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Kathmandu, Nepal 14–16 November

# REGIONAL CONFERENCE 2024

*Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights*



Presented at the FIG Regional Conference 2024,  
14-16 November 2024 in Kathmandu, Nepal

## Unlocking the Potential of Earth Observation Data in Cultivating a Climate-Resilient City

NG Nok-hang, Mickey  
Hong Kong SAR, China

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## Climate Changes Pose Threats to City

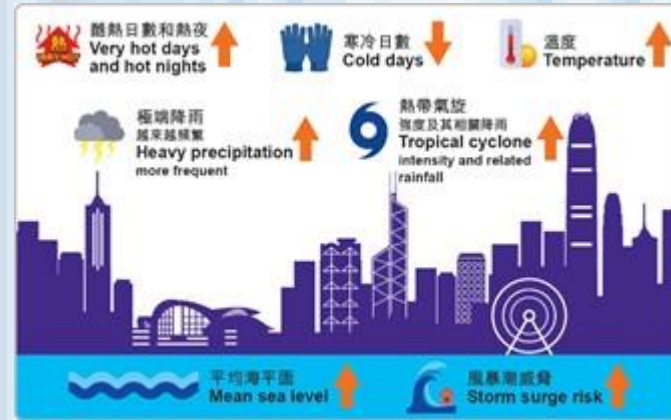
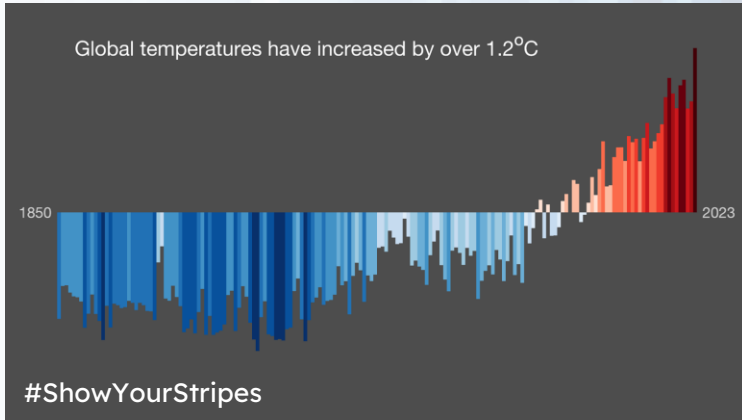


Image Courtesy of Professor Ed Hawkins (<https://showyourstripes.info/>); HKO, The Government of HKSAR, South China Morning Post (<https://www.scmp.com/topics/typhoon-mangkhut>)

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## Respond to Threat

香港邁向 **碳中和**  
Carbon Neutral@HK



Image Courtesy of EEB, The Government of HKSAR

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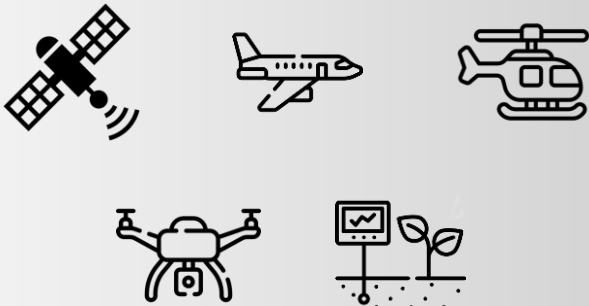
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## Earth Observation Industry

Upstream



COLLECTING petabytes of primary data about our planet daily from various sensors



Public/Private Entities

Polar/Geostationary Orbits



Regular/Tasking



Active/Passive



Image Courtesy of NASA; Flaticon.com

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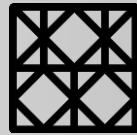


## Earth Observation Industry Midstream

Conducting various pre-PROCESSING operations on primary data to create derived data



Atmospheric, Radiometric,  
Geometric Corrections



Mosaicking, Tiling,  
Seamline Editing



Color Enhancement



Searching, Streaming,  
Downloading, On-the-fly  
Processing

Image Courtesy of NASA; Flaticon.com

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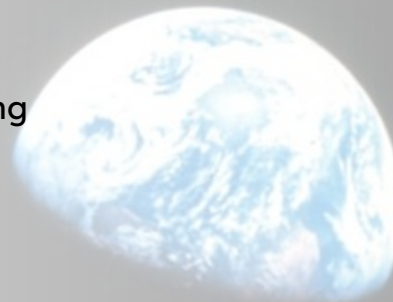
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## Earth Observation Industry Downstream

Developing wide range of APPLICATION across domains drive decision making



Mapping



Land Management,  
Urban Planning



ESG



Agriculture

Image Courtesy of NASA; Flaticon.com

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## EO Application in Climate Adaptation and Resilience

### Quick Response and Recovery

- Share Additional Data in Emergencies
- Provide Alternative Data Collection Option
- Identify Affected Area with Analytic

### Precise and Persistent Monitoring

- Support Coastal Management and Sponge City Initiatives
- Strengthen the Slope
- Monitor the Land Cover Change for Regional Land Management

Image Courtesy of IMF



## Share Additional Data in Emergencies

- Need of Real Time Data
- Capability of EO Data
- Sharing Mechanism with Government/Commercial Entities



Image Courtesy of Vaniatos from Canva



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## Provide Alternative Data Collection Option

- Need of Alternative Data Collection Methods
- Use of Drone Survey
- Capability of Drone Management



Image Courtesy of Justin Tonnesen from Canva

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## Identify Affected Area with Analytic

- Need of Analysing Affected Area
- Use of SAR Data
- Use of Thermal Infrared Data

Image Courtesy of Metamorworks from Canva

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## Support Coastal Management and Sponge City Initiatives

- Need of Monitoring Tidal Level, and Coastal Management
- Integration LiDAR data with Tide Gauge Station
- Support of Sponge City Initiatives

Lau Fau Shan, Hong Kong

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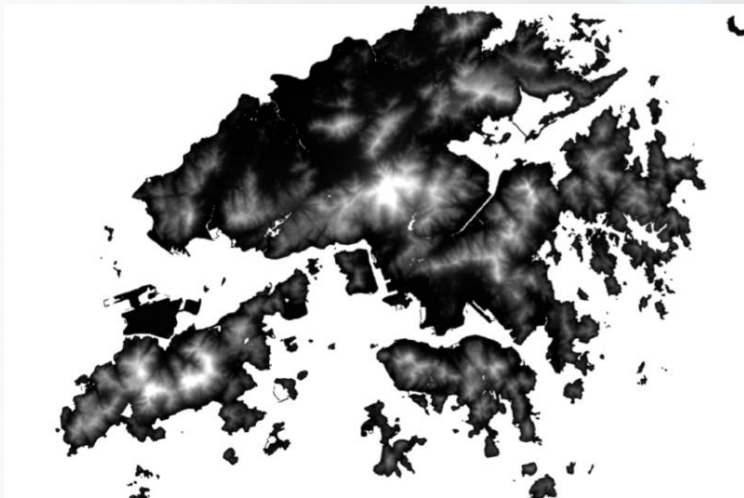
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## Strengthen the Slope

- Need of Identifying the Risk of Slope Failure
- Use of EO Data
- Mitigation of Risks



**DTM of Hong Kong from Airborne LiDAR**  
(CEDD, the government of the HKSAR; Esri Inc.)

Pok Fu Lam, Hong Kong

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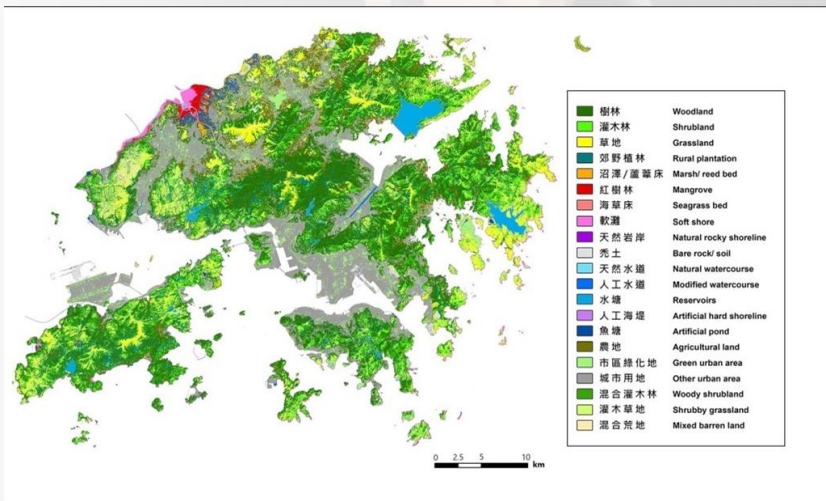
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## Monitor the Land Cover Change for Regional Land Management

- Need of Regional Monitoring and Planning
- Leveraging the Power of LCM
- Requirement of Developing LCM



**Terrestrial Habitat Map of Hong Kong**  
(AFCD, the government of the HKSAR; CUHK)

Image Courtesy of Mojo\_cp from Canva

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## Wayforward



Technological Advancement  
of EO



Widely Use of EO Data



Role of Land Surveyor in Best  
Practice of EO

Image Courtesy of Courtneyk from Canva

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## Points to Take

1. Remote Sensing Makes EO Data Available to:
  - Support Quick Responses & Recovery
  - Enables Precise and Persistent Monitoring
2. Create a Reliable Foundation of a City
3. Generate Significant Long-term Benefits to our Living Environment



Image Courtesy of Alexandra\_Koch from Canva