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The Role of GeoAI in the National Geospatial Strategy

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GeoAI has enriched geographic data at global scale

- Plethora of overhead and terrestrial imagery
  - New 2D, 3D, and 4D maps of the world
  - Object recognition and functional mapping
  - Uncovering landscape processes (agricultural and urbanization trends)
- Closer integration with High Performance Computing
  - Summit, Titan, Blue Water, Roger
  - Planetary computers GEE, Microsoft, Facebook
- Disaster response and human security applications have significantly benefitted

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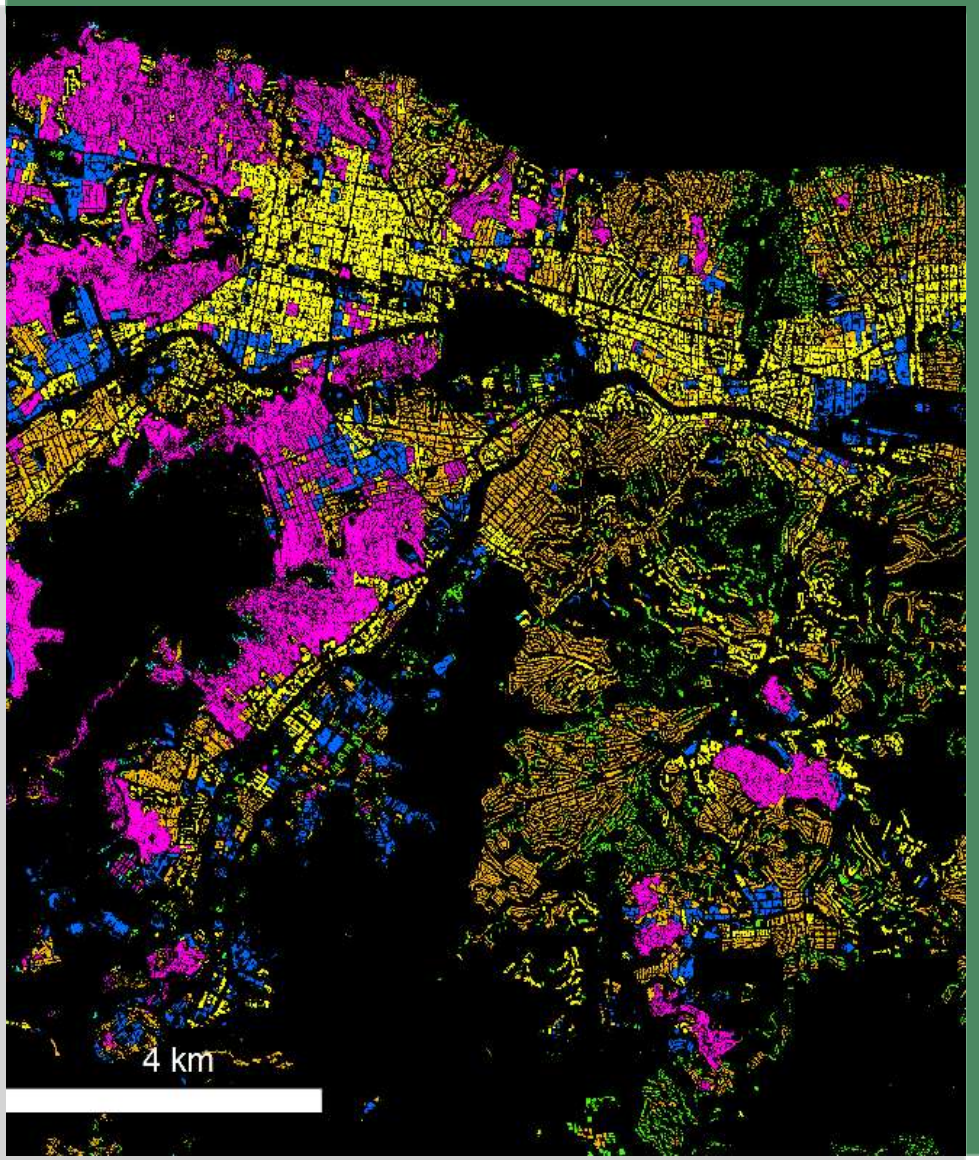
GeoAI remains imagery focused

- Overwhelming majority of the research community focused on object detection from optical imagery
  - Satellite and airborne imagery availability
  - Landsat archive, Planet Scope
  - Limited applications on vector data
- GeoAI models are largely inflexible
  - Human intensive labeling
  - Source specific and lacks generalizability
  - Fragile and sensitive to image quality
- GeoAI models lack higher level reasoning
  - Spatial and temporal context and associations are often missing



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Future opportunities for GeoAI

- Foundational GeoAI models
  - Mitigating expensive sampling requirements through novel sampling strategies, human-computer collaborations, and robust architectures
- Addressing uncertainty and adversarial threats to model geoassurance and data privacy
- Edge deployment of GeoAI models in limited communications, low-power environments
- Forecasting, anticipatory scenario generation with Geospatial Digital Twins
- GeoAI models beyond human performance