

SPACE TECHNOLOGY INSTITUTE, VNREDSat-1 and DATA PROVIDER NODE (DPN) REPORT



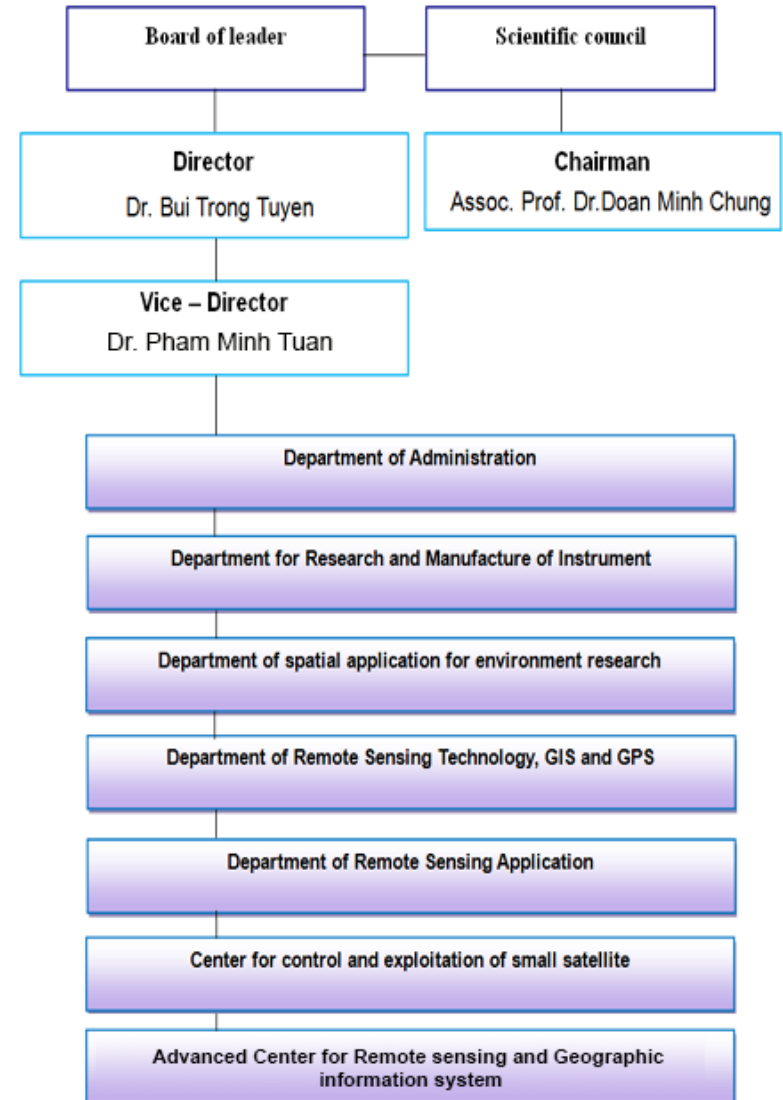


CONTENT

- 1. Overview of Space Technology Institute (STI)**
- 2. Main activities and achievements by STI**
- 3. VNREDSat-1, its applications and SA's DPN**

- STI established in 20/11/2006

Organization



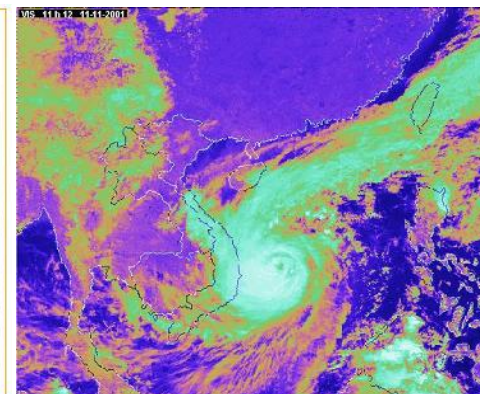
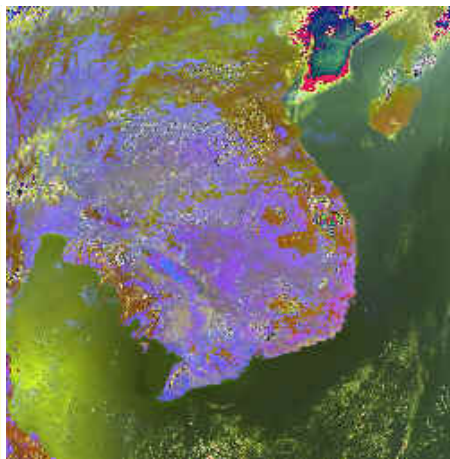
Members: ~60 members

Main activities and achievements by STI

- **Satellite and ground station technology**
- **Applications of remote sensing, GPS and GIS**
- **Control and exploitation of VNREDSat-1 system**

Satellite and ground station technology

- Pioneer in research, design and manufacture of receiving stations for polar and geostationary metrological satellites.



WEAFAX APT receiving system

GMS/MT-SAT/FY-2 receiving system



NOAA receiving system



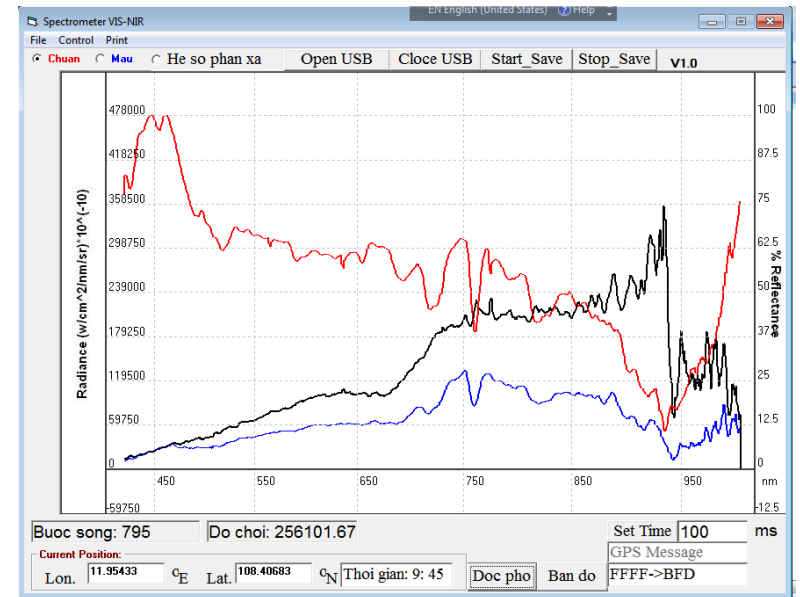
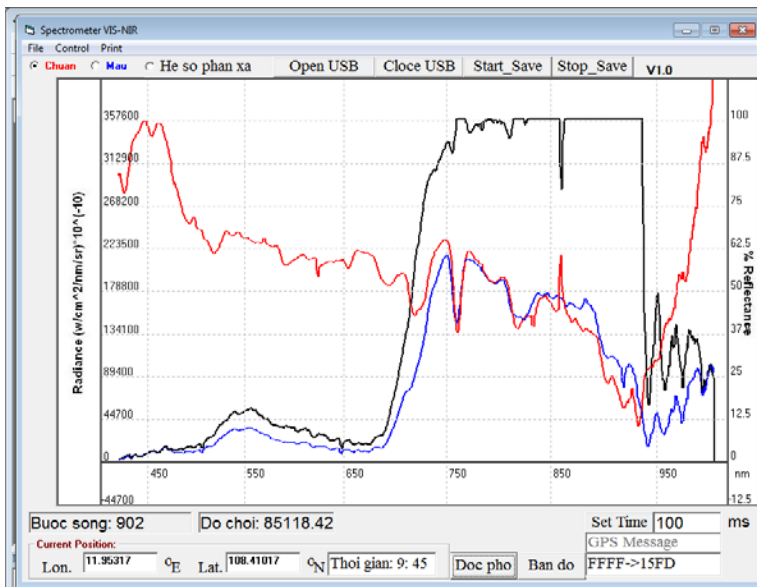
Utilization of NOAA receiving systems in natural disaster management



VIS-NIR Spectrometer



Spectrometer onboard UAV



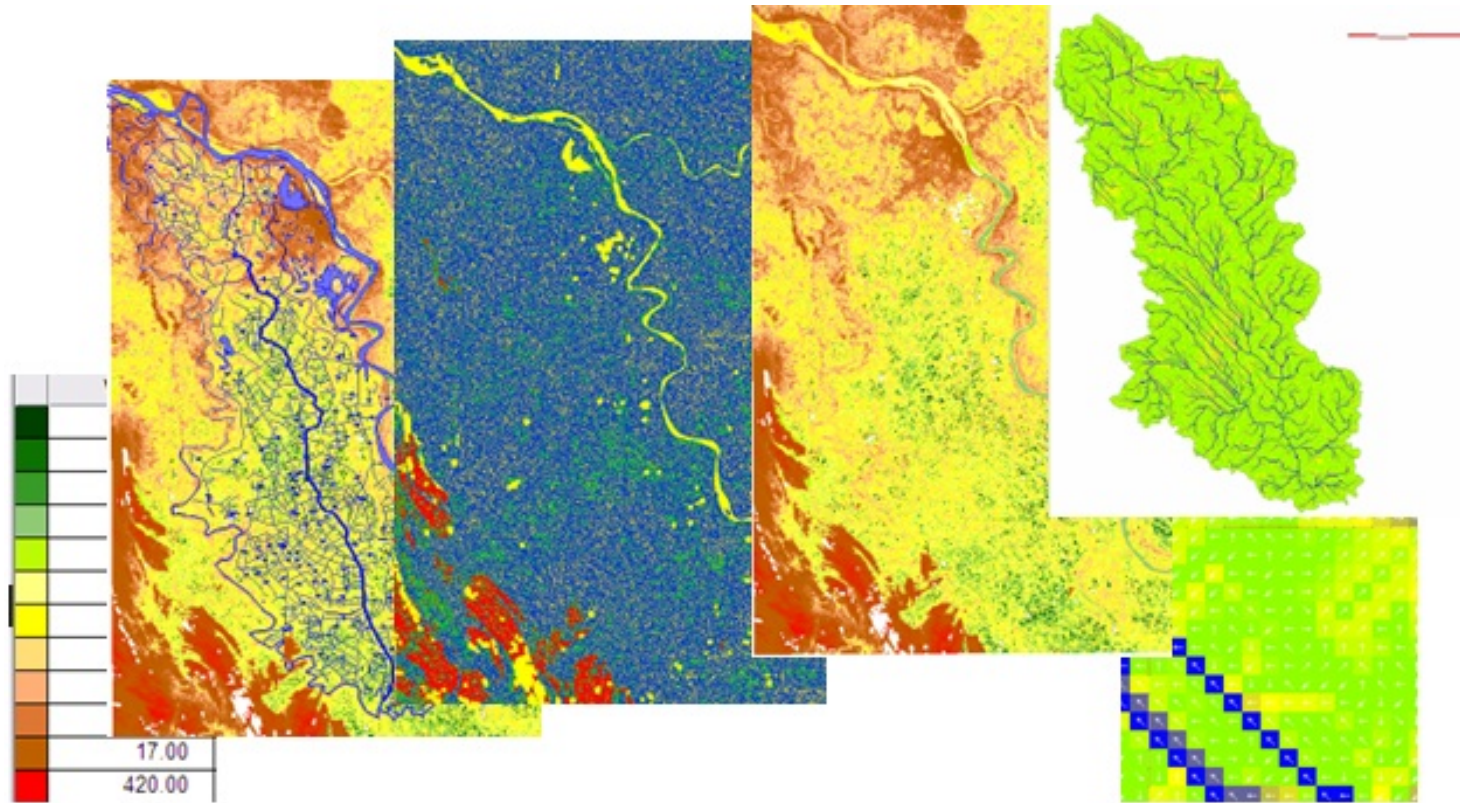
Optical & Near-infrared spectrum



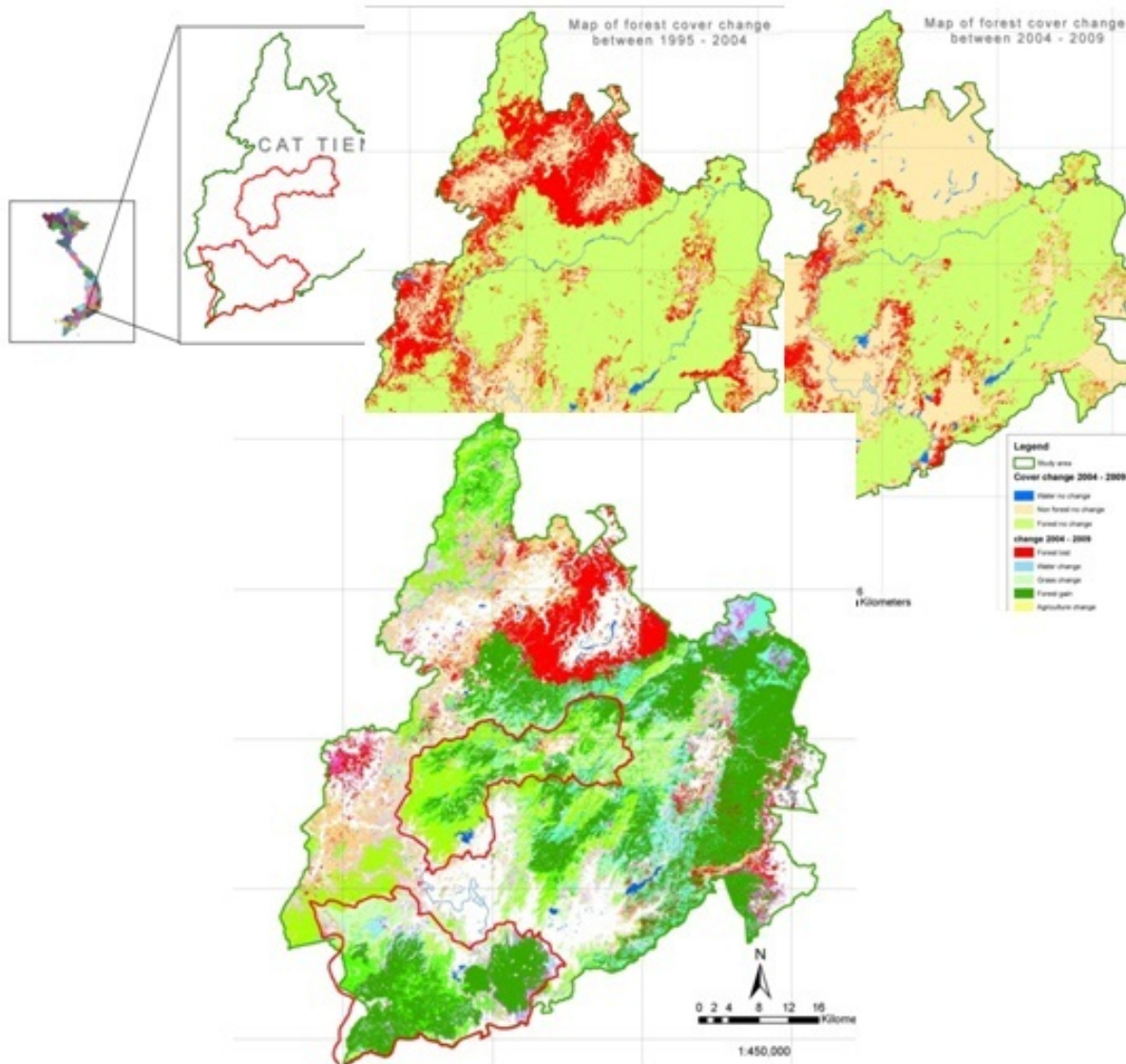
UAV & its application for monitoring forest fires, drought /flood, water quality, ship and oil spill, etc (VAST program)

Spectrometer (manufactured by STI) used for measuring the reflective spectrum of the natural objects

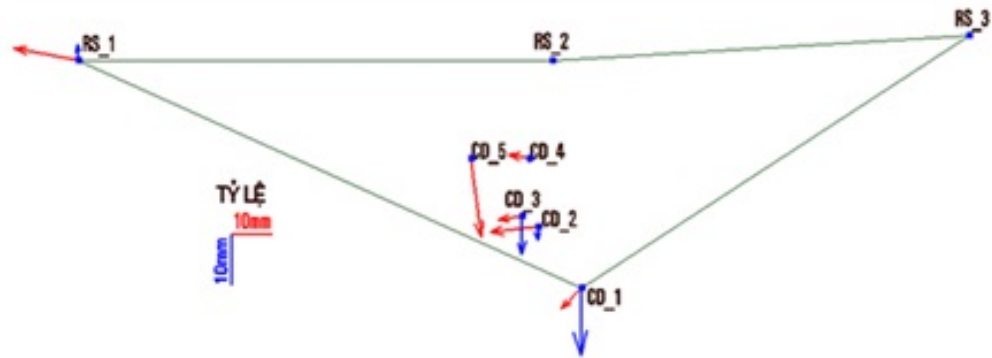
Applications of remote sensing GPS and GIS



Integration and modeling of remote sensing information in GIS for Cau River basin, disaster management



Assessment on change of forest cover, REDD (Reducing Emissions from Deforestation and Degradation) project Viet Nam



Application of high-precision GPS for monitoring of costal building displacement

**VNREDSat-1 system
and its contribution as
SA-DPN**

VNREDSat-1

(1st VietNam Natural Resource, Environment & Disaster monitoring system)

Owner: VAST

Launch date: 07/5/2013 from Kourou, France

Resolution: PAN (2.5m) and 4 MS (10m)

Revisit: **3 days**

Orbit: **SSO, 680 km altitude**

LTAN : **10:42 PM**

Mass: **~130 kgs**

Design lifetime: **5 years**

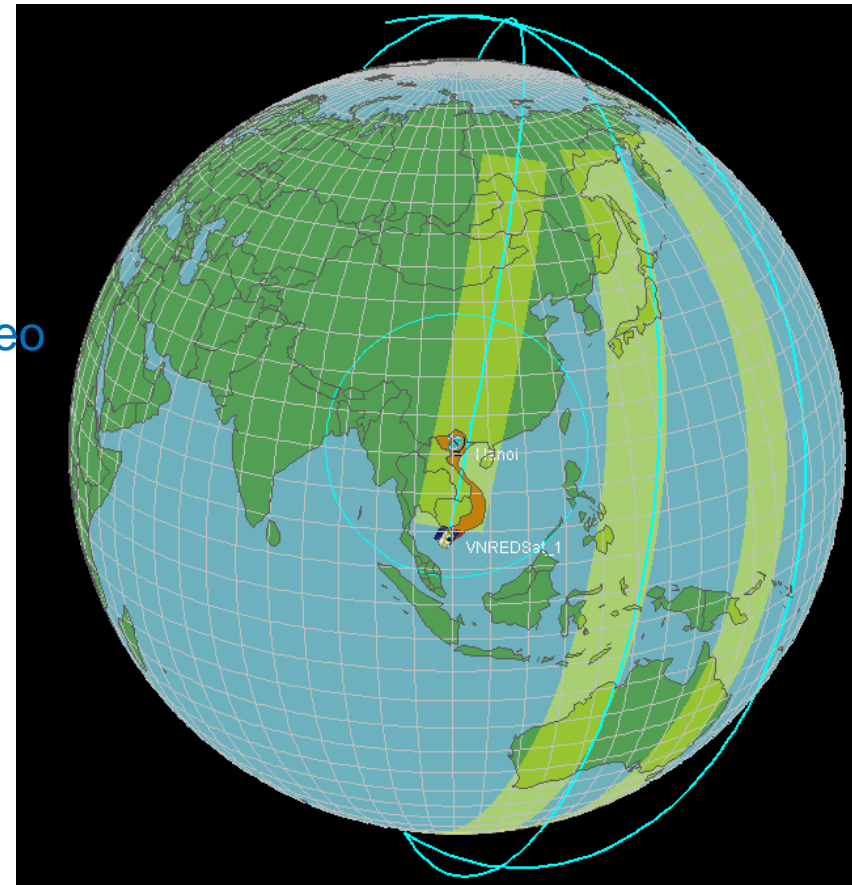
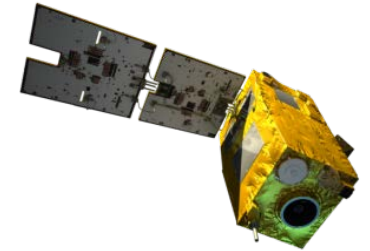
Imaging mode: single shot, scanning, stereo

Swath: **17.5 km**

Length: **823 km (PAN + MS)**

Scenes/day: **100**

Agility : +/- 35 degrees



Spectral bands

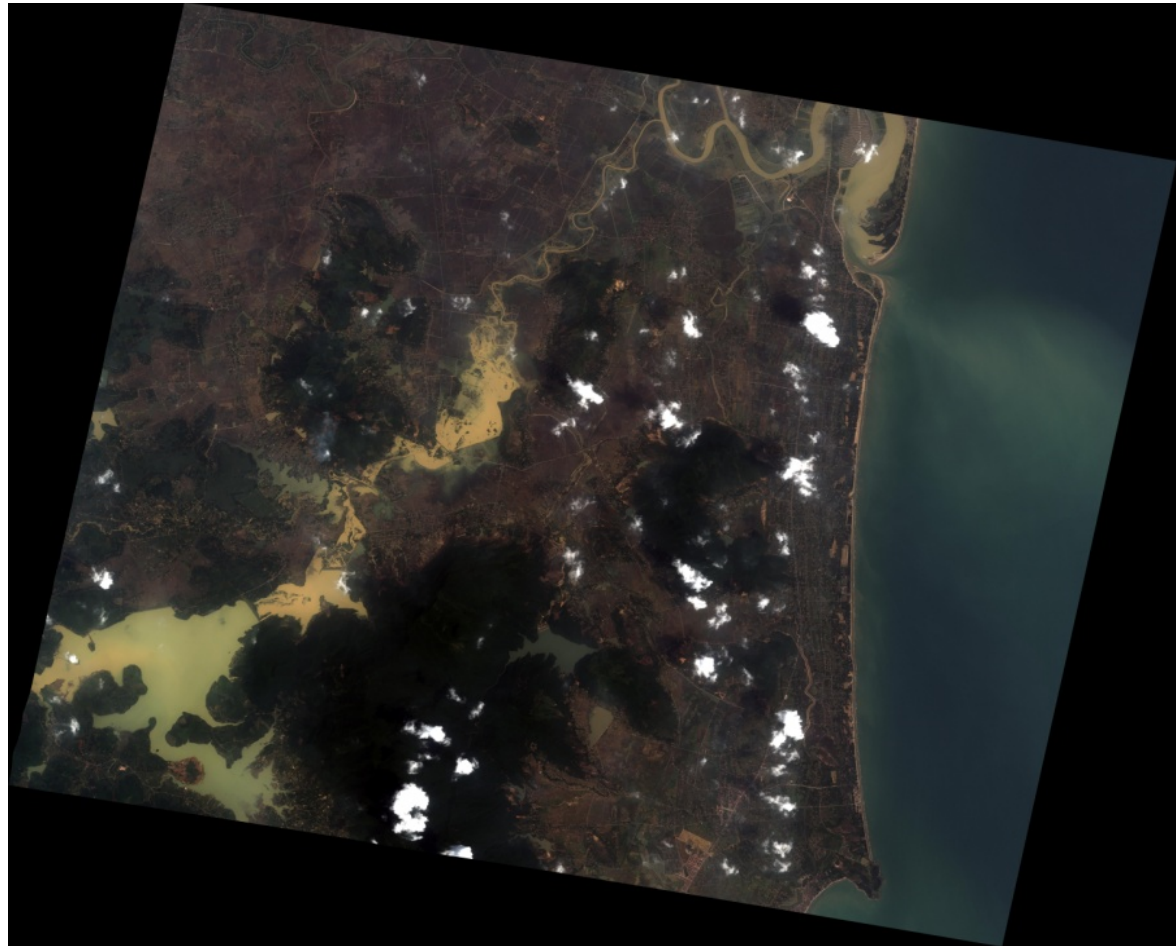


Band	Name	Lower Band Edge (μm)	Upper Band Edge (μm)
Panchromatic	PAN	0.45 +/- 0.02	0.75 +/- 0.02
Blue	B1	0.45 +/- 0.02	0.52 +/- 0.02
Green	B2	0.53 +/- 0.02	0.59 +/- 0.02
Red	B3	0.625 +/- 0.02	0.695 +/- 0.02
Near-Infrared	B4	0.76 +/- 0.02	0.89 +/- 0.02



Typical applications of VNREDSat-1

- Land use mapping
- Agriculture
- Forest management
- Environment and territory (oil spill, water, atmospheric pollution)
- Island and costal management
- Disaster management: monitoring, early-warning, assessment, ...



*VNREDSat-1 image dated 4/10/2013
over Nghe An Province.
Flood caused by hydro-power plant*

VNREDSat-1: a SA's DPN

- 18/11/2015: VNREDSat-1/STI accepted as a SA-DPN/DAN
- Related activities:
 - APRSAF
 - SCOSA
 - SA's meeting:
 - **COORDINATION IMPROVEMENT BETWEEN DISASTER RELATED AGENCIES AND SENTINEL ASIA (GIC, AIT, JAXA, STI, DMC, MONRE), Hanoi, Nov 2016**
 - **DPN meeting in Sri Lanka**
 - **SC's meeting, Bangkok, 2016**
 - ...

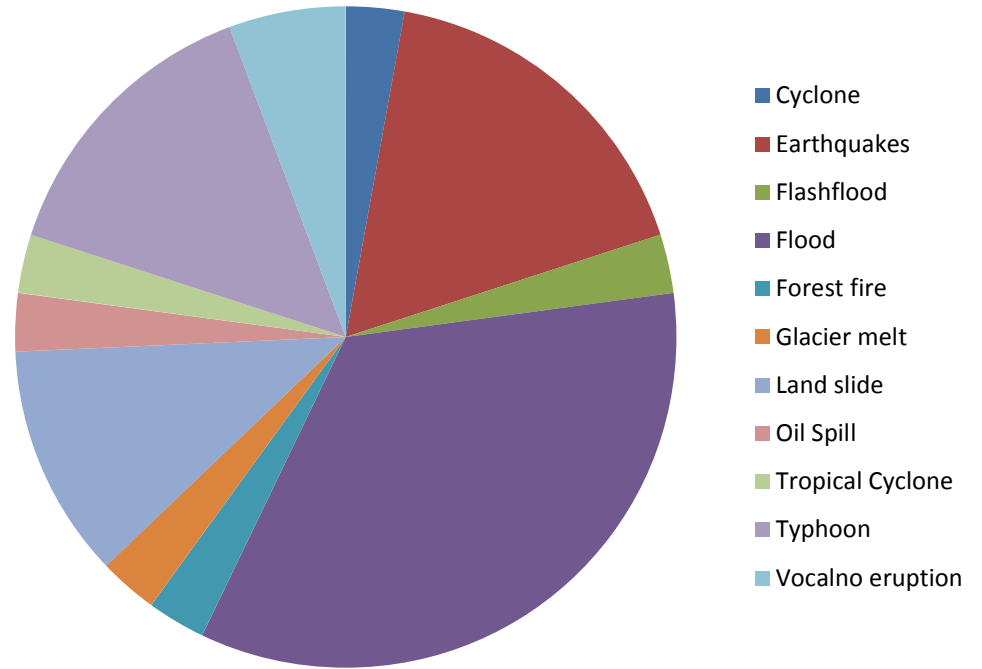
VNREDSat-1 responses

No	Date	Disaster	Location	Requester
1	16/01/2014	Flood	Jakarta, Indonesia	SA
2	10/12/2015	Typhoon	Tacloban, Philippine	SA
3	8/11/2015	Flood	Tamil Nadu, India	SA
4	6/2/2016	Earthquake	Taiwan	SA
5	22/02/2016	Typhoon	Fiji Island, Pacific Ocean	SA
6	25/02/2016	Glacier melt	Northern of Myanmar	SA
7	1/3/2016	Flood	Northern of Myanmar	SA
8	2/3/2016	Flood	Jakarta, Indonesia	SA
9	14/03/2016	Flood	Bandung, Indonesia	SA
10	1/4/2016	Forest fire	Philippines	SA
11	1/4/2016	Oil Spill	Taiwan	SA
12	6/4/2016	Land slide	Pakistan	SA
13	14/04/2016	Earthquake	Myanmar	SA
14	16/04/2016	Earthquake	Japan	SA
15	16/04/2016	Earthquake	Ecuador	SA
16	16/05/2016	Flood	SriLanKa	SA
17	23/05/2016	Vocalno eruption	Indonesia	SA
18	20/06/2016	Land slide	Indonesia	SA
19	06/07/2016	Flood	Nepal	SA
20	11/07/2016	Typhoon	Taiwan	SA
21	15/09/2016	Tropical Cyclone	Philippines	SA
22	16/09/2016	Typhoon	Taiwan	SA
23	27/09/2016	Flash flood	Indonesia	SA
24	23/09/2016	Land slide	Indonesia	SA
25	21/10/2016	Typhoon	Philippines	SA
26	01/11/2016	Flood	VietNam	SA
27	07/12/2016	Earthquake	Indonesia	SA
28	25/12/2016	Flood	Ghami_Nepal	SA
29	28/12/2016	Cyclone (NockTen)	Philippines	SA
30	28/12/2016	Vocalno eruption	Philippines	SA
31	11/01/2017	Flood	Thailand	SA
32	21/01/2017	Flood	Philippines	SA
33	13/02/2017	Earthquake	Philippines	SA
34	21/02/2017	Flood	Indonesia	SA
35	22/02/2017	Land slide	Indonesia	SA

Year	No. of scences
2014	6
2015	15
2016	335
2017	69

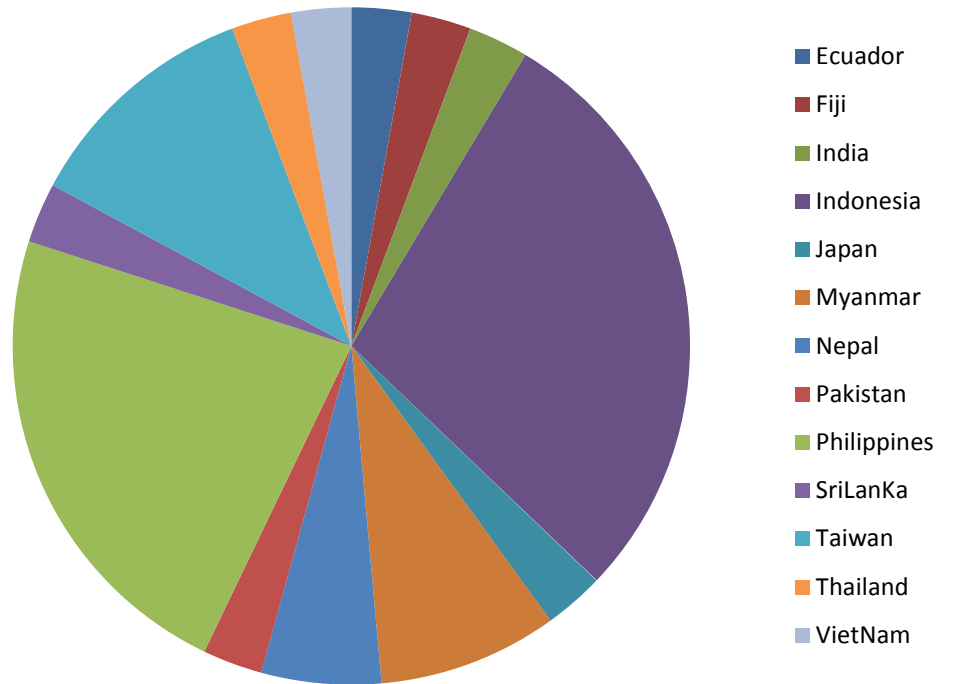
VNREDSat-1: Type of disaster

Cyclone	1
Earthquakes	6
Flashflood	1
Flood	12
Forest fire	1
Glacier melt	1
Land slide	4
Oil Spill	1
Tropical Cyclone	1
Typhoon	5
Vocalno eruption	2
	35



VNREDSat-1: by country

Ecuador	1
Fiji	1
India	1
Indonesia	10
Japan	1
Myanmar	3
Nepal	2
Pakistan	1
Philippines	8
SriLanKa	1
Taiwan	4
Thailand	1
VietNam	1



Comments and suggestions

VNREDSat-1 images:

- VNREDSat-1: 3 day revisit and most EORs are outside Vietnam so response in timely manner (less than 3 days to acquire the image over the area of interest).
- VNREDSat-1: an optical system-> image quality influenced by cloud. Suggestion: optical image before and after the disaster (for disaster assessment activities).
- No dedicated server currently available for SA's data sharing -> long time to find alternate way to upload the data (asking for end user server, sending images by e-mail,...).

Forecasting data:

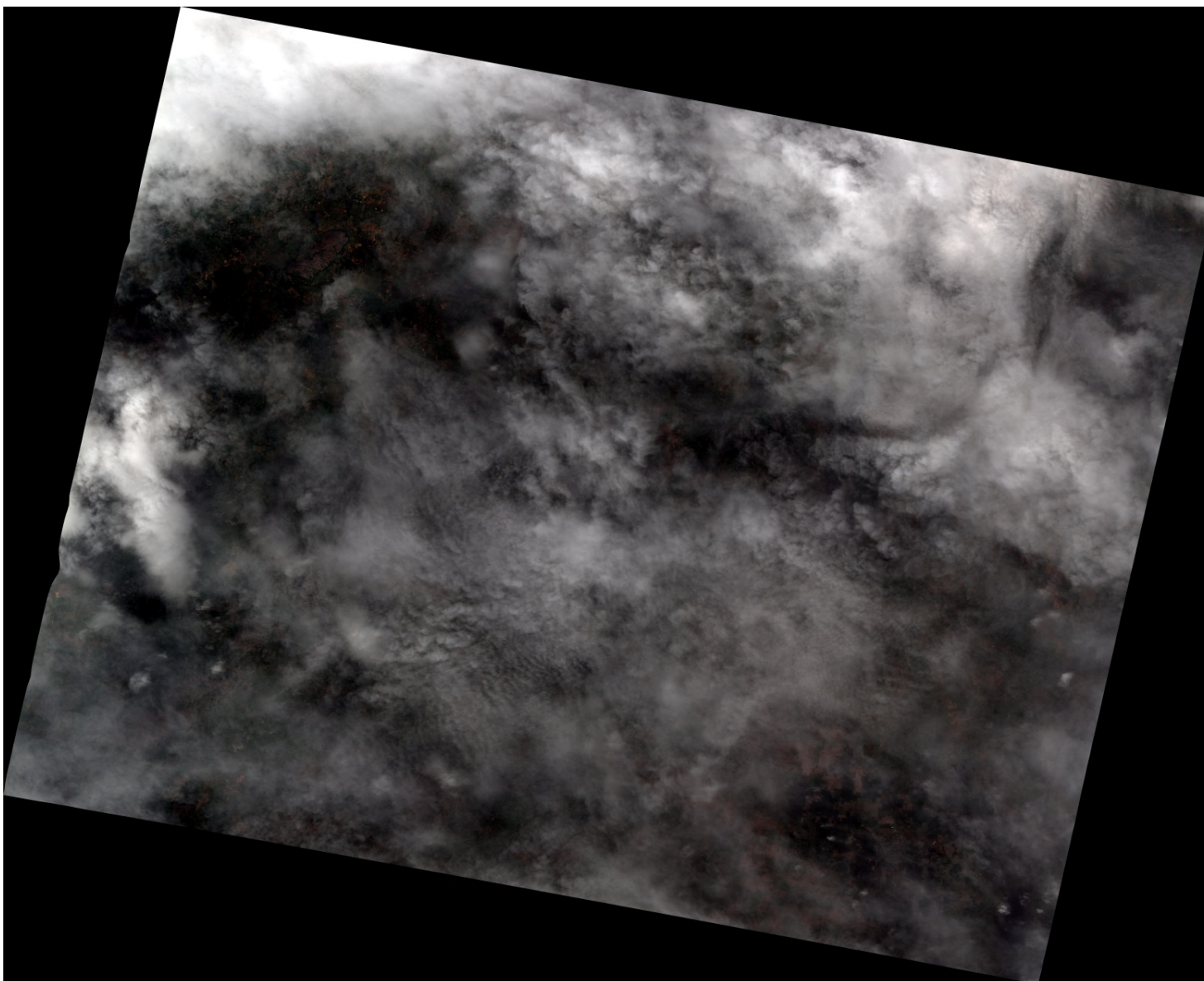
- Pre-disaster satellite images are needed for assessment and monitoring activities.
- Forecasting should be taken into account for pre-disaster imaging.
- -> good source of forecasting data and pre-disaster requests are needed.

Processing:

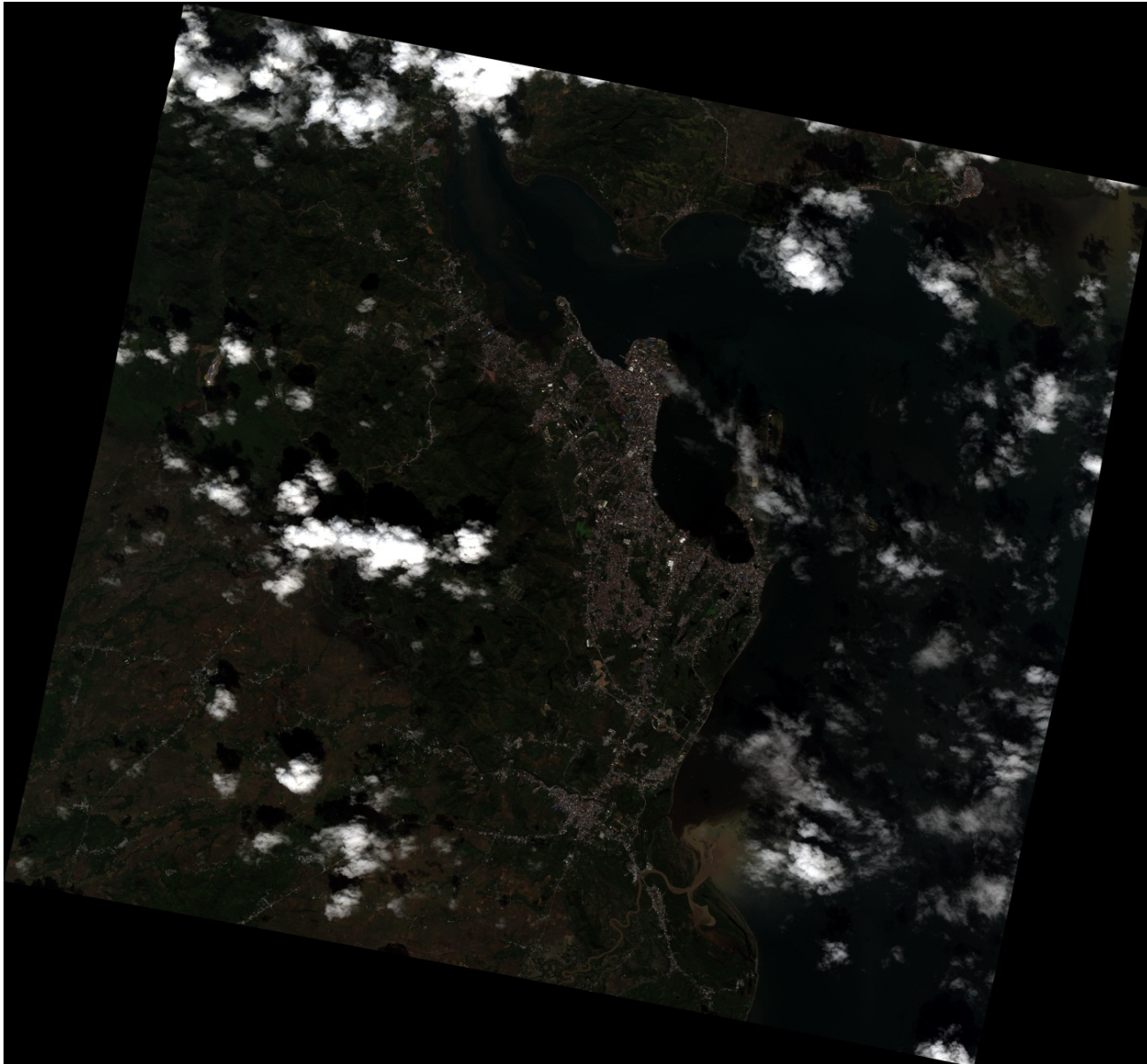
- Joint processing of DAN should be considered to improve response time
- Local DMO coordination: Local coordination, sharing mechanism, local needs etc.

Review: regular review (monthly) should be done and dispatched to each DPN for their synthesis and report.

VNREDSat-1 image of Tamil Nadu, India (3/12/2015) –
EOR dated 2/12/2015



VNREDSat-1 of Tacloban, The Philippines (10/12/2015) –
EOR dated 9/12/2015





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Space Technology Institute

THANK YOU VERY MUCH

www.sti.vast.ac.vn