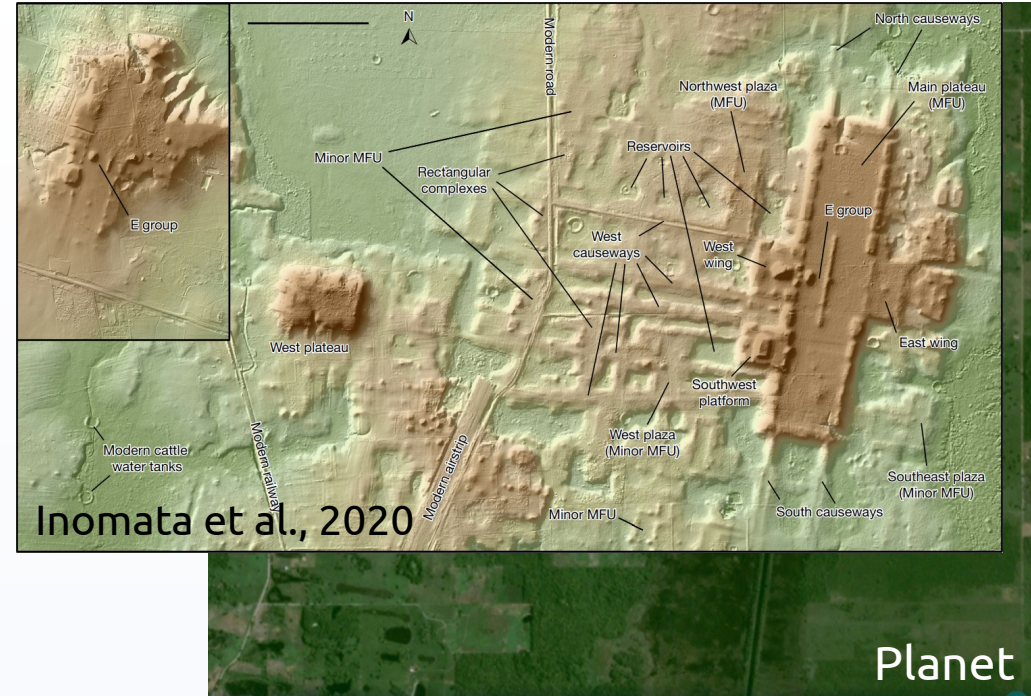


EGM310: GIS and Remote Sensing

Week 12, Part 4: Applications – Archaeology

- Excavating full extent of monuments, cities is difficult
- More so in tropical regions with thick vegetation cover
- Remote Sensing can help “see” through vegetation, reveal extent of hidden sites
- Example: recent finds at Aguada Fénix, Mexico (1000 – 800 BC)

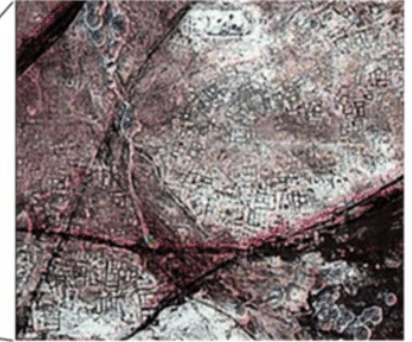


- Features on the surface:
 - Visible ruins
 - Mounds
 - Rock piles
 - Surface markings
- Example: Nazca lines (Perú), “rediscovered” in 20th century by airplane pilots



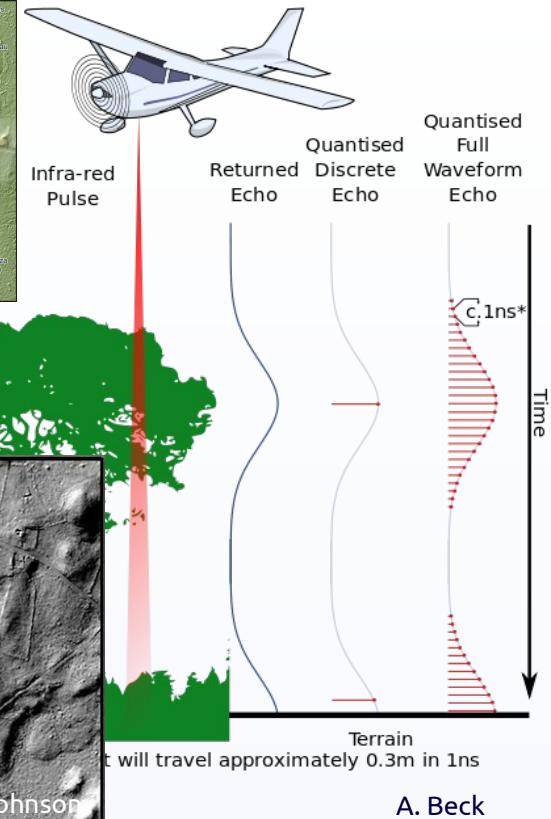
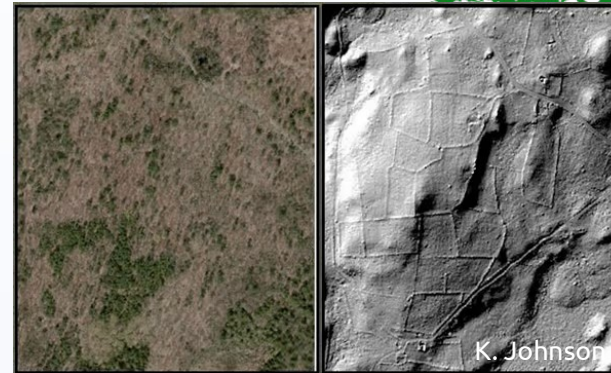
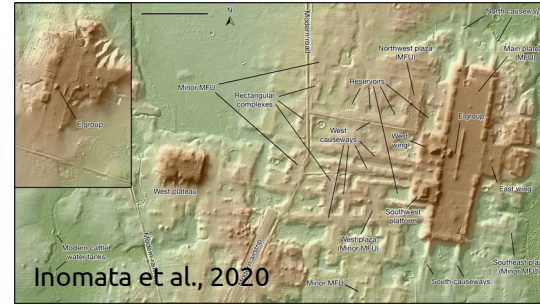
Subsurface features

- Buried/obscured by vegetation
- Revealed by subtle differences in:
 - Crop growth
 - Soil moisture, chemistry
 - Surface temperature
 - Topography
- Example: Ancient city of Tanis (Egypt)
- Example: Roman villa foundation



S. Parcak

- LiDAR pulse will “see” different parts of vegetation
- “Remove” vegetation, show ground elevation (**digital terrain model**)
- Reveals objects obscured by vegetation
- Highlight subtle topographic differences (e.g., roads)



Underwater shipwrecks

- Shipwrecks create scour pits
- Scour pits fill with sediment during slack tides
- During flood and ebb tides, sediment re-suspends
- Sediment plumes can be seen in satellite images



- Remote sensing can help us identify ancient archaeological sites
- Surface features: visual interpretation
- Subsurface features:
 - Multispectral imagery
 - Thermal bands
 - LiDAR & elevation models
- Can identify underwater sites, too

- Sarah Parcak: Archaeology from Space [[TED](#)]
- [GlobalXplorer](#)
- Archaeological mysteries hidden in satellite images [[TED](#)]
- LiDAR and the Archaeological Revolution [[GIS Lounge](#)]
- Sediments betray hidden shipwrecks [[NASA](#)]