



EUROPEAN ASSOCIATION  
OF REMOTE SENSING LABORATORIES



# EO for Cultural and Natural Heritage Workshop 2024

15-16 October 2024 | ESA/ESRIN



# Geoheritage to Support Heritage Authorities:

Research Case Studies on Maya Archaeological Sites

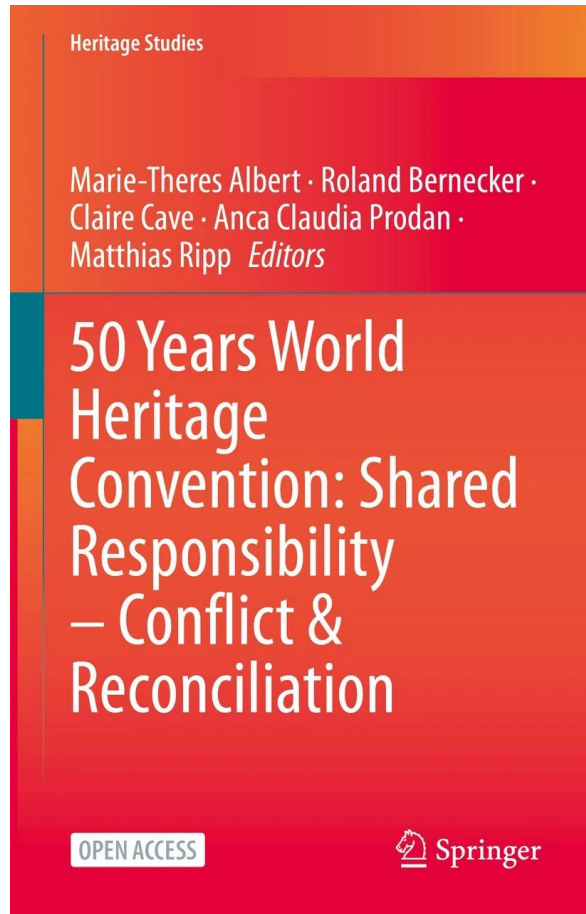
Mario Hernández, Philippe De Maeyer, Luc Zwartjes, Antonio Benavides, José Huchim

ESA UNCLASSIFIED - For ESA Official Use Only



→ THE EUROPEAN SPACE AGENCY





- Modern Technologies
- Modern Technologies a threat for Heritage
- Modern digital space science and technologies (digital geoheritage): beneficial for Heritage



1950 UNESCO World Heritage



During pandemic, EU tele-meeting



# Modern technologies a + or – for Heritage



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Easy to communicate and share



Social Media



6,600 passengers  
+ crew of 2,200



Low Cost  
on arrival taxi is more  
expensive than air ticket



# Heritage under stress



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Chichen Itza – Mexico (2022)

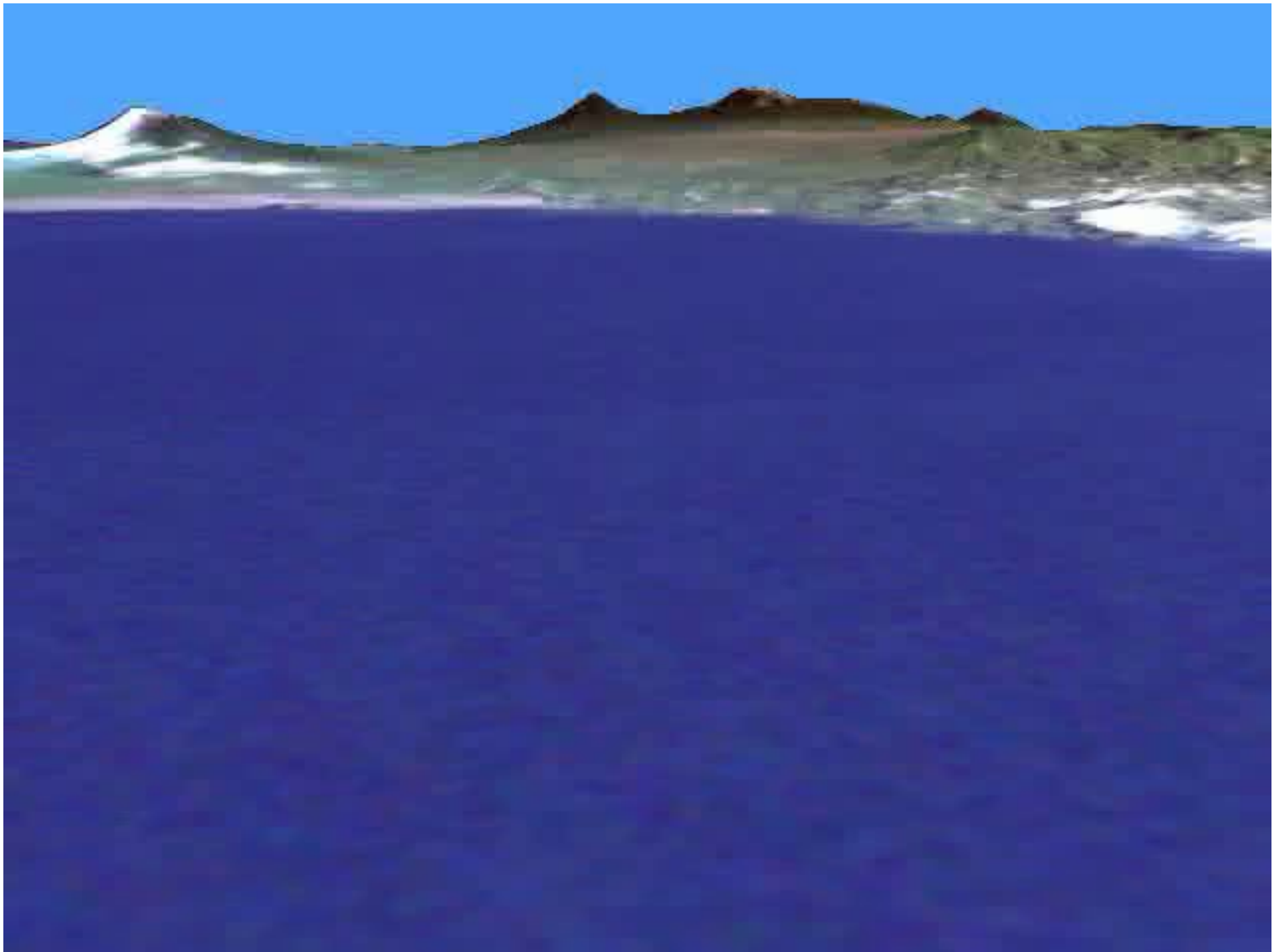


Florence – Italy (2019)

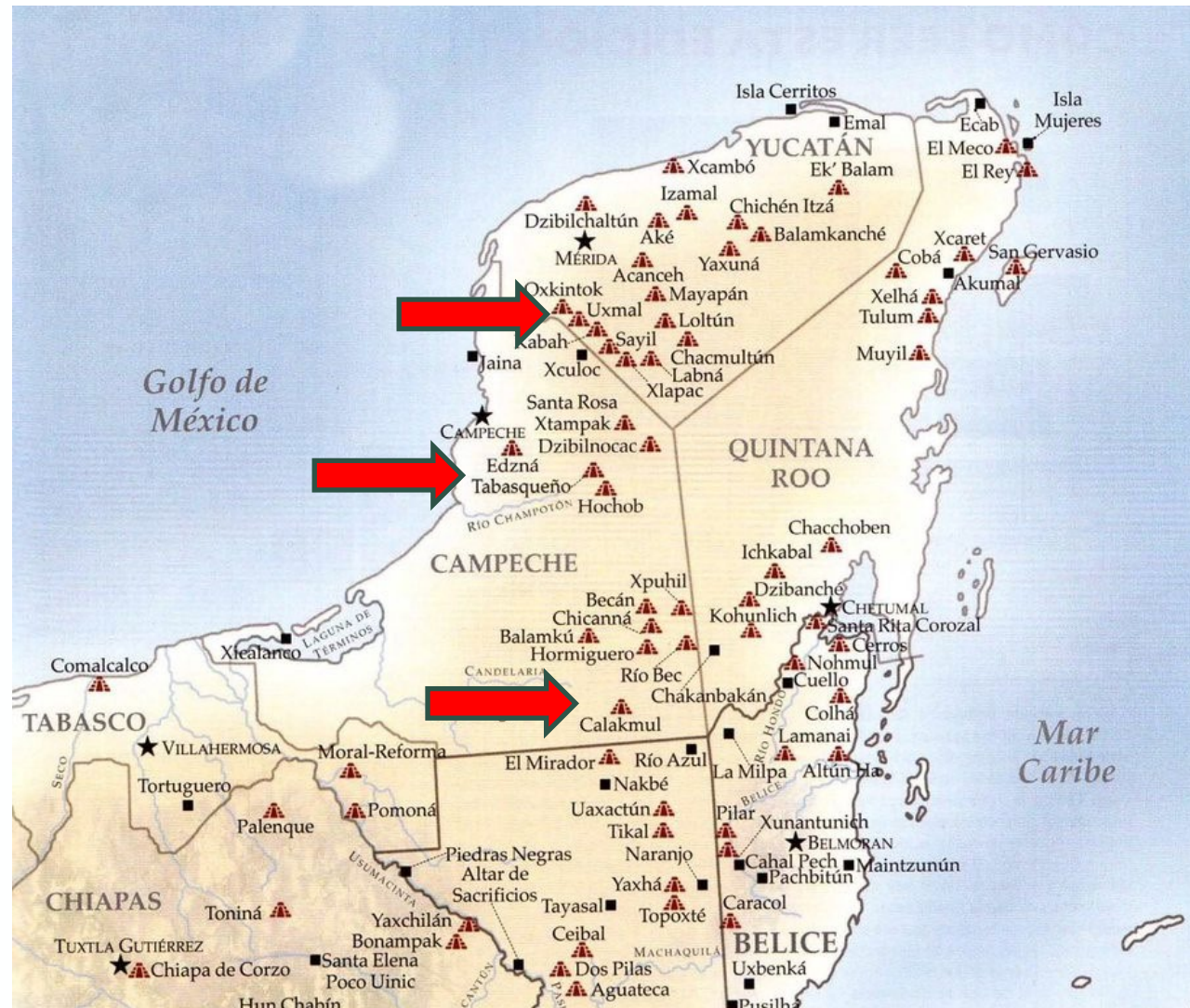










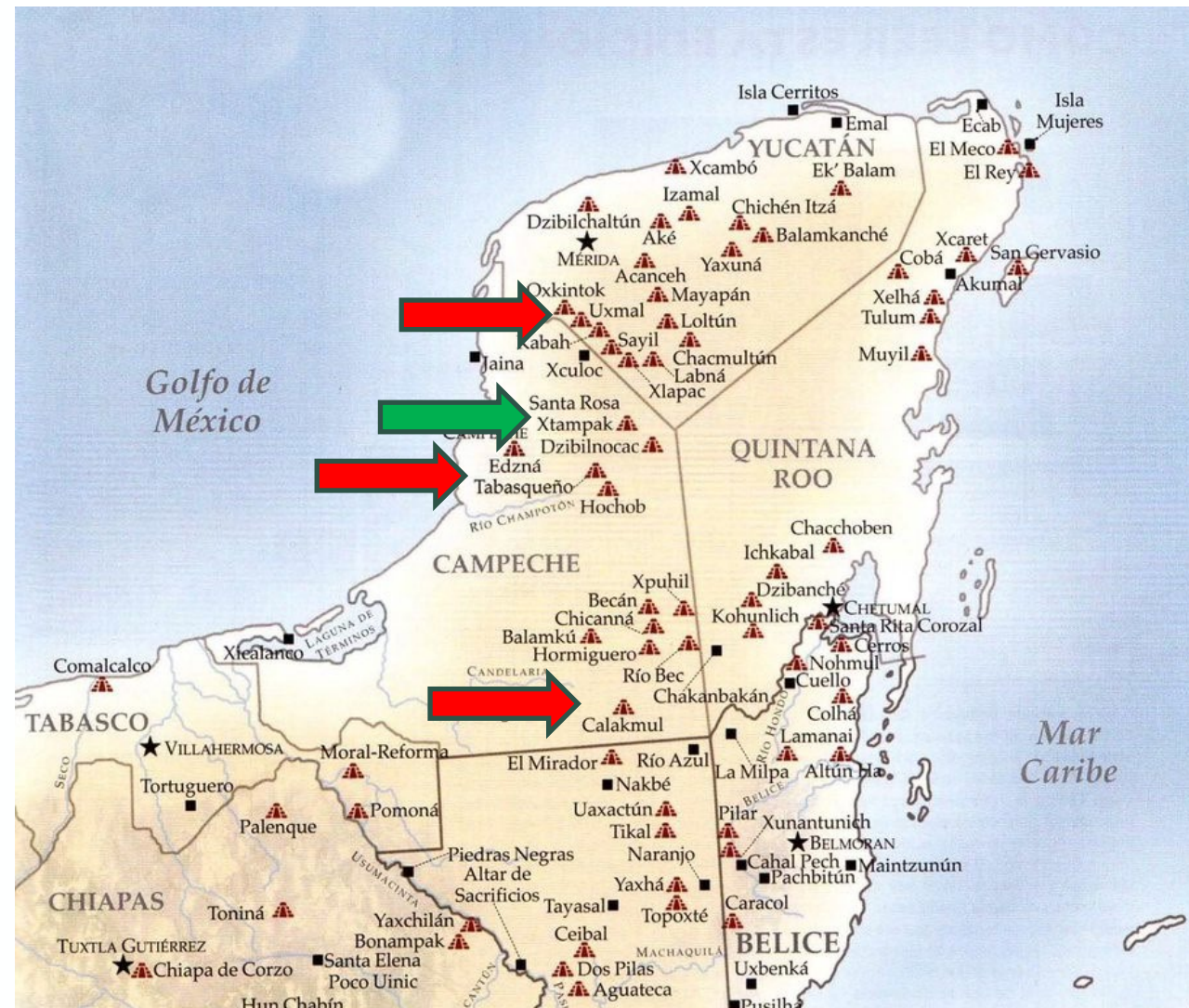


Calakmul

Edzná

Uxmal





Calakmul

Edzná

Uxmal

Santa Rosa  
Xtampak





New archeological research : Uxmal as a Maya metropolis linked with Kabà and Lebnà

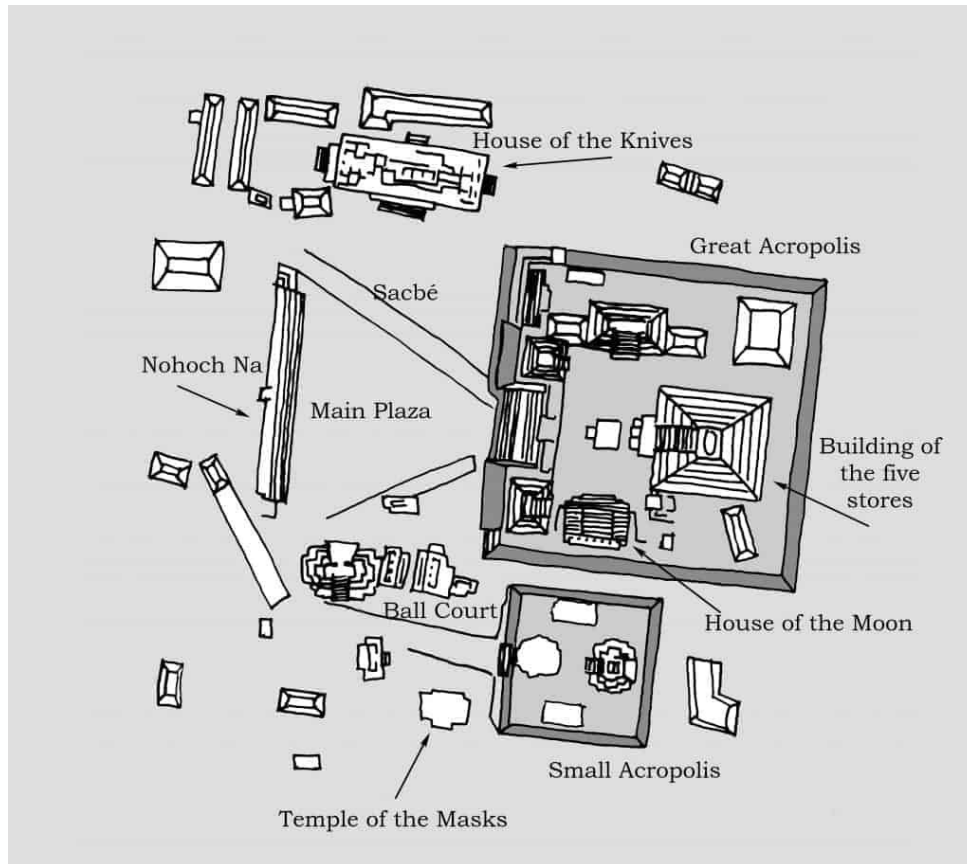


# Edzna in the State of Campeche - Mexico



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25 km<sup>2</sup>

Only 10% cleaned of  
vegetation

Overall archaeological  
research on-going

Open Public area







# EDZNA 3D



UNIVERSITEIT GENT | geography Ghent University | INAH





Documentation  
 Accurate “maps”  
 Temporal changes (4D)  
 Subsidence (after rain season)  
 Research  
 Restoration  
 Presentation  
 Dissemination

Master Degree  
 PhD Degree





## TRANSFER

Expertise – methodology – knowledge

## TRANSFER ?

- Awareness about the potential of geo-heritage
- Establishment of a local interdisciplinary network
- Easy access to derived information
- Information about national services (academy and/or commercial)



CULTURA



INAH









# Uxmal visitors



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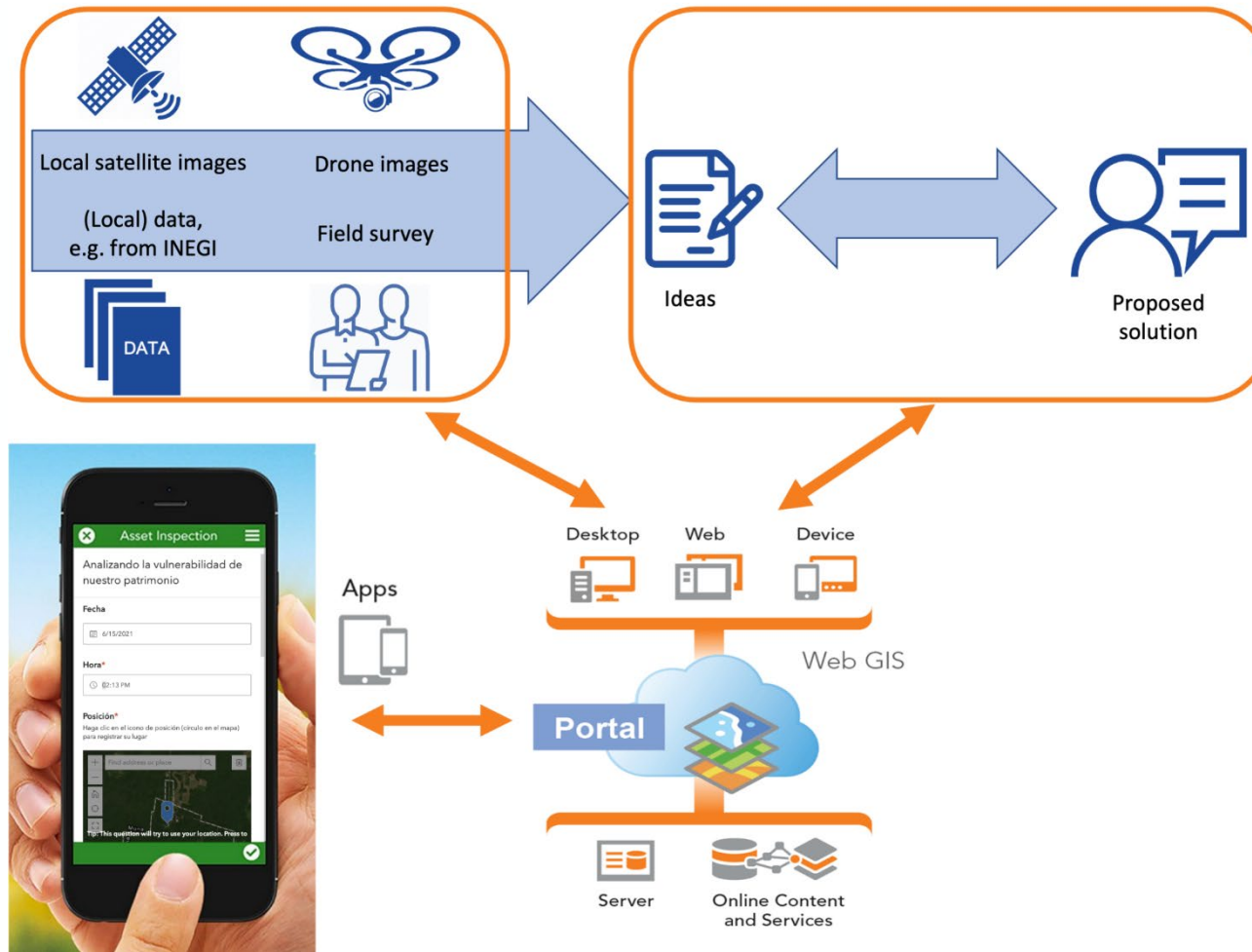
# Uxmal visitors



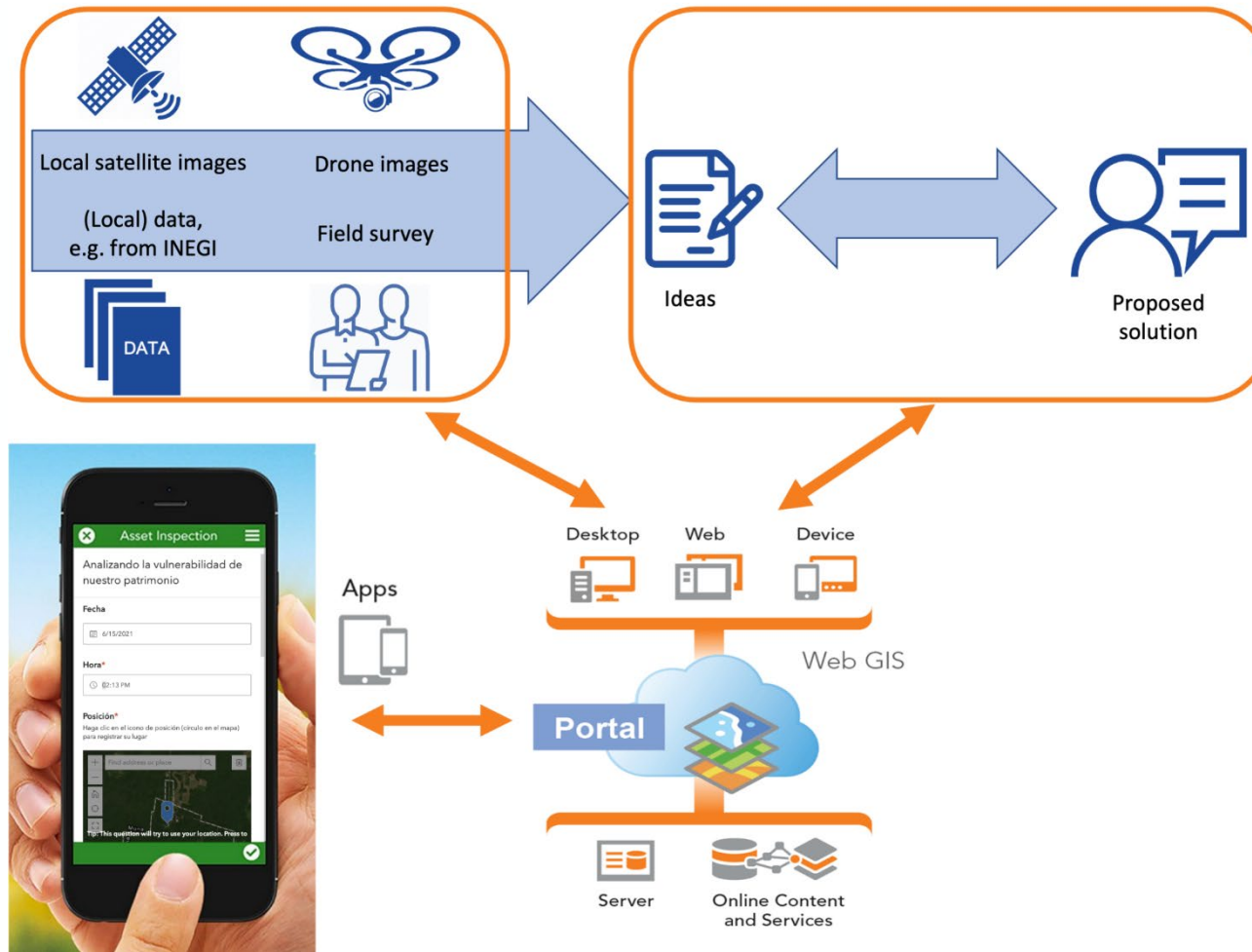
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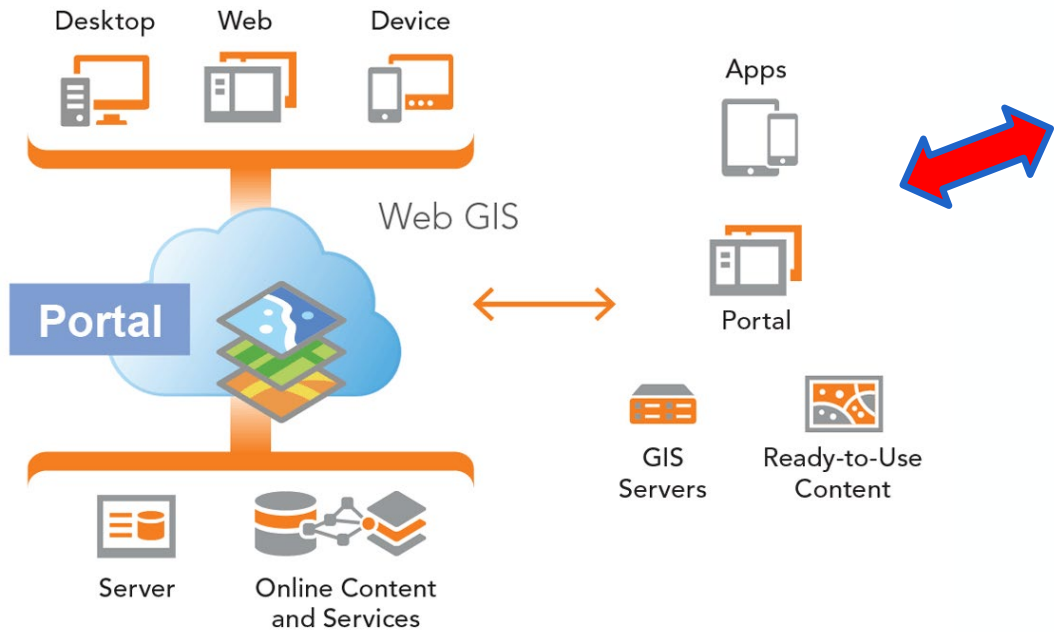




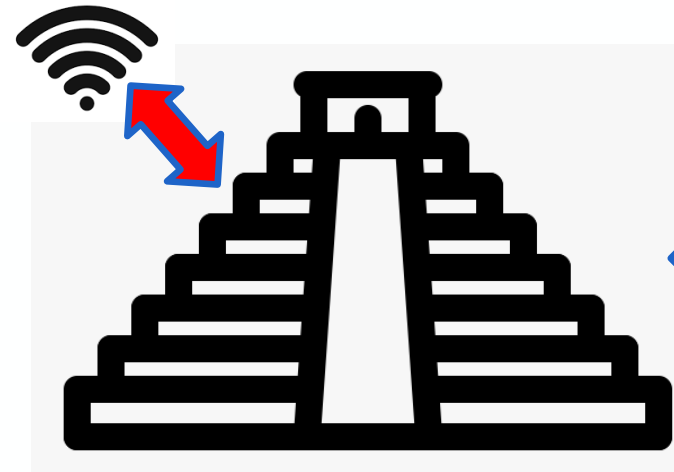








University of Ghent  
 Web-GIS database  
 Connecting GIS complex infrastructures



INAH Uxmal office located inside the Tropical Forest  
 Good internet connection



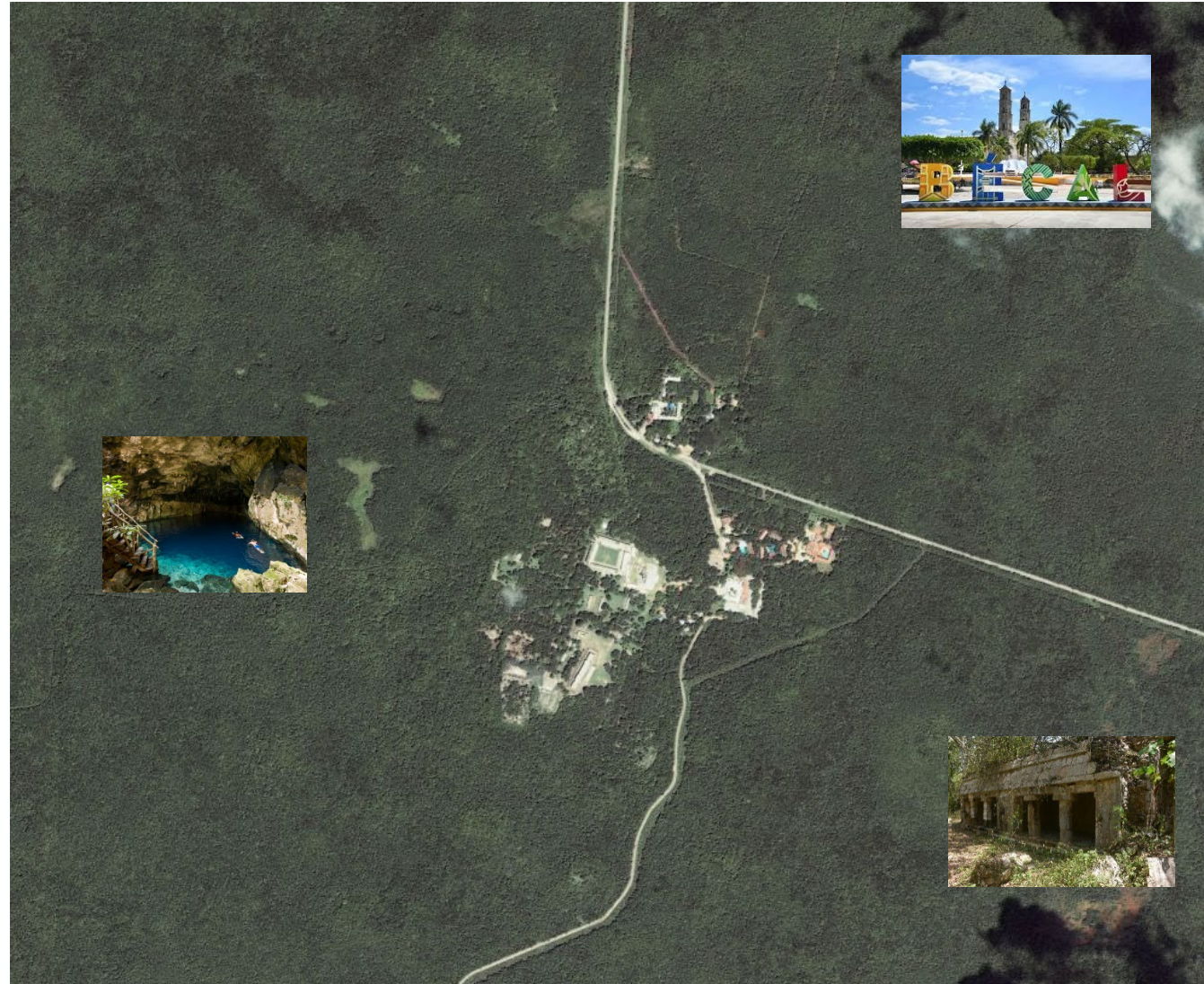
Data capture done by local communities



# Tourist map (simulation)



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By the local people obtaining a benefit they will appreciate the HERITAGE

The HERITAGE being used as an economical benefit for the local population







**Yuum bo'otik**

**(Than You in Maya language)**





# Yuum bo'otik

# (Than You in Maya language)







