



# LANDSCAIPIES

Finding Srivijaya empire's lost cities



Srivijaya is described as the last great lost civilization. It was a Thalassocratic empire located on Sumatra and ruled Indonesia and much of Southeast Asia between 7th and 12th centuries.

The empire grew its power from trade between India, China and even the Middle East as well as religious center of Mahayana Buddhism with pilgrims coming over from China and India.

It disappeared without a trace around the 14th century and its existence was all but forgotten until early 20th century.



# Srivijaya empire



Srivijaya: A fabled 'island of gold' lost since the 1300s is finally revealing its treasures

Who doesn't like a story about a lost city of gold, right? We've all seen the Hollywood movies and heard the fabled stories of forgotten empires lost to the...

3 déc. 2021



Whatever Happened to Srivijaya, Forgotten Maritime Trade Center?

Srivijaya (often referred to as the Srivijaya Empire) was a thalassocracy (meaning a maritime/sea-based state) that flourished between the...

26 nov. 2019



Once a floating kingdom on Silk Route, now fishermen are finding priceless artifacts from Srivijaya,

Srivijaya is probably the greatest empire you've never heard of: known as the Island of Gold, the floating kingdom ruled Indonesia (and much...)

27 oct. 2021



The  
Guardian

Have Sumatran fishing crews found the fabled Island of Gold?



Where are the glorious remains of Srivijaya empire?



# Sumatra

## Geology

Mountainous island associated to the subduction of the Indian plate. Very active volcanisms and numerous gold mines that gave Sumatra its nickname: "The Island of Gold"

## Topography

Abrupt changes in topography to the West, due to volcanic activity and very flat lowland (topography lower than 10m to the East) with well-developed river systems

## Climate

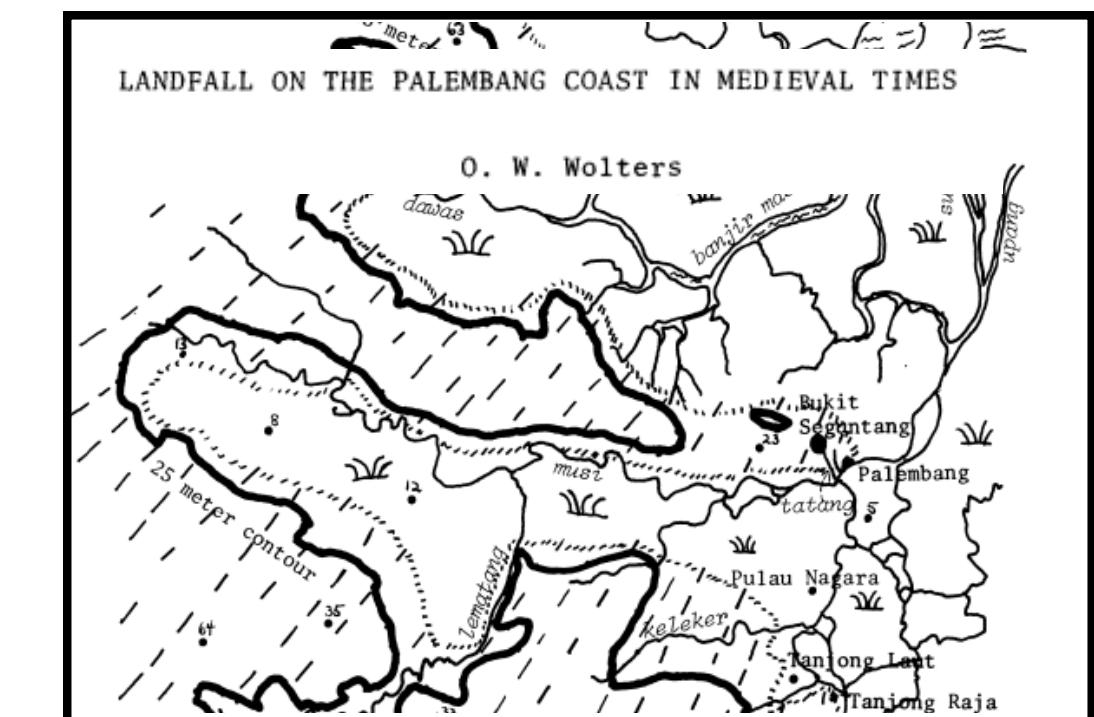
Tropical climate with pervasive vegetation affected by high rainfall, monsoon seasons and flooding episodes

## Human Activity and Land Use

Land use has significantly changed over the past decades (deforestation and oil palm plantation) leading to accelerated landscape changes

## Highly changing river system

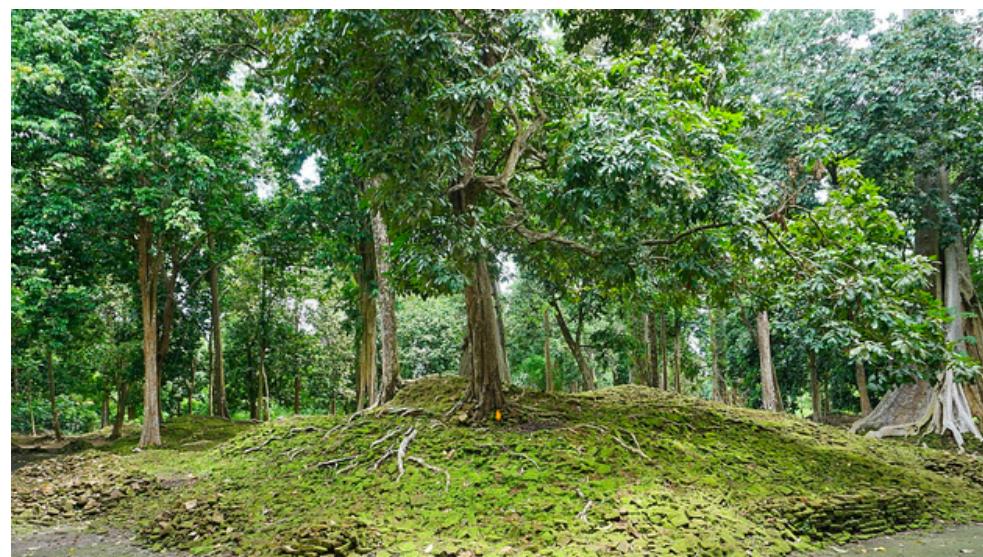
Sumatra river system and coastline are highly changing as illustrated by recent satellite images, XIXth century maps and tales from early explorers



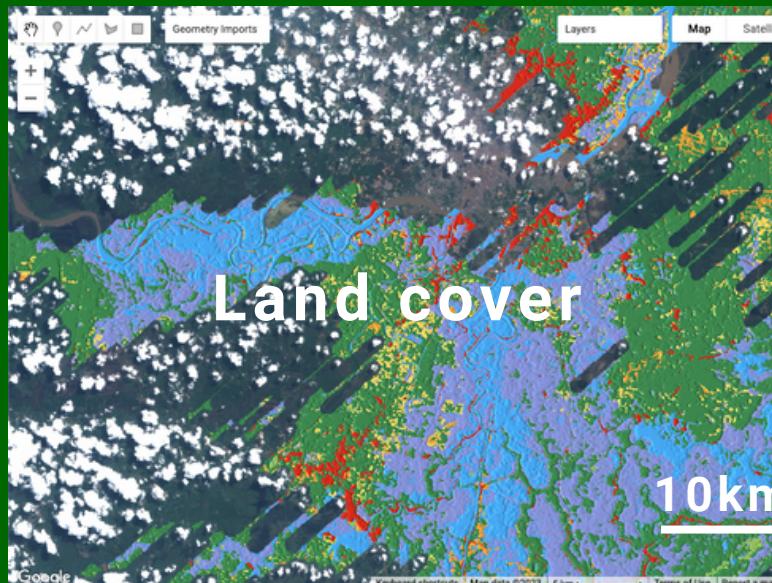
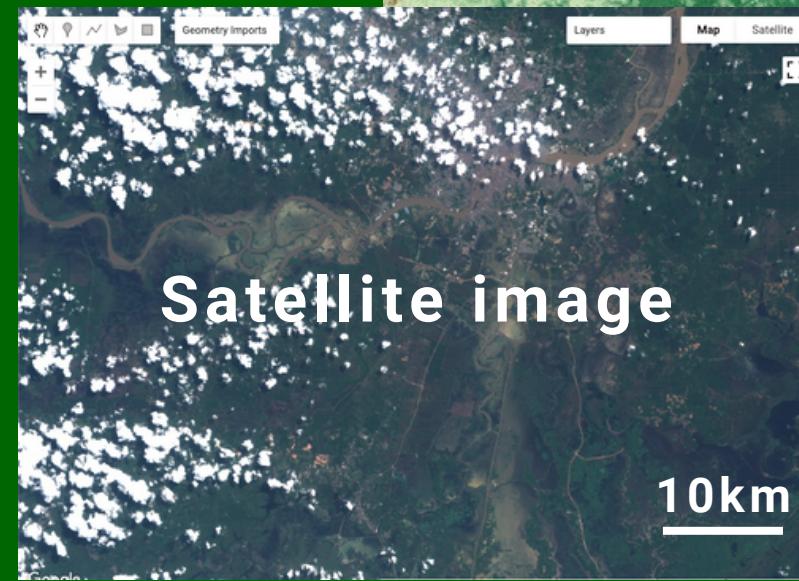
Has Srivijaya empire disappeared due to such river/coastline changes?

# Changes in river course

Changes in river courses and land use can be highlighted from satellite images in public domain (Landsat from 1972 to present - Sentinel-2 from 2012).



Assess river changes for possible buried cities



## Let's find the lost cities of Srivijaya!

- Access satellite data through **Google Earth Engine** and process it with **Google Cloud Platform**



- Map river changes in satellite images since 1984
  - River detection (**KNN**, **CNN**, **Image segmentation**)
- Identify location of significant river changes and anomalous satellite measurements on the river banks
- Perform **AI detection** of possibly buried archeological sites using existing sites as training data