



# ICOMOS

## Heritage from Space

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# International Scientific Committees

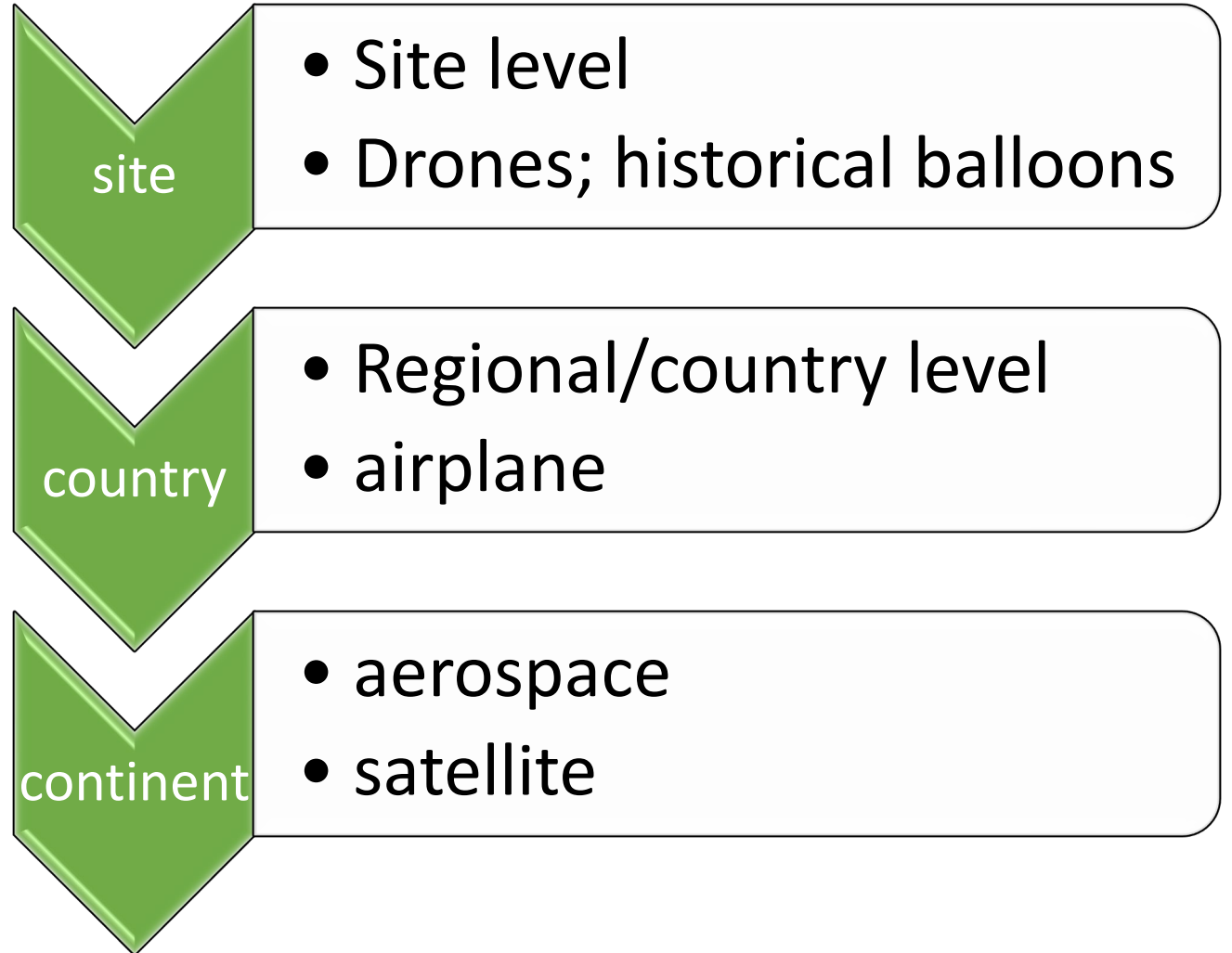


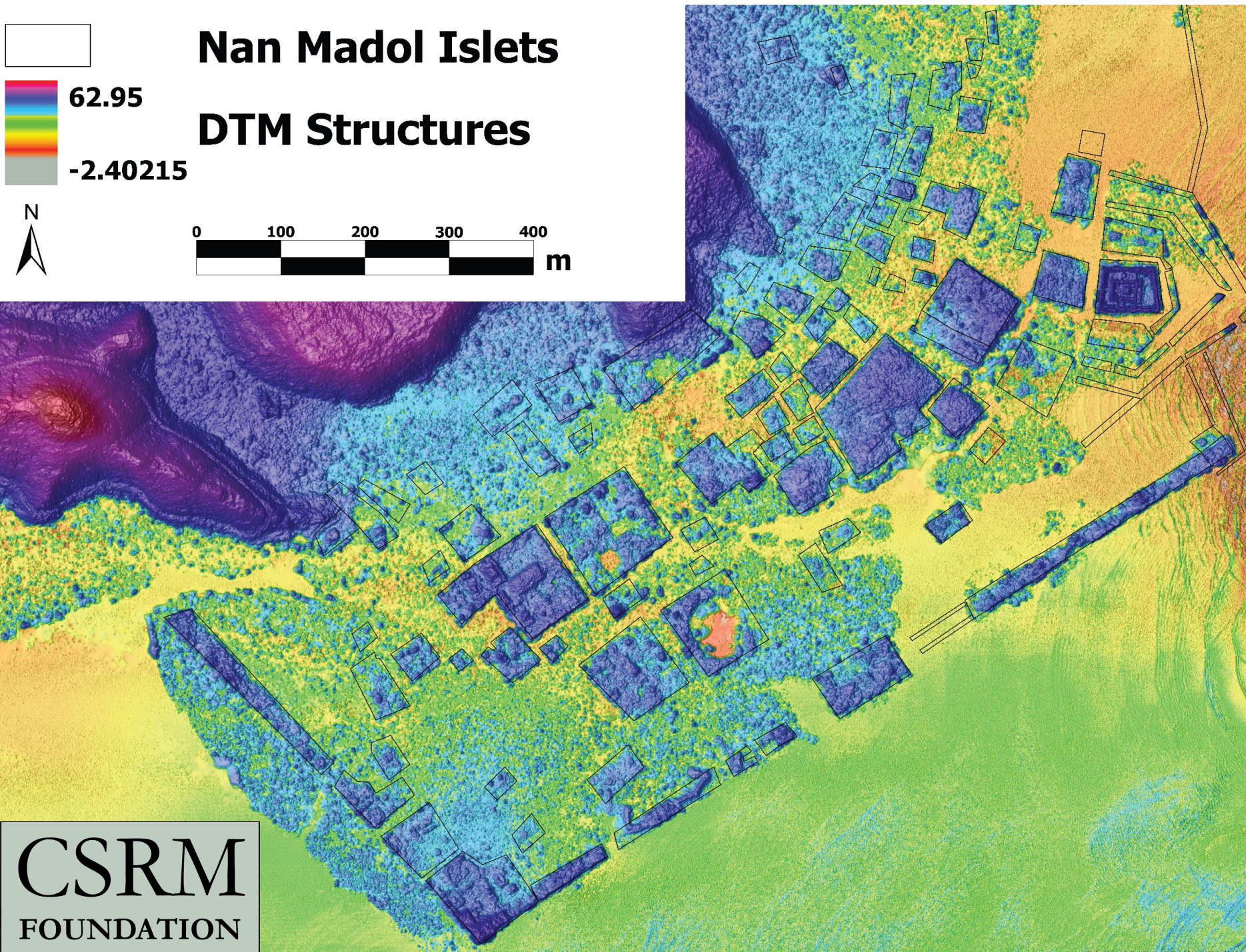
# Working Groups



# Scales

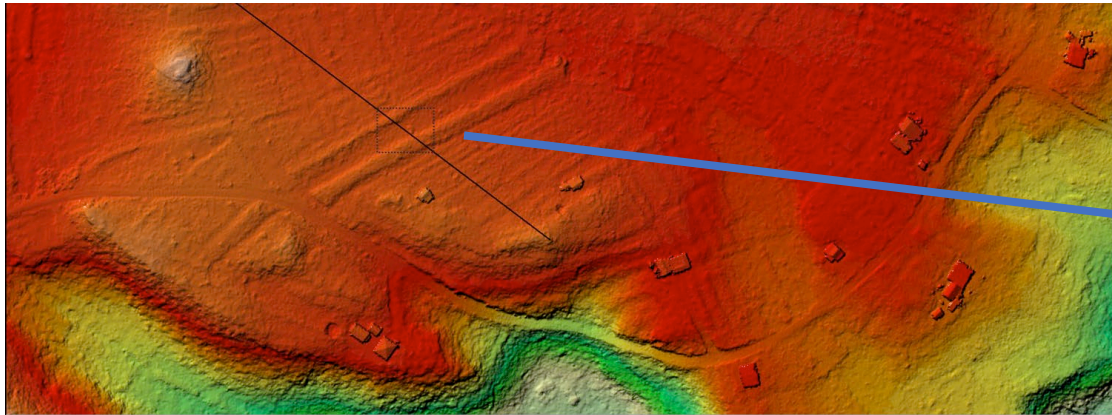
Connectivity between levels of imagery data is critical



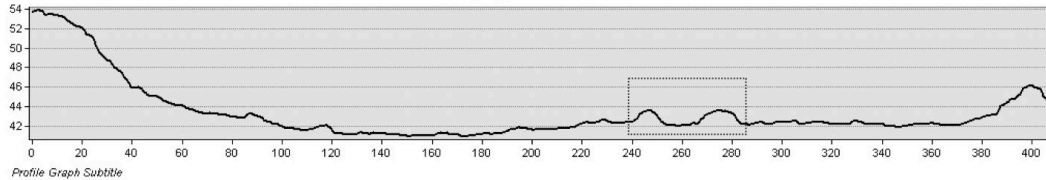


Aerial LiDAR survey at the World Heritage Site of Nan Madol (Pohnpei, FSM) reveals state of conservation relevant to authenticity and integrity. The area is completely covered by dense vegetation. Elevations at structures and islets taken every 50cm.

# CSRM FOUNDATION



Temwen (SW) Terrace Elevations



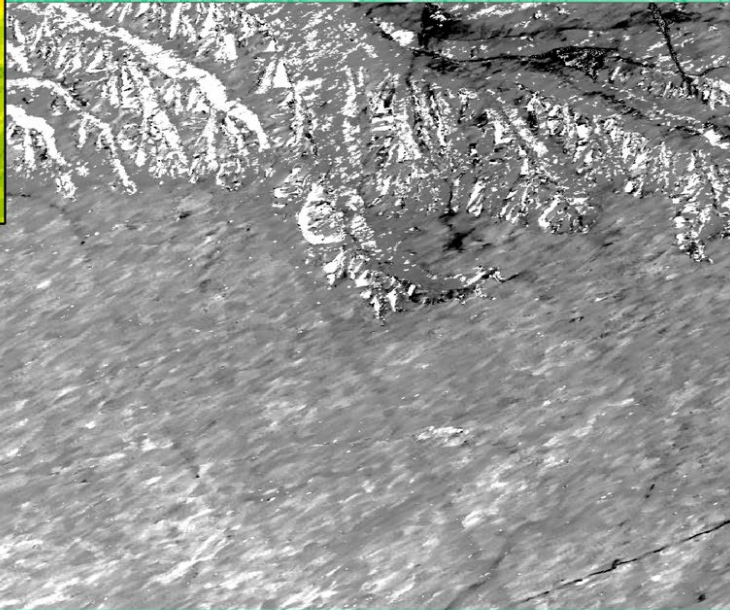
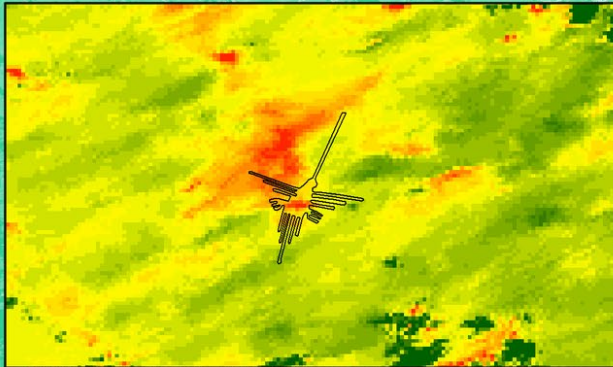
Airborne LiDAR detection of features similar to those used in other Pacific islands for ancient yam cultivation. These were not previously recorded because of extremely dense vegetation cover.



# CSRM FOUNDATION

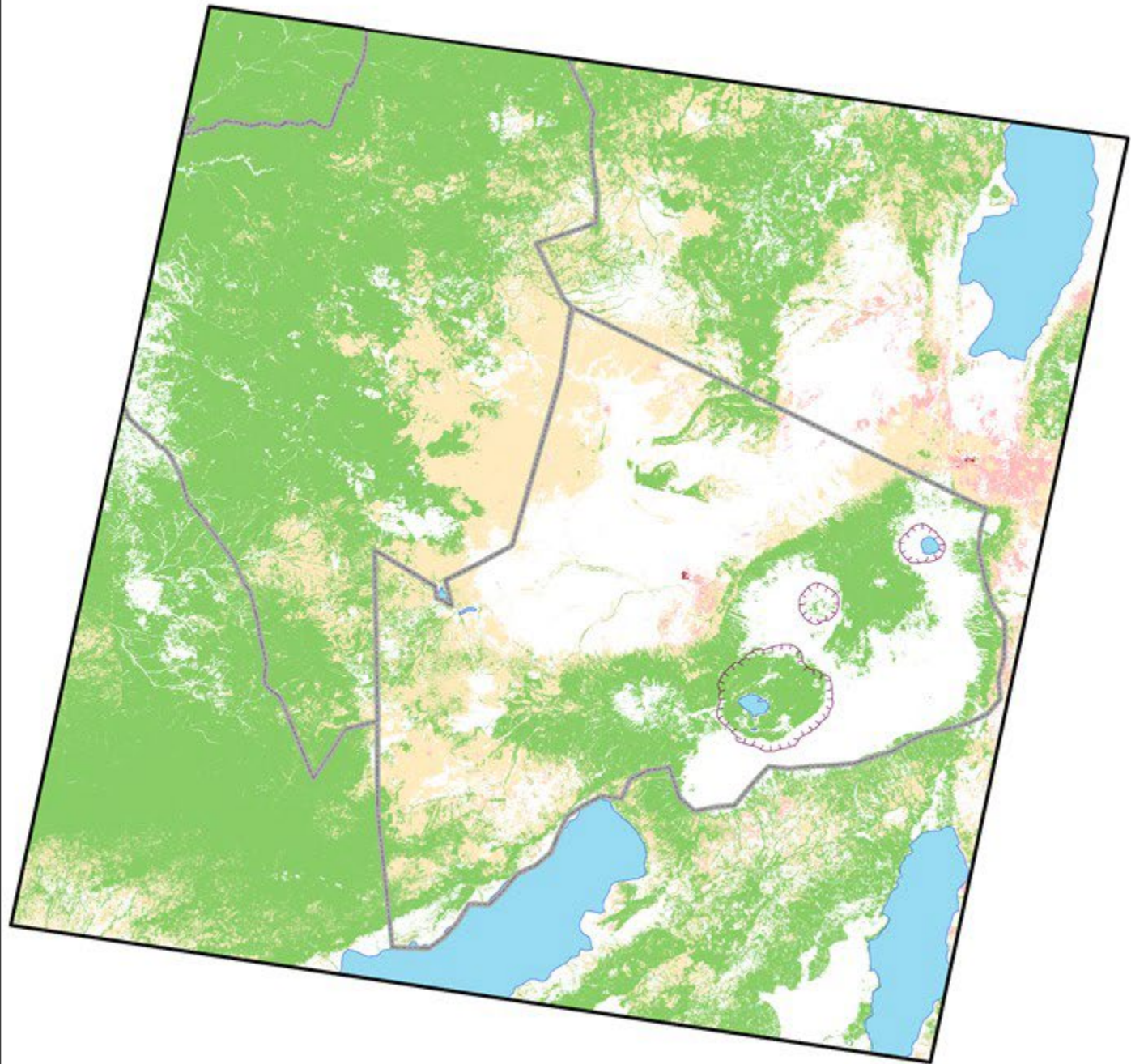


Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community



0 250 500 1,000 Meters

In collaboration with a synthetic aperture radar (SAR) expert from NASA's Jet Propulsion Laboratory (JPL) and Peruvian archaeologists, CSRM Foundation used SAR data to detect terrain disturbance and threats to the world-renowned archaeological features and natural environment at the Nasca and Pampas de Jumana World Heritage Site, in southern Peru. With SAR collected from both aircraft and satellites, changes to the ground surface in and near the site were mapped and measured. Some of these changes were damaging, or potentially damaging, to the famous Nasca Lines. In the image to the lower left, degree of surface disturbance to the famed Hummingbird Geoglyph ranges from low (green) to high (red). Even the track taken by those who disturbed the geoglyph is visible.



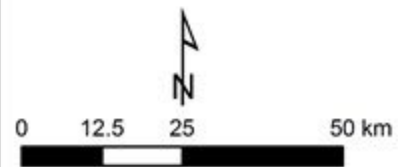
### Estimated changes in savanna, etc. (NDVI value 0.6 to 0.3)

- Stable
- Change to sparser grass/shrub
- Change to very sparse foliage or soil
- Change to barren landscape
- Change to water

Working with the Ngorongoro Conservation Area Authority through the University of Colorado to verify model and explore causes for change, 2002-2017.

**CSR**  
**M**  
**FOUNDATION**

- Craters
- Standing Water
- World Heritage Site Boundaries





# Issues for data

- Resolution
- Accessibility
- Availability for “citizen science”