

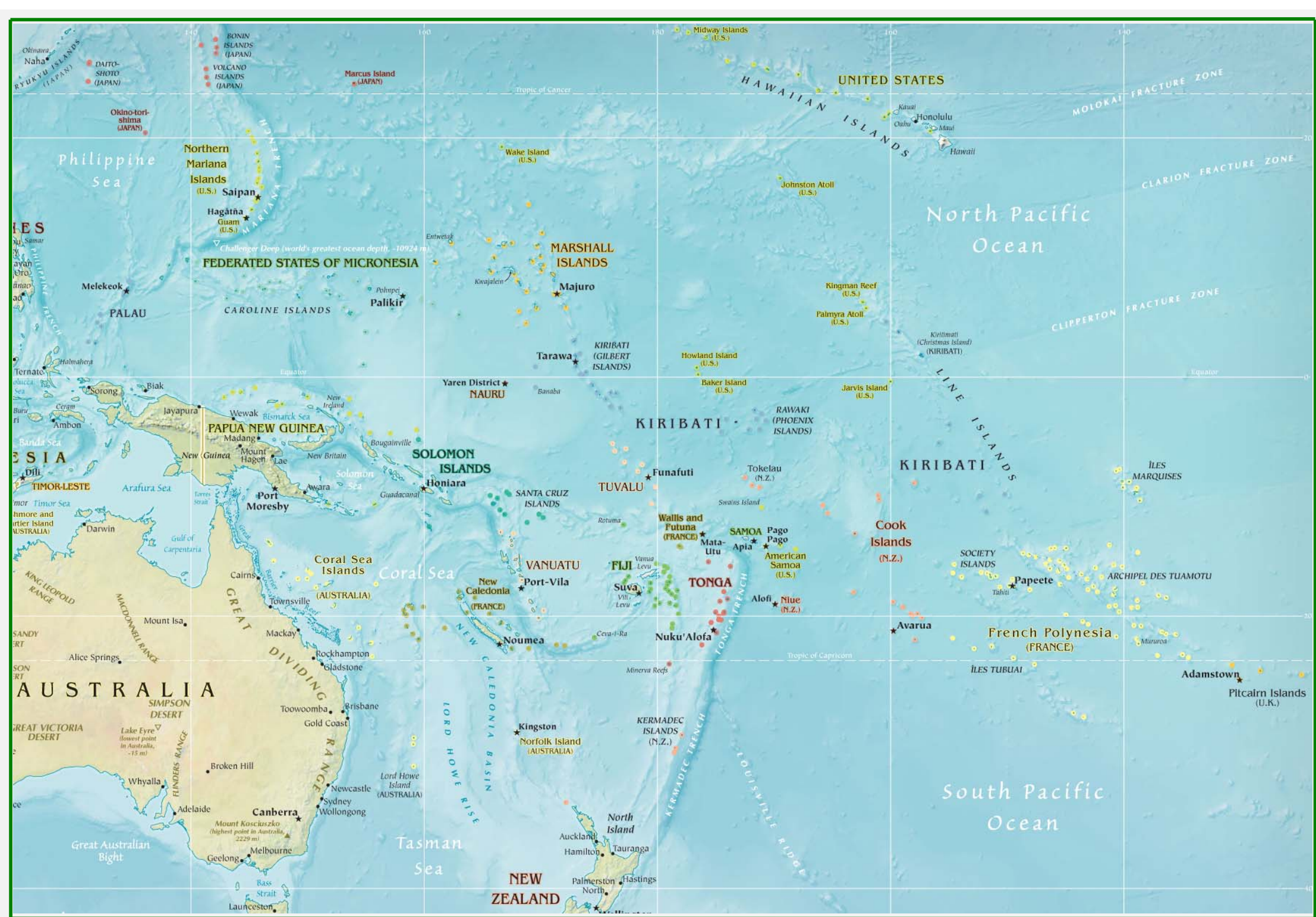
K&C Phase 4 – Status report

Improving Forest and Carbon Monitoring in the Pacific Island Region

Wolf Forstreuter
Pacific Community (SPC)



Science Team meeting #22
Tokyo, Japan, February 16-18, 2016





SPC

- 600 specialists and support staff
- Headquarter in New Caledonia
- Funded by member countries and international donors
- SPC covers 22 Pacific Island States

Assistance of
Pacific Island Countries,
Implementation of technology,
Know how transfer

Pacific Island Countries, (a) Atoll Islands

Monitoring performed
through visual interpretation
and overlay over historical
vegetation maps (1:10,000)

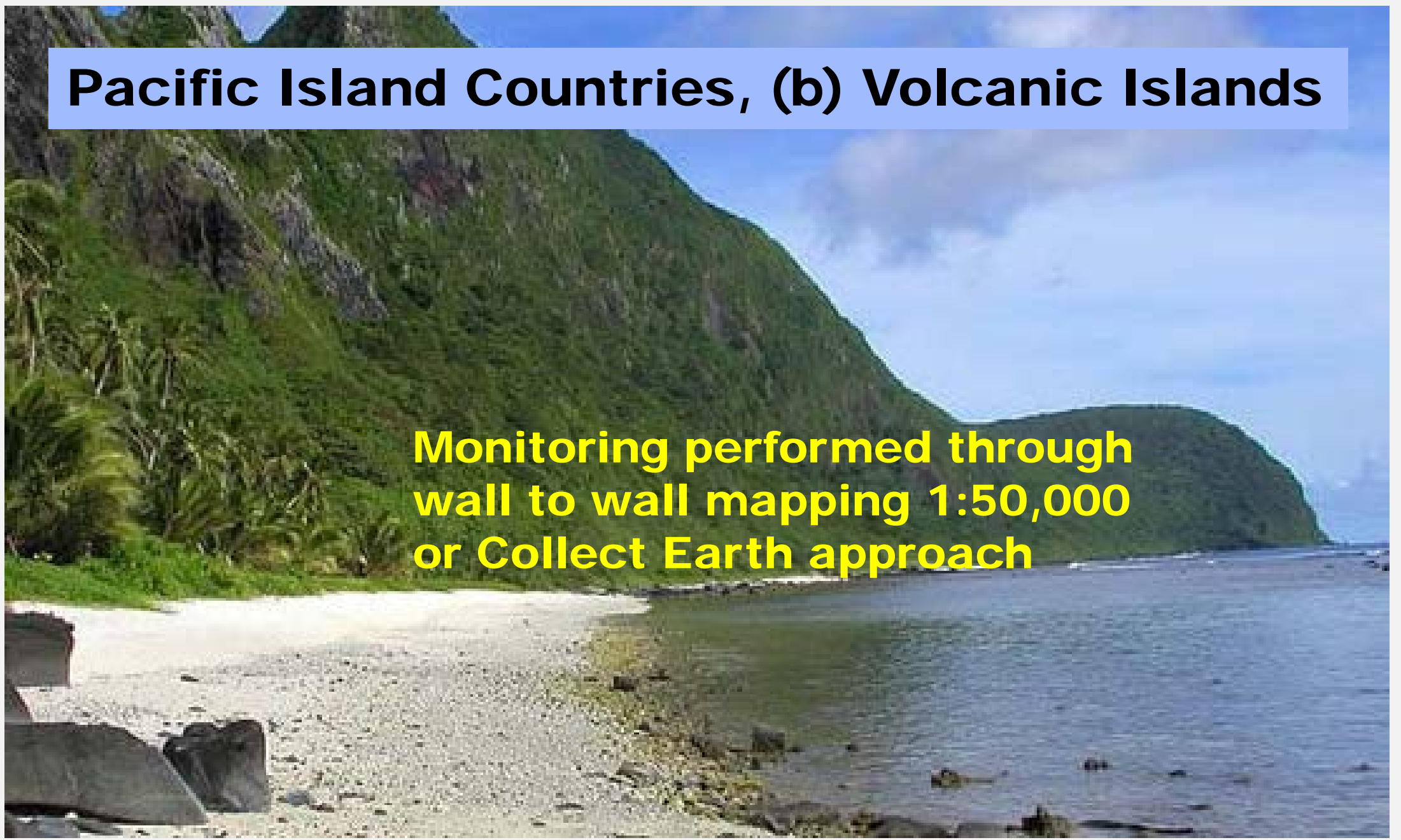
Coconut is the "tree" of life

The ALOS logo is displayed in a white serif font against a background of a satellite map showing a river network in blue and green terrain.

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Pacific Island Countries, (b) Volcanic Islands

A photograph of a tropical coastal landscape. In the foreground, there is a sandy and pebbly beach with some dark rocks. The middle ground shows a calm body of water meeting a steep, lush green hillside covered in dense vegetation, including palm trees. In the background, another smaller green island is visible under a blue sky with scattered white clouds.

Monitoring performed through
wall to wall mapping 1:50,000
or Collect Earth approach

Wall to Wall Mapping Fiji (Volcanic Island)

- Visual interpretation of Landsat IV data recorded 1991 transferred via
- Visual interpretation of Landsat VII data recorded 2001
- Visual interpretation of ALOS optical data recorded 2007
- Forest loss 1991 → 2001: 2%
- Forest loss 2001 → 2007: < 1%



The screenshot shows the Google Earth interface with a forested area. A blue arrow points to the historical image timeline at the top left, which shows a range from 2003 to 2015, with a specific date of 6/22/2015 selected. A yellow grid is overlaid on the forest, with a red square in the center. A white arrow points from this red square to the land use data panel on the right. The panel contains the following information:

- Land use category:** Forest, Cropland, Grassland, Wetland, Settlement, Other, No Data, Accuracy, YES, NO.
- Land use sub-category:** F > F, C > F, G > F, W > F, S > F, O > F, Accuracy, YES, NO, Year, N/A.
- Land use sub-division:** Natural Forest, Mangrove, Plantation, Softwood, Hardwood, Accuracy, YES, NO.
- Canopy:** (partially visible)

At the bottom of the screen, the status bar shows the Imagery Date as 6/6/2015, a date selector for 2004, coordinates 17°38'10.35" S 177°33'44.90" E, elevation 1360 ft, and eye altitude 2199 ft. The Windows taskbar at the bottom shows the time as 12:55 PM on 11/16/2015.

Historical Image Data available

Forest loss < 1%

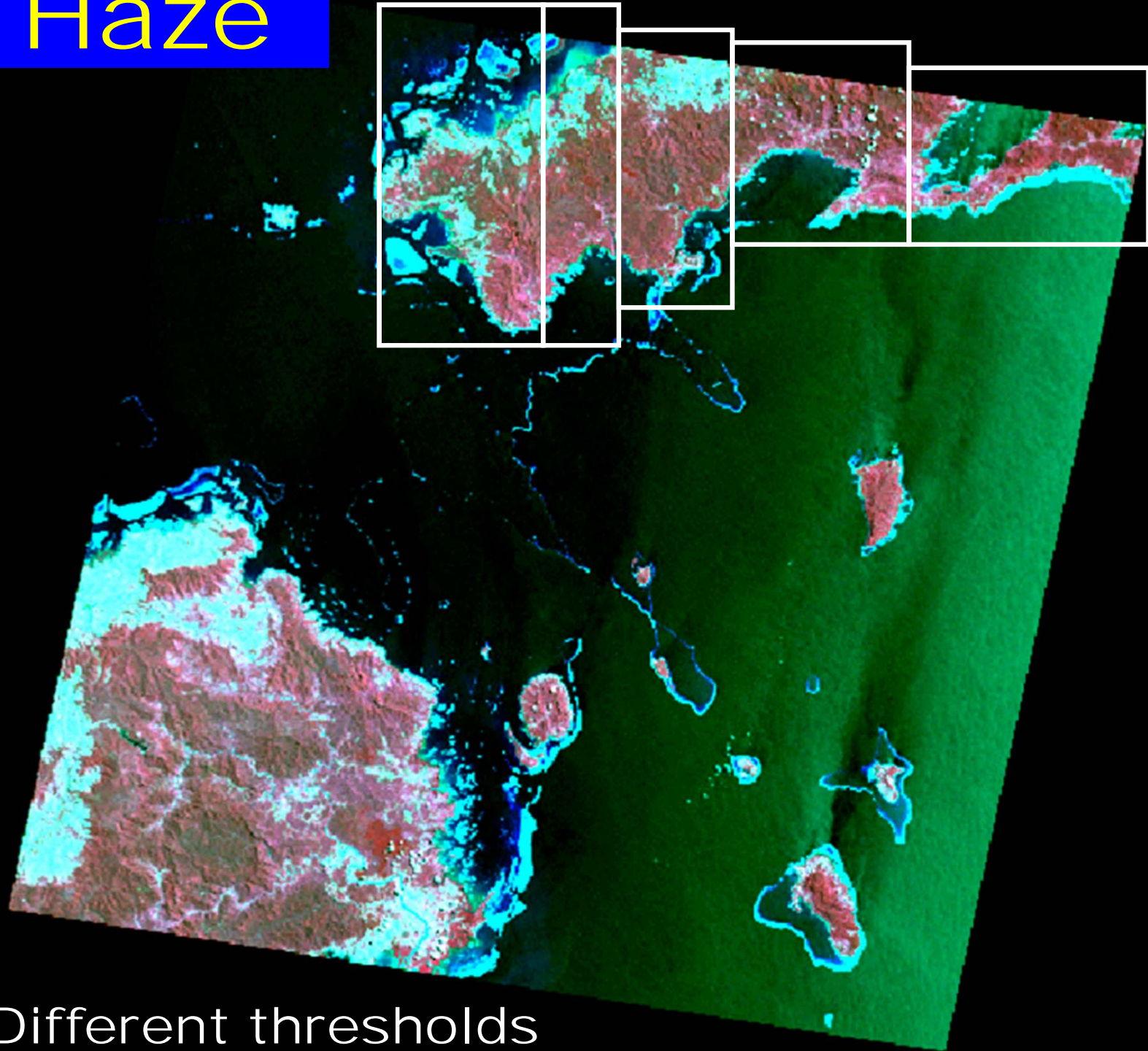
The image is a composite of four aerial photographs of a forest, arranged in a 2x2 grid. The top-left photo shows a small red outline on a dark green forest. The top-right photo shows a larger, more complex red outline. The bottom-left photo shows a large area outlined in red, with a black line and the text 'N27_1' overlaid. The bottom-right photo shows a large area outlined in red, with a black line and a small white area. A semi-transparent black text box is overlaid on the right side of the image, containing white text.

Forest (Area) Change

Most carbon removal through selective logging, visible through logging tracks ... for ~ 3 months only

N27_1

Haze



Atmospheric Conditions

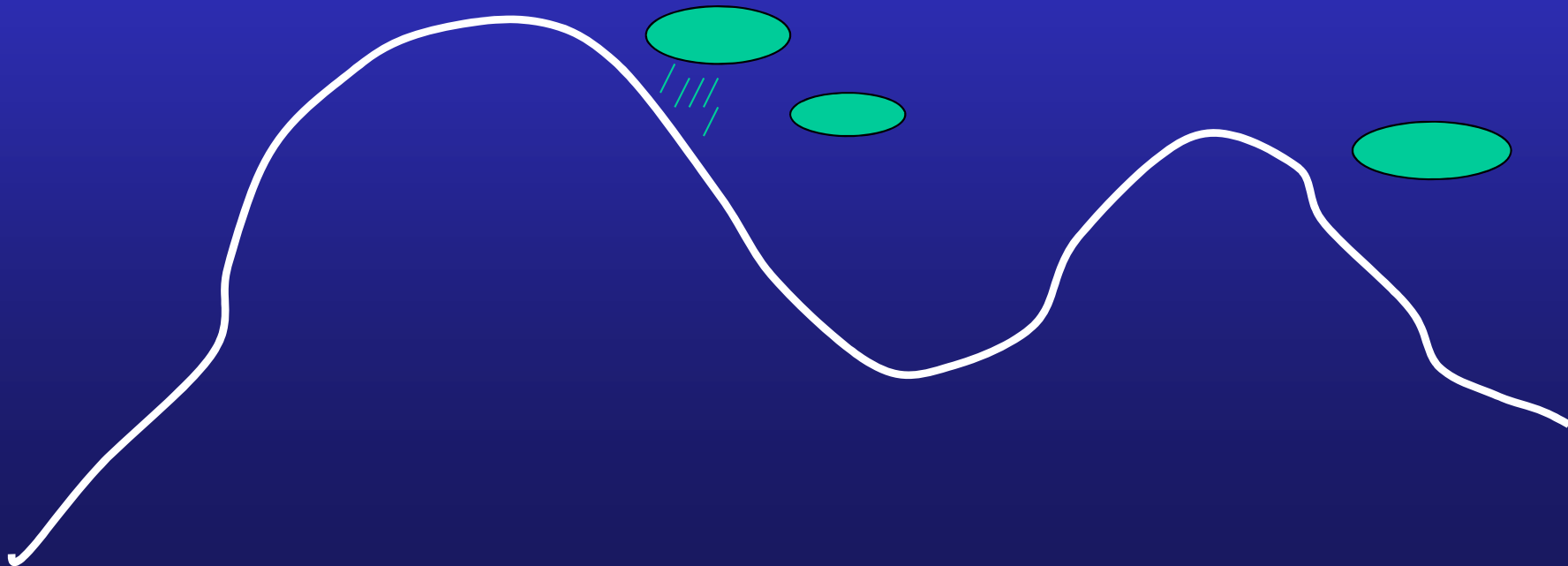
Small Islands Large Ocean

Relief, Moisture, Reflectance

West



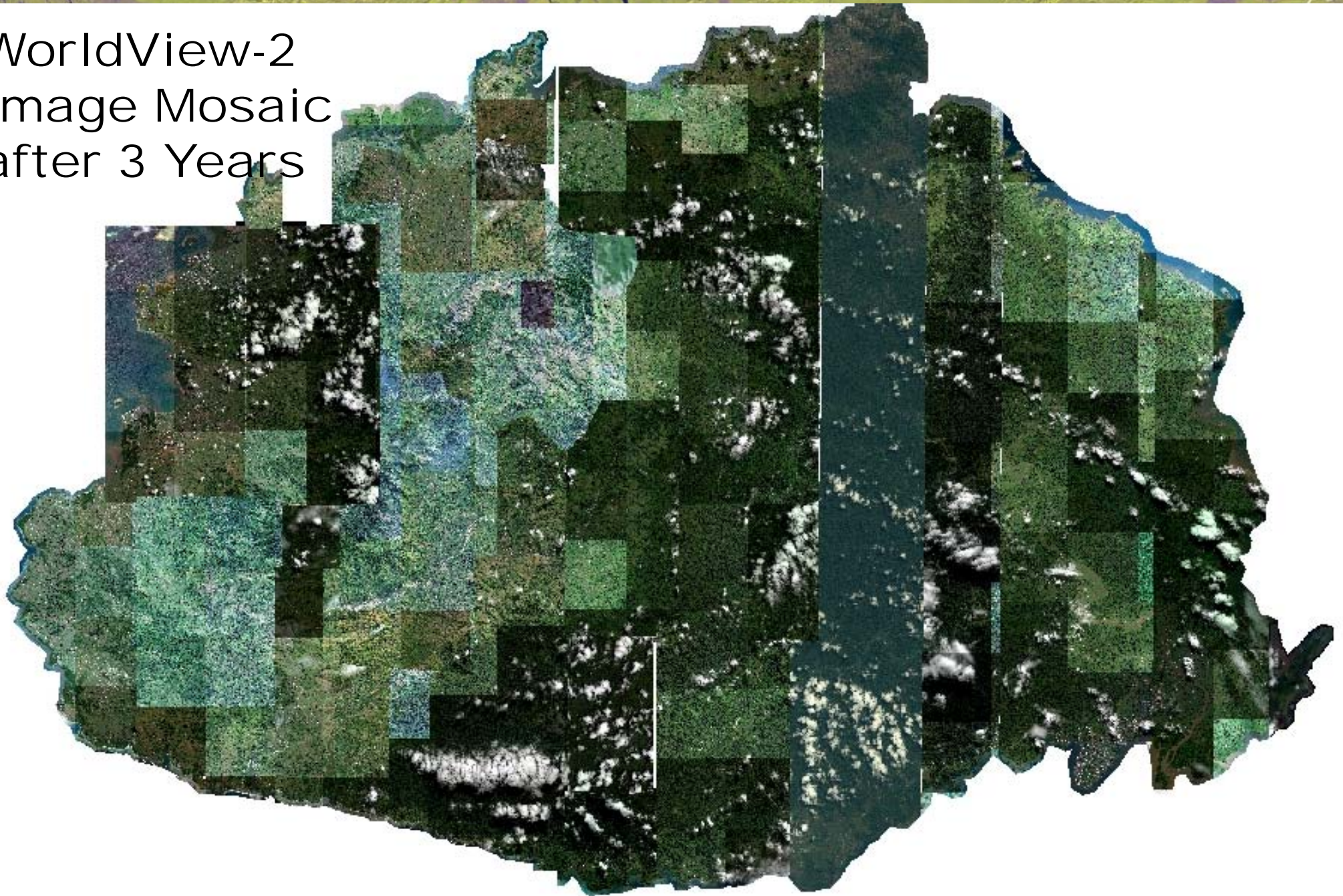
East



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WorldView-2
Image Mosaic
after 3 Years



Project Objectives

- Mapping of forest roads to show **forest degradation**, where optical data have to be recorded within a time window of 3 months.
- Mapping of small areas where no cloud free optical image data is available to create a seamless forest layer.
- Mapping of deforestation in Vanuatu and Solomon Islands

Project Frame

- Position of radar investigator will be funded by GIZ
- Support from GIZ in Fiji, Vanuatu and Solomon Islands
- Support from Wageningen University (co-investigator)
- Support from Fiji Forestry Department / REDD+ Fiji

Project Areas

- Main areas in Viti Levu (main island of Fiji)
Nakavu under investigation since 25 years
➔ SFM
- Espiritu Santo, Tana, Malekula and Erromango in Vanuatu
- [Betio in Kiribati (coastal change)]
- Choiseul in Solomon Islands

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FIJI ISLANDS



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tu



all Islands

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lands:

Choiseul ...

t. Coverage required
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ALOS

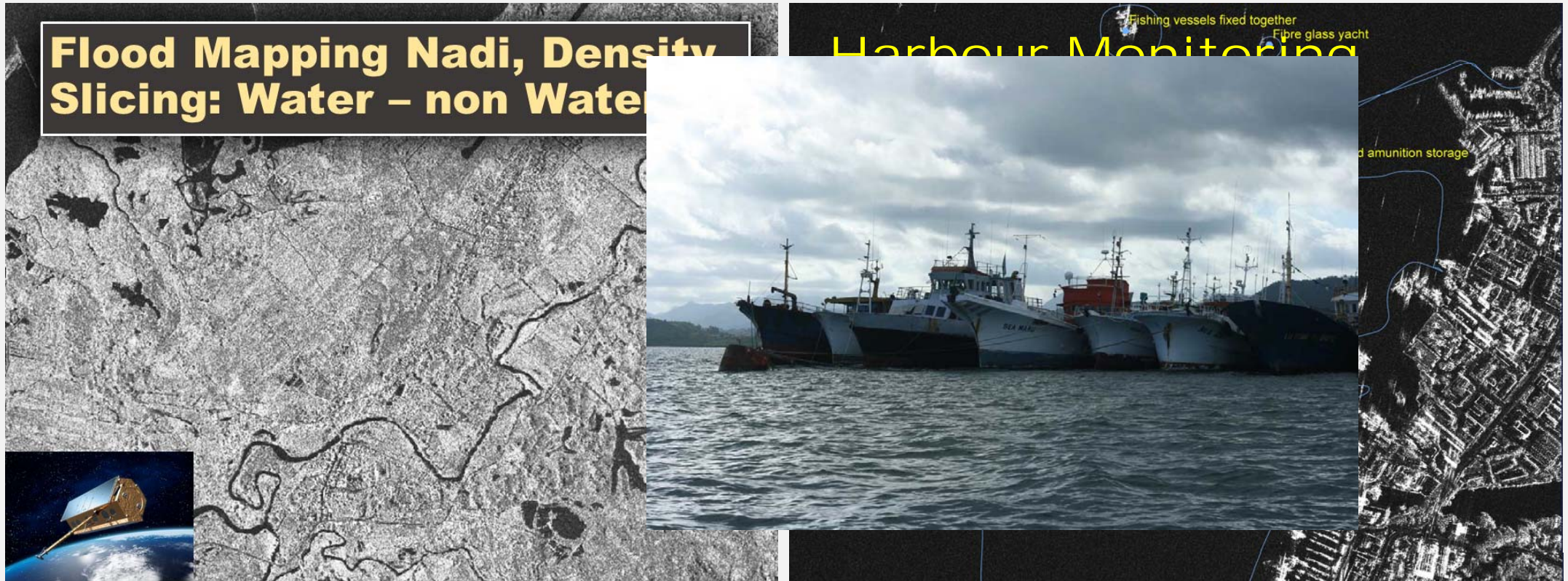
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Other Demand for Radar Application

Flood Mapping Nadi, Density Slicing: Water – non Water

Harbour Monitoring



Cross check of VMS (Vessel Monitoring System)

Coastline change, storm events in atolls islands

Possible Outcome

- SPC-GSD is JAXA data reseller, but no Palsar data requested from any Pacific Island Country ... so far.
- If: (i) radar data enhancement and processing unit is established and (ii) examples demonstrate successful application → **ALOS Palsar will be requested by volcanic islands**
- If radar unit is established other applications will be handled as well

Vehicles of Information Dissemination

- Pacific Islands GIS&RS Newsletter
- E-Mail distribution list GIS-PacNet
- Pacific Islands GIS&RS User Conference
- Requests to the satellite data focal point GIS&RS Unit at SPC, which is also Pacific representative for DigitalGlobe and Thaichote Thailand

Pacific Islands GIS&RS User Conference



- More than 300 participants
- More than 20 countries
- Pacific users, companies and scientists



K&C Thematic Drivers

- Project supports Fiji REDD+ (World Bank) and GIZ activities in Vanuatu and Solomon Islands
- UNFCCC reporting on REDD+, GHG inventory. Data will contribute to refinement of INDC (Intended Nationally Determined Contributions to climate change mitigation targets) in Fiji, Vanuatu and Solomon Islands (Papua New Guinea)
- Investigations ongoing to integrate radar in monitoring of forest conservation areas
“degradation of forest”

Project Milestones & Data Sharing

- Establishment of radar data analysis unit
 - Hardware & software *done*
 - Contracting of person *(within next four weeks)*
- Establishment of link with Wageningen University for backstopping *done*
- Analysis of first test areas in Fiji regarding mapping of logging roads *next six months*
- Development method and infrastructure of cloud patching for optical data in Fiji *end of 2016*
- Analysing test areas in Vanuatu and Solomon Islands *2017, 2018*

Deliverables etc.

Planned output of project:

- Reference for radar data analysis available such as (i) forest - non forest mask, (ii) DSM, (iii) mask normal forest – degraded forest FJ, (iv) land use cover map 1:10,000 FJ, WS, partly SB, partly VU, KI, TV
- Method development, visible through instruction papers

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Thanks

