



“Joining Land and Sea” - Problem as Seen by the UN-GGIM Expert Group on Land Administration and Management (EG-LAM)

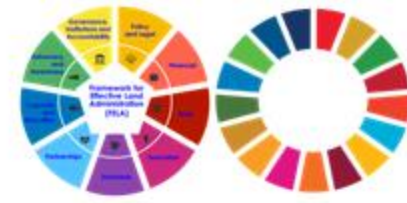
Dr. Victor Khoo

Director (Survey & Geomatics), Singapore Land Authority

Co-Chair, Expert Group on Land Administration & Management, UN-GGIM



Expert Group on Land Administration and Management (EG-LAM)



- EG-LAM was endorsed by the UN-GGIM in August 2015
- Current Co-chairs: Singapore and Chile

Objectives

- Play a leading role at the policy level;
- Encourage the use of geospatial information tools and systems.

Functions

- Provide a forum for coordination and dialogue among global experts;
- Propose work plans, informed by broad global consultation, to address the main areas of focus;
- Address governance, data management, institutional and technology adoption and sustainability issues;
- Undertake work that is able to contribute to the Sustainable Development Goals;

Member States (28)	Professional Bodies (9)
Barbados	IHO
Belgium	FAO
Burkina Faso	UNECE-WPLA
Canada	UN-Habitat/GLTN
Chile	World Bank
China	Standards Development Organisation
Egypt	
Finland	UN-GGIM: Geospatial Societies
Germany	UN-GGIM: Academic Network
Guyana	UN-GGIM: Private Sector Network
India	
Korea (Republic of)	
Kuwait	
Lesotho	
Mexico	
Morocco	
Netherlands	
Norway	
Philippines	
Saudi Arabia (Kingdom of)	
Singapore	
Spain	
Sri Lanka	
Suriname	
Sweden	
Tonga (Kingdom of)	
United Arab Emirates	
United Kingdom	

Current members as of August 2022

UN-GGIM's Functional Groups

High-level Group

1. High-level Group of the Integrated Geospatial Information Framework

Subcommittee

1. Subcommittee on Geodesy (formerly WG on Global Geodetic Reference Frame)

Expert Groups

1. Expert Group on the Integration of Statistical and Geospatial Information
2. Expert Group on Land Administration and Management

Working Groups

1. Working Group on Geospatial Information and Services for Disasters
2. Working Group on Policy and Legal Frameworks for Geospatial Information Management
3. Working Group on Marine Geospatial Information



EG-LAM Workplan 2023-2025



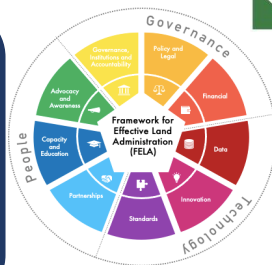
Focus Area 5: Engagement and collaboration including to further anchor the FELA in the UN-GGIM programme of Work

Scope 11: Identify, agree and **work on cooperative projects** including with UN-GGIM regional committees, functional groups, thematic networks and relevant stakeholders.



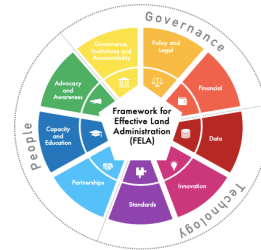
Focus Area 4: Innovation in land administration and management to strengthen resilience and sustainability

Scope 7: Promote effective land administration **within an 'ecosystem' or 'interconnected domains'**;
 Scope 8: Address **rights, restrictions and responsibilities** associated with land;
 Scope 9: Address **digital and mobile access** to land information including cybersecurity and data security mechanisms to protect vital land information;
 Scope 10: Address the integration of information related to **land tenure, land value, land development, land use and land use change**.



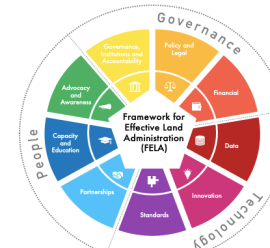
Focus Area 1: Leadership and Advocacy in Effective Land Administration

Scope 1: Promote and raise awareness of the merits and benefits of **effective land administration**;
 Scope 2: Encourage, promote and develop **guidance** for Member States to implement FELA at country level.



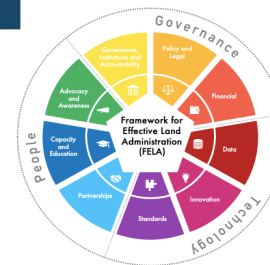
Focus Area 2: Promote and encourage the implementation of the FELA at the country level

Scope 3: Review, elaborate and adapt the **UN-IGIF Implementation Guide** and related implementation resources to further guide and support the implementation of FELA according to national circumstances and needs;
 Scope 4: Encourage volunteered **translation** of the FELA into languages other than English to support raising of awareness and promote better understanding;
 Scope 5: Facilitate sharing and exchange of knowledge, information, experiences, and practices, including relevant **use cases** and implementation examples.



Focus Area 3: Integration of terrestrial, maritime, built and cadastral domains

Scope 6: **Gain better understanding** through cooperative project and activities.



https://ggim.un.org/documents/EG-LAM Work plan_2023-2025_Final.pdf



Framework for Effective Land Administration (FELA)



A reference for developing, renewing, reforming, strengthening, modernizing, or monitoring land administration, cognizant of national priorities and circumstances.

Endorsed in **August 2020** and now it is at Implementation Phase

Vision

Secured people to land relationships in all forms for the wellbeing of partnerships, planet, prosperity and peace.

Mission

To provide leadership, coordination and internationally recognized standards, and support responsible innovation and partnerships, for effective land administration to realise sustainable social, environmental and economic development.



https://ggim.un.org/meetings/GGIM-committee/10th-Session/documents/E-C.20-2020-29-Add_2-Framework-for-Effective-Land-Administration.pdf



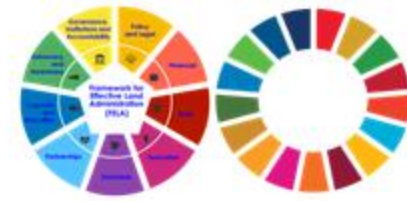
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United Nations Committee of Experts on
Global Geospatial Information Management

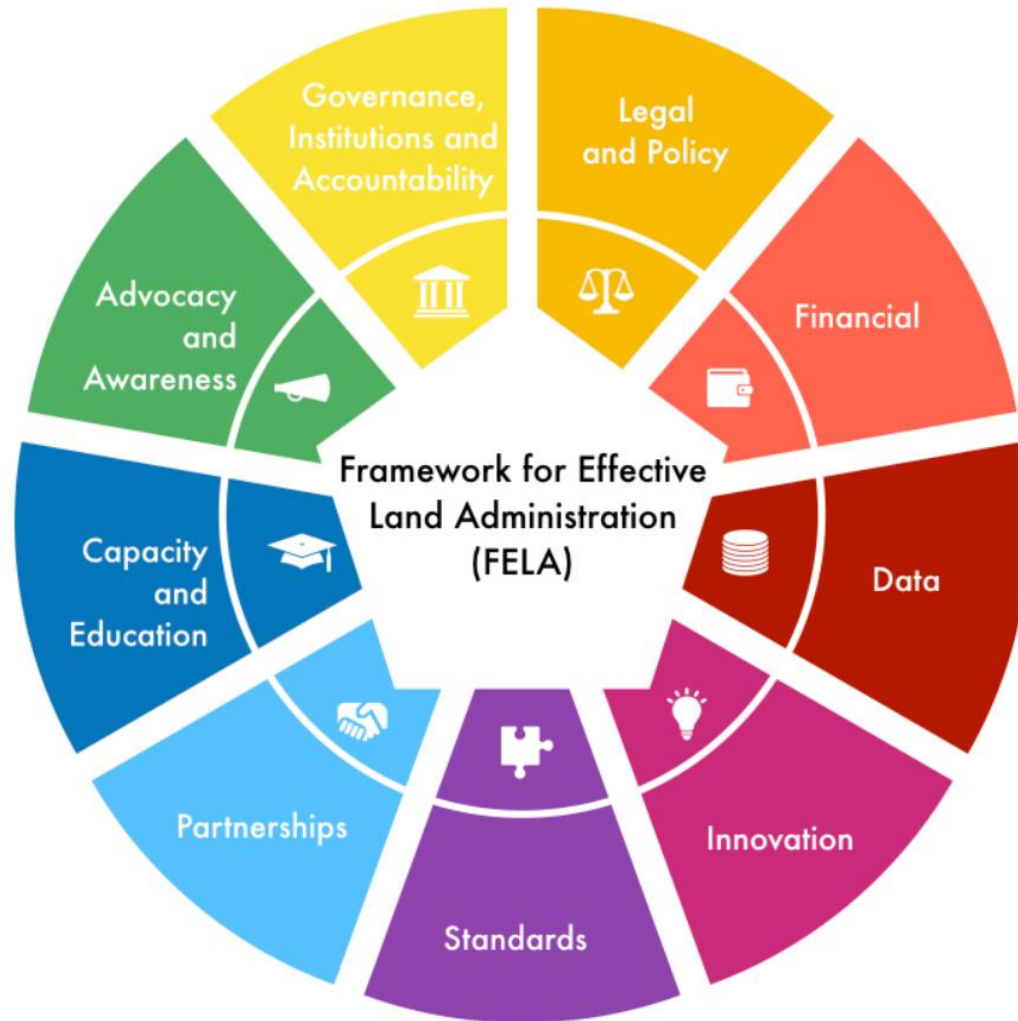
EXPERT GROUP ON
LAND ADMINISTRATION AND MANAGEMENT

Positioning geospatial information to address global challenges

ggim.un.org

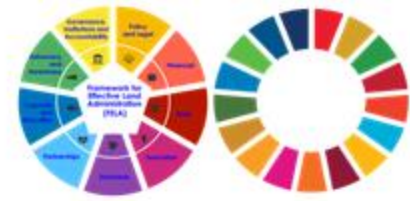


FELA with its nine pathways is an overarching policy guide and provides a reference for Member States when establishing, strengthening, co-ordinating, and monitoring its land administration nationally or sub-nationally.



FELA aligns directly to the overarching and strategic IGIF. FELA implements the IGIF for the land sector. All pathways are linked and overlap and address a specific objective.





Effective land administration ensures preparedness and resilience, participatory and inclusive land use planning, monitoring of land-cover change, sustainable resource management, building back better, and the protection of our planet's natural resources and environment for future generations.

Sustainable Development

PLANET



Protect our planet's natural resources and climate for future generations

PEOPLE



End poverty and hunger in all forms and ensure dignity and equality

Effective land administration supports poverty eradication, food security, and can support ensuring dignity and equality through documenting, recording and recognizing people to land relationships in all forms, notwithstanding the potential to undermine dignity when the information is misused.



Effective land administration enables access to tenure security and efficient land markets fostering prosperity, wellbeing of all communities, revenues for authorities, and fulfilled lives through sustainable land management, land use, land development and land markets.

PROSPERITY



Ensure prosperous and fulfilling lives in harmony with nature

Effective land administration enables partnerships at all levels – international, regional, national and community – bringing together diverse but interoperable and complementary capabilities, experiences, technologies, integrated data, knowledge and resources.

PARTNERSHIP



Implement the agenda through a solid global partnership



Effective land administration prevents land-related conflicts, stabilizes situations and fosters peaceful, just and inclusive societies

PEACE



Foster peaceful, just and inclusive societies



UN-GGIM

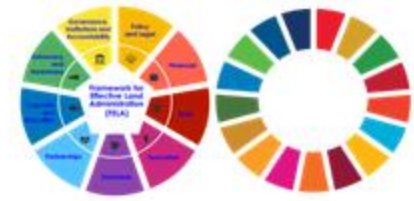
United Nations Committee of Experts on Global Geospatial Information Management

EXPERT GROUP ON LAND ADMINISTRATION AND MANAGEMENT

Positioning geospatial information to address global challenges

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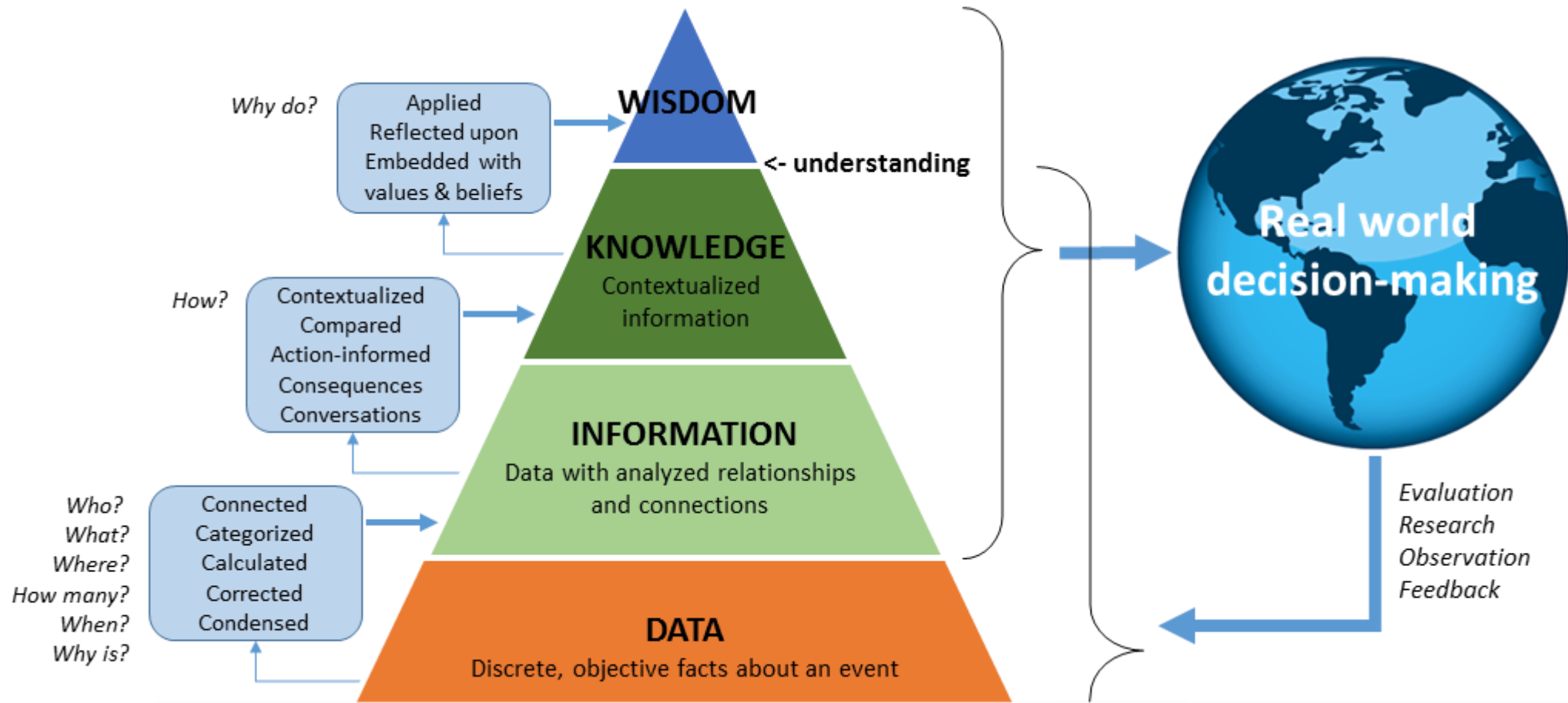
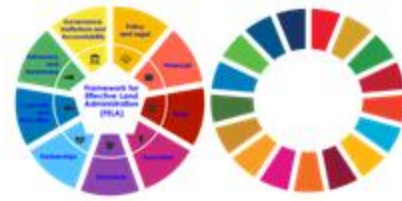
Why Need Geospatial Domain Integration?



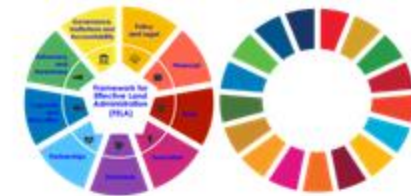
- Why need geospatial data integration?
 - Support Decision Making
 - Digital Twins and Metaverse
 - New Use cases / Applications requirements
 - Increased 3D applications



Data-Driven, Evidence-based Decision Making

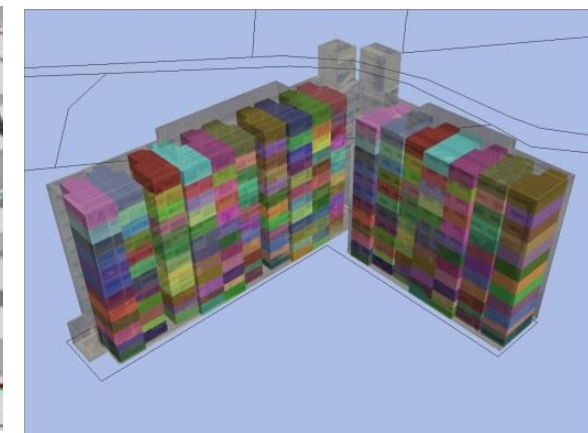
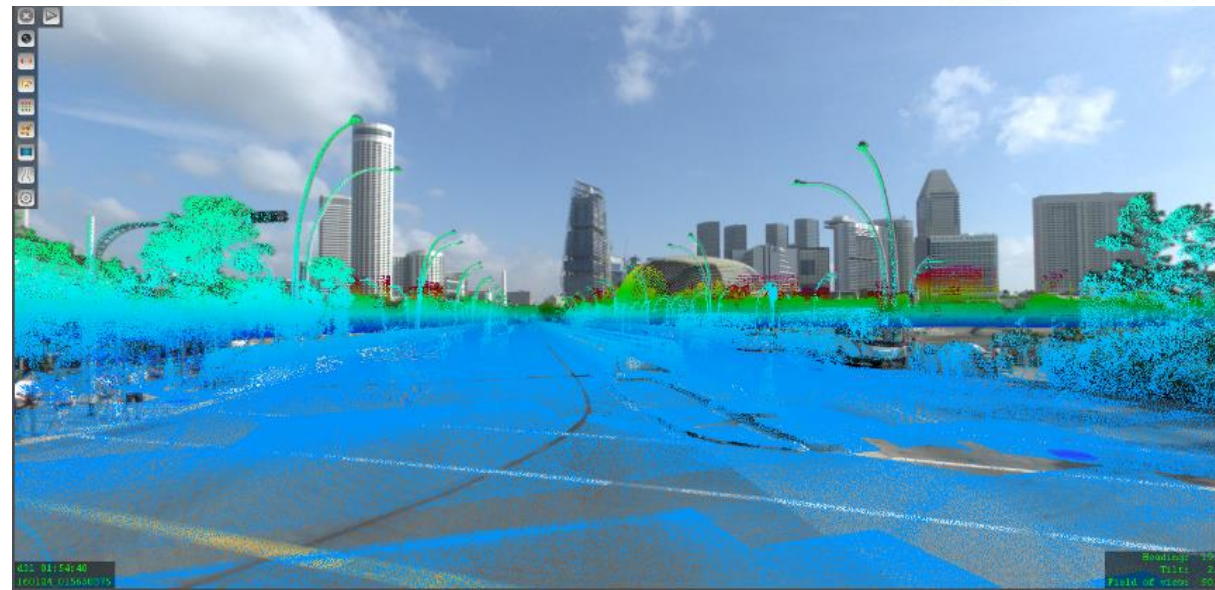
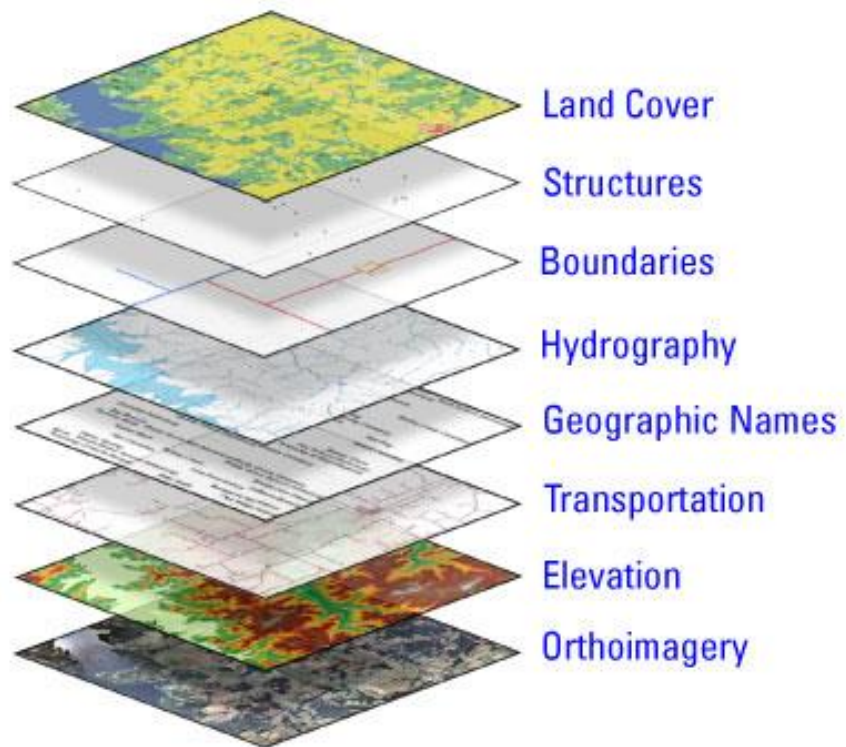


2D GIS vs 3D Datasets

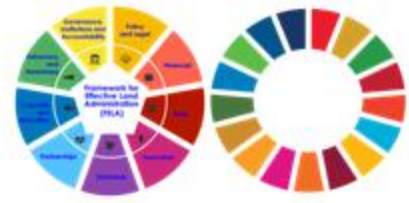


3D Datasets - Integrate

2D GIS - Overlay



Digital Twin



Source: Bentley YII 2023

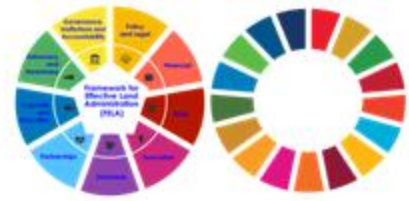


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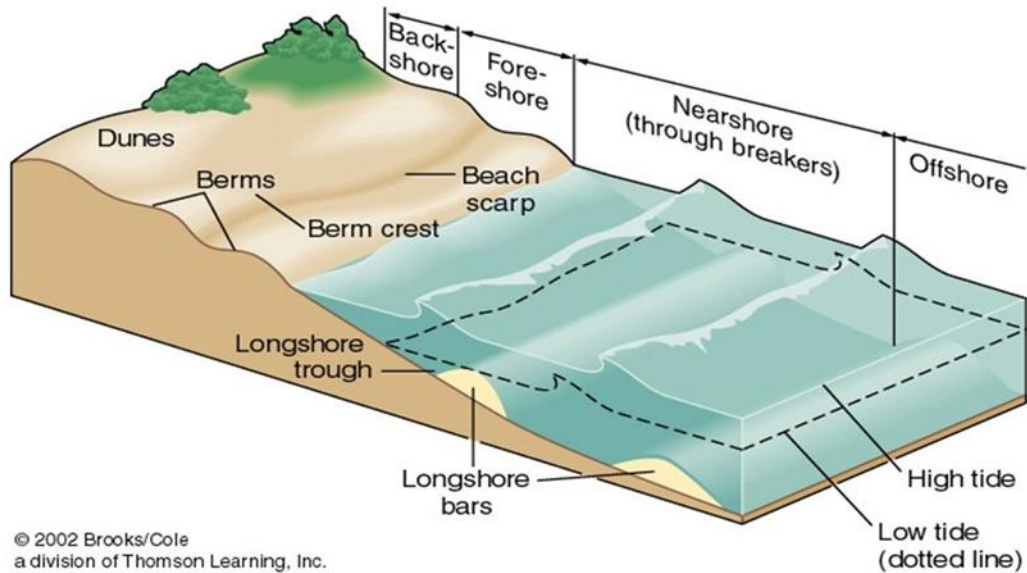
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Global Geospatial Information Management

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Why need geospatial data integration – New Use Cases



Climate Adaptation



Smart Land Administration

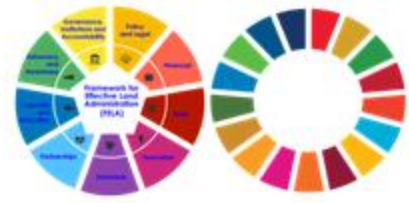


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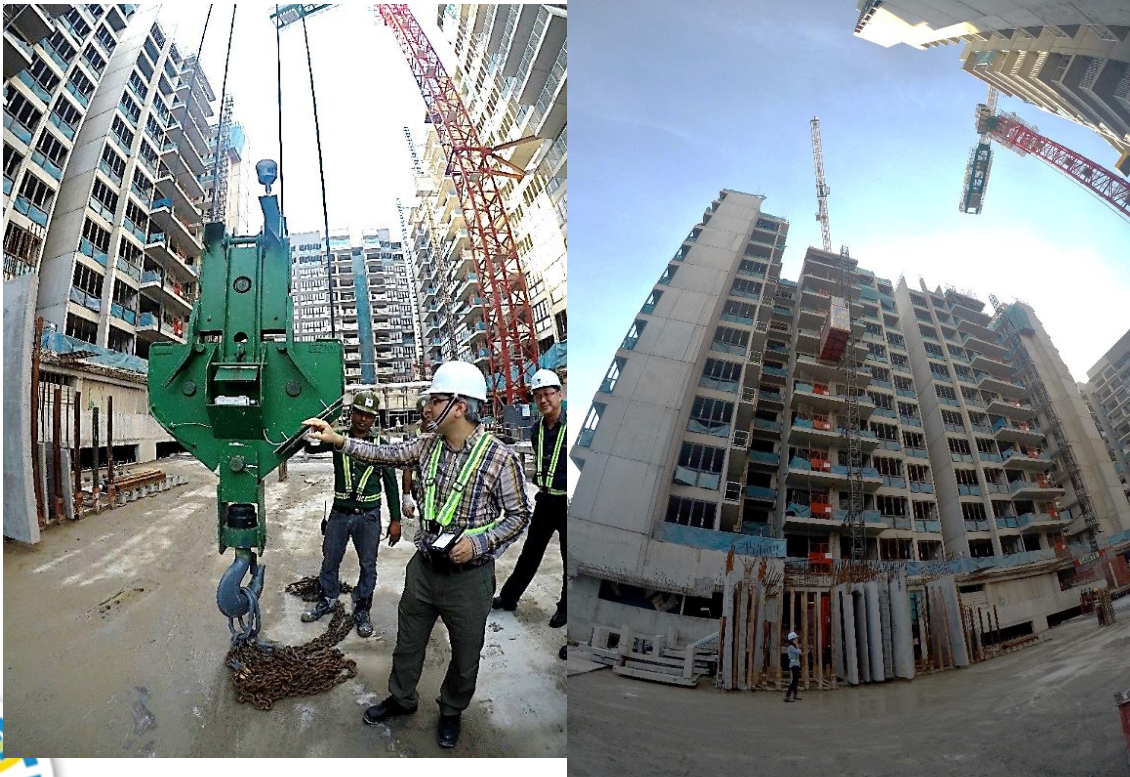
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Why need geospatial data integration – New Use Cases

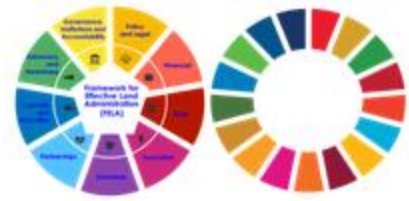


Digital Construction (i.e. BIM & GNSS)

Autonomous Mobile Robots (indoor & outdoor data)



Why need geospatial data integration – New Use Cases



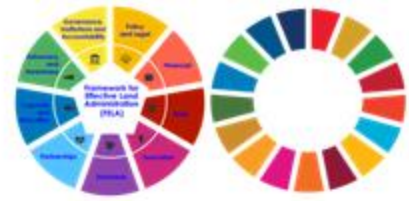
Coastal Protection



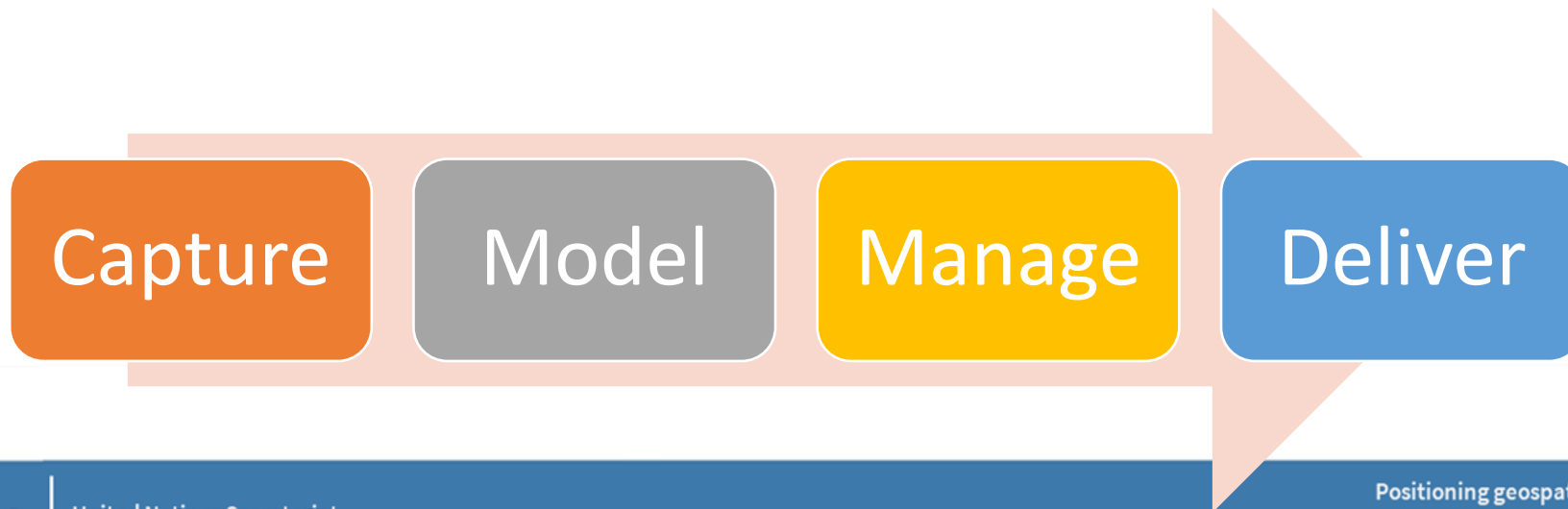
Underground Asset and Space Management



What are the Challenges of geospatial data integration



- Geospatial data from many sources captured by different group of people
- Many different technologies were used to capture different type of geospatial data
- Many reference systems and map projections used
- A large variety of formats exist which are not interoperable
- Data models, Scales, resolutions and temporal variation caused inconsistency
- Data cost, access rights, use restrictions and licensing incompatibility



Focus Area 3: Integration of terrestrial, maritime, built and cadastral domains



Scope 6

Gain better understanding
through cooperative project
and activities.



- The integration of height and chart datums (with the Working Group on Marine Geospatial Information and the IHO-Singapore Innovation and Technology Laboratory)
- Authoritative data, data sharing and integration (with the Working Group on Policy and Legal Frameworks for Geospatial Information Management)
- Understand the role of open standards, keep abreast with and support the development of ISO 19152 LADM and relevant IHO and OGC standards
- Develop a brief or paper to elaborate key considerations in the integration of terrestrial, maritime, built and cadastral domains



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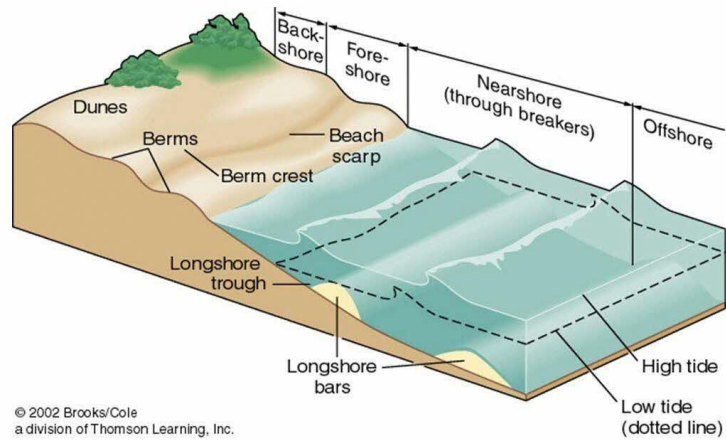
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Positioning geospatial information to address global challenges

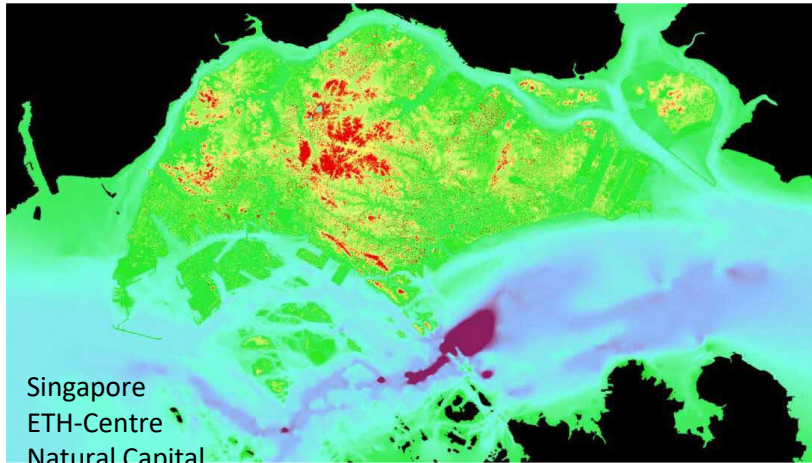
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"Joining Land & Sea"

Coastal and Nearshore Mapping

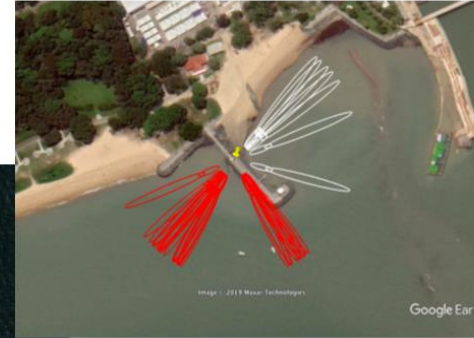
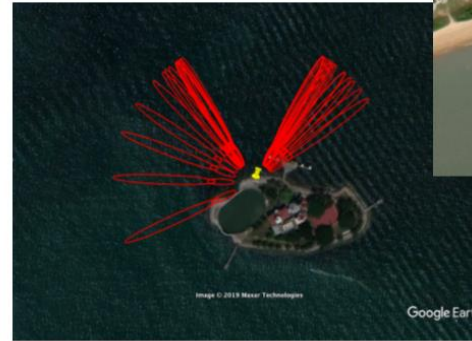
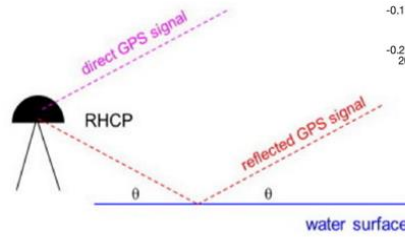
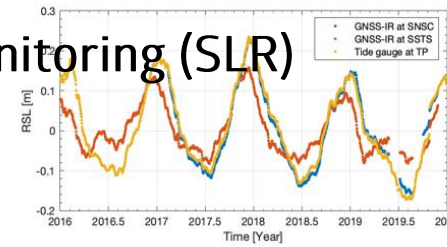


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Singapore
ETH-Centre
Natural Capital

Sea Level Rise Monitoring (SLR)

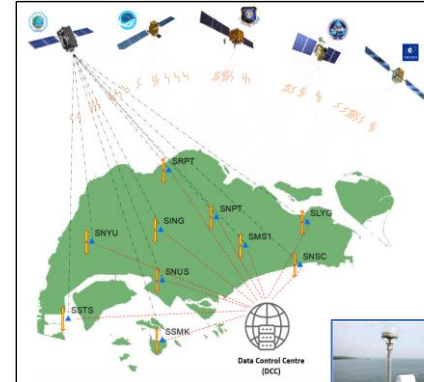


- Simultaneously monitoring VLM and SLR
- Direct signals vs. reflected signals

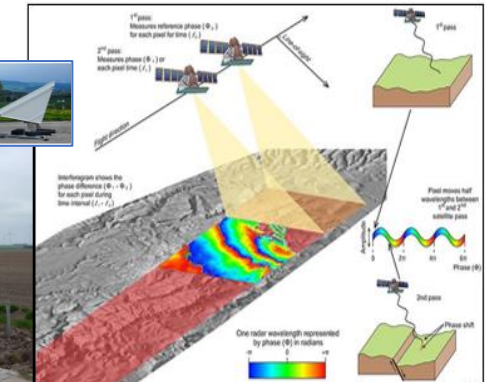
Vertical Land Motion Monitoring (VLM)

- Using GNSS, InSAR and Geodetic instrumentation -

Singapore Satellite Positioning Reference Network

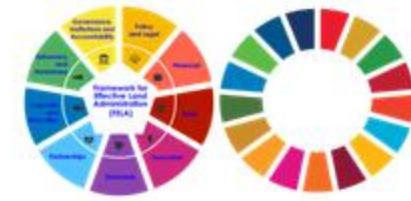


Interferometric Synthetic Aperture Radar



Geodetic Instrumentation

Patent # 2019105.21,
June 2017, Patent
Cooperation Treaty (PCT)





UN-GGCE International Workshop
JOINING LAND AND SEA
The Integration of Terrestrial, Maritime, Built, and Cadastral Domains

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Kasih!*

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