CURRENT PROGRESS

- Set up for model run on Elbe estuary where SWOT data will be assessed for modeling of coastal and estuarine processes
- Altimeter virtual stations identified for the Elbe estuary (Fig. 1) and the Rhine river (Fig. 2, left) and water heights compared to model (Fig. 3) and in-situ data (Fig. 4).
- Use of CNES Large scale Hydrology Simulator (*SWOT_HR_CNES)* with support by CNES to address EA's challenges (Figs. 2, 5)
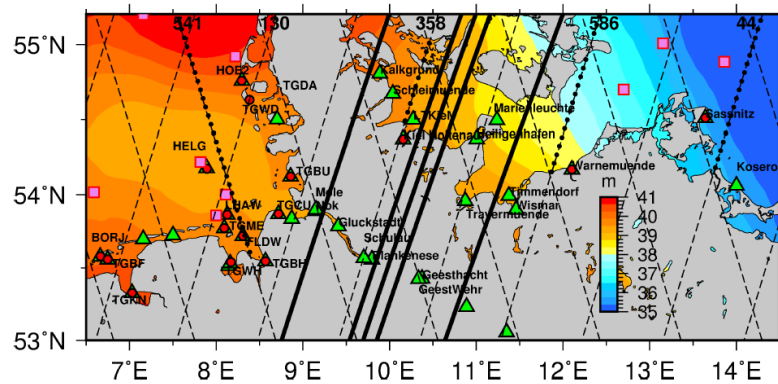- Consider Metropolis-Manning method for river discharge (Durand et al. 2016).

Fig. 1 Region of analysis with ground tracks of Sentinel-3A (dasked black line) and SWOT (continuous black line), tide gauge (green triangle), GPS (red circle), buoys (square). In coloured scale is the Local geoid German Combined QuasiGeoid 2016 (GCG2016) Bundesamt für Kartographie und Geodäsie (BKG) & Leibniz Universität Hannover (IfE).
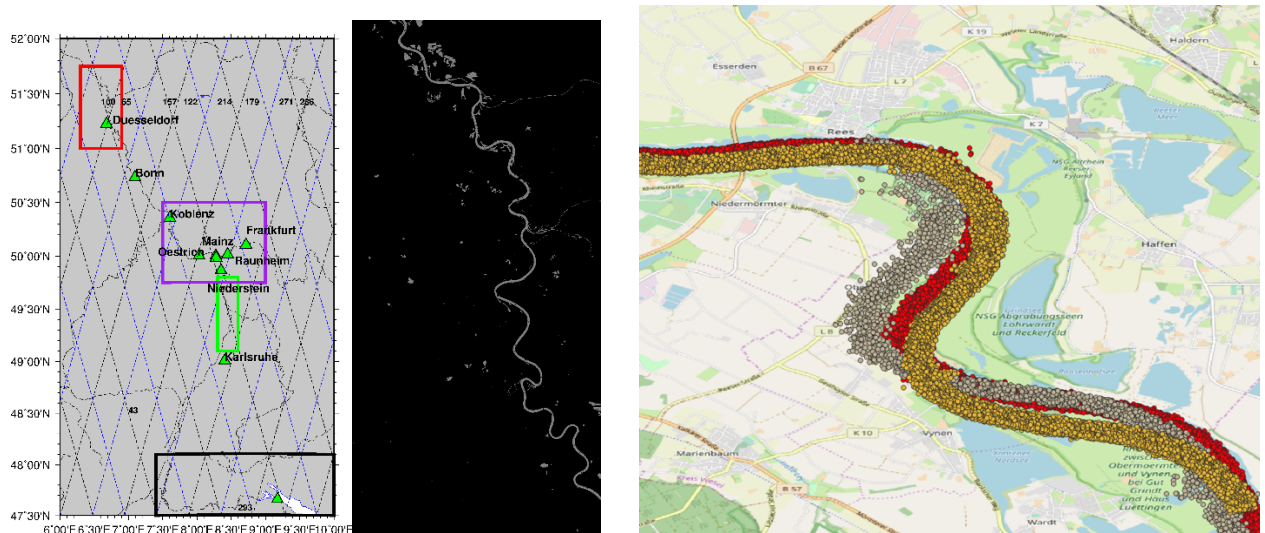

Figure 2. Rhine river region (left). Rhine river mask seen by Sentinel-2 (centre). Pixel clouds output of *SWOT_HR_CNES* large scale hydrology simulator for three time epochs (right).

NEXT STEPS:

- Consider systematically all passes of Sentinel-3A/B in the two regions
- Use the Geestacht COAstal SysTem *(GCOAST_SCHISM)* model of the Elbe estuary in the SWOT_LR_JPL ocean simulator. High resolution thanks to the unstructured grid.
- Use the *SWOT_HR_CNES CNES* varying both input shape file and surface elevation
- Use the *Metropolis-Manning method* (Durand et al.,2016) for Rhine and Elbe discharge
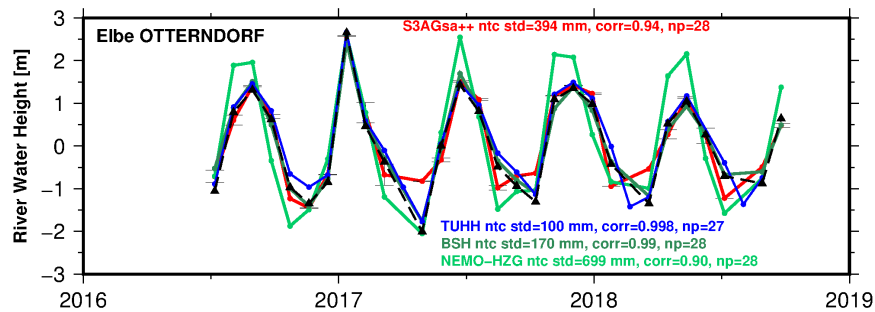- Attend SWOT Hackathon-2020 in person or remotely.

Figure 3. Sentinel-3A, models and in-situ water level at Ottendorf, Elbe Estuary. Models of Technical University Harbourg Hamburg (TUHH), German Federal Maritime and Hydrographic Agency (BSH) and GCOAST_Nemo model used. Use of high resolution model GCOAST_SCHISM unstructured grid is planned.
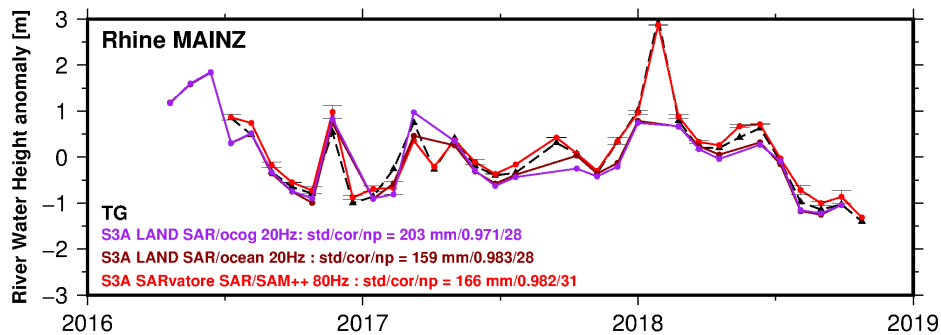

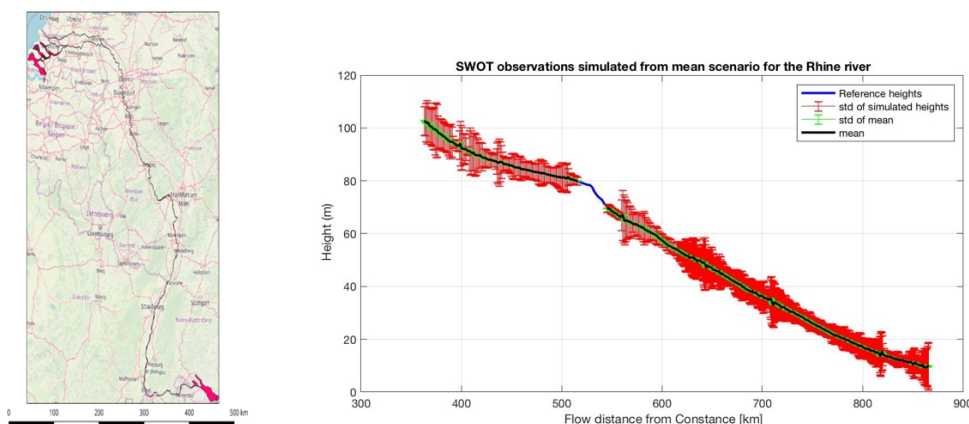Figure 4. Sentinel-3 Altimeter virtual station on the Rhine and in-situ data (dashed black)

Figure 5. Run of the *SWOT_HR_CNES* large scale simulator for medium level heights and average pixel clouds along the river