Disaster Risk Management

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ADB | Japan Fund for Poverty Reduction | URBAN CLIMATE CHANGE RESILIENCE TRUST FUND

Catalyzing Innovations and Digitization for
Safe, Sustainable, Resilient, and Inclusive Water Management

HKV, knowledge entrepreneurs in flood risk and water resources management

- Independent consultancy firm
- 73 employees, based in the Netherlands
- Specialized in:
  - Risk and Disaster Management
  - Integrated Water Resource Management
  - Rivers, Coasts and Deltas
  - Flood defences
  - Monitoring
  - Plastics
  - Flood Early Warning System
- 10% of budget spent on research & development

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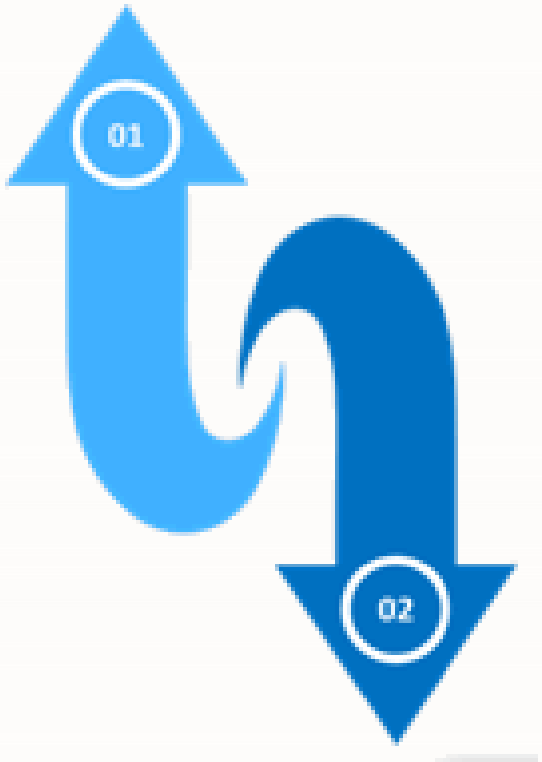
Specialists with research & products on multiple scales

- Continent scale
- Country scale
- Catchment scale
- City scale
- Neighborhood scale
- Drain scale



HydroPC – HYDROlogical forecasting using Publicly available data and free Cloud-based technologies

- Data technologies to support water and disaster risk management in Mozambique
- Google Earth Engine
- Country or Continent scale
- From past to present
- https://dmmangrove.hkvservices.nl/hydropc/

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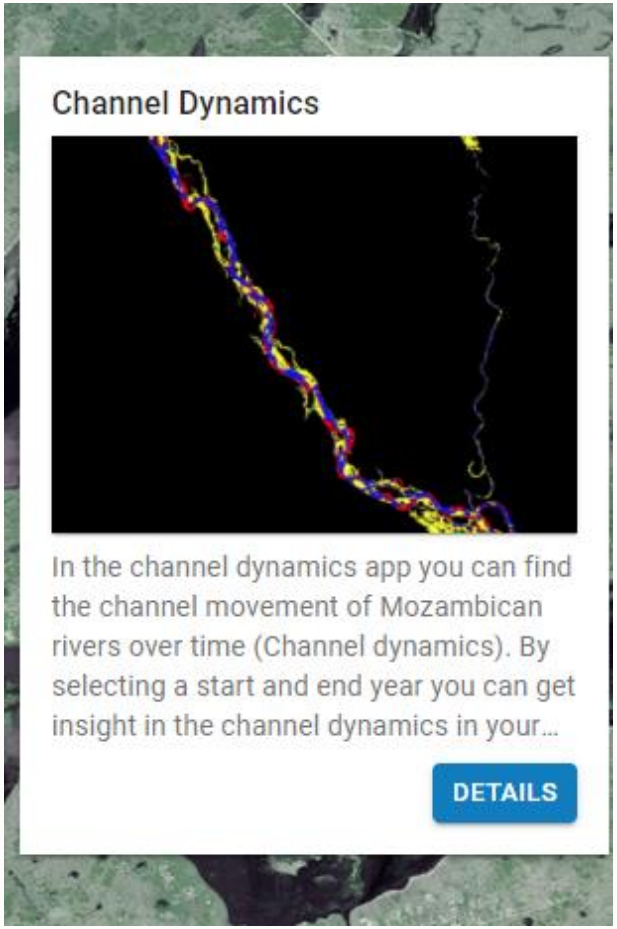
Channel dynamics

- Movement of the river since ~ 1985
- Which parts of the river are dynamic and which parts are not?
- Important for infrastructure



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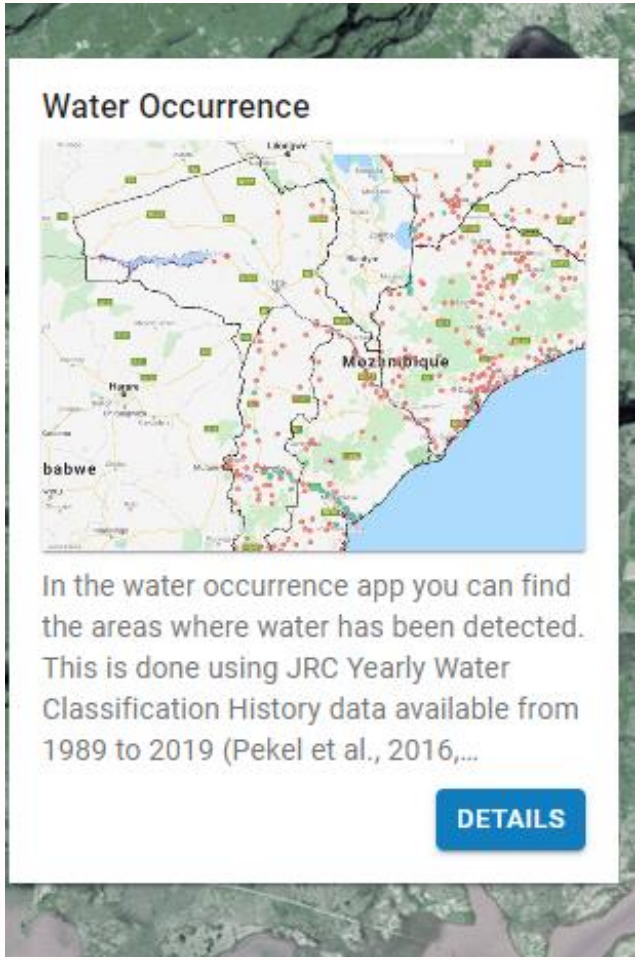
Water occurrence

- Planning of facilities
- When disaster hits, which facilities are most likely to flood based on previous experiences



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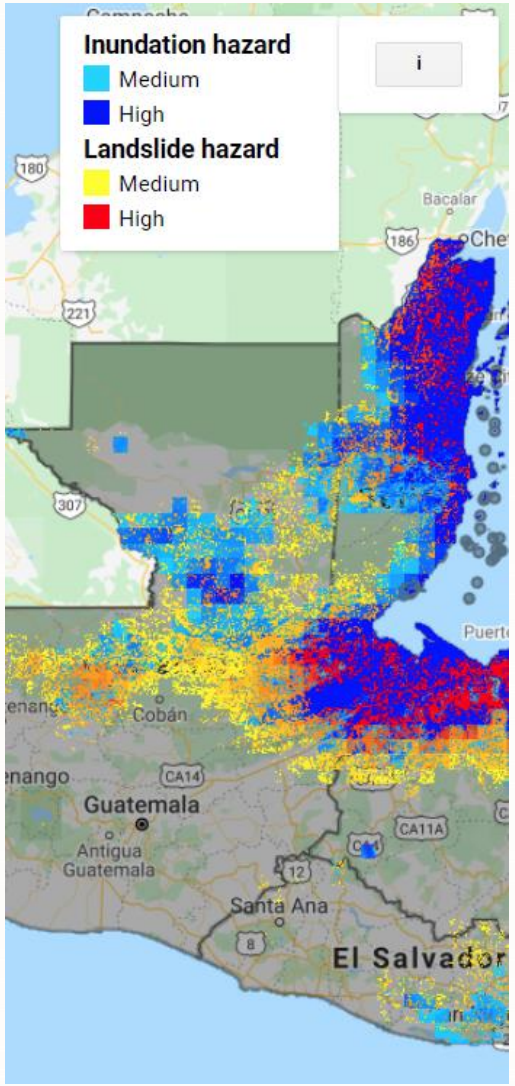
Remote Disaster Surge Support

- Countries can request the Netherlands to give Disaster Surge Support
- Country and Continent Scale
- From present to Future
- Satellite information – Google Earth Engine

- Example: Guatemala, hurricane Iota
- Landslide & Flood risk
- https://hkvgee.users.earthengine.app/view/landslide-and-inundation-hazard



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Rainsat
rainfall observations and nowcasts

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Meteosat to precipitation estimates

Algorithm : NIPE

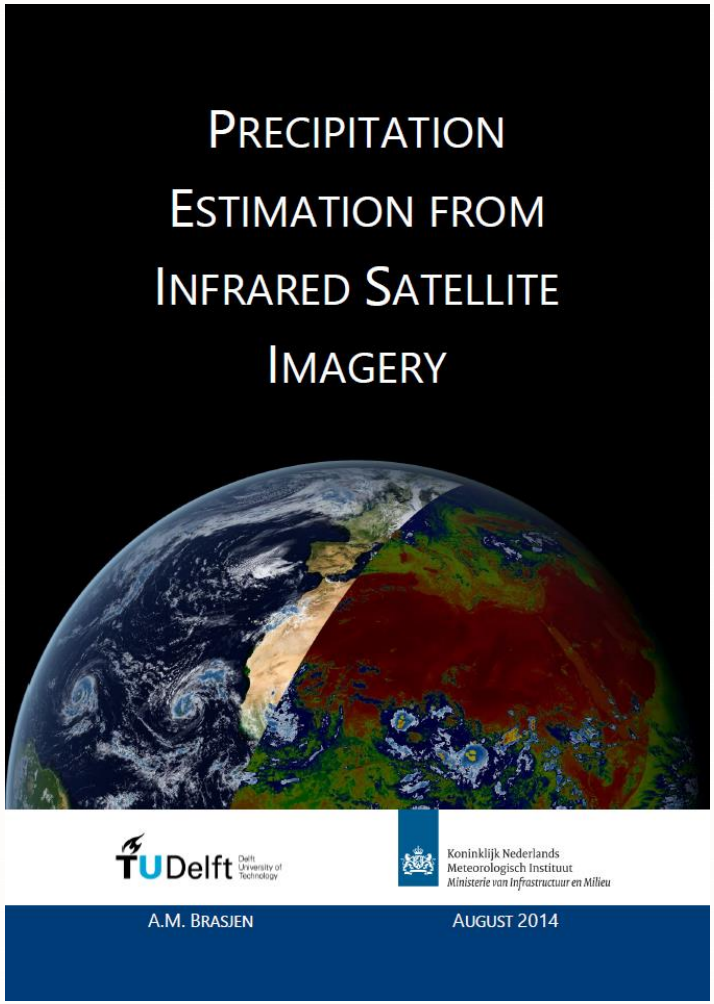
Nighttime Infrared Precipitation Estimation

By KNMI/TU Delft

(Brasjen, A.M., et al., 2014)

LEAP-AGRI WAGRINNOVA:

Calibration on GPM



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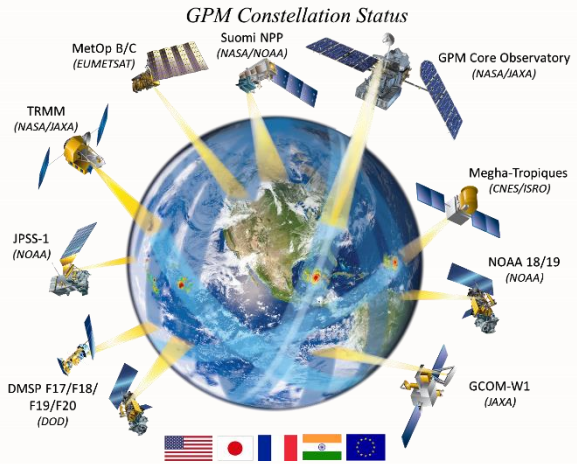
Meteosat Second Generation vs. GPM

Meteosat (MSG)

- Region: Africa and Europa
- Latency: 45 min.
- Temp. res.: 15 min.
- Spat. res.: ~3x3 km

GPM

- Region: Global
- Latency: some hours
- Temp. res.: 30 min.
- Spat. res.: ~10x10 km



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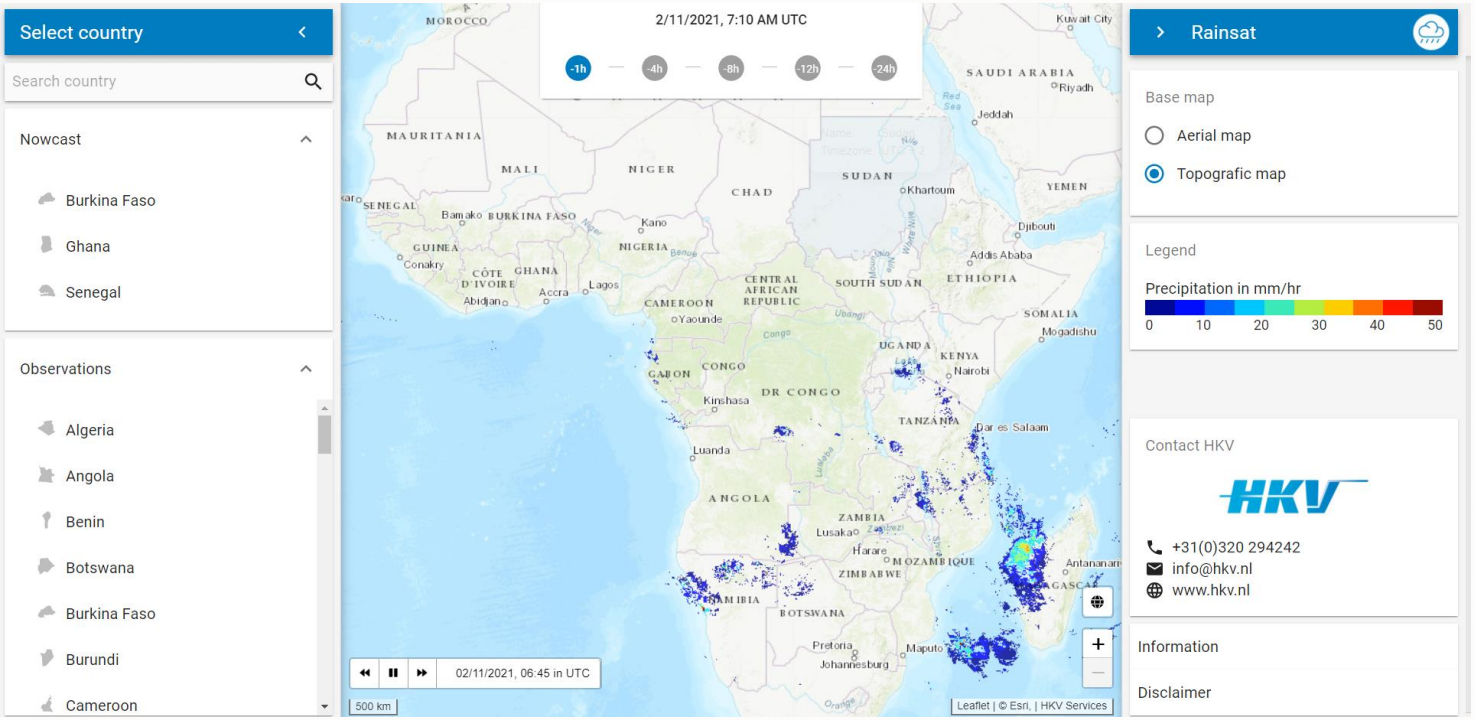
RAINSAT

- Website and app (rainsat.net)
- **Real-time rainfall** estimates for entire continent Africa
- **Nowcast** (3-hour forecast) for Ghana/Senegal and Burkina Faso

rainsat.net



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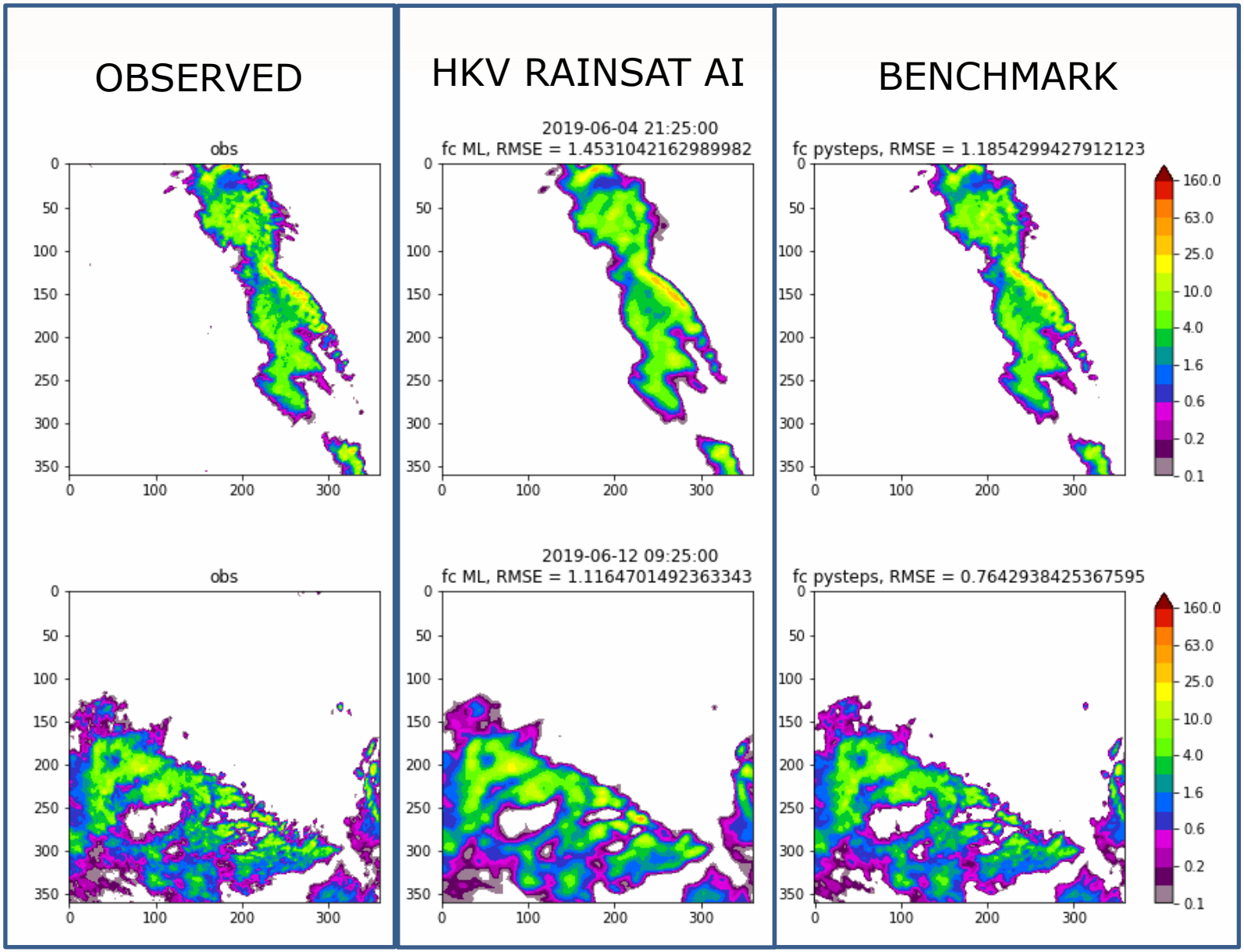

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Rainsat

- In production in continental Africa on using geostationary satellite
- In research in Netherlands using radar imagery

- We now have better nowcasts for tropical showers than benchmark

- **Valuable with increase of extreme precipitation**

NOWCASTS 4 NEIGHBORHOUD FLASH FLOOD WARNINGS

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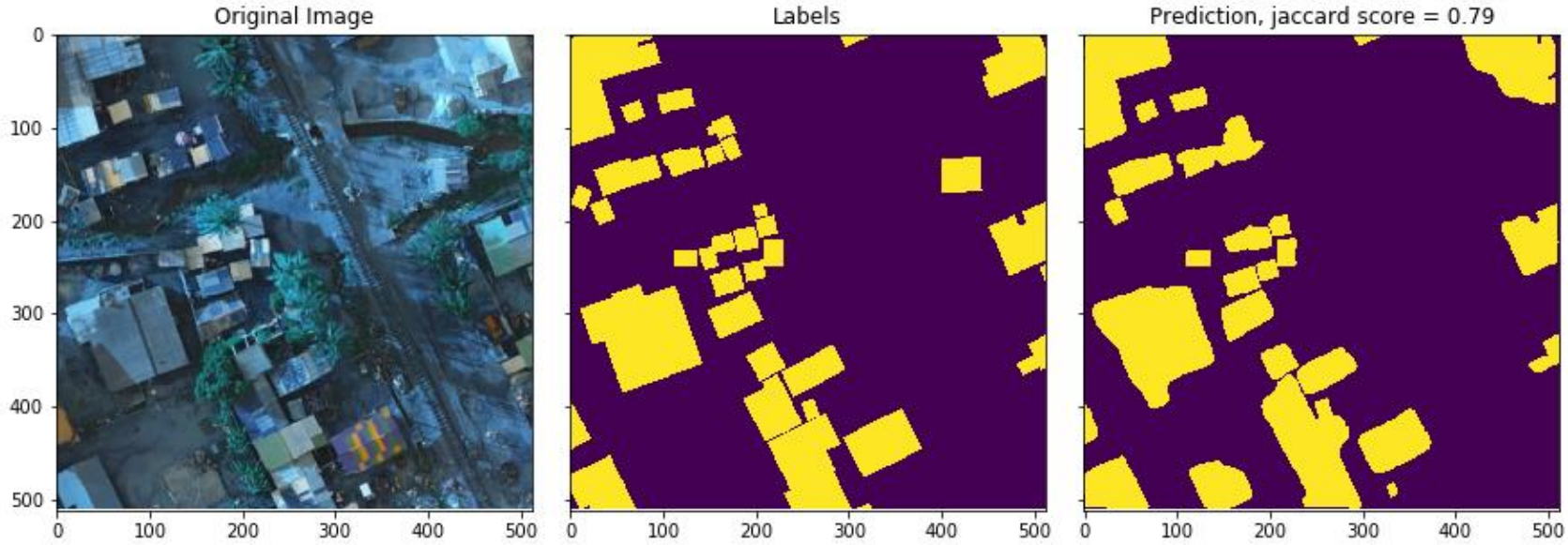
From rain in the city to drain in the city

- Participant in challenge WorldBank for object detection
  - Use Artificial Intelligence to detect buildings from high resolution imagery



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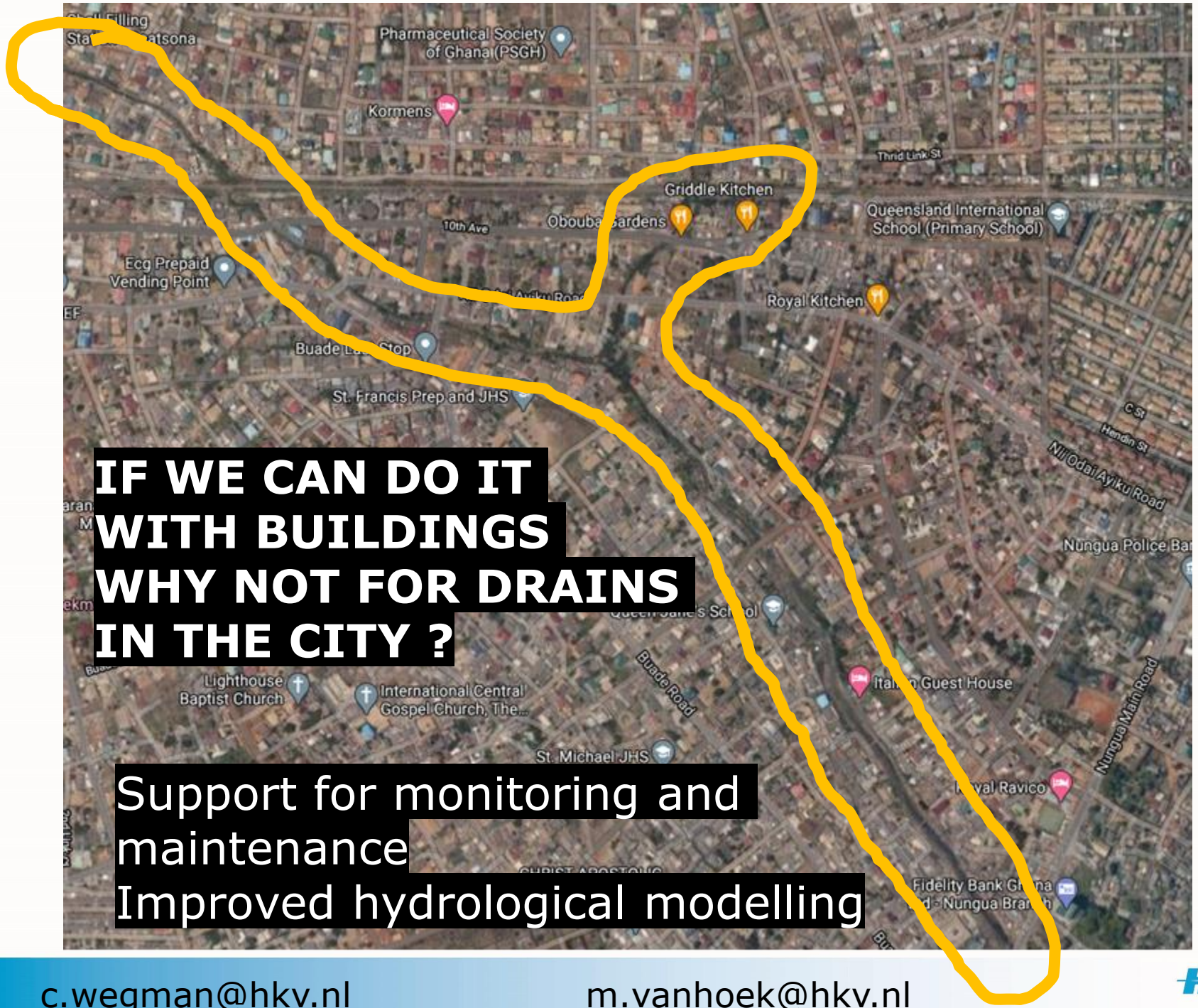

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Even more zoomed-in.. Object detection from ground

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What are we looking for?

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Incoming pipes

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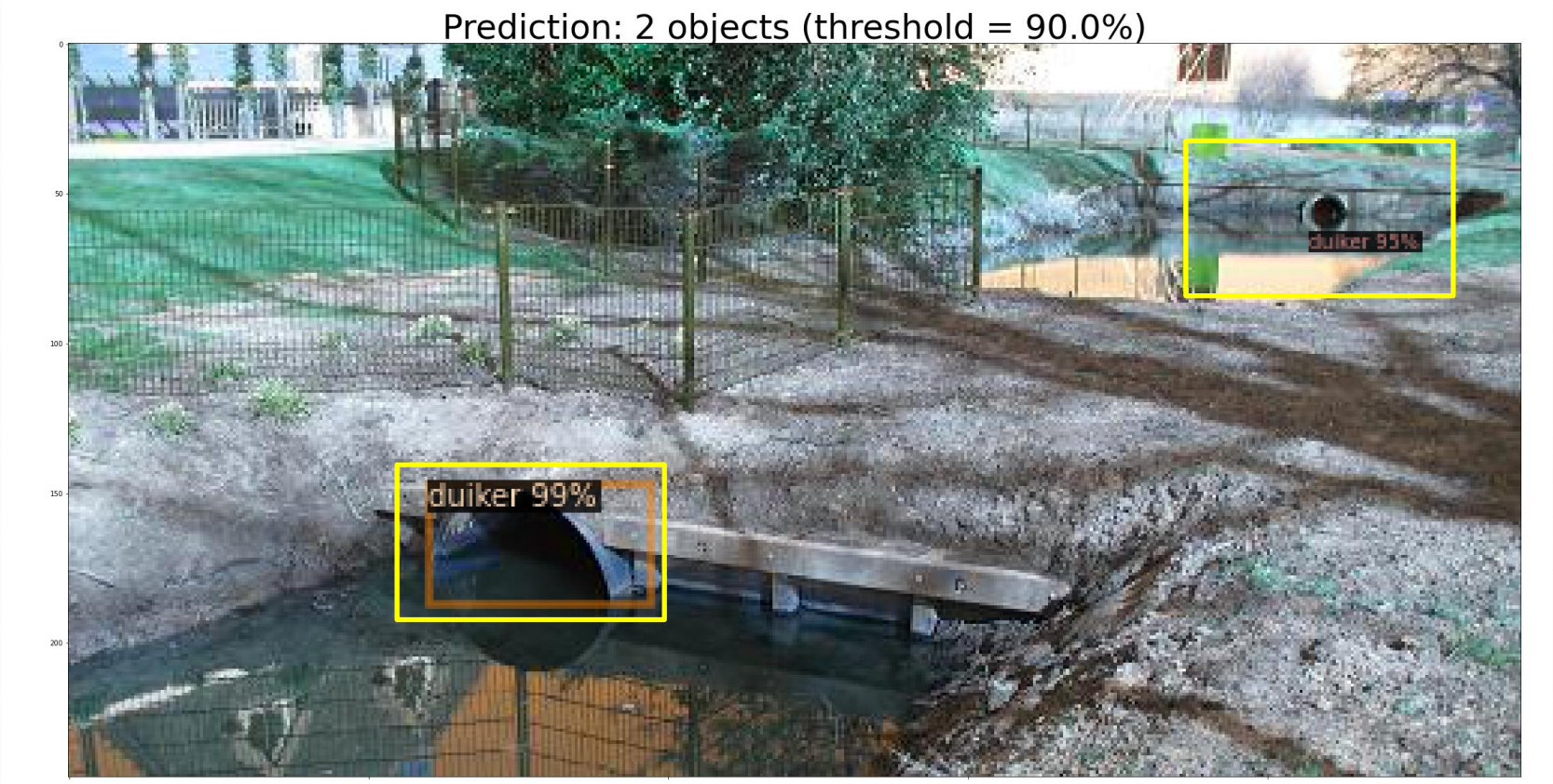
Divers



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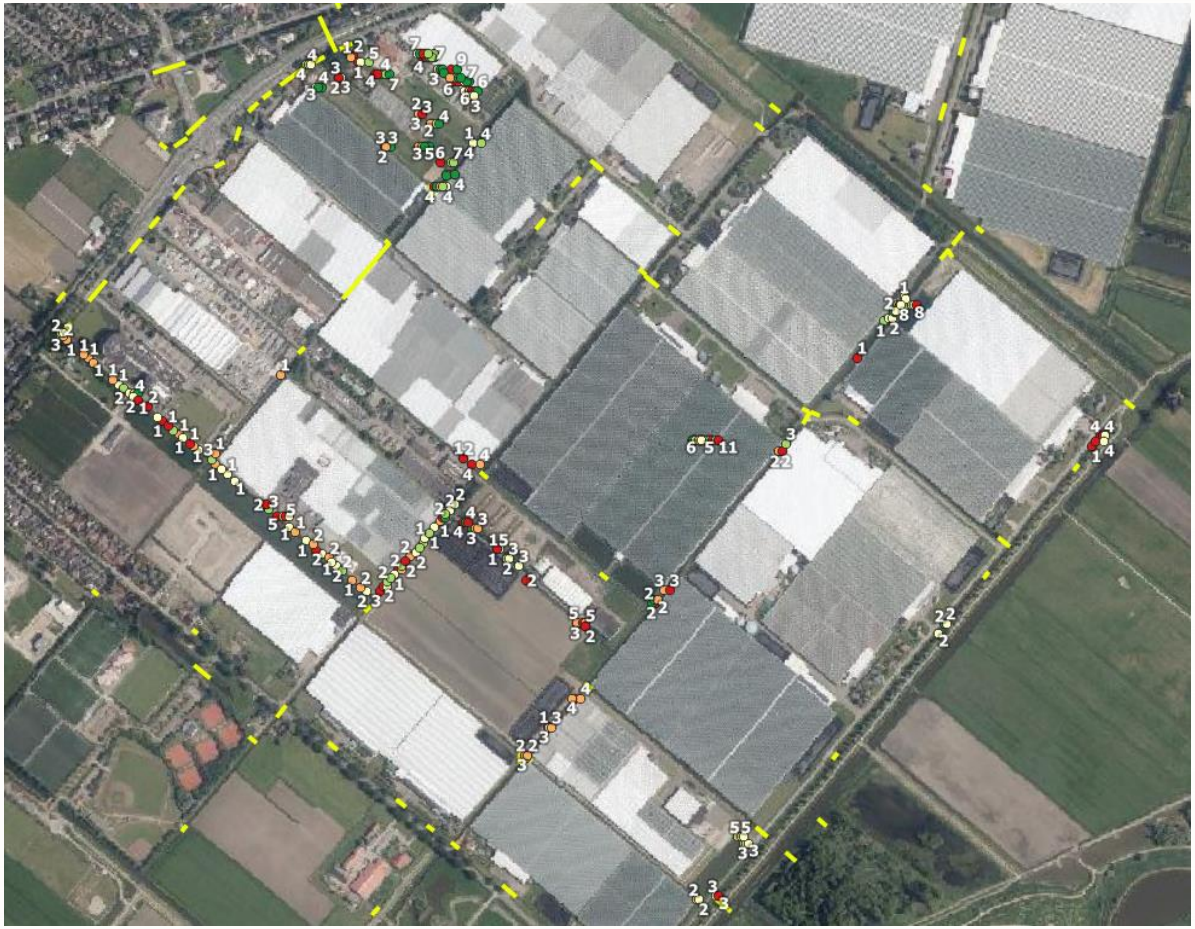
Overview maps



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HKV Specialists – From RAIN to DRAIN

Services for

- Flood early warning systems
- Real-time control systems
- Decision support systems
- and Hydrological forecasting.

In-depth knowledge of

- Hydrology
- Hydraulics
- Morphology
- Mathematics & AI
- Remote sensing
- and IT.

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