

Foreign, Commonwealth & Development Office

# SOUTH ASIA HYDROMET FORUM III

#### SESSION 5. OBSERVATIONAL SYSTEMS AND REGIONAL DATA EXCHANGE FOR MONITORING AND PREDICTION OF EXTREMES

Data and products support to South Asia hydromet services: ESA Climate Change Initiatives and programs in support of Intl. Development

> CLEMENT ALBERGEL Climate Applications Scientist at ESA

November 15-18, 2021 Annual Event- Virtual



## ESA-DEVELOPED EARTH OBSERVATION MISSIONS



## **ESA Climate Change Initiative projects**

23 ECV projects, 2 budget closure projects, a data support project a climate modelling project and a fellowship call currently comprise the CCI.



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### **Coastal residents – relative sea level rise (SLR)**



Irrawaddy Delta, Myanmar

© contains modified Copernicus Sentinel data (2017), processed by ESA, <u>CC BY-SA 3.0 IGO</u>



Nicholls, R.J., Lincke, D., Hinkel, J. *et al.* A global analysis of subsidence, relative sea-level change and coastal flood exposure. *Nat. Clim. Chang.* 11, 338–342 (2021). https://doi.org/10.1038/s41558-021-00993-z

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Coastal residents experience sea level rise ~ four times faster than global mean sea level rise (7.8 - 9.9)v 2.6 mm yr-1)

Global relative sea level rise derived from ESA CCI Sea Level data set, isostatic adjustment, subsidence data

Managing subsidence has a high potential for reducing coastal exposure for climate mitigation over the next 30 years

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## CCI\_glacier: accelerated mass loss



- Complete global picture of glacier ice mass loss
- Study includes EO data for Earth's 220,000 glaciers (IPCC only reports on a subset)
- Annual losses 267  $\pm$  16 Gt 2000-2019; accelerating to 298 Gt from 2015
- Uses CCI methodology, processing tools, DEMs and glacier outlines submitted to Randolph Glacier Inventory
- Alaska, Iceland and Alps melting fastest
- Glaciers contribute 21% to sea level rise

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## Regional glacier mass changes and their temporal evolution from 2000 to 2019.

Hugonnet, R., McNabb, R., Berthier, E. et al. Accelerated global glacier mass loss in the early twenty-first century. **Nature** (2021). https://doi.org/10.1038/s41586-021-03436-z



#### From Miami to Shanghai -3C of warming will leave world cities below sea level From https://www.theguardian.com/cities/2017/nov/03/miami-shanghai-3c-warming-cities-underwater



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How Shanghai would look with a rise of just 2C: the UN warned this week of a potential 3C scenario. Photograph: Nickolay Lamm/Courtesy Climate Central



## ESA EO PROGRAMS IN SUPPORT OF INTL. DEVELOPMENT

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### **EO4SD:** 2016-23

**Consolidate requirements**, engage stakeholders (IFIs & client states) via regional demonstrations of EO



**GDA:** 2020-25 | **Space for IDA Mainstream & transfer EO** into operational working processes & financing of ODA/development aid as `best-practice' source of geo-information



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eo4sd

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## ESA EO PROGRAMS IN SUPPORT OF INTL. DEVELOPMENT

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→ EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

- eoworld: 2008-15 Small-scale demonstrations of EO services in support of IFI projects to raise awareness
- EO4SD: 2016-23



**GDA:** 2020-25 | **Space for IDA** Mainstream & transfer EO into operational working processes & financing of ODA/development aid as 'best-practice' source of geo-information



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eoworld

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## ASSESSING RANGELANDS DEGRADATION DUE TO CLIMATE CHANGE IN TAJIKISTAN



- <u>Stakeholder</u>: International Fund for Agricultural Development (IFAD)
- <u>Project</u>: Community-Based Agricultural Support Project-2 (status: project proposal)
- <u>Objective</u>: IFAD's project objective is to stimulate inclusive economic growth and poverty reduction in Tajikistan poor rural communities by improving access to productive infrastructure and services that are expected to lead to sustainable agricultural production and equitable returns.
- The EO4SD CR cluster collaborates with the Food and Agriculture Organization (FAO) and IFAD to jointly identify climate vulnerable pastoral communities and analyse the rangelands degradation.



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http://eo4sd.esa.int/climate

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## ASSESSING RANGELANDS DEGRADATION DUE TO CLIMATE CHANGE IN TAJIKISTAN



- Service: The EO4SD CR cluster provided EO-based rangeland condition changes over the period 2000-2020 per grazing season and aggregated at district level, climate indicators over the degraded pastures to assess the climate change impact and soil erosion rates to determine land degradation over Tajikistan. In-situ information gathered by local consultants was used to localised methodologies to the country's grazing practices.
- Impact/ Added Value: The rangeland and climate products supported the climate rational for IFAD to solicit co-funding from the Green Climate Fund.
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## HYDROMET FORUM III

## PROGRAM TO SUPPORT SOUTH ASIA REGIONAL DEVELOPMENT IN OPERATIONAL FORECASTING AND SERVICE DELIVERY

2021

SAHF Website: https://sahf3event.rimes.int/

YouTube Broadcast: https://youtu.be/QAAf326wP00