

**INFORMATION OF SPACE WEATHER EFFECTS
TO GPS/GNSS RECEIVER FOR FISHERMEN
ACTIVITIES IN INDONESIA**

Varuliantor Dear & Slamet Supriadi
(LAPAN)

National Institute of Aeronautics and Space of Indonesia

Outline

The Poster talk about : “How to support the Indonesian fishermen due to the effects of space weather conditions to their activities over the sea”

Background

Challenges

Method

Summary & Next Step

INDONESIA



Foto credit : wikipedia

- 13,466 Islands , archipelago & developed country
- Fishing is a commonly people livelihood in the coast area
- Many types of fishermen (Traditional to Modern)
- Traditional fishermen have a **positive trend to use a GPS receiver for fishing (positioning) and navigation activities**
- Due to the limitation fund → Low cost single frequency GPS equipment
- Limitation of fishermen knowledge
- Government support the maritime sector

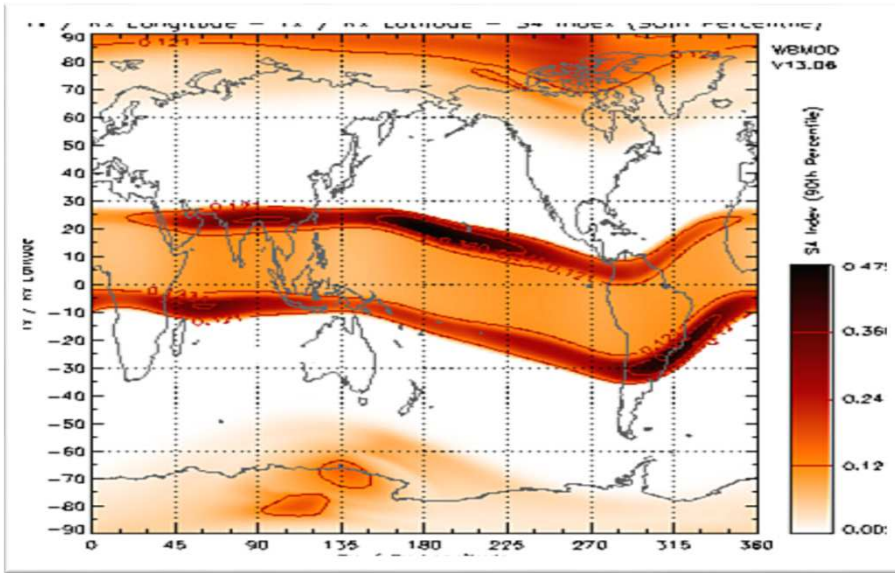


Foto credit fiheries ministrie



Foto credit : Brawijaya Univ.



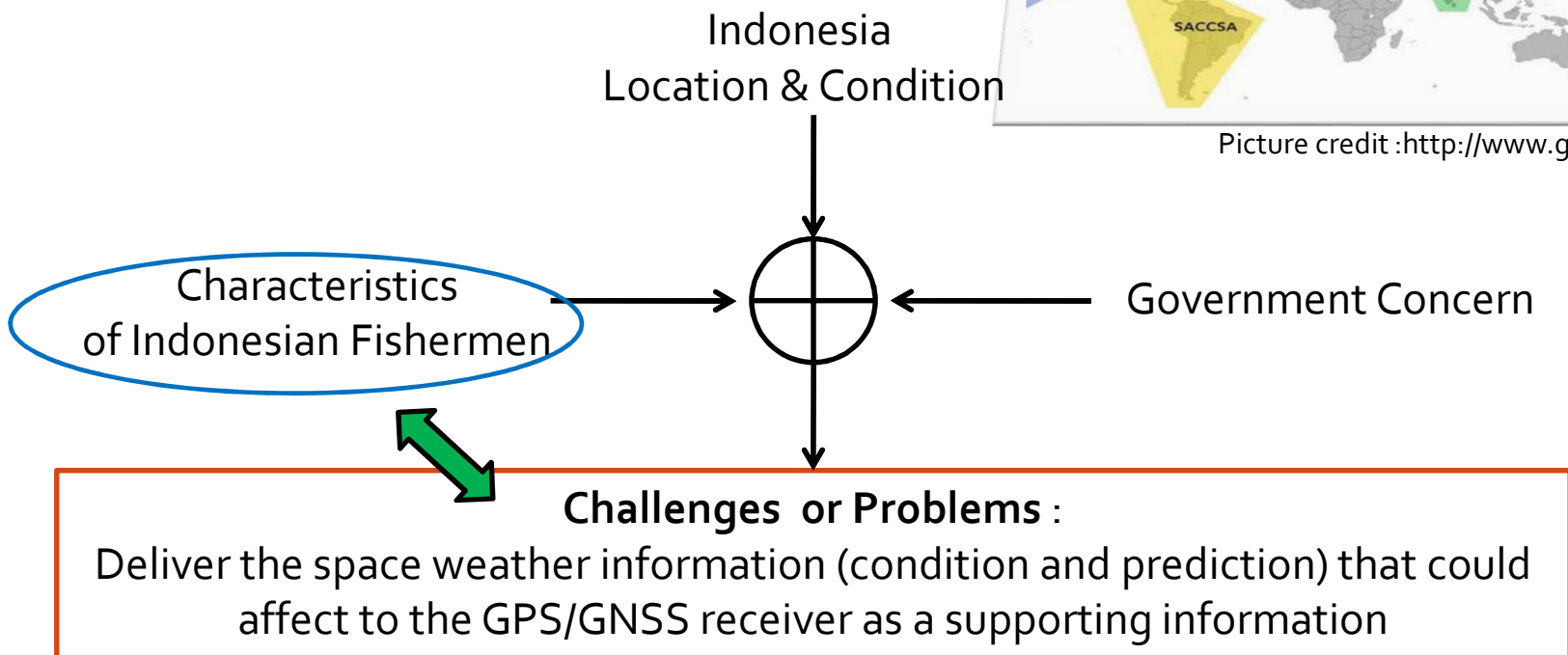


Picture credit : IPS.gov.au

- Indonesia in the Equatorial Ionospheric Anomaly region (EIA)
- Space weather condition would affect the GPS
- No augmentation system for GPS/GNSS, yet

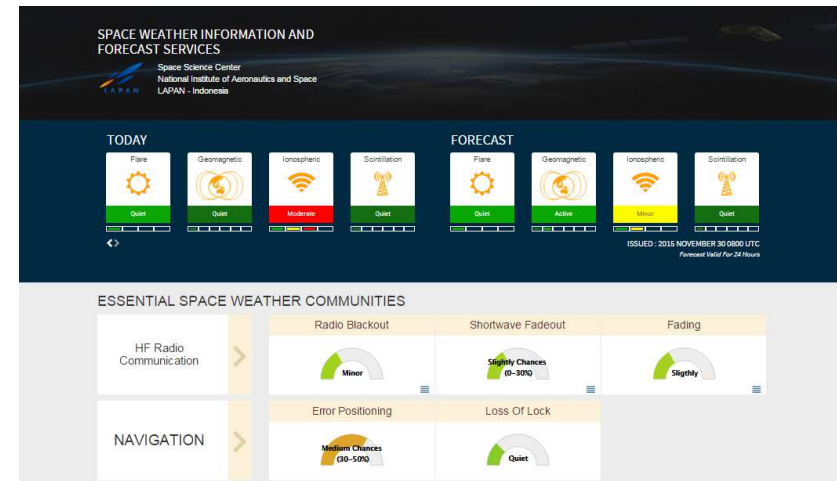


Picture credit : <http://www.gmv.com>

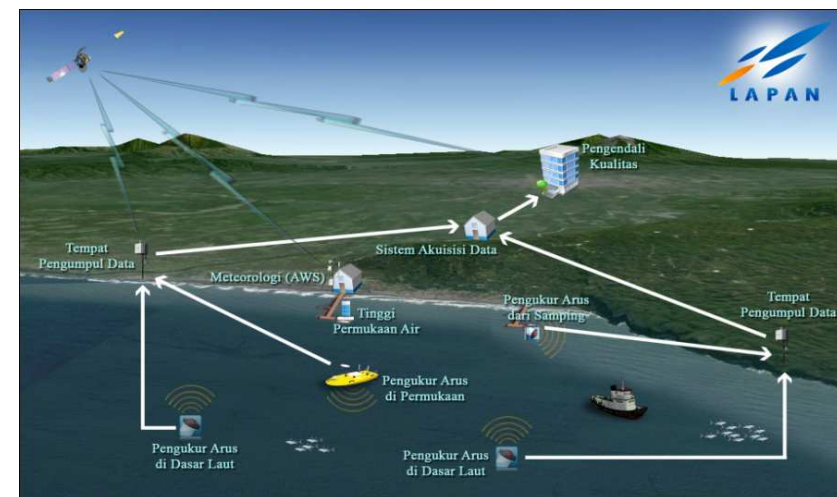


Method

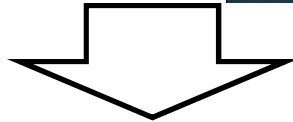
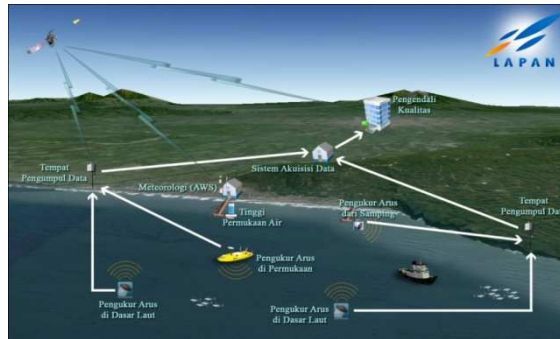
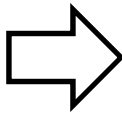
- March 2015 *SWIFTs* start to service: Inform the space weather conditions and predictions also the effect to the essential user in qualitative form (www.swifts.sains.lapan.go.id)
- 2015 LAPAN start to design a **Decision Supporting System for fishermen** in Sadeng area (Collaboration with local government of Jogjakarta province): Provide an information of Potential fishing area or locations (ZPPI), Condition over the sea (Weather, Sea Current, etc).
- **Develop a Single Side Band (SSB) Radio Communication System as a prime telecommunication infrastructure** to deliver the information to the fishermen over the sea.
- **Dissemination, socialization and training for fishermen** to improve the services and **to get a feedback** from the real conditions of fishermen.



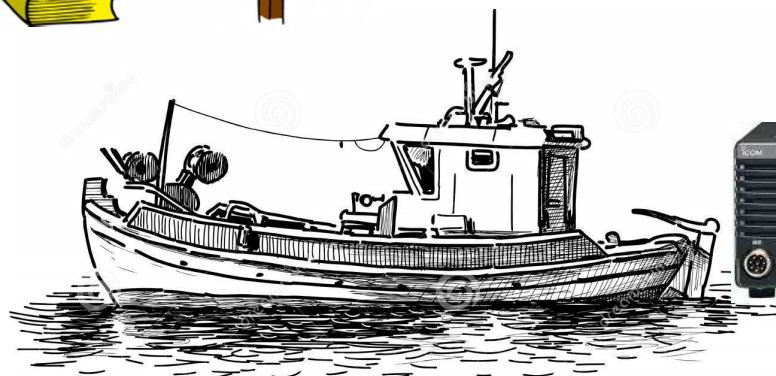
swifts.sains.lapan.go.id



60.253.114.155



Portmaster office



- 4-ary FSK, Symbol period (T_s) = 50 symbol/second
→ will be enhanced
- Point to Point & Point to Multipoint Mode
- Working frequencies were determined from the skywave and groundwave propagation analysis.
- consideration to the international regulation for maritime use.

An update informations will be kept in the memory and will always shown in the running text to minimize the loss of information

"Qualitative information about space weather conditions and the predictions that could affect the navigation in a running text form"

Summary & Next Step

- The information of space weather that could affect to the GPS/GNSS receiver which used by the fishermen in Indonesia were served by LAPAN.

- Since the characteristic of Indonesian fishermen are unique and there also no augmentation service for GPS/GNSS in Indonesia yet, LAPAN use a SSB radio communication system to delivered the alternative information in a qualitative form as a supporting information for the fishermen activities.

- We realize that this effort are still far away from the integrated system of augmentation of GPS /GNSS receiver. But, it is fit to the characteristic of Indonesian fishermen for today conditions.

- LAPAN homework are to **improve the services quality** with a consideration to the real conditions of the fishermen activities **and also propose the use of the trend of technology that fits to the fishermen in Indonesia.**

|| Thank you

