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

APEX hyperspectral vs Sony Nex RGB

2. Camera - Geometry

3. Illumination conditions

4. Dynamic environment
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
IMAGE PROCESSING

Radiometry
- ANTI-VIGNETTING
- RESIZE
- SKYGLINT
- REFLECTANCE

Georeference
- TIME_SYNC
- GEOREFERENCING
- RESAMPLING

TSM
- Emperical
- Analytical

RAW
META DATA

RGB
TSM
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
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
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)