# EO FOR SUSTAINABLE DEVELOPMENT IN THE CLIMATE RESILIENCE DOMAIN

# DELIVERY
## QUESTION & ANSWER SESSION

**WEBINAR SERIES 1:** WEBINAR SERIES ON HOW TO USE EARTH OBSERVATION TO TACKLE CLIMATE CHANGE

**MODULE 4:** WATER WORLD: HOW EO DATA IS DEEPENING OUR KNOWLEDGE OF FLOOD RISK AND WATER RESOURCE MANAGEMENT

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# Q&A

Q1: **Anonymous Attendee:** Hi - Question for Norman: where have you currently tested the wetland and water monitoring products? Have you tested this in drier areas?

A1.1: **Christian Treml:** Hi! The algorithm was tested and already applied across the world

A.1.2: **Norman Kiesslich:** Some specific examples are the state of Amazonas in Peru (ca. 270.000 km2 on a bi-weekly basis), Zambesi watersheds (ca. 250.000km2 on a monthly basis), African Horn (ca. 220.000km2 on a monthly basis), Sahel zone (ca. 400.000km2 on a monthly basis) and many more. The above examples were produced and delivered for 2 years from 2016-2018.

A.1.3: **Norman Kiesslich:** This method was also used to produce the High Resolution Layers for Surface Water for all of Europe (EEA, 39, incl. Turkey; 10.180.000 km2)

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Q2: **Generich Capuli:** Aside from creating trends of the past, can we also utilize the available 'layers'/parameters to generate future projections/models?

A2: **Norman Kiesslich:** Dear Generich, this service provides past trend up the the present (i.e. the past month). The service itself does not perform modelling to predict water availability but the information allows for the identification of trends and their assessment in relation to other key variables (e.g. precipitation, actual evapotranspiration, etc.). These variables are also available from satellite observations. But the service we provide is limited to the detection of water from the satellite data, modelling is not included in the service itself.

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Q3: **Manuel Nhangumbe:** Is there any specific method you used for thresholding the time series? I mean those different thresholds for detecting dry, wet land, permanent water.

A3: **Christian Treml**: The water and wetness classification thresholds are based on the specifications of the Copernicus HRL WAW2015 and WAW2018 layers defined by the European Environmental Agency. The thresholds are applied rule based to the water and wetness frequencies which are also outputs of the water and wetland extent services.

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Q4: **Elke Verbeeten (African Risk Capacity):** Thank you for the presentation. Is the Water & Wetland Monitoring service intended to be available as a free service? I can find the technical specifications ("surface water monitoring"), but not the actual service. If I can examine products somewhere online, could you share the link?

A4: **Christian Treml :** This is not a free service, but it was/is provided as a service **upon request** from engaged stakeholders under the collaboration with EO4SD CR (accuracy is much higher) or the EO4SD Lab (automatic solution with lower accuracy). You can visit our portal https://landmonitoring.earth/portal/ where you can find the HRL15 Water&Wetness layer as well one example of water dynamics in the Phillippines (Manila).

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Q5: **Elke Verbeeten (African Risk Capacity):** Are the same algorithms used as you (Geoville) have used in the comparison of some flood scenes for the African Risk Capacity?
A5: **Christian Treml**: The same principles apply to both applications - it is the same algorithm but applied on single scenes instead of monthly composites and metrics.

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Q6: **Sebastian Goihl (LfULG):** Hello. Question to Norman: Do you have a Demo or a Web Viewer, so that I could show my colleagues the wetland and water monitoring service?
A6: **Christian Treml:** Hello Sebastian! You can visit our portal https://landmonitoring.earth/portal/ where you can find the HRL15 Water&Wetness layer as well one example of water dynamics in the Phillippines (Manila). Just click on the Maps menu

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Q7: **Flavia:** This is a question for Norman - thank you for your interesting presentation. I was wondering if you have seen any significant differences in the amount of water in water bodies/the frequency of flooding/any change that may result from global warming since 2016. Also, how are the thresholds for the different classes (permanent water, temporary water etc) determined? Thank you in advance
A7: **Norman Kiesslich:** Dear Flavia, the service is requested by different stakeholders with varying interests ranging from the monitoring of waterway navigability / the migration of sand banks, location and live time of ephemeral water bodies for pastorial use to climate change impact assessment. So, yes, that is a use case. However, for climate trend analyses, longer time series are needed which means that for now we need to combine this service with Landsat datasets which are of lesser quality because they are of coarser resolution, were recorded less frequently and had no radar component, which plays an important role. So it´s to be compared with caution. Changes from 2016 on are evident in some parts of the world but due to the limited length of the time series, I would not go so far as to reliably attribute those to climate change.

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Q8: **Anonymous Attendee:** This is based on a combination of Sentinel-2 and Sentinel-1, right?
A8: **Christian Treml:** yes

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Q9: **Anonymous Attendee:** Question for Norman: how did you deal with desert sand in Sentinel-1 imagery given the fact that sand has a very similar (low backscatter) response compared to flooded areas?
A9: **Christian Treml:** Since we use Sentinel-2 imagery as well, we compute sand/bare soil indices to mask out these areas

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Q10: **Romy Schlogel:** Hello Norman, I'm a UNITAR-UNOSAT trainer in geoinformation technology for DRR in African countries. I'm wondering if it'd be possible to use the wetness and water frequency maps for capacity building in these countries? are the data/results freely available to download?
A10: **Norman Kiesslich:** They are not freely available for download but if you´re interested in some samples, I´ll be more than happy to send them to you. Which part of Africa are you most interested in? We have time series from the Zambesi region, for example. Would you be interested in those? Please reach out to me via email: kiesslich@geoville.com

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Q11: **Anonymous Attendee:** For the precipitation data, aside from the ECMWF, can we also utilize other accessible ensembles and then integrate or 'collate' them?
A11: **Mohamad Nobakht**: At the moment ERA5 data are used for analysis of extreme events. We may cover other sources of data in future

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Q12: **Charles Serele:** Hi Mohamed: Question on the previous slides: how do they or can they incorporate/compensate for climate change ? In areas with clear wetter/drier trends or with changed intensity the return period calculation would otherwise not give realistic probabilities.
A12: **Mohamad Nobakht** If you mean the historical climate change trends, we used GEV analysis based on the stationary assumption. The non-stationarity of the trends will be covered on the future updates of the tool

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Q13: **Raul Garcia**: A question for ARC. -

How is vulnerability considered in your risk study? Thank you in advance

A13: **François Kayitakire**: The index is still under development. There're two options we're considering: either an index based on the response cost, or index based on losses. The vulnerability component is then incorporated in the estimate of the response cost.