River, lake and ocean shorelines are dynamic environments that change over varying time scales driven by many factors including lithological composition, wave action, currents, tidal influences and several others. In addition, anthropogenic factors increasingly impact the morphology of coasts as well as lake and river banks either directly through constructions (e.g. removal and/or deposition of sediment) or indirectly through actions driving climate change.

Knowledge of hydrological networks is the basis for measuring and characterizing land and water resources, such as the area of the land, the length of rivers and the perimeter of lakes and coastlines. Information about hydrological networks (e.g. position, orientation and geometric shape) is also essential for autonomous navigation, geographical exploration, erosion monitoring and modeling, and resource inventory and management.

With Earth Observation data hydrological networks (i.e. rivers, lakes and coast) can be analyzed approximately 45 years back in time based on different data sets. Recently declassified US spy satellite images from the 1960s and 1970s provide a unique historical data source for information about the hydrological networks, and when combined with modern high resolution satellite images, long time series of hydrological network developments can be analyzed.

### SUMMARY

#### CHALLENGE
- Need to monitor erosion/deposition changes along coast and lake shorelines and in river courses
- Lack of historical information on hydrological network dynamics
- Timely detection of changes needed for rapid assessments of e.g. storm impacts

#### SOLUTION
- The EO service uses optical and radar data for up-to-date and long-term monitoring of hydrological networks i.e. rivers, lakes and coastlines
- Quantification of Erosion / deposition rates

#### VALUE
- Supports navigation, site planning and exploration as well as assessments of vulnerability and environmental impacts by tracking long term developments in hydrological networks

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Example of EO based hydrological network mapping and change assessments from Bangladesh and Gambia.
Satellite Earth Observation (EO) technology has a tremendous potential to inform and facilitate international development work. Since 2008 the European Space Agency (ESA) has worked together with the International Financing Institutions (IFIs) and their client countries to harness the benefits of EO in their operations and resources management.

EO4SD – Earth Observation for Sustainable Development – is an ESA initiative which aims to achieve a step increase in the uptake of satellite-based information in the IFIs regional and global programs, aiming at more systematic data user approach in order to meet longer-term strategic geospatial information needs in the individual developing countries as well as international and regional development organizations.

The EO4SD initiative cover a wide range of thematic domains including Water Resources Management which is regarded as one of the most critical development challenges.

The activities will start in spring 2016 and will run for a period of three years. The first year will be dedicated to stakeholder engagement and requirements consolidation and with years two and three focusing on information production, delivery and capacity building.