This document presents a short summary of and key lessons from the European Space Agency’s Earth Observation for Sustainable Development (EO4SD) Climate Resilience Cluster’s recent webinar “Water World: How EO data is deepening our knowledge of flood risk and water resource management”. The webinar, the fourth in a series of seven held by the EO4SD Climate Resilience Cluster in June and July 2020, presented in detail how Earth Observation (EO) data with different spatial and temporal resolution can contribute to flood risk, water and wetness management.

Francois presented the advances in EO that have led to improved flood risk modelling and gave an overview of African Risk Capacity’s (ARC) flood risk insurance. ARC identify areas of risk, create an index for monitoring that risk, and also identify decision support and possible pay-outs arising from that risk being triggered. Ever-improving EO data, in terms of temporal and spatial resolution, greatly enhances the capacity of modelling flood risk and increases the quality of disaster risk modelling outputs. The ARC Flood Extent Depiction Model (AFED) uses satellite remote sensing from microwave sensors that measure the earth's radiation to detect rising flood levels.

In order to effectively estimate risk, one needs to fully understand the assets at risk due to exposure. ARC uses EO services to map the exposure of land use and cover areas, including all urban areas and agricultural areas. Additionally, EO services are used to develop high-resolution Digital Surface Model (DSM) products in order to have a more detailed characterisation of the urban environment (e.g. building heights). In-season monitoring is valuable for forecasting, and EO services provide a centralised source of targeted detailed spatial information and decision support for interested parties.

Norman presented EO4SD’s Water and Wetland Monitoring Service citing EO services as essential for the large-scale monitoring of water resources. EO data about water can help support the implementation, monitoring, and evaluation of Sustainable Development Goals (SDGs). Water scarcity affects more than 40% of the world’s population, creating the need for accurate and timely information on water availability. In large, remote, and inaccessible regions, existing monitoring can benefit from EO data, as the more you monitor, the better the results. The Water and Wetland Monitoring Service can identify water bodies, assess how permanent water bodies change over time, as well as changes in surface water bodies.

Diagram showing the methodology for building a Water and Wetness Classification using EO data.
Advances in EO and climate modelling provide the opportunity to construct long-term records of precipitation on a global scale.

The return period, a measure of rareness of extreme events which might cause huge damages to society and the environment, lies at the heart of risk assessment problems.

EO4SD-CR return level products provide valuable information on global scales for assessment of historical risks.

The more you monitor, the better your results.

“EO is increasingly being recognized as an essential tool, especially for large-scale monitoring of water resources”.

- Norman Kiesslich, Senior Project Manager, GeoVille