Disaster Management using Digital Elevation Model & Radar Weather Independent Earth Observation data (SAR)

Ciro Farinelli, **Future Earth Observation SAR Programs**

Virginia Herrera, **SAR Application Developer**

Connected Intelligence
Airbus Defence and Space
Germany

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EO SAR: Airbus Missions

TerraSAR-X (2007)
TanDEM-X (2010)

PAZ (2018)

Future mission

WorldSAR Constellation Cooperation
with Hisdesat (ES)

Next Generation Service Scenarios

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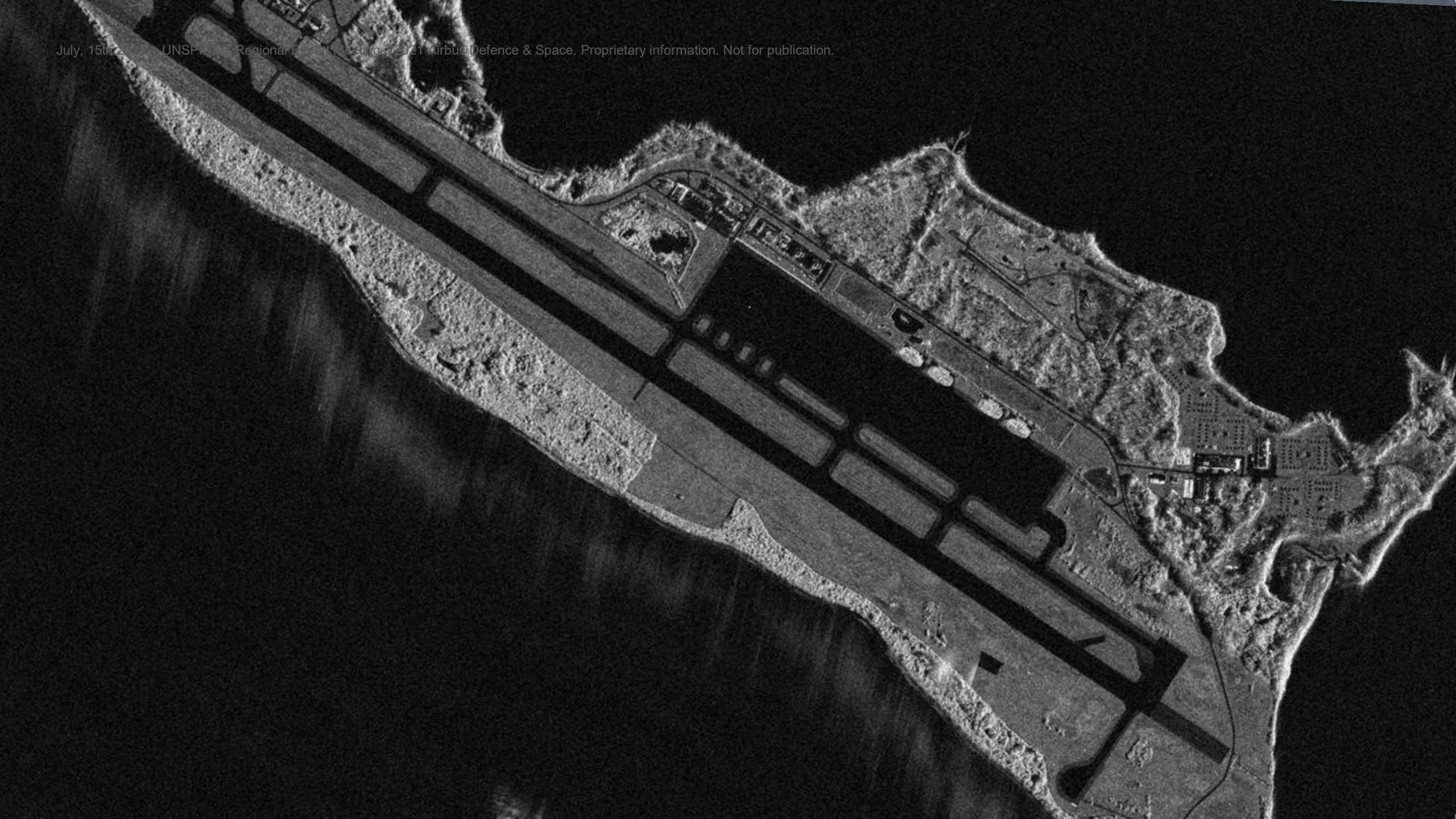
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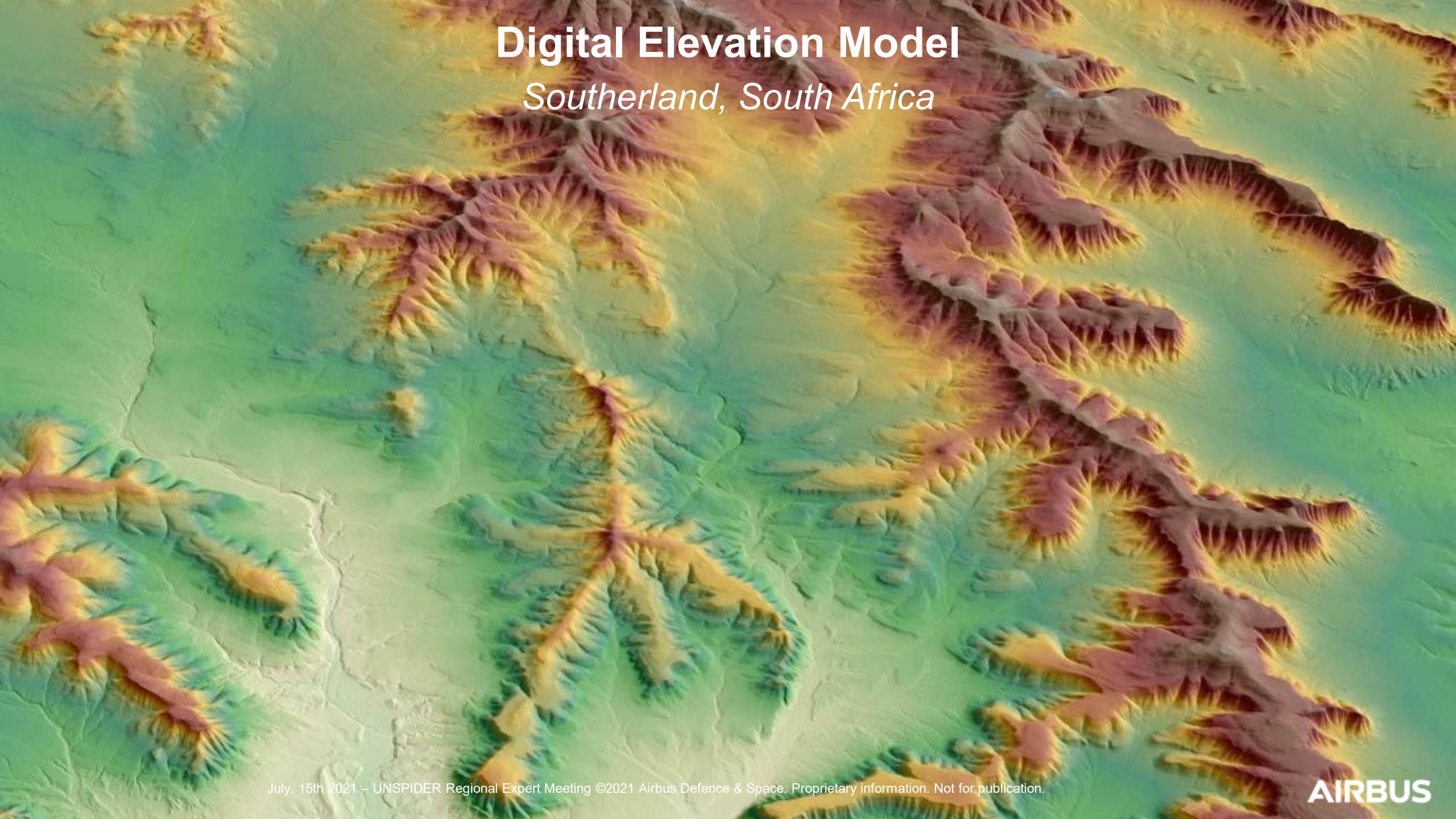
Digital Elevation Model

Southerland, South Africa



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Use Case #1

Ghana: Inundation Hazard Modelling

Applications:
- Storm Surges
- Coastal Floods

NADMO GHANA

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

15 LIFE ON LAND

Coastal flooding simulation, Accra West, Ghana

Analysis from WorldDEM™, Background Image from Sentinel 2

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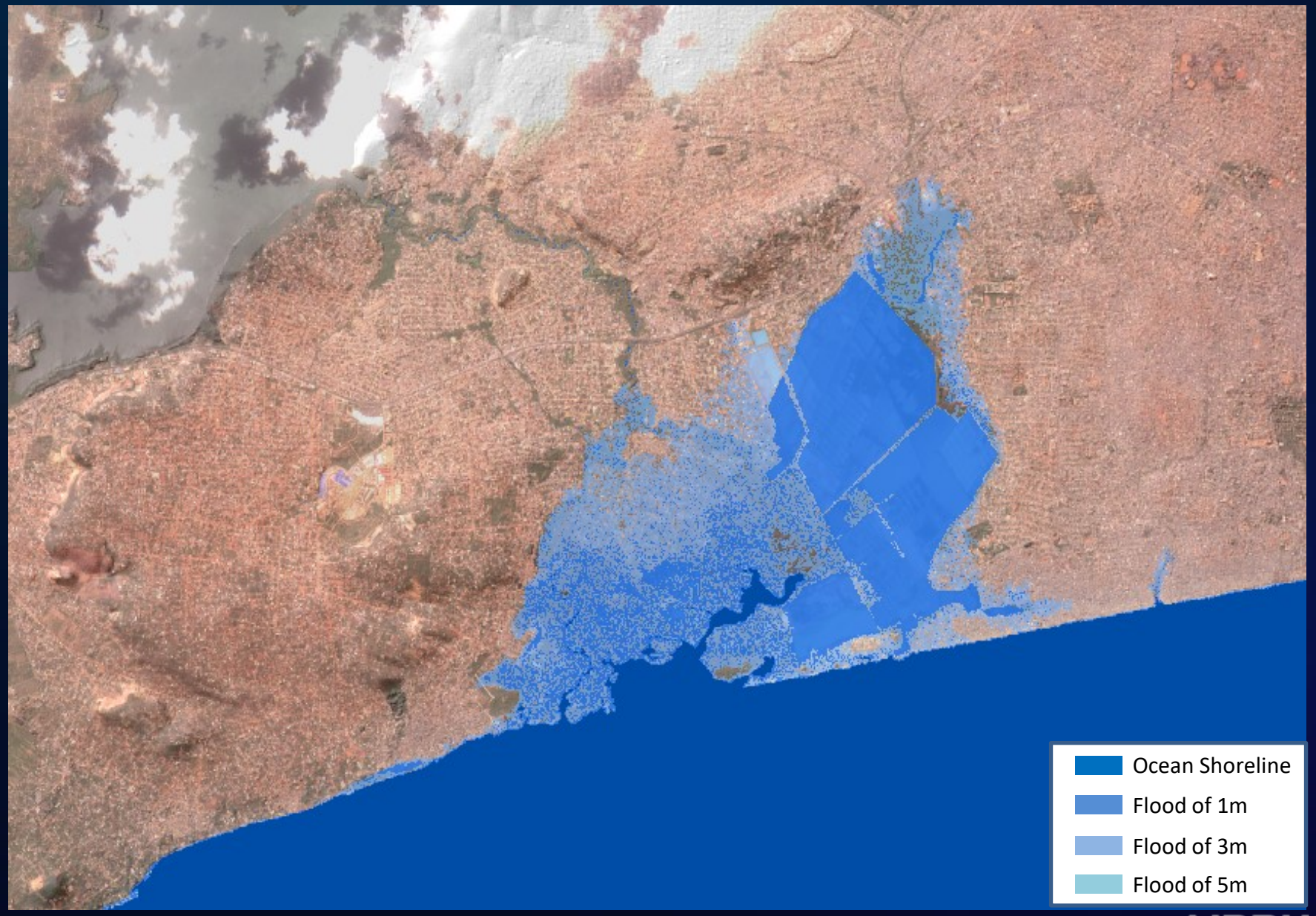

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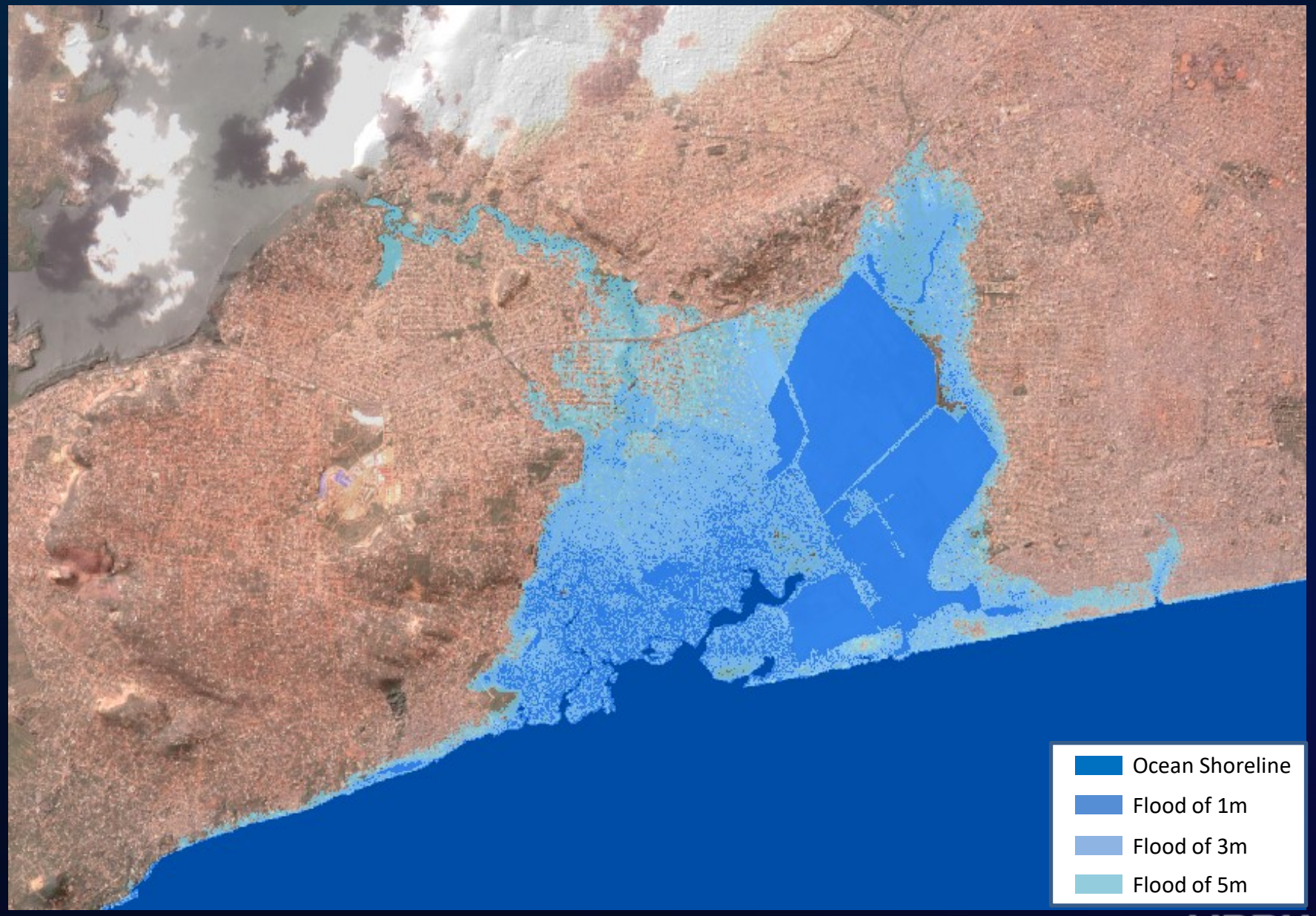

Analysis from WorldDEM™, Background Image from Sentinel 2

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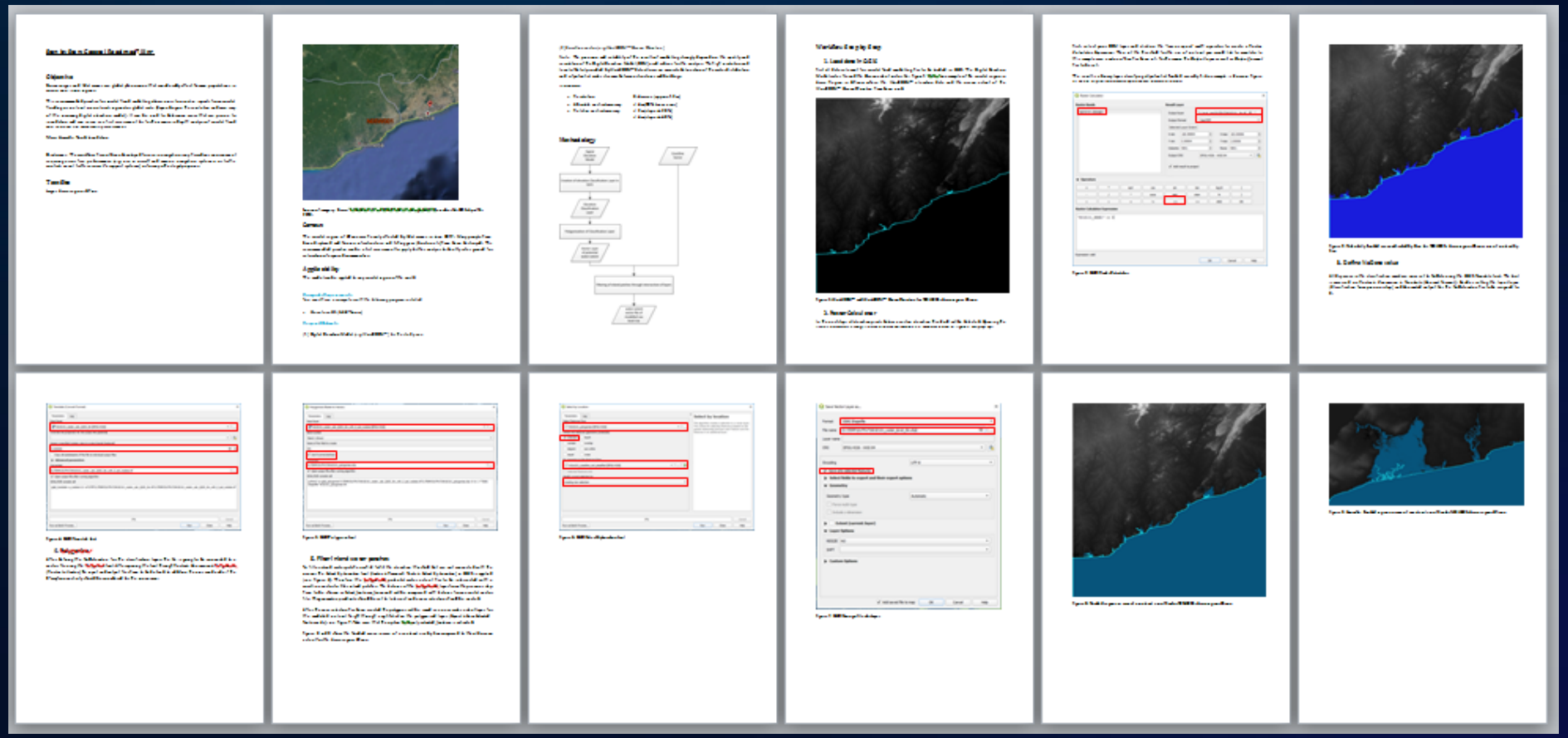
Use Case #1

Recommended Practice for coastal flood modelling

→ **Published at the UN-SPIDER Knowledge Portal**

Coastal flooding simulation, Accra West, Ghana



- Open source GIS software
- Easy handling
- Applicable for all DEM data

UNITED NATIONS
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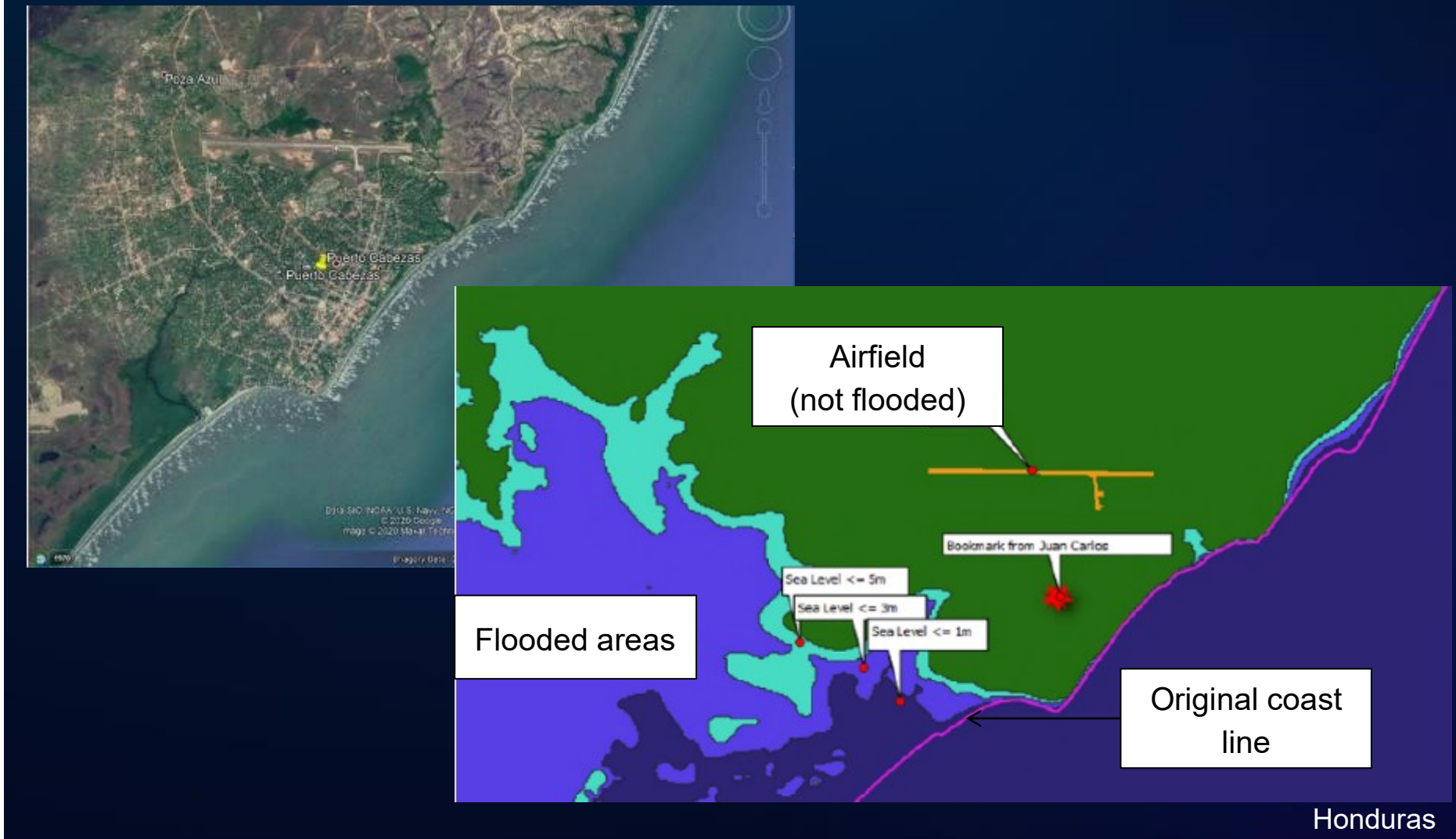
Use Case #2

Nicaragua: Flood maps to enable first aid to land in safe airfield

Applications:

- Emergency response
- Storm surges
- Hurricanes

Nicaragua – Hurricane November 2020



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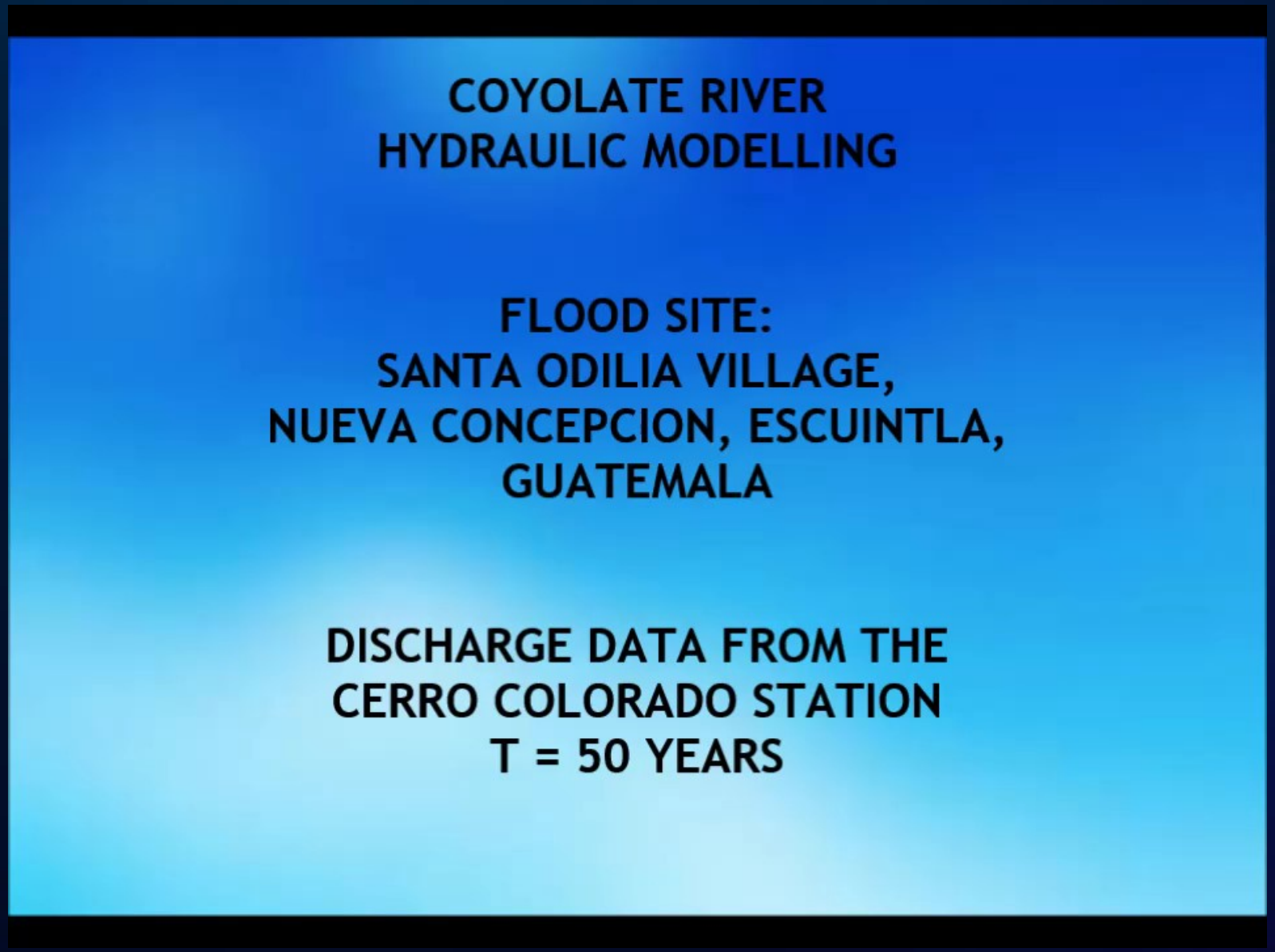
Use Case #3

Guatemala: River Inundation Modelling

Comparison between WorldDEM and free and open data

Flood Simulation, Coyolate River, Guatemala



Courtesy of Private Institute for Climate Change Research

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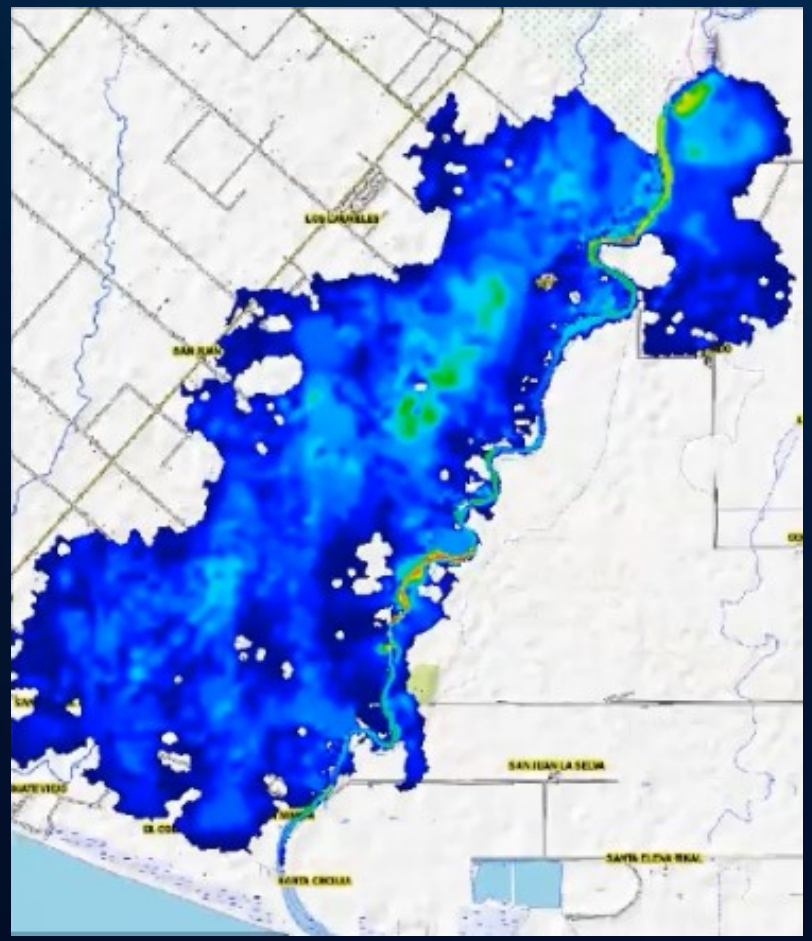

Specific discharge

SRTM, 30M

VS

Specific discharge

WorldDEM, 12M

Courtesy of Private Institute for Climate Change Research

ICC Instituto Privado de Investigación sobre Cambio Climático ¡Ciencia en acción para enfrentar el cambio climático!

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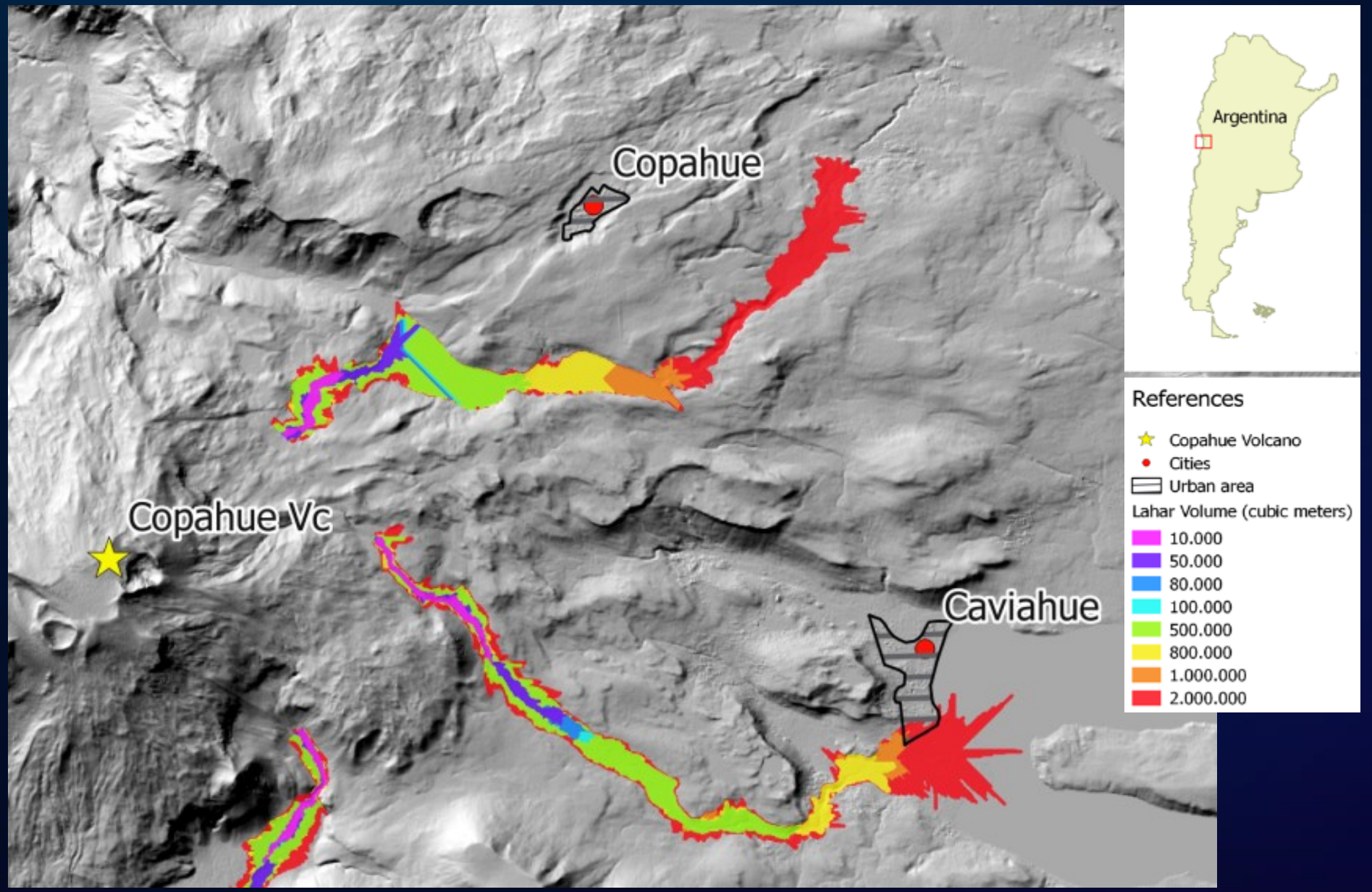
Use Case #4

Argentina: Lahar Modelling
Using WorldDEM™

Applications:
- Lahar modelling
- Settlement areas hazard risk assessment

Lahar Modelling, Copahue Vulcano, Argentina



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Use Case #5

Germany: River Inundation modelling with WorldDEM DTM$_{lite}$

Example of a 100 Year Return Flood modelling. Neckarau (Germany)

Example of a 100 Year Return Flood modelling. Neckarau (Germany)

Slide with animation

In collaboration with: geomer GEOINTELLIGENCE AND BEYOND

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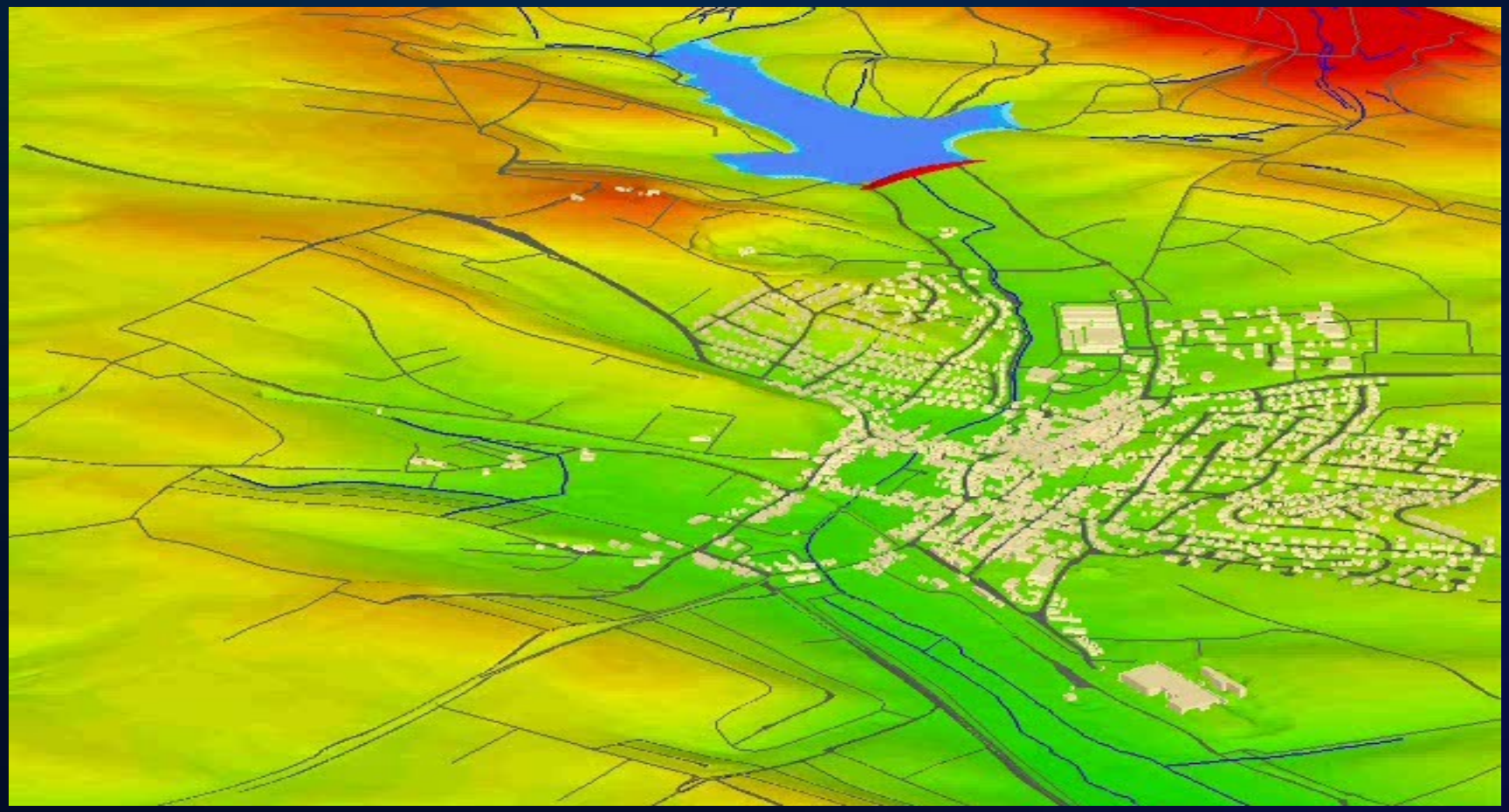
Use Case #6

Dam Failure scenario

With simulation models such as FloodArea and Airbus Digital Elevation models, these processes can be well modeled to fit the customer requirements

Combination of DTM and buildings 3D for flood simulation



Slide with animation

In collaboration with: geomer GEOINTELLIGENCE AND BEYOND

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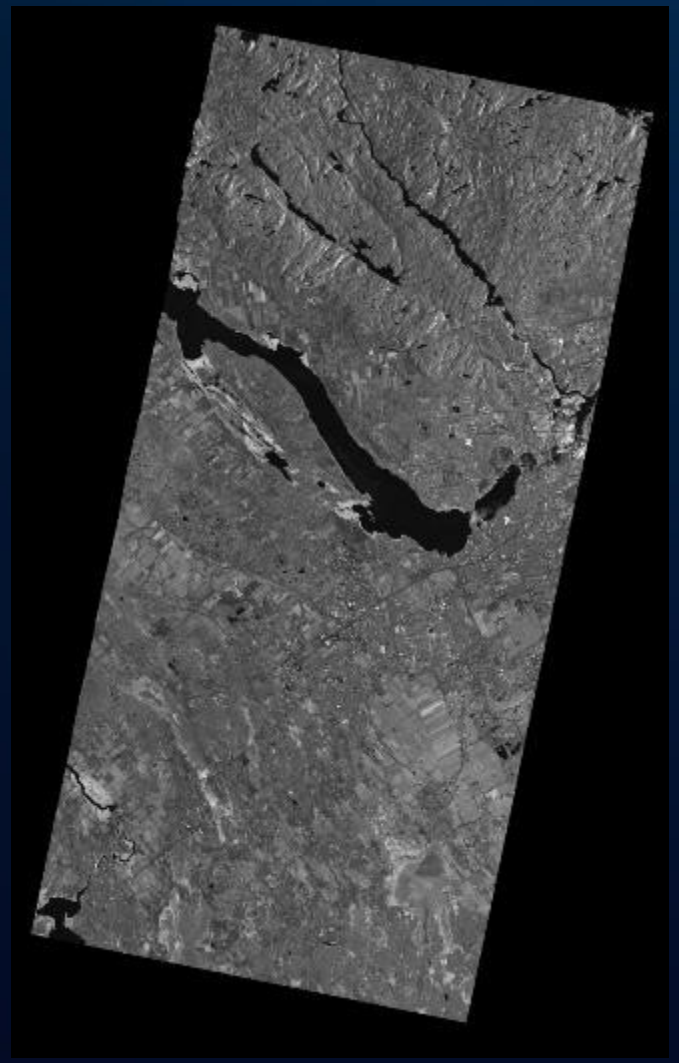
Use Case #7

Flood Rapid Mapping

Global availability of WorldDEM data and derived DTM_{lite} allows for the implementation of globally robust procedures to assist the automated mapping of flood events.

Use of WorldDEM™ data to support rapid mapping of flood events



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- Water in time 2 - Open water
- Water in time 2 - water under vegetation
- Water in time 1 - main permanent water bodies

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Thank you

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