

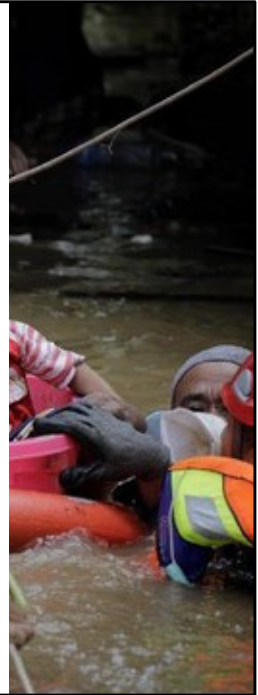
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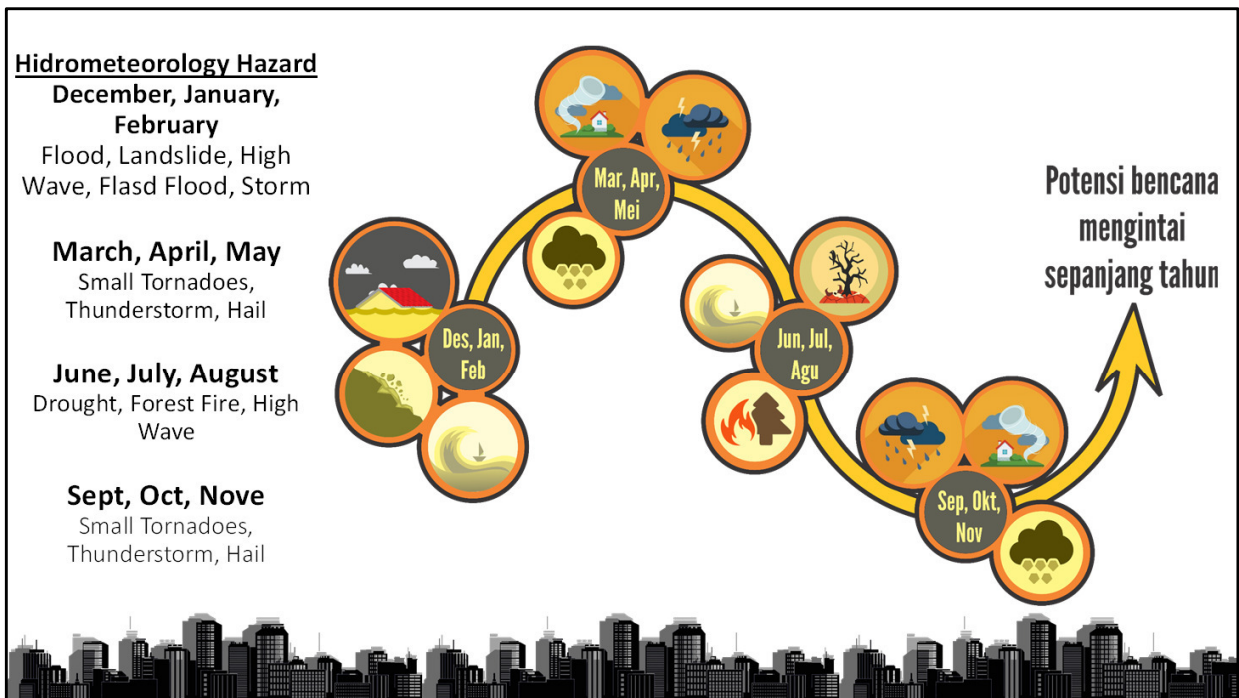
Operational early warning system for extreme weather in Indonesia

Dr. Agie Wandala Putra
(Head of Weather Early Warning Sub Division
in BMKG)

agie.wandala@bmkgo.go.id

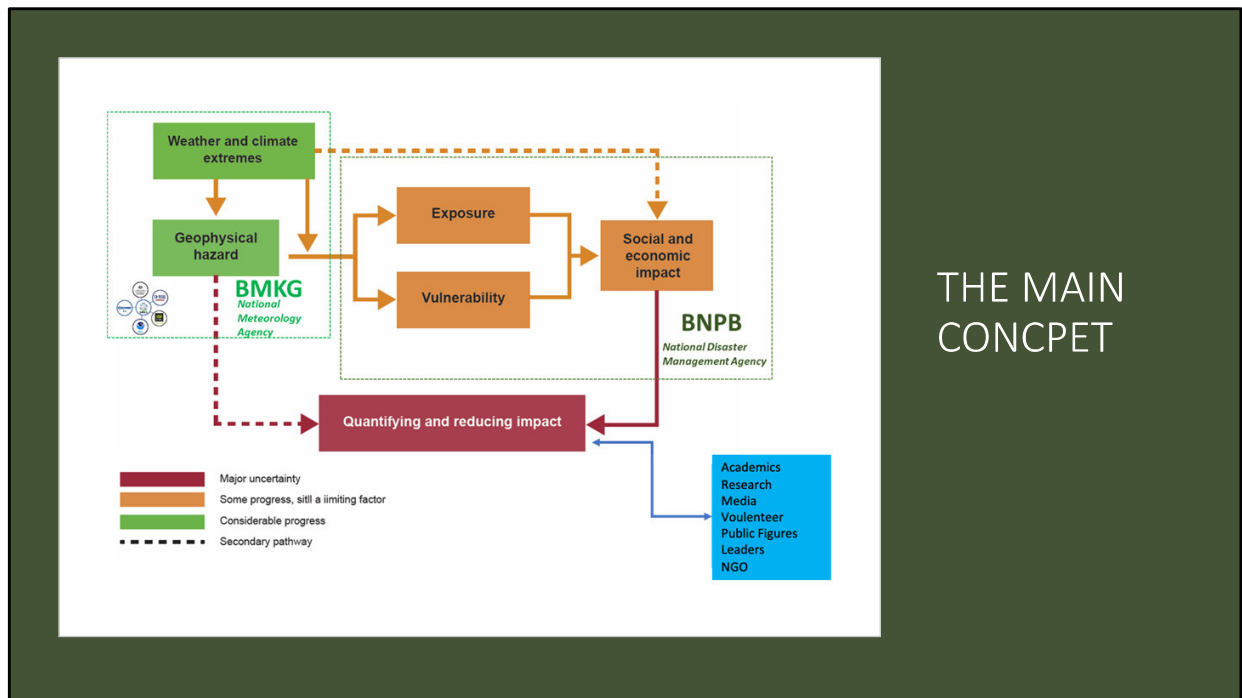


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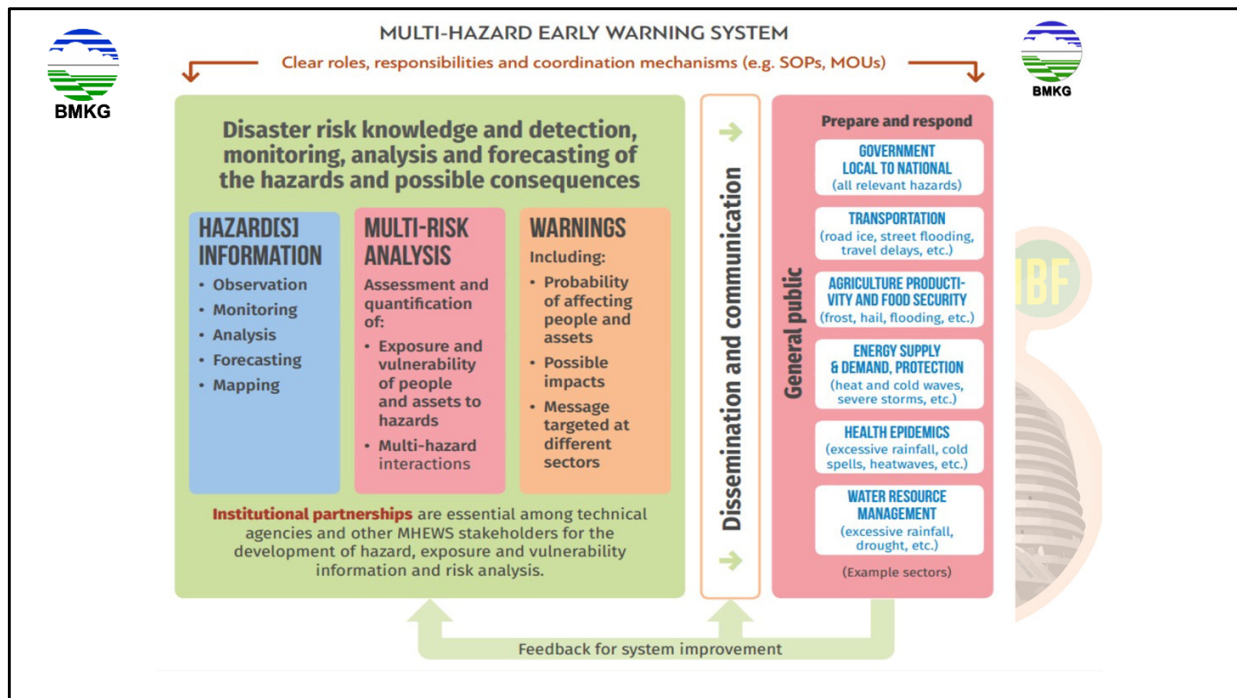




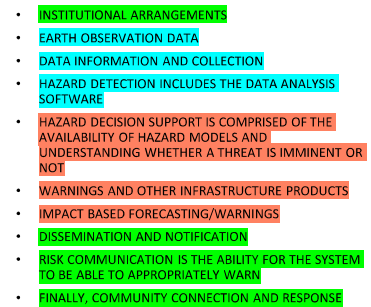
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Multi-hazard Early Warning System

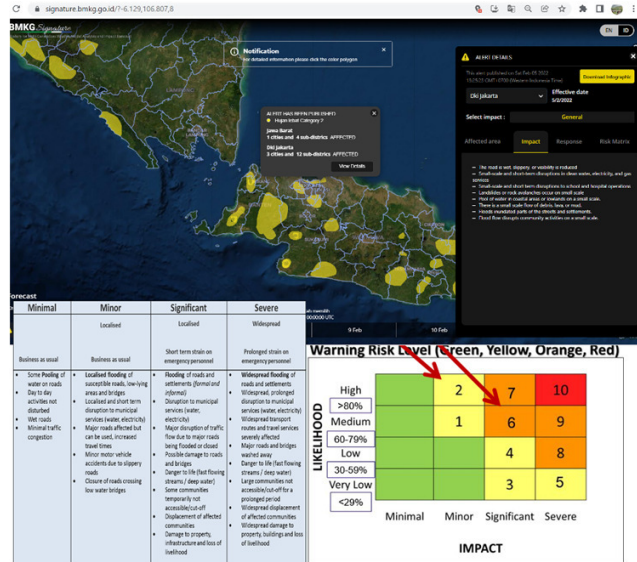


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HOW DOES IT WORK? (signature.bmkg.go.id)

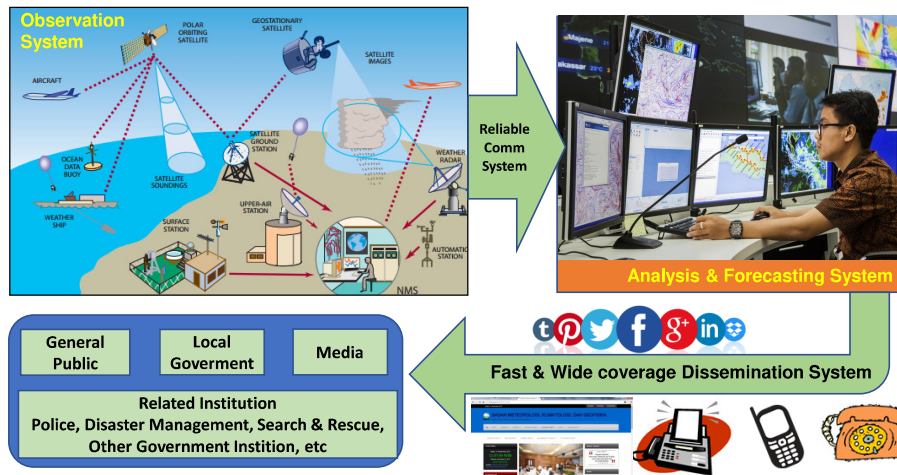
- BMKG and BNPB have met the risk and response matrix according to the predicted phenomena.
- Responses from BNPB from each warning level were compiled based on the agreed likelihood (BMKG) and impact (BNPB).
- BMKG provides forecasts and warnings with impact levels that can be responded to directly by BNPB, BPBD, PMI, TAGANA, etc



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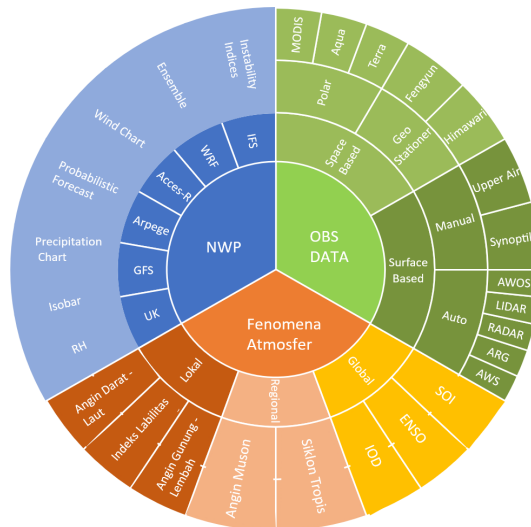
Operational Design of Extreme Weather Warning System



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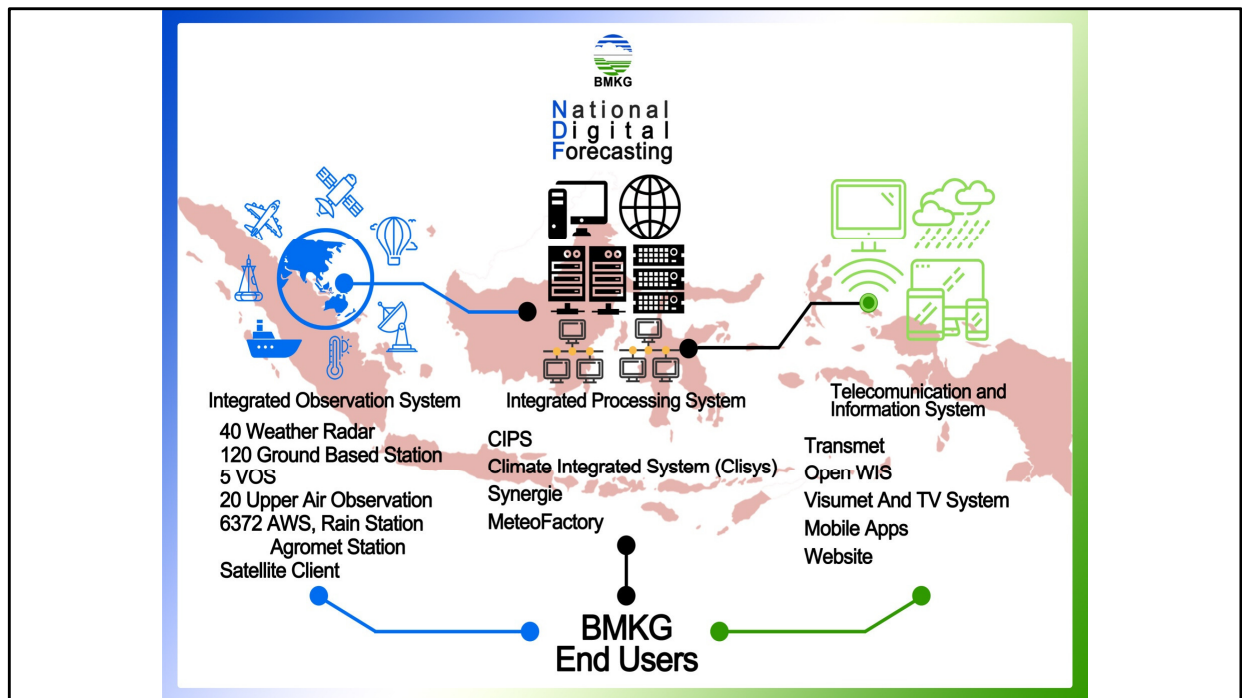


Behind the Weather Forecast

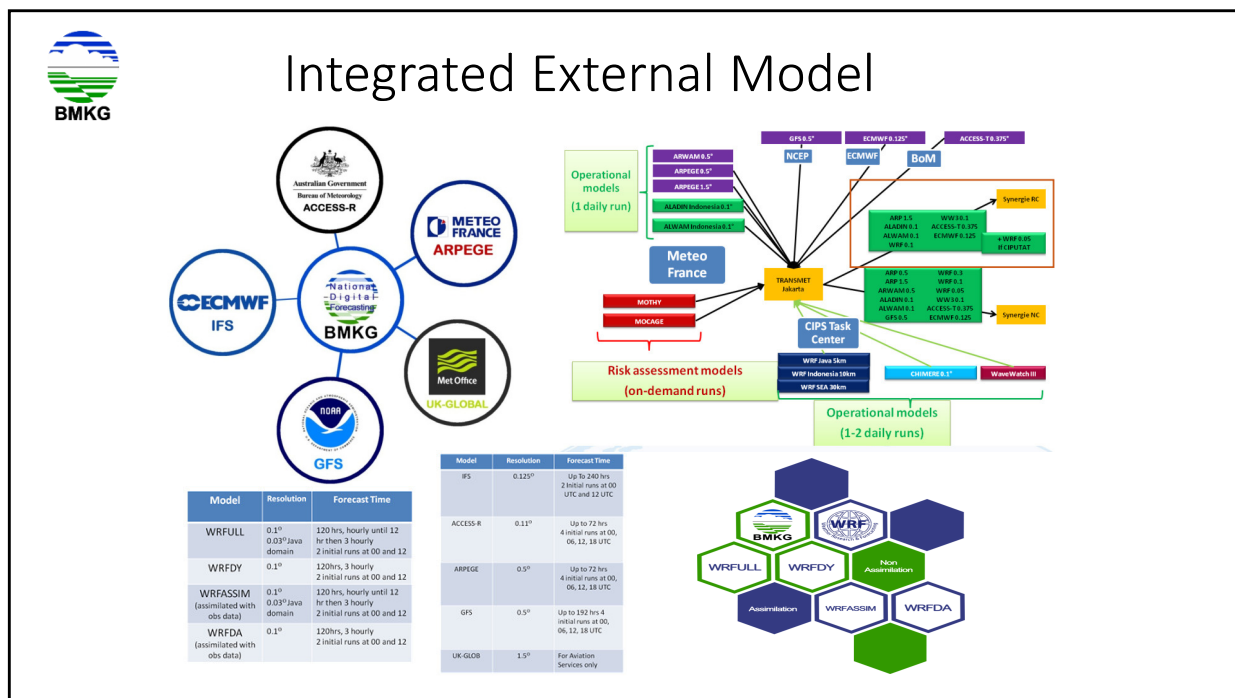


42	Radar
113	Meteorological Station
102	Upper Air Station
14	Marine Meteorological Station
1200 +	AWS
6	NWP Models
240 Hrs	Maximal Forecast Range
3 Km	Highest Spatial Resolution

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In making prediction, BMKG using some NWP model integrated to NDF system.

IFS has the longest prediction time up to 240 hrs (10 days)

Forecaster analyze all the data before making a weather forecast

By using the guidance from available NWP models, BMKG can provide weather forecast up to 3 days. (in short range)

Obs. Radius :

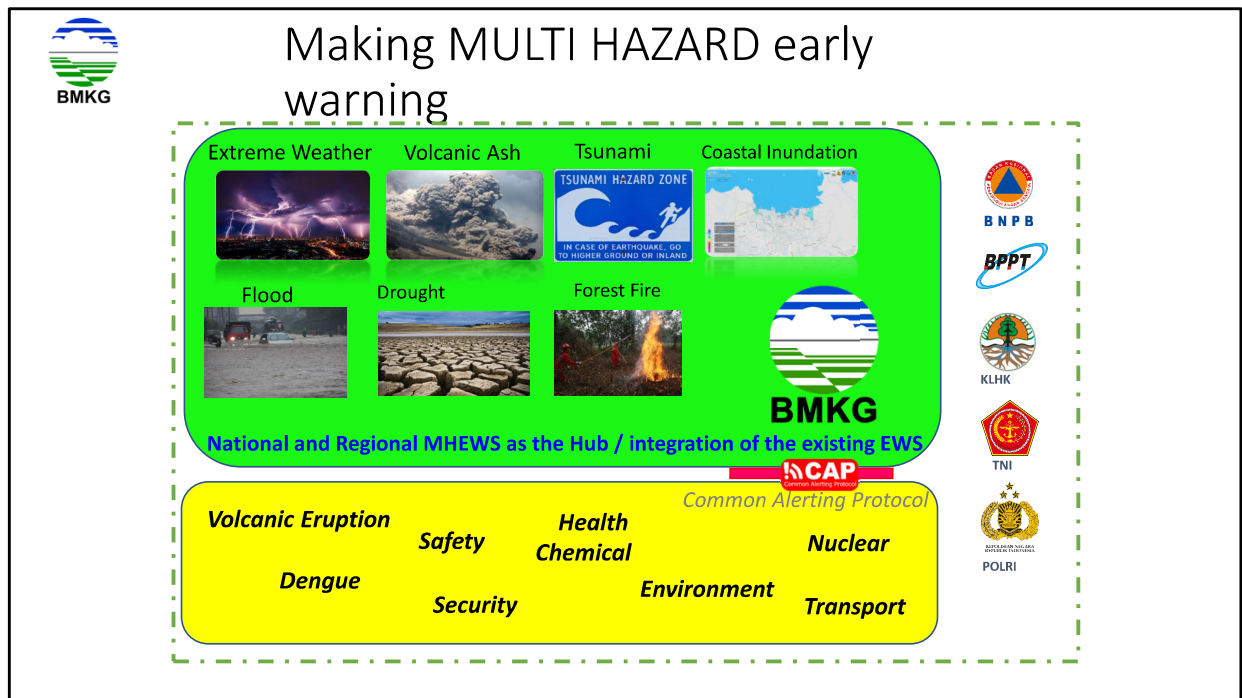
- X-Band (50km)
- C-Band (150km)
- S-Band (300km)

1575 km

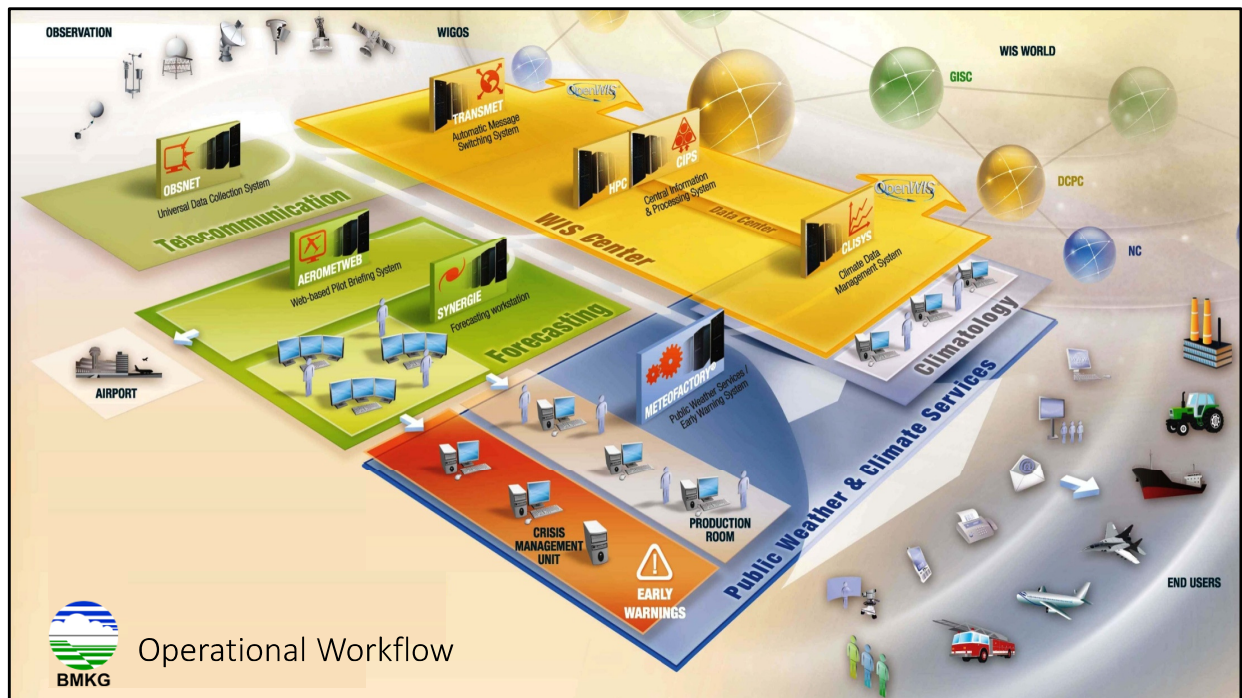
Legend:

- Existing : C/X-Band single-pol (2006-2014)
- Installed in 2015 (X-Band dual-pol)
- Planned S-Band dual-pol (2017-2025)
- Planned New site (X-Band dual-pol)
- Planned New site (C-Band dual-pol)

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BMKG

Brief Explanation of FDRS

- *Since the beginning of development, FDRS (Fire Danger Rating System) Indonesia based on FWI (Fire Weather Index) system from Canada which calibrated to the environmental conditions of Indonesia's forest and land fires.*

This system was built as an early warning and mitigation of forest / land fires based on weather parameters:



TEMPERATURE



HUMIDITY

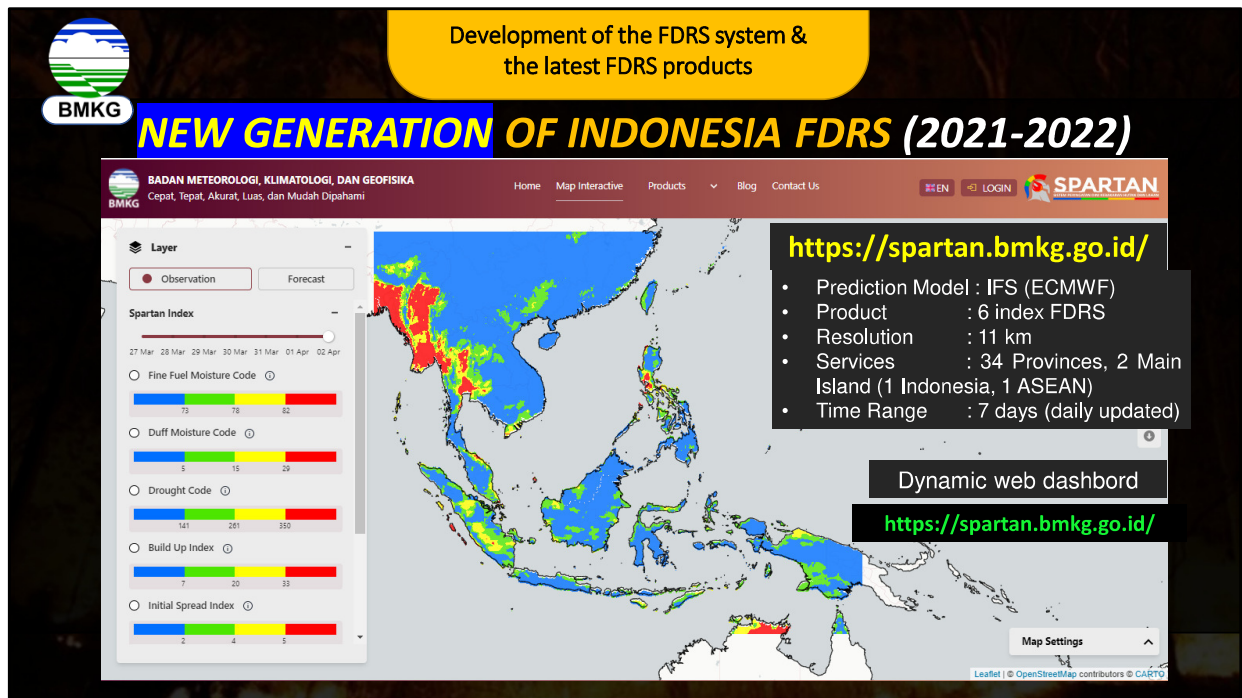


WIND



RAINFALL

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FDRS INDEX

FIRE WEATHER INDEX (FWI)

- FWI shows the intensity of fire in the event of a forest fire
- Strongly influenced by the value of ISI and BUI
- The combination of the elements of fuel availability / fuel (BUI) and the ease of spreading fire (ISI)



FWI = 9



FWI = 15

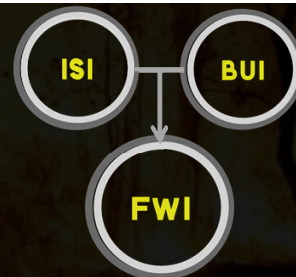
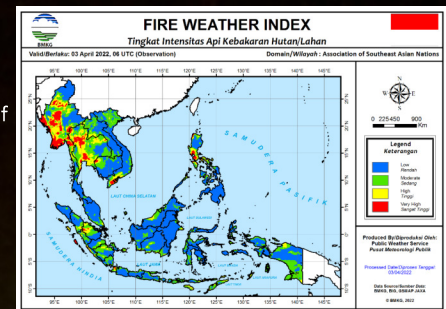


FWI = 17



FWI = 34

Color	Range	Description
Blue	0 – 1	Fire intensity in low category. Fire is easy to control, tends to go out on its own.
Green	2 – 6	Fire intensity in low category. Fire is easy to control, tends to go out on its own.
Yellow	7 – 13	Fire intensity in high category. Fire is hard to control.
Red	>13	Fire intensity in very high category. Fire is very difficult to control.



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Common Alert Protocol

- “CAP is a standard message format designed for All-Media, All-Hazard, communications”
- **All media** : Television, radio, telephone, highway sign, email, websites, etc
- **All Kind of Hazard** : Weather, Fire, Earthquakes, Volcanoes, etc.
- **To Anyone** : public, designated group, specific users.

<https://signature.bmkg.go.id/alert/public/en/rss.xml>

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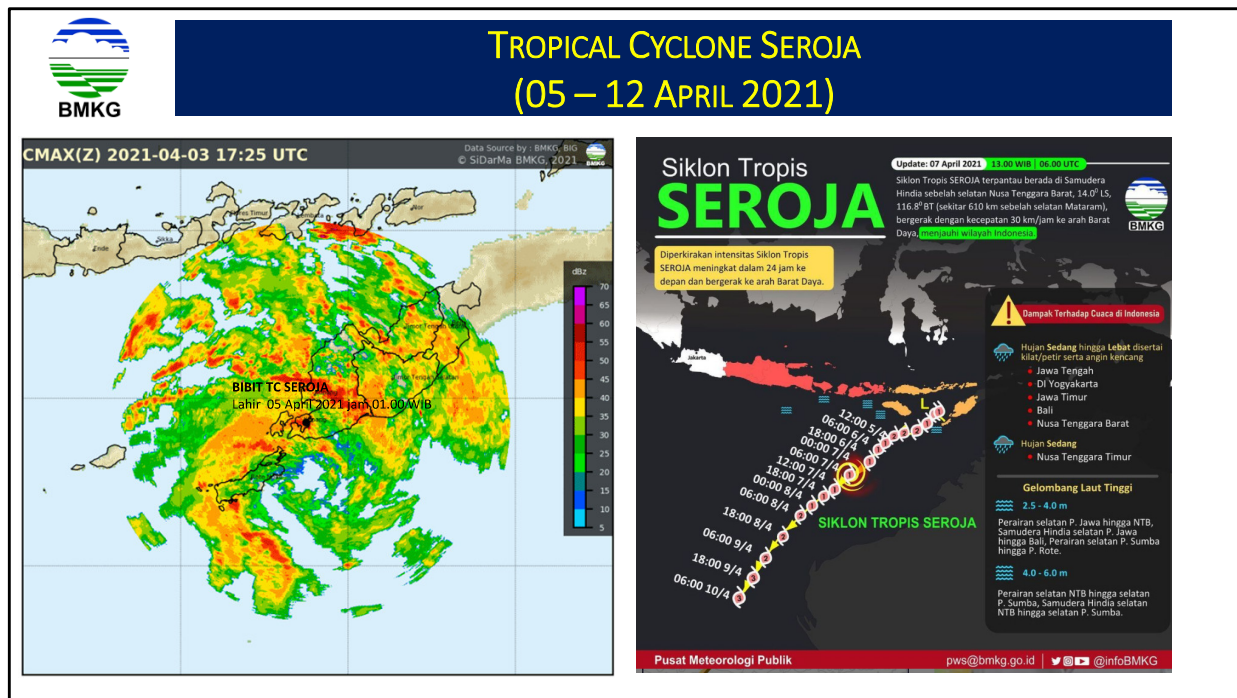


Public Awareness Program

- Climate/weather field school
- Table top exercise
- Tactical floor game

MOSAIC
A program that has main purpose to reduce disaster potential by learning about how to get weather information, how to interpret weather information, and how to response weather information.

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Pak Dewa Selamatkan Jiwa Warga Desa Oesapa NTT

Setelah saya mendapatkan informasi dari BMKG mengenai Siklon Tropis Seroja akan datang, hal pertama yang saya lakukan adalah menyampaikan kepada warga. Saya bersyukur sempat memberi peringatan kepada warga desa, meski ada rekan yang masih di tengah laut harus menjadi korban, karena tidak mendapatkan pesan telepon karena tidak ada sinyal.

Muhammad Mansur Dokeng (Pak Dewa)
Warga Kampung Nelayan Oesapa,
Nusa Tenggara Timur

Info BMKG Kawat
Indonesia Tangguh dan Tumbuh

- Pak Dewa, a fisherman from the village of Oesapa East Nusa Tenggara Province, managed to convince the villagers to evacuate before the tropical cyclone Seroja came. He is an alumnus of the BMKG Fisherman Field School. After receiving information via a WhatsApp group broadcast, he managed to save the villagers.

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Terimakasih
Thank You
