DRONESED – Drone based water quality monitoring

De Keukelaere, L., Raymaekers, D., Knaeps, S. Strackx, S., Verstappen, T. Decrop, B., Bollen, M.

DRONES - KNOWN CHALLENGES

1. Camera - Radiometry

VS

APEX hyperspectral

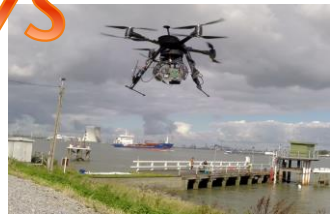
Sony Nex RGB

2. Camera - Geometry

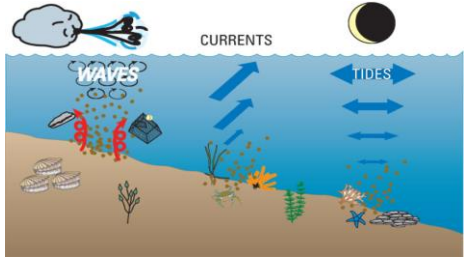
VS

3. Illumination conditions

VS



4. Dynamic environment

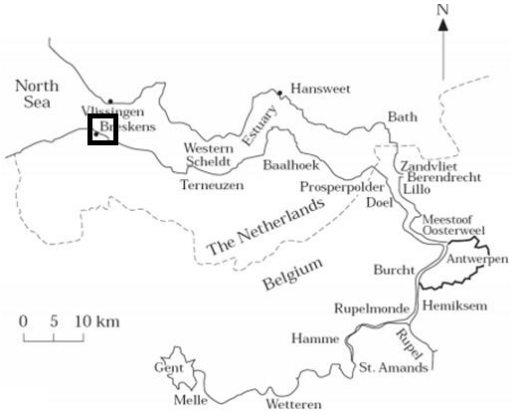


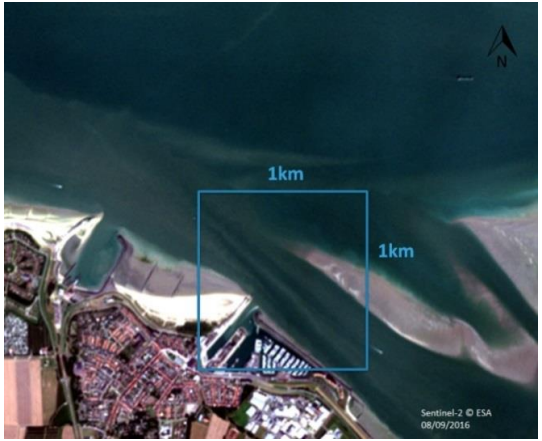
Port of Zeebrugge, Belgium 17/09/2014

Scheldt river, Belgium 25/09/2015

Breskens, The Netherlands 15/07/2016 & 15/12/2016

FIELD CAMPAIGN – BRESKENS, SCHELDT RIVER (NL)





15/07/2016
15/12/2016

FIELD CAMPAIGN – SET-UP

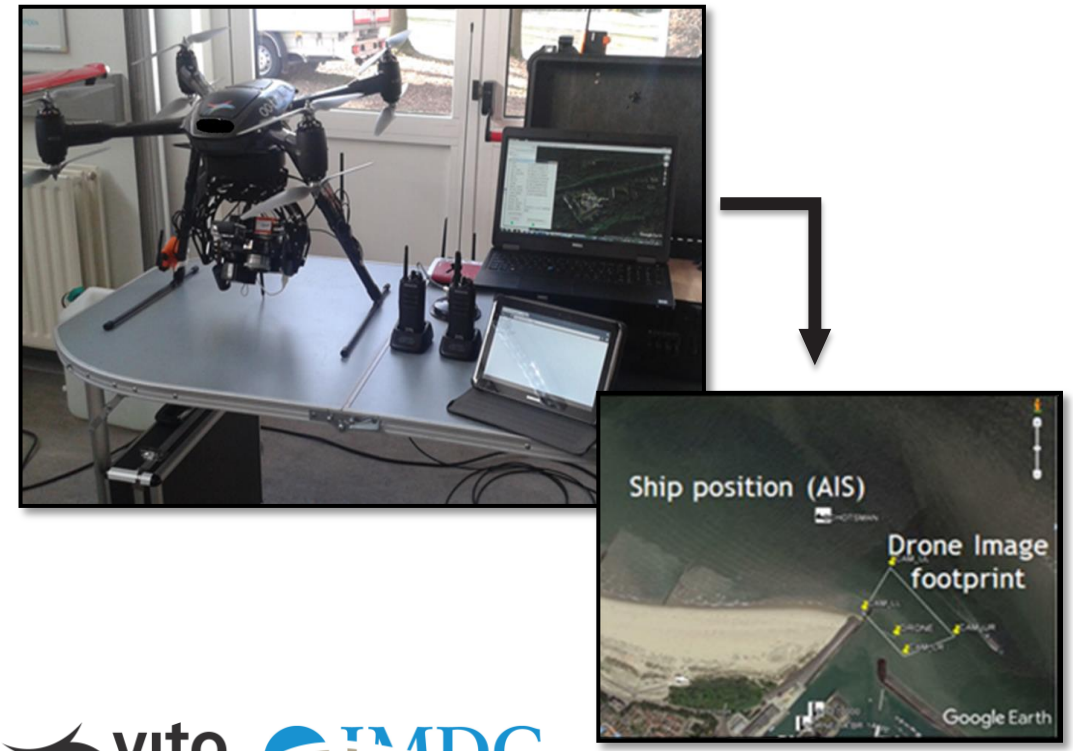
DRONE- team

- Take-off and landing of drone
- Triggering camera and GPS
- See what drone was ‘seeing’

In-situ team

- Take TSM samples during drone overpass
- Write down location and time

DRONE TEAM



Drone

- Altura Zenith
- Camera: Sony Nex 6
- GPS/IMU system
- Rasberry-pi

Base station

- AIS information on vessels
- Footprint of camera view
- Settings of camera
- Location of drone

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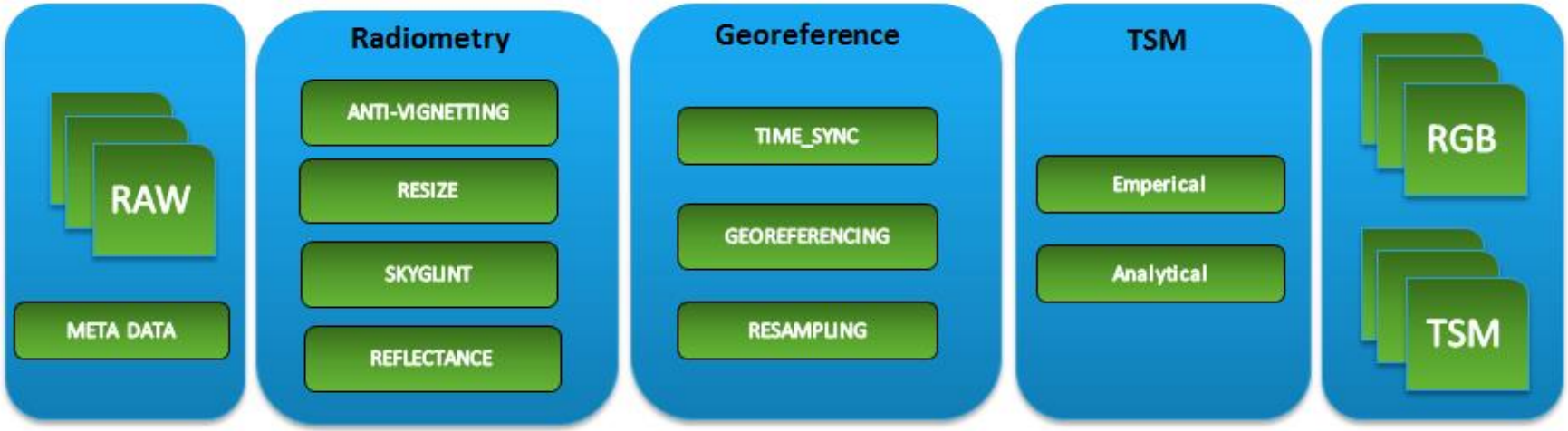
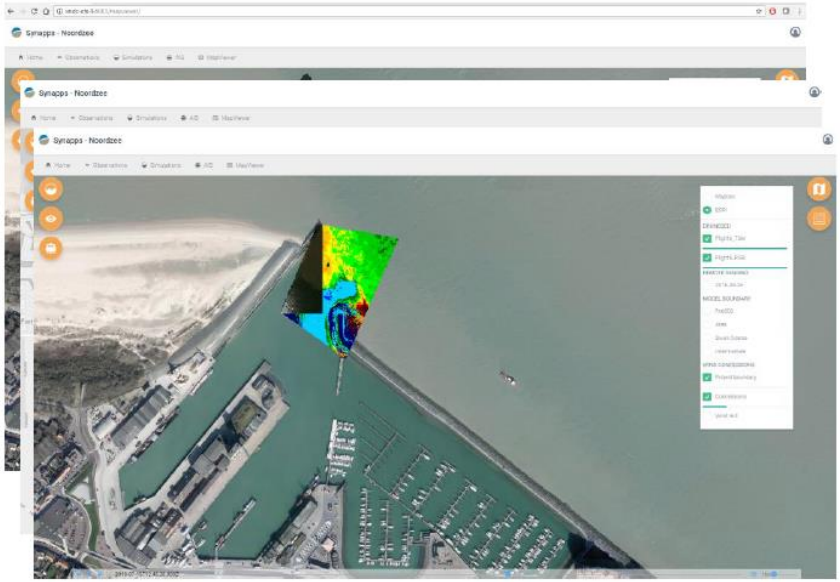
IMAGE PROCESSING



GET DATA TO THE END-USER

IMDC's operational support system 'SYNAPPS'

- Web-based
- Modular
- RS layers
- Real-time hydro measurement data
- Numerical model results
- Project-specific outline
- Visual data analysis



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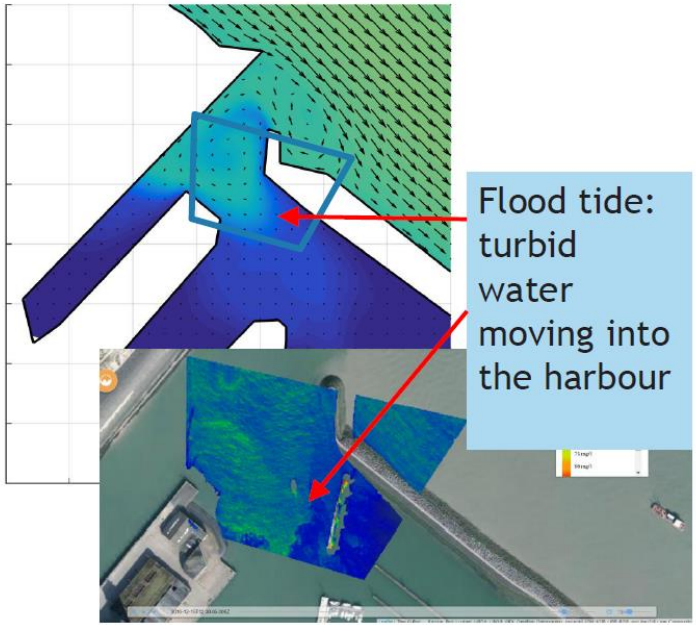
SEDIMENT MODELLING

- Sediment plumes moving in at flood tide
- Comparison between tidal flow model +
  sediment transport model
- Drone image:
  - Gives insight in spatial pattern
  - Calibration/Validation of model



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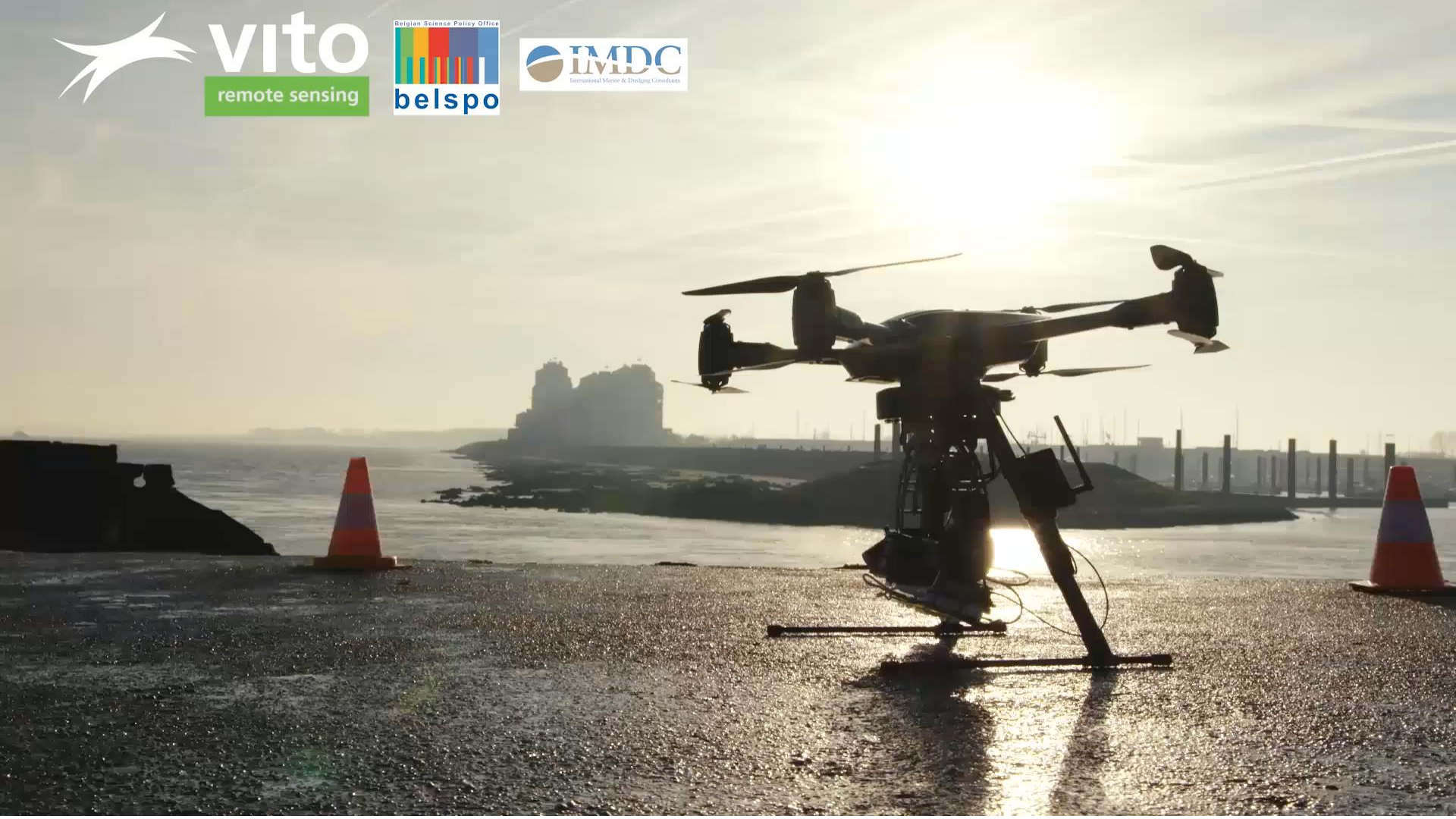
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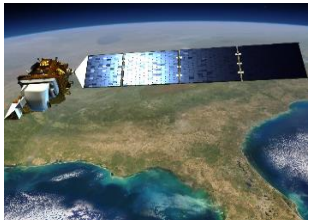
Data sources

UAV

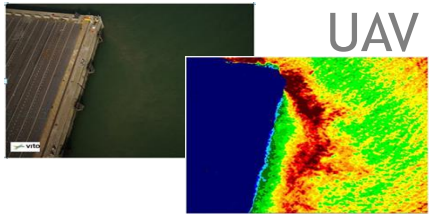
Satellite



Processing

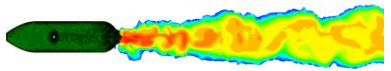
Sediment maps

UAV

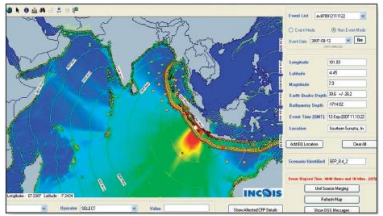


Satellite

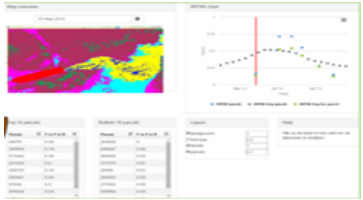
Sediment Modelling



SDI



Data analysis



Decision support

VALIDATION/MONITORING DREDGING PLUMES

Validation of:

- Computational Fluid Dynamics model
- Mid-field plumes in tidal model (order 500m from dredges)

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