



NARLabs 國家實驗研究院

國家太空中心

National Space Organization

Data Provider Node (DPN) Report

NARLabs

A center of innovation and excellence for space technology in Taiwan

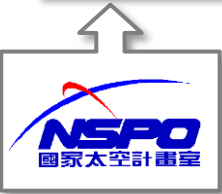


Jan. 23, SA JPTM2018

NSPO Major Milestones

Remote Sensing Satellites

承諾 · 熱情 · 創新



- NSPO established
- 1st Phase Program approved

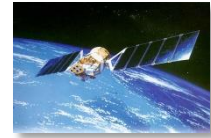
Renamed to National Space Organization



I&T Facility Completion



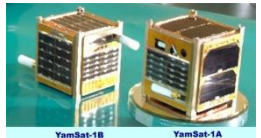
SR-1 Launch



FORMOSAT-1 Launch



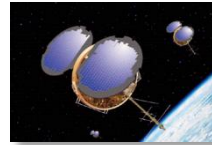
2nd Phase Plan approved



Yamsat Completion



FORMOSAT-2 Launch



FORMOSAT-3 Launch



Approval of FORMOSAT-5 (Updated)

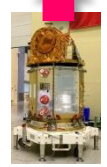
FORMOSAT-2 begin contributing to Sentinel Asia



Approval of FORMOSAT-7



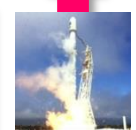
SR-10 Launch



FORMOSAT-5 I&T Completion



FORMOSAT-2 Decommissioning



FS-5 Launch



FS-7 Launch

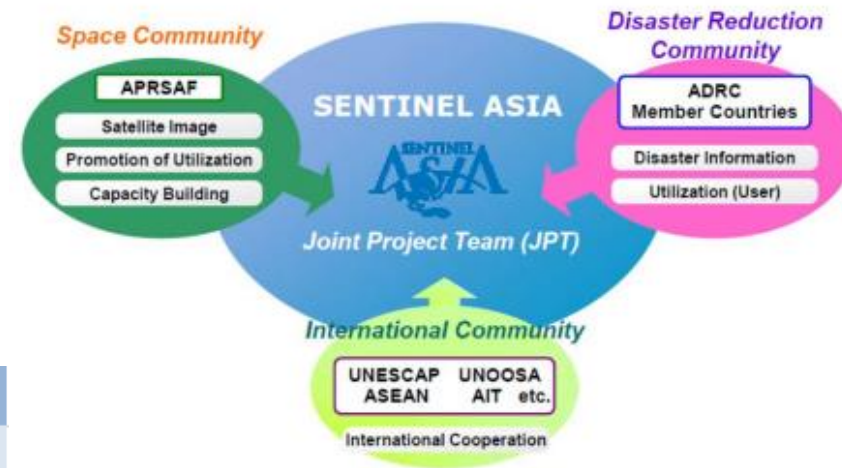
FS-5 operation



till 2016

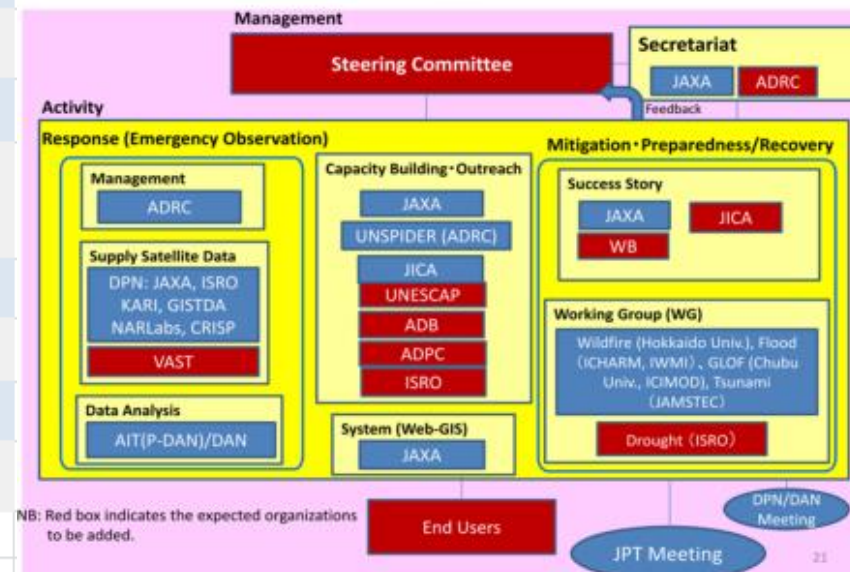
承諾 · 熱情 · 創新

- Asia-Pacific region is threatened by natural disasters.
- FORMOSAT-2 has been contributing to Sentinel Asia since 2010.



Disaster Type	2010	2011	2012	2013	2014	2015	2016*
Earthquake	0	5	3	0	0	2	2
Landslide	2	0	1	3	3	0	0
Tsunami	1	0	0	0	0	0	0
Volcano eruption	2	1	0	1	3	0	0
Flood	5	16	4	5	3	4	4
Flash flood	2	3	0	2	0	1	0
Others	1	0	7	2	2	3	2
Total	13	25	15	13	11	10	8

* ~2016/6/20


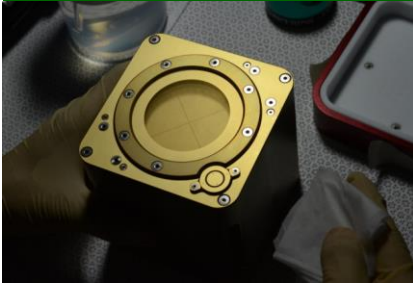





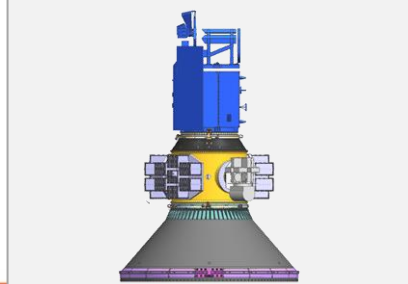


NB: Red box indicates the expected organizations to be added.



FORMOSAT-5 Program

- To build up and demonstrate Taiwan's indigenous space technology on the remote sensing satellite
- To continuously serve the global imagery user's community of FORMOSAT-2
- Utilizing the linear CMOS image sensor for high-resolution (GSD =2m) EO satellite
- Capable of smart agility (or asynchronous imaging) to allow flexibility of image tasking
- Completed its environmental tests by the end of 2015 and launched by Falcon 9 in August 25th 2017

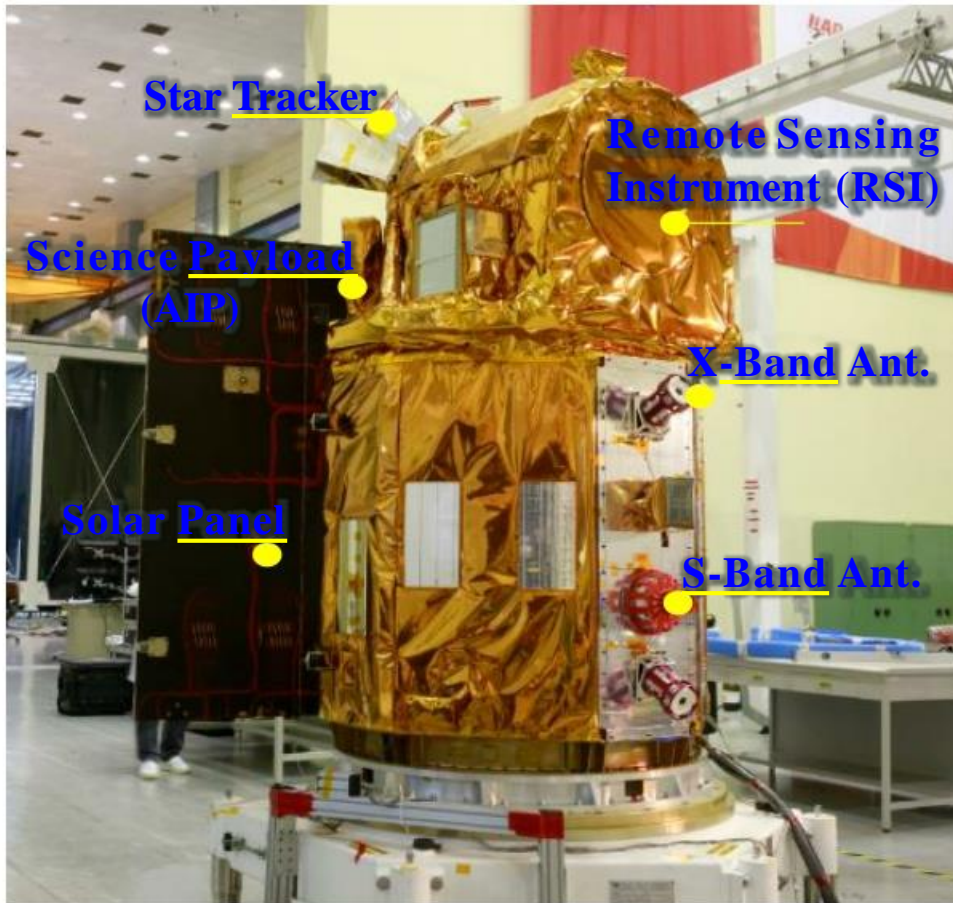
Space Segment		Ground Segment	Launch Segment
Spacecraft Bus	AIP (Science P/L)	Mission Ops	Falcon 9
			
RSI (Mission P/L)	Satellite I&T	Image Processing	Launch Configuration
			

FORMOSAT-5 Launch

承諾 · 熱情 · 創新



FS5 Key Parameters



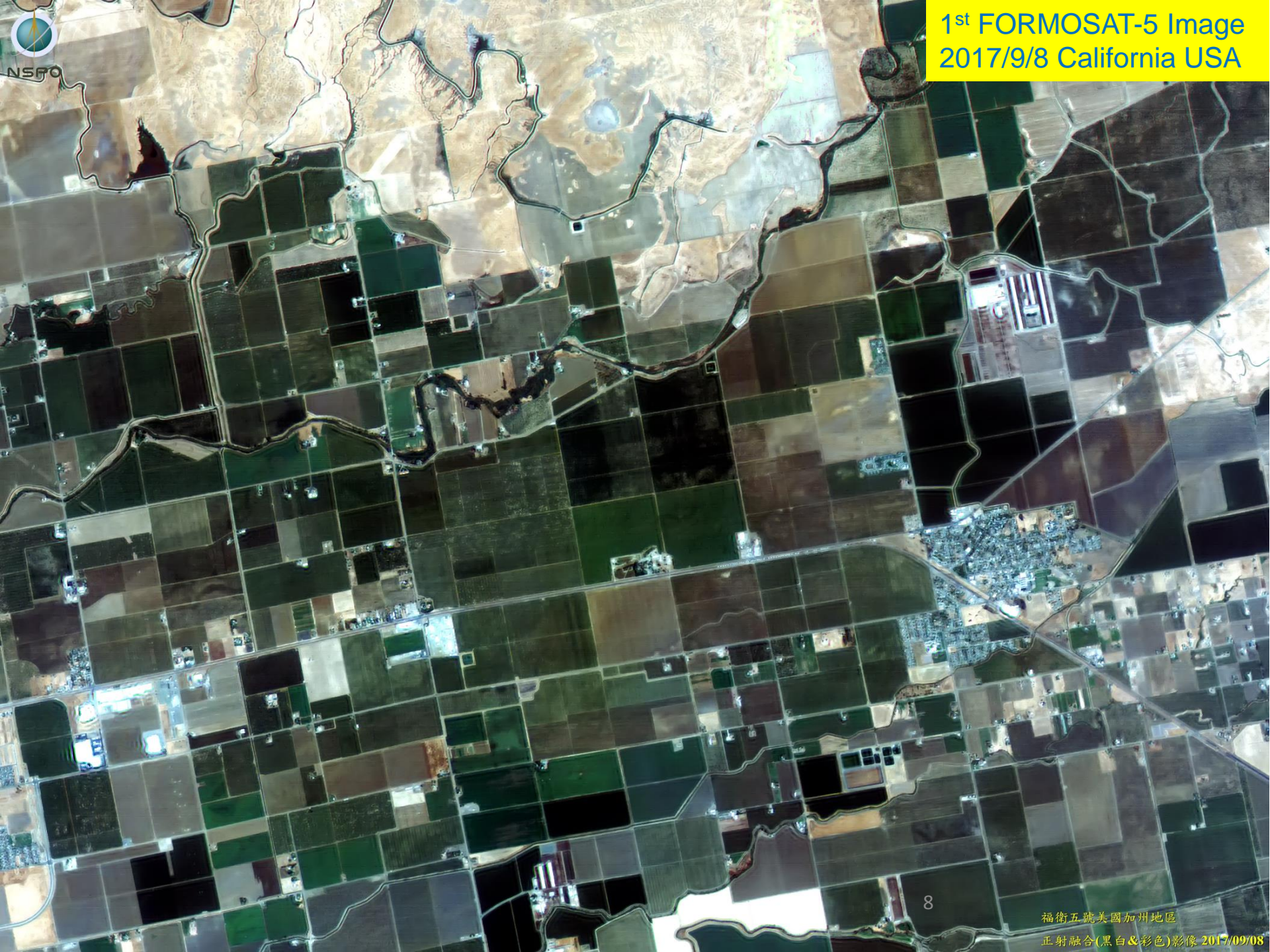
Parameter	Specification
Orbit	SSO @720km/98.28°
Revisit Period	2days (FS-2,1day)
Mission Life	5 years
GSD	PAN, 2m MS, 4m (FS-2 8m)
Swath	24 km
Agility	±45°
Spectral Bands	PAN + 4 MS
Payloads	RSI/CMOS AIP
RSI duty Cycle	8%
Satellite Weight	<500 kg

FORMOSAT-5 Images and AIP Science Data

Now is in Commissioning Phase for Calibration
and Performance Verification



1st FORMOSAT-5 Image
2017/9/8 California USA



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福衛五號美國加州地區
正射融合(黑白&彩色)影像 2017/09/08

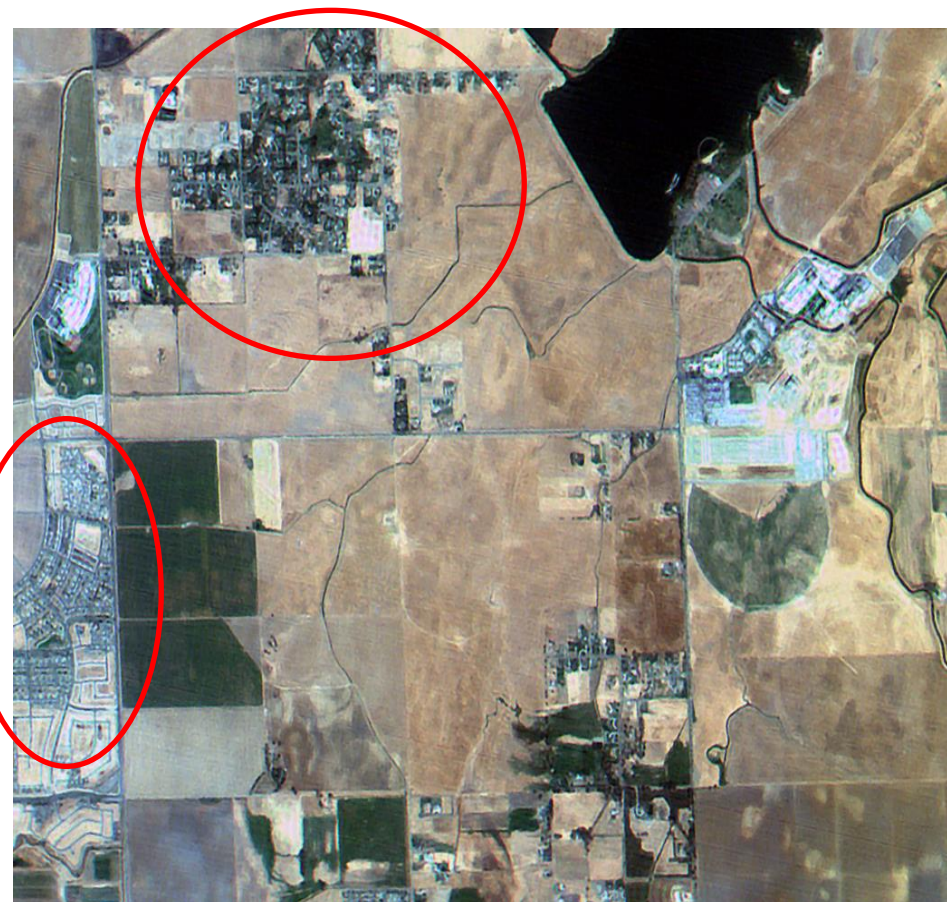
Comparison of FORMOSAT-5 & FORMOSAT-2 **NAR Labs** Images (California USA)

承諾 · 熱情 · 創新

FORMOSAT-2 2013/10/27



FORMOSAT-5 2017/9/8



10/7 San Francisco Image



09/19 Taiwan Nantou Image

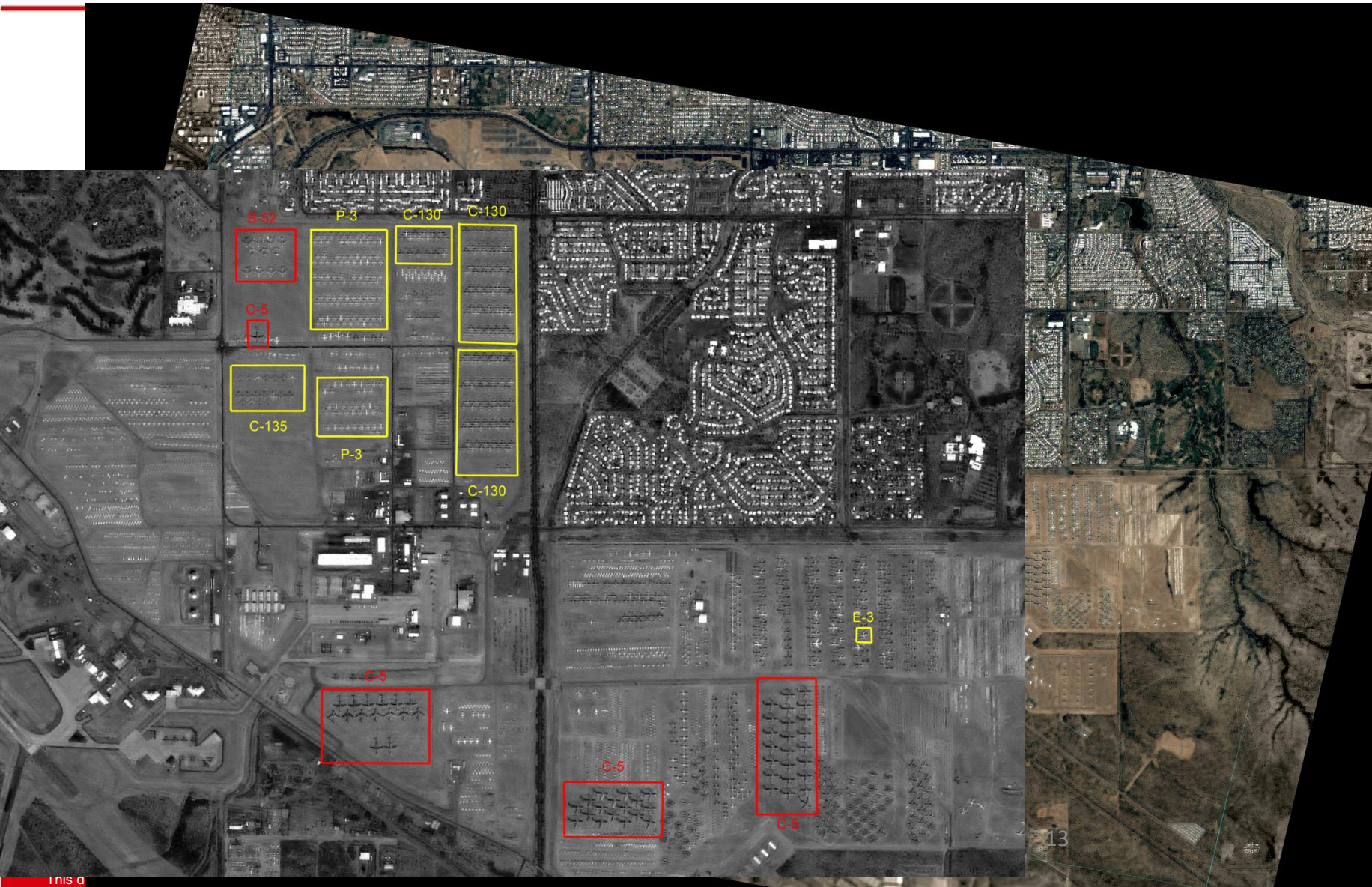


10/1 Taiwan Taipei Image



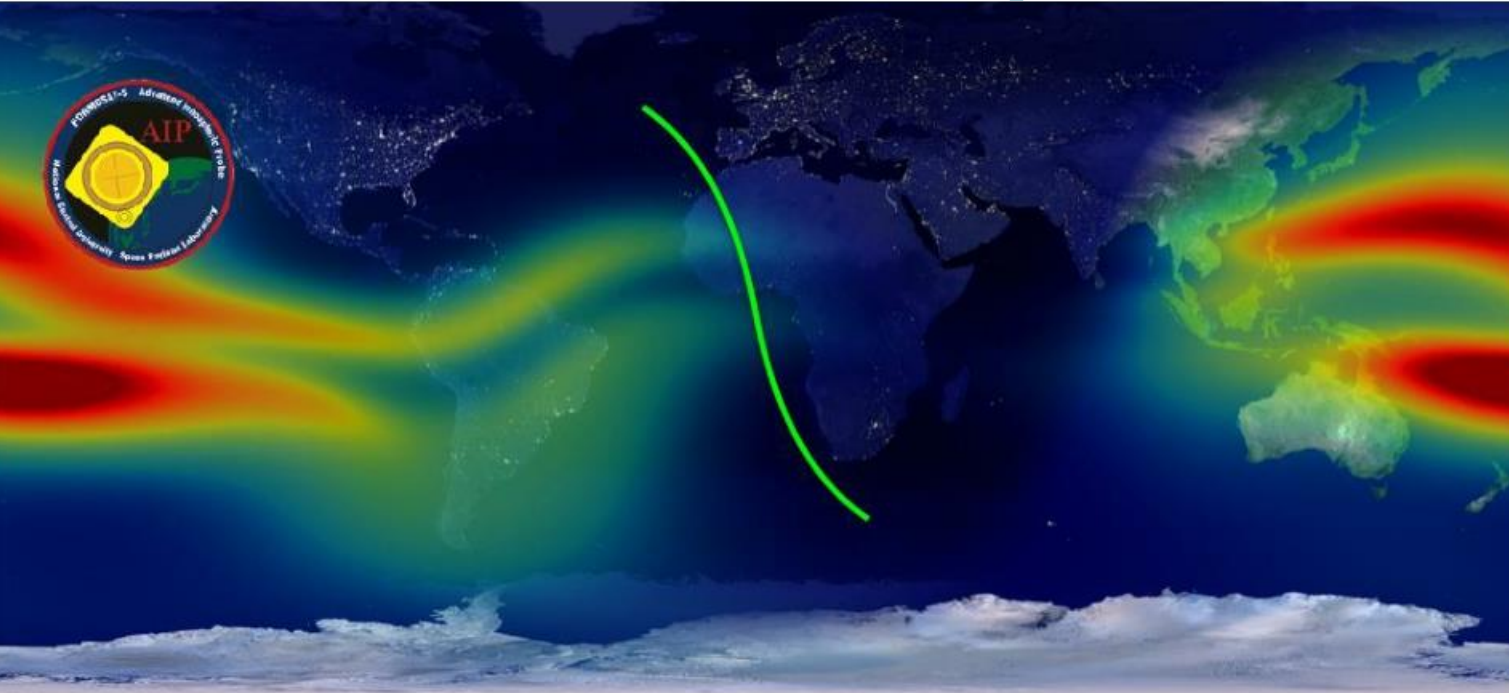
10/28 Davis Airport USA

承諾・熱情・創新

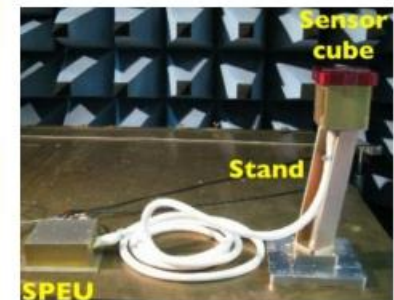
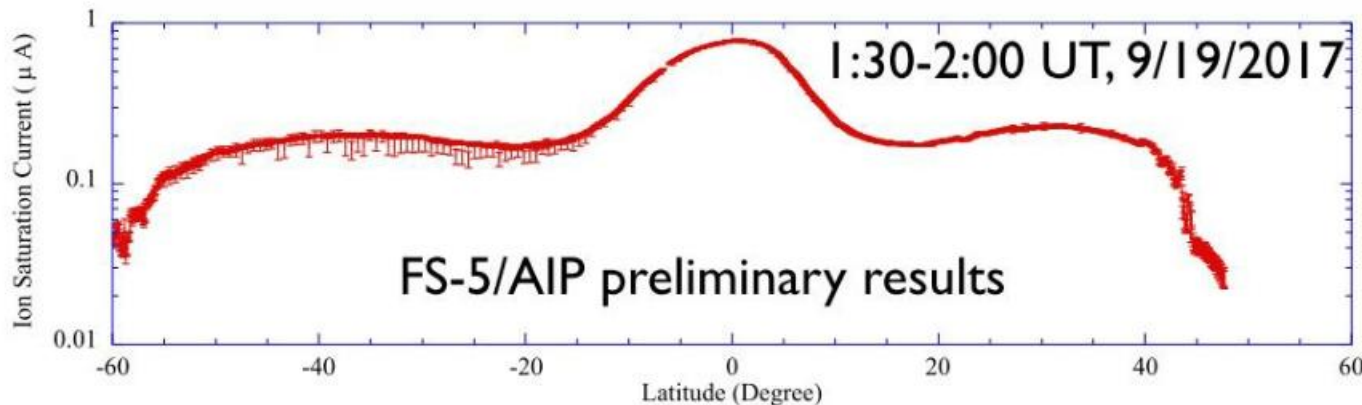




Data from **NAR Labs** Advanced Ionospheric Probe



- AIP is a piggyback science payload developed by National Central University
- to explore space weather/climate and seismic precursors associated with strong earthquakes.



Disaster-related needs supply planning

- **Disaster-related needs are expected to be available this year (2018) during the flood season (Taiwan) ◦**
- **Disaster-related needs for Sentinel Asia are expected to be available after commissioning phase (to be discussed) ◦**



ps:

- Commissioning
- Trial operation
- Operation

Disaster Rescue

Target Name	Disaster Type	Image Status
Qasr -e Shirin, Kermanshah Province, Iran	Earthquake	Good image
Wildfire_Ventura, CA, United States	Wildfire	Good image
East China Sea oil tanker disaster	Oil pollution	Good image



Thanks for Your Attention



NSPO
NATIONAL SPACE ORGANIZATION