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Recent activities by UN-SPIDER and Changes in Satellite Data Procurement and Application Systems

9th Joint Project Team Meeting for Sentinel Asia STEP-3 (JPTM2024)

November 2024

Objective for Today

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Presentation Outcomes

- Introduction of UN-SPIDER Recent Activities in Tongatapu Island
- Changes in Satellite Data Procurement and Application Systems

Jumpei Takami - *Associate Expert in Remote Sensing for Disaster Management*

UN-SPIDER at United Nations Office for Outer Space Affairs (UNOOSA)

- ✓ **Landslide** Monitoring with the World Bank in Nepal
- ✓ **Land Subsidence** Monitoring with JICA in Guatemala
- ✓ **Flooding** Analysis with DEM using the Foundation Model
- ✓ **Forest Height** Estimation with ADB as the Individual Consultant in Indonesia
- ✓ TomoSAR + PolSAR using RF+UNET to estimate **forest height and AGB**
- ✓ Tonga Preparedness Pilot Project for **Sea Level Rise** simulation using Digital Twin products using AI and Machine Learning

National Disaster Risk Management Office

Tonga Preparedness Pilot Project Video

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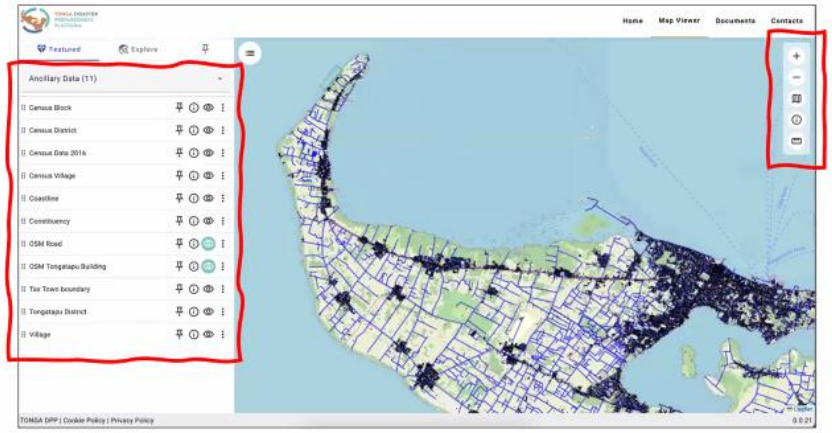
TONGA DISASTER PREPAREDNESS PLATFORM

CEOS Tonga Preparedness Pilot Stakeholder Discussion
27 June 2024



Project Backgrounds and Objectives

- Idea born from UNOOSA Technical Advisory Mission Dec 2023
- Support Tonga for improved preparedness and demonstrate usefulness of satellite EO and derived products for EW4All in "big ocean" states
- Leverage Tonga chairmanship of PIF to showcase innovation in Tonga, scalable to other big ocean states

Contributions by UNOOSA/UN-SPIDER

- **Leadership**; land subsidence analysis using ALOS-2/Sentinel-1/CSK&CSG SAR data over Tongatapu; share 30cm resolution optical data set over Tongatapu (through Airbus); drought monitoring analysis using 3m optical satellite data (through Planet); simulate the sea level rise using digital twin products using AI technology (through Space Data Inc.); liaison with UN organizations.

YouTube Video:
Tonga Disaster Preparedness Pilot - A Tonga NDRMO/UNOOSA/CEOS initiative
https://www.youtube.com/watch?v=-RAIo5OfBlM

Challenges in Remote Sensing

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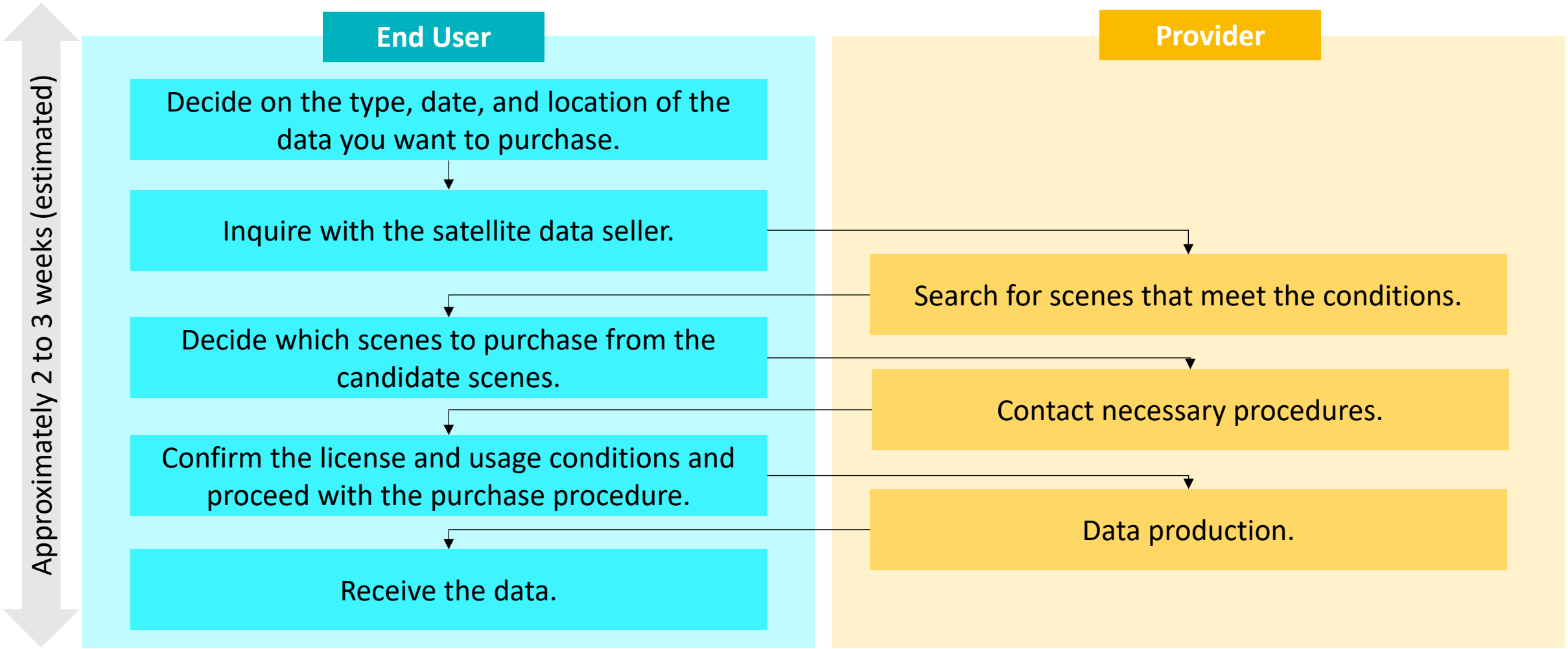
- **Resolution, Revisit, and Observation Variability**: Different remote sensing data products have varying resolutions, revisit, and observations. For instance, assessing forest fires requires high spatial and temporal resolution data.
- **Coverage Gaps**: Lidar remote sensing, for example, faces gaps in ocean-based deployments. Improving data quality control and open access is critical for unleashing its full potential.
- **Affordability and Accessibility**: Making remote sensing data more affordable and accessible is essential. Developing systems for better distribution and affordability can enhance its utilization.
- **Preprocessing and Validation**: Handling preprocessing tasks and validating remote sensing data can be complex. Ensuring data accuracy and reliability is crucial.

Affordability and Accessibility
Example of Satellite Data Purchase Flow



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Preprocessing and Validation
Satellite Image Application Business Flow

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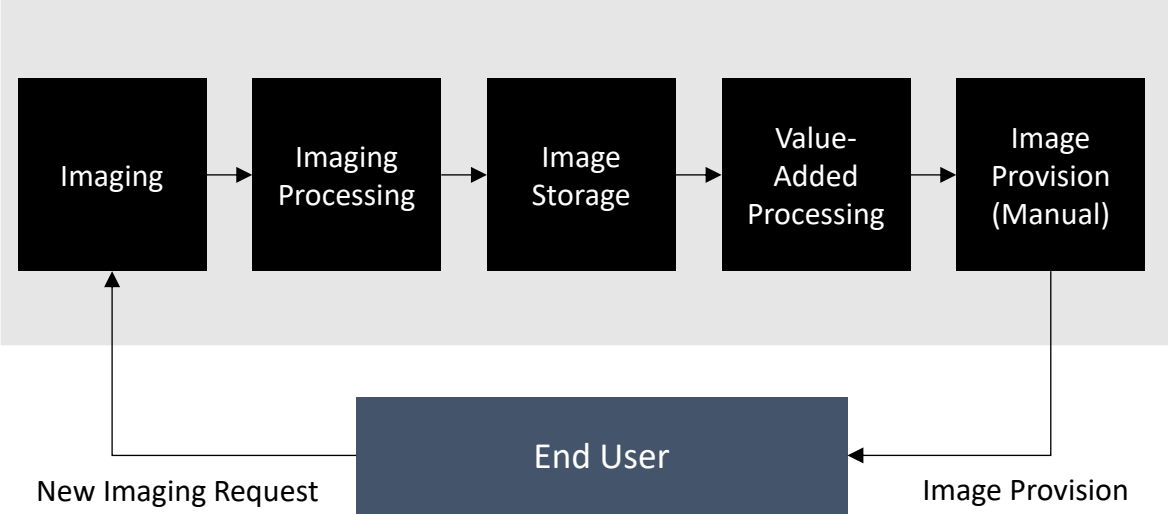
Gap between data providers and end users



- Issue 1: Unable to issue imaging requests without understanding what types of satellite data contribute to problem-solving.
- Issue 2: Unable to analyze or understand what insights can be derived from satellite images.

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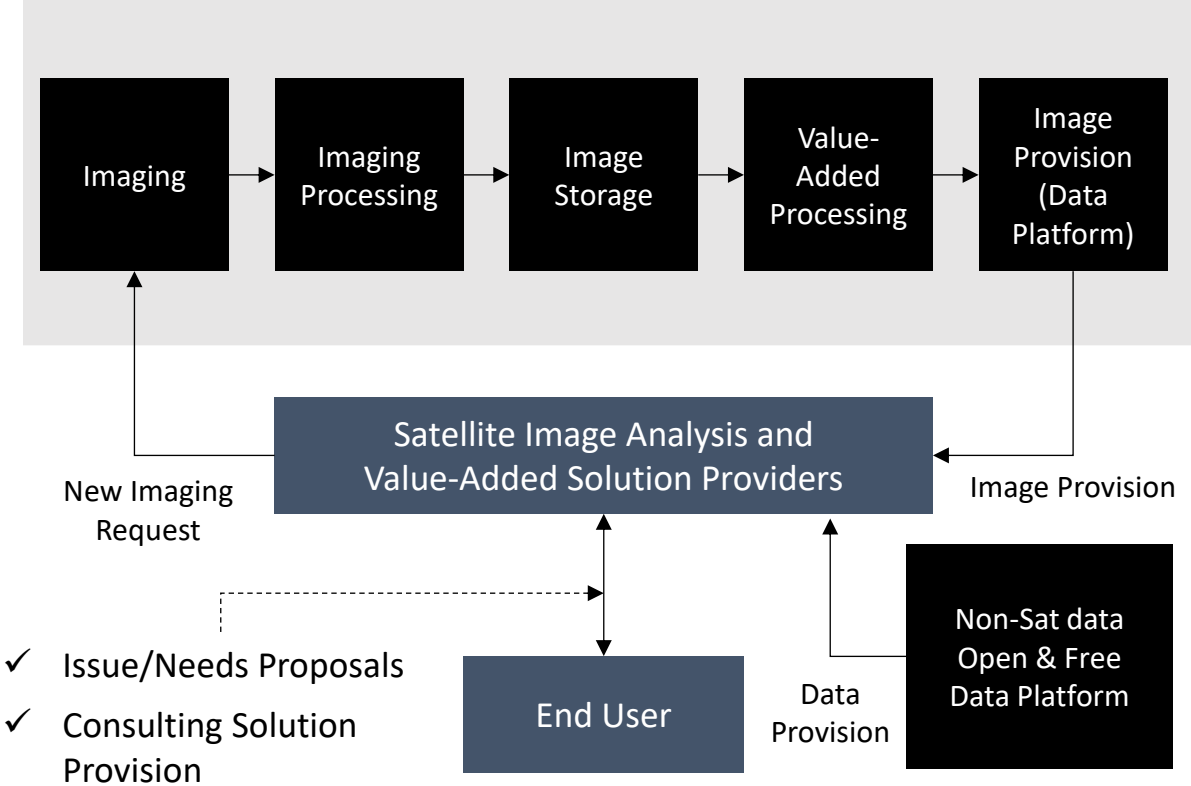
"Lower the barriers" to the use of satellite imagery



- ✓ Issue/Needs Proposals
- ✓ Consulting Solution Provision
- ✓ Funded by third parties to accelerate application

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Thank you

23 October 2024