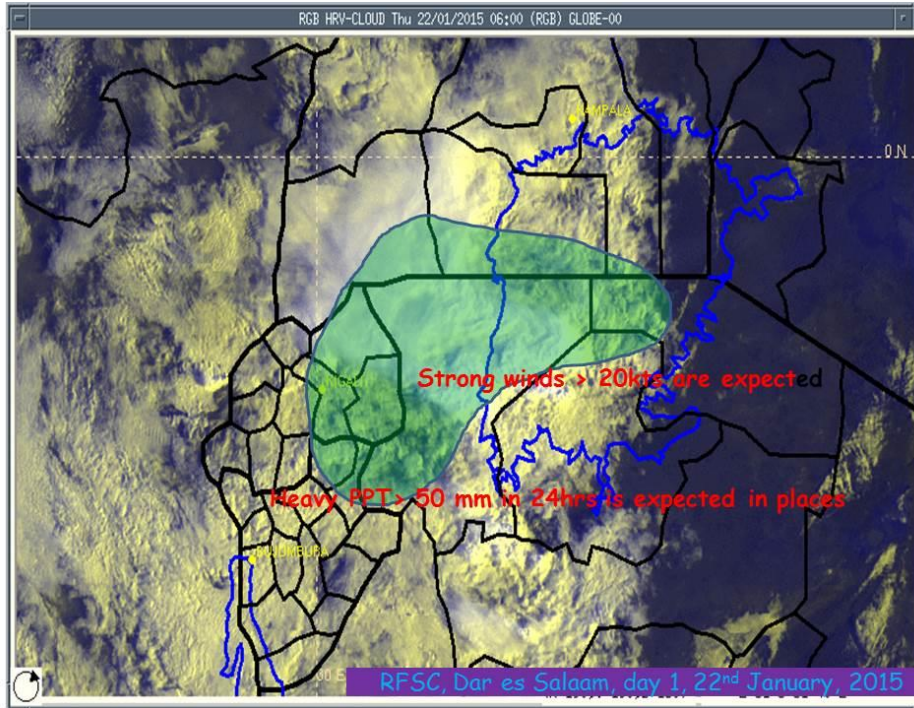
RSMC Wellington
METSERVICE
1800 252 252
© 2012 Meteorological Service of New Zealand Limited



(Supported by Canadian funds)

SWFDP RA-I-Eastern Africa

(Development started in 2010, and RSMC web portal since 2011)



Benefitting Countries (7):

Burundi, Ethiopia, Kenya, Rwanda, South Sudan, Tanzania and Uganda

Global Centres: ECMWF, UKMO, NOAA/NCEP, DWD

Regional Centre: RSMC Nairobi (for whole domain)

RFSC Dar Es Salaam (Lake Victoria basin)

Joint meeting of RSMT and SeAFFGS (23 November 2017)

Linkages between SWFDP-SeA and SEAFFGS

Requirements of SWFDP-SeA

- 5 x5 km spatial resolution NWP/QPF products up to 5 days.
- 2 x2 km spatial resolution QPF products for MR basin and four countries up to 48 hours.
- 3-hr nowcasting of QPF including satellite and Radar data.
- Post processing of QPF.
- Views on best estimation of precipitation via data assimilation.

Provision/Benefits to SWFDP-SeA

- WRF 3-4 km model.
- FFGS dashboard/Products/map server page.

Joint meeting of RSMT and SeAFFGS (23 November 2017)

Linkages between SWFDP-SeA and SEAFFGS

Strengths

- In principle representatives from all NMCs agreed to have SEAFFGS operational 24/7 in SeA (subject to agreement by the respective PRs)
- HPC upgradation at RFSC Ha Noi in 2018 for improved NWP LAM (using WRF and COSMO/ICON-LAM) with 5 Km resolution over SeA domain and 2/3 km resolution for domain over Mekong River basin and four countries
- Strengthening and upgradation of Radar Network in Viet Nam in 2018/2019
- Potential NWP LAM capacity at NMCs (DHM-Lao PDR will run WRF with 3 km resolution in future, Thailand already running WRF with 2 km resolution for 2 days and 6 km for 3-5 days)
- Satellite coverage (e.g. JMA, CMA and KMA)
- NMCs are getting support through several projects (e.g. WB, ADB, ECC-Canada USAID etc.) . Opportunity to align project activities and develop synergies

Limitations

- Poor radar coverage of SeA and lack of reliable radar data and products for use in SeAFFGS



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- Capacity of NMCs e.g. DoM-Cambodia and DHM-Lao PDR

SWFDP- RA II Bay of Bengal

(development planning started in 2012, now ready to start demonstration)



SEVERE WEATHER FORECASTING DEMONSTRATION PROJECT (SWFDP) -BAY OF BENGAL
REGIONAL SPECIALIZED METEOROLOGICAL CENTRE- NEW DELHI



Project website since September 2015

[Home](#) | [Logout](#)

Guidance Prod.

Satellite

Global/Regional NWP Prod.

Global EPS Prod.

Ocean Forecast

BOB-NWS Links

SWFDP-BOB Links

Images -->

Rainfall Products -->

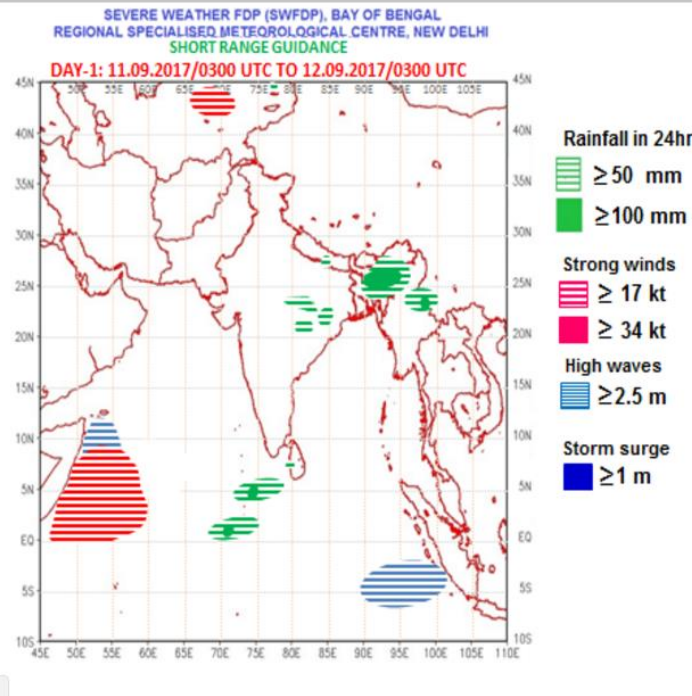
Nowcast -->

new
SCOPE-Nowcasting

9 Countries:

**Bangladesh, Bhutan, India,
Maldives, Myanmar,
Nepal, Pakistan, Sri Lanka
& Thailand**

**Focus : Heavy rainfall,
Strong winds, High
waves, storm surges,
swell**



Domain:

**10° S, 35° N,
45° E and 110° E**

Global Centres:

**IMD, ECMWF, UKMO,
NOAA/NCEP (NWP
guidance material,
satellite products)**

Regional Centres:

RSMC New Delhi

(Funding from UN ESCAP through RIMES during 2012-2015)

(First meeting of RSMT likely in 2018 subject to availability of funds)



WMO OMM

SWFDP- RA II Central Asia

Technical Planning Workshop in Almaty, Kazakhstan , 25-27 April 2015

SWFDP Workshop on analysis and interpretation of NWP products, Moscow, Russia, 6-10 July 2015

Workshop on Forecasting and Public Weather Services (PWS) for Forecasters and Users, Almaty, Kazakhstan, 22 Feb. to 4 March 2016

Focus

Heavy Rain and associated hazards (e.g. flooding)

Heavy Snow

Strong winds

Snow storms/blizzards

Extreme temperatures

Dry spells

Domain

29° N - 60° N

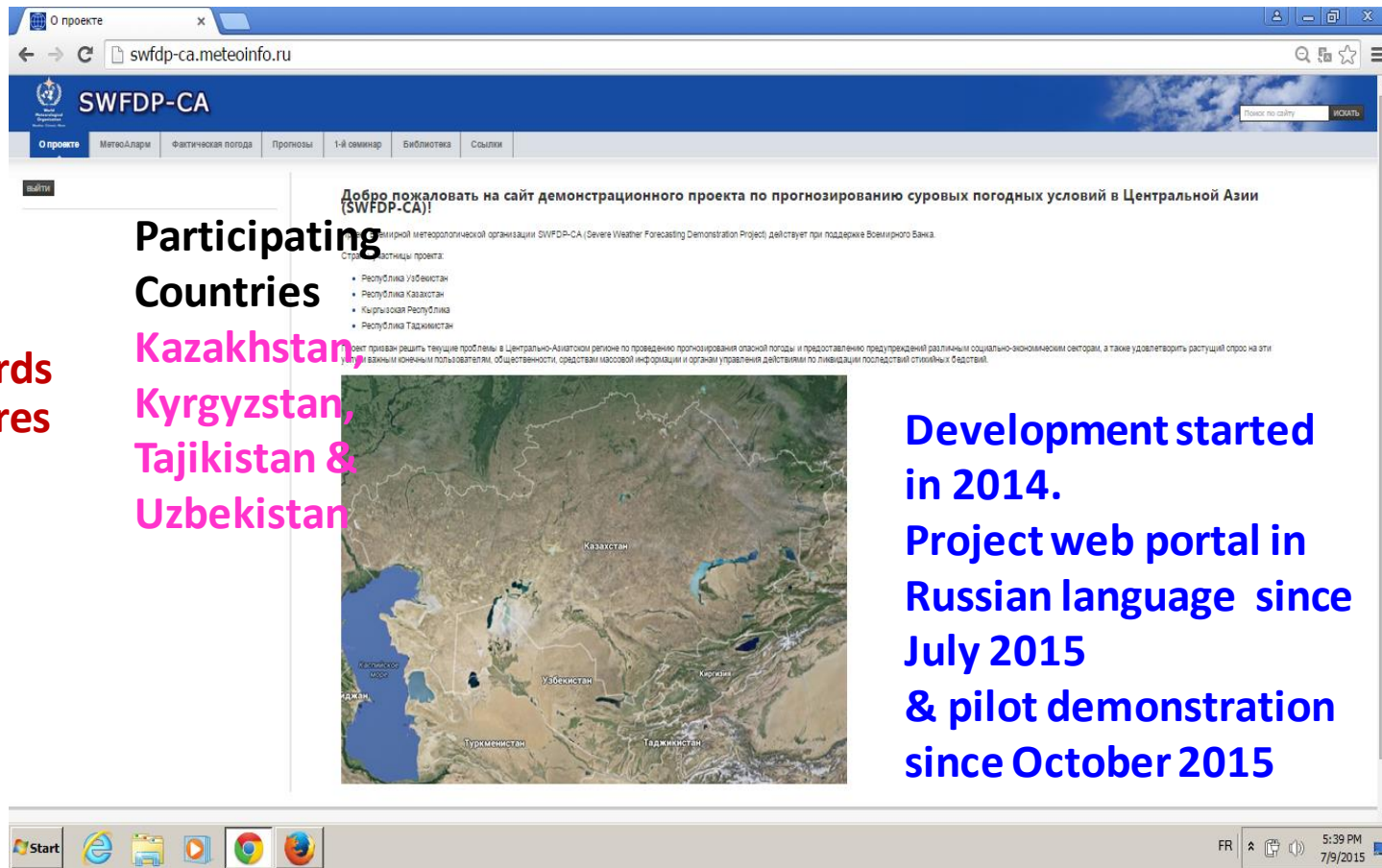
25° E - 90° E

For Mountainous Region

36° N - 45° N

63° E - 82° E

**Regional Centre
RSMC Tashkent**



Participating Countries

**Kazakhstan,
Kyrgyzstan,
Tajikistan &
Uzbekistan**

Development started in 2014.

Project web portal in Russian language since July 2015

& pilot demonstration since October 2015

Global Centres

RosHydromet, ECMWF, CMA, JMA, KMA

Funding: World Bank



Логин

Пароль

Запомнить меня

ВОЙТИ

- [Забыли пароль?](#)
- [Забыли логин?](#)

Добро пожаловать на сайт демонстрационного проекта по прогнозированию суровых погодных условий в Центральной Азии !

Welcome to the website of the Severe Weather Forecast Demonstration Project for the Central Asia !

Демонстрационный проект ВМО по прогнозированию суровой погоды в Центральной Азии действует при поддержке Всемирного Банка.
The WMO Severe Weather Forecasting Demonstration Project for the Central Asia (SWFDP-CA) is run with support of the World Bank.

Страны-участницы проекта / Countries participating in the project :

- Республика Узбекистан / Republic of Uzbekistan
- Республика Казахстан / Republic of Kazakhstan
- Кыргызская Республика / Republic of Kyrgyzstan
- Республика Таджикистан / Republic of Tajikistan



MeteoAlert/MeteoAlert x

swfdp-ca.meteoinfo.ru/meteoalarm

SWFDP-CA

О проекте/About MeteoAlert/MeteoAlert Фактическая погода/Actual Weather Прогнозы/Forecasts События/Events Библиотека/News Library Ссылки/Links

МетеоAlert/MeteoAlert

2017-03-10 2017-03-11 2017-03-12

Прогноз на 2017-03-10

Legend:

- ☁ KZ
- ☀ KG
- ☀ TJ
- ☀ UZ

□ Данные отсутствуют
 🟢 Оповещения о погоде не требуются
 🟡 Погода потенциально опасна
 🟠 Погода опасна. Имеется вероятность стихийных бедствий, нанесения ущерба
 🔴 Погода очень опасна. Имеется вероятность крупных разрушений и катастроф

her Forecasting Demonstration Project)



SWFDP- RA I West Africa

Technical Planning Meeting to develop Implementation Plan for SWFDP-
West Africa (Abidjan, Ivory Coast, 4-8 September 2017)

RSMC Dakar

ACMAD Niamey

DMN Morocco

Global Centres:

MeteoFrance

ECMWF

UKMO?

NOAA/NCEP?

Env. Canada?

Domain

0°N to 35°N

30°W to 25°E

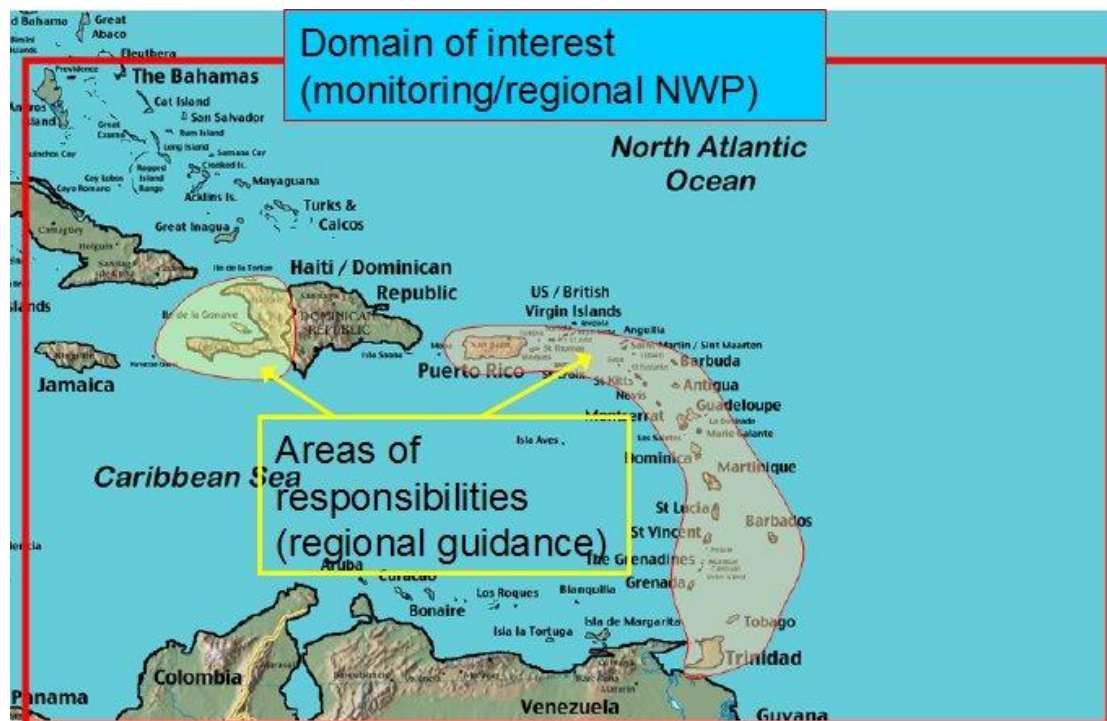


(In development with funding from multiple sources including CREWS. Seed funding was provided by KMA)

SWFDP- RA III Eastern Caribbean

(Development planning started with RA III Expert Group Meeting on SWFDP in December 2016 in Martinique, and then again in Miami in May 2017)

Domain: 50°- 80° W/ 8°- 25° N



Regional Centres:

RFSF Martinique (lead centre)

RSMC Miami (for TC and hurricanes)

CIMH Barbados (for technical support)

Global Centres:

MeteoFrance/ ECMWF,
NOAA/NCEP

Env. Canada

Participating SIDS/NMCs: CMO Members (Anguilla, Antigua and Barbuda, Barbados, British Virgin Islands, Dominica, Grenada, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad & Tobago), Haiti, Sint Maarten, Martinique/Guadeloupe/Saint-Martin/St-Barth (France), Puerto-Rico/US Virgin Islands (USA);

Regional Subprojects in Discussion

- *Southeast Asia Oceania*

The concept SWFDP-SAO was conceived during SAOFFGS initial planning meeting, Jakarta, Indonesia during 2 to 4 February 2016. Pending formal request from P/RA-V and subject to availability of funds)

- *South America*

A Technical-Planning Workshop for RA III (South America) was held in Asunción, Paraguay during 2-3 October 2017. Workshop report is available at: <http://www.wmo.int/pages/prog/www/CBS-Reports/DPFS-index.html>

All the countries of RA-III would contribute to the virtual portal to be developed in the project, taking into account their knowledge and capabilities, whose functions and responsibilities would be described in the implementation plan.

- *Central Africa*

RA I in 2015 has requested to expand SWFDP in to whole Africa. Pending availability of resources



Training Programs

Based on the regional and national needs, the following approach is followed for designing the SWFDP training programmes

- *Two-week SWFDP training workshops for each region (subject to availability of resources such training workshops are held annually and rotated among participating countries in a sub-region)*
- *RSMC Training Desk (e.g. at RSMC Pretoria Training Desk for Southern Africa, RFSC Training Desk for Southeast Asia)*
- *In-country training (e.g. for countries in Southwest Pacific)*



Training Programs

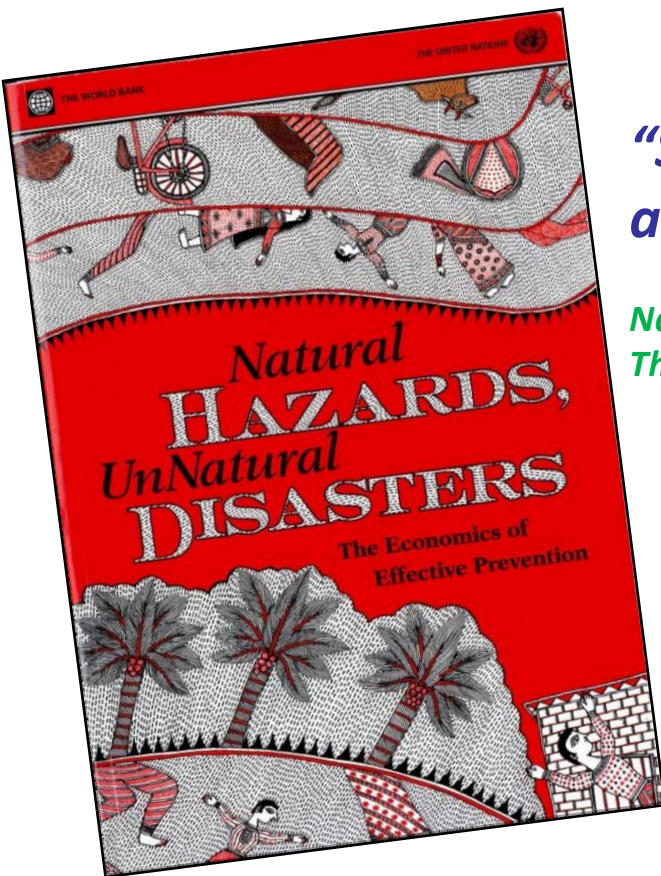
In addition

- ECMWF annual training for WMO Members
- DWD annual training on COSMO
- Regional Training Centres (RTC training programs on forecasting aligned with the SWFDP requirements)
- NOAA/NCEP Desks
- E-Learning (e.g. COMET)

SWFDP Training Programs

- In 2014, 103 personnel (including forecasters, hydrologists, representatives of disaster management agencies and media) were trained in Southern Africa, Eastern Africa, and Southeast Asia.
- In 2015, around 200 personnel (including forecasters, hydrologists, representatives of disaster management agencies and media) were trained in Southern Africa, South Pacific, Eastern Africa, Southeast Asia, and Bay of Bengal.
- In 2016, around 150 personnel (including forecasters, hydrologists, representatives of disaster management agencies and media) were trained in Central Asia, Southern Africa, and South Pacific





“Spending on improving weather forecasting and sharing data have high returns.”

*Natural Hazards UnNatural Disasters –
The Economics of Effective Prevention, WB, UN (2011)*

**Thank you
Merci**

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