

Estimating ensemble likelihoods for the Sentinel-1 based Global Flood Monitoring product of the Copernicus Emergency Management Service

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² TU Wien

³ Luxembourg Institute of Science and Technology

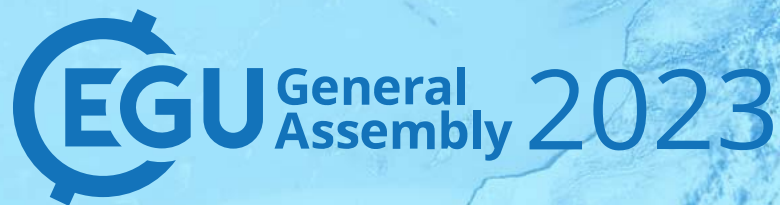
⁴ Joint Research Centre, European Commission

EGU General Assembly, April 24 – 28 2023, Vienna

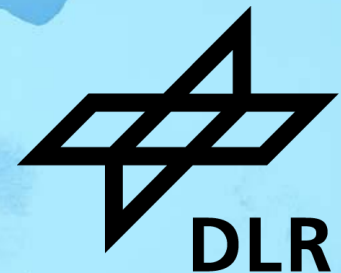
NH 6.3. SAR remote sensing for natural and human-induced hazard applications



Sharing is encouraged

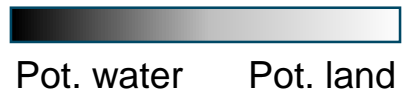
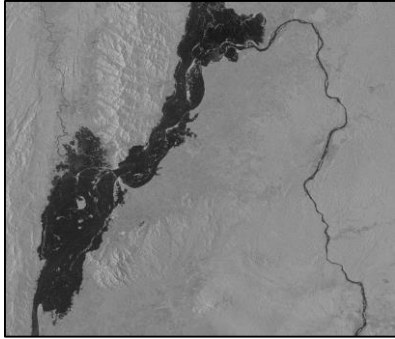


Global Flood Monitoring



DLR

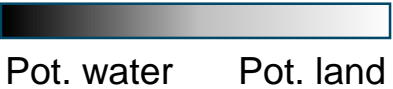
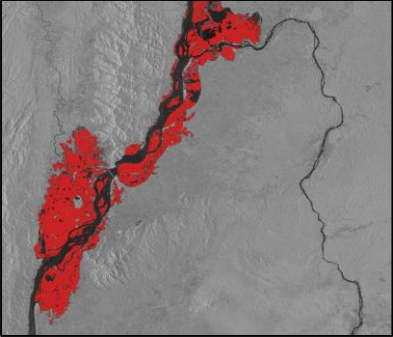
Motivation



Motivation



LIST 

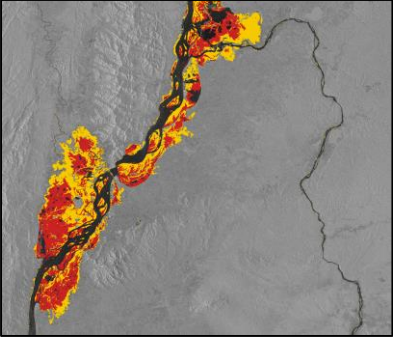


Motivation

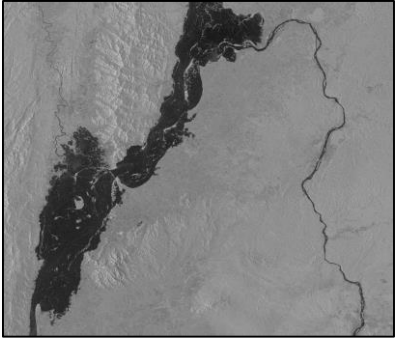


Pot. water Pot. land

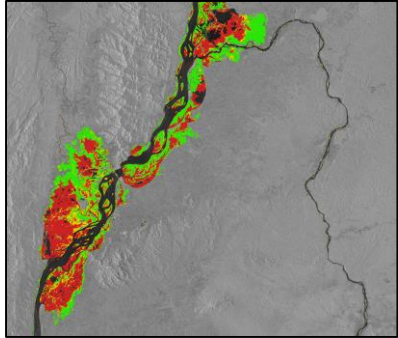
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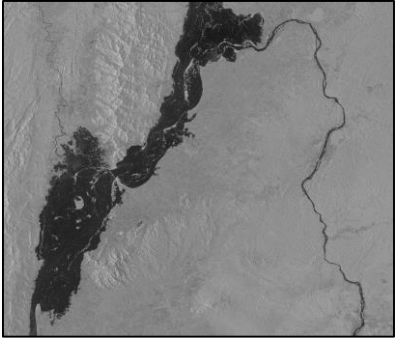
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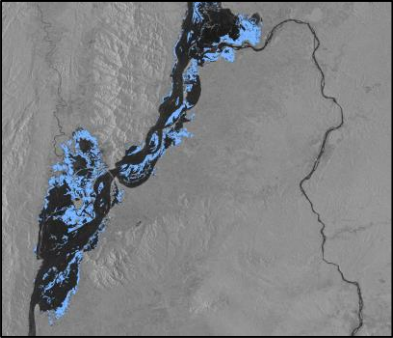
Pot. water Pot. land



Motivation



Pot. water Pot. land

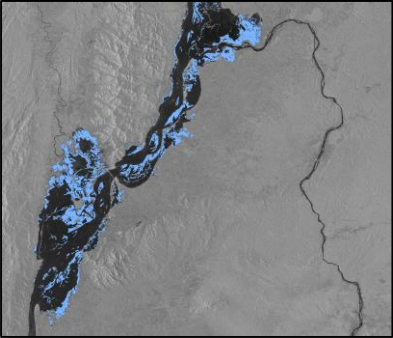


Ensemble flood

Motivation

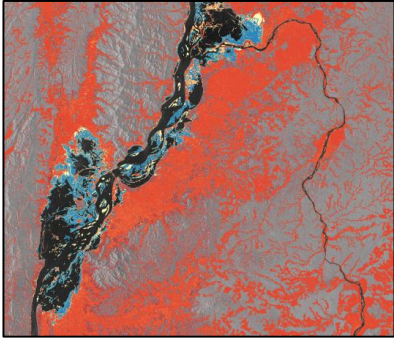


Pot. water Pot. land



Ensemble flood

Flood likelihood

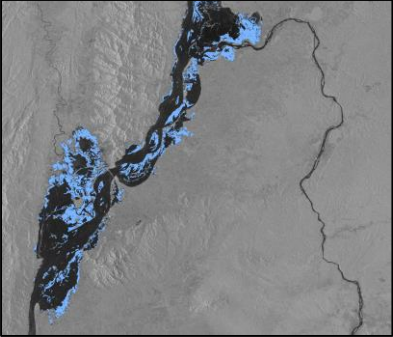


Low High

Motivation

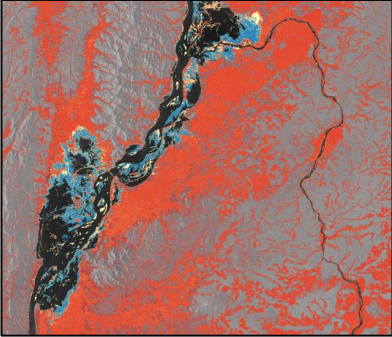


Pot. water Pot. land



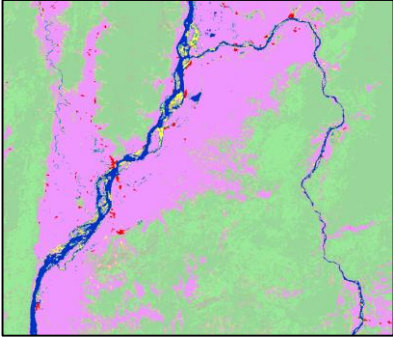
Ensemble flood

Flood likelihood



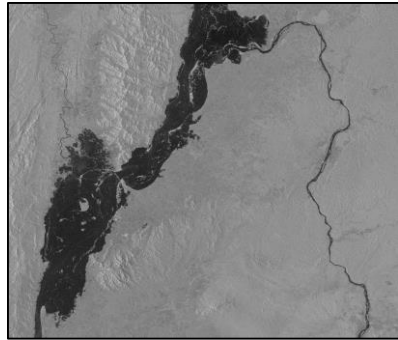
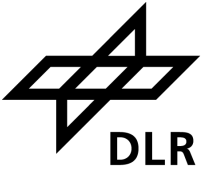
Low High

Land cover

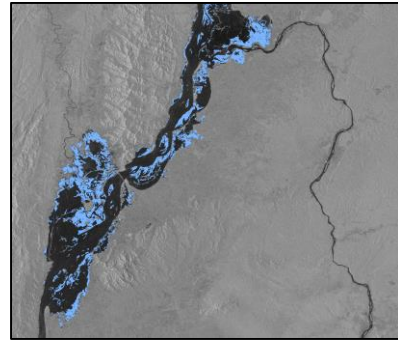


Agriculture Built-up

Motivation

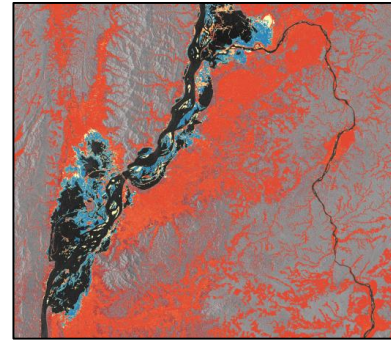


Pot. water Pot. land



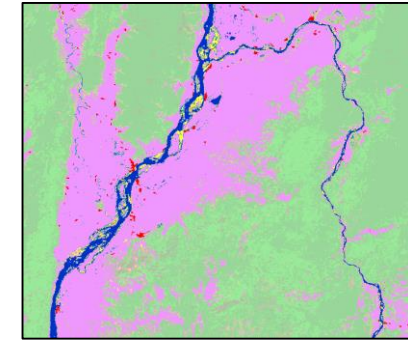
Ensemble flood

Flood likelihood

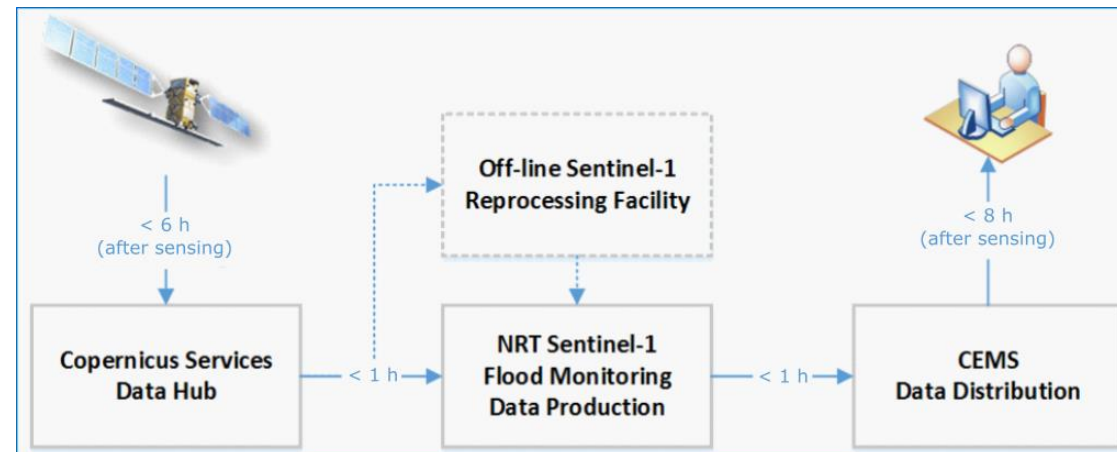


Low High

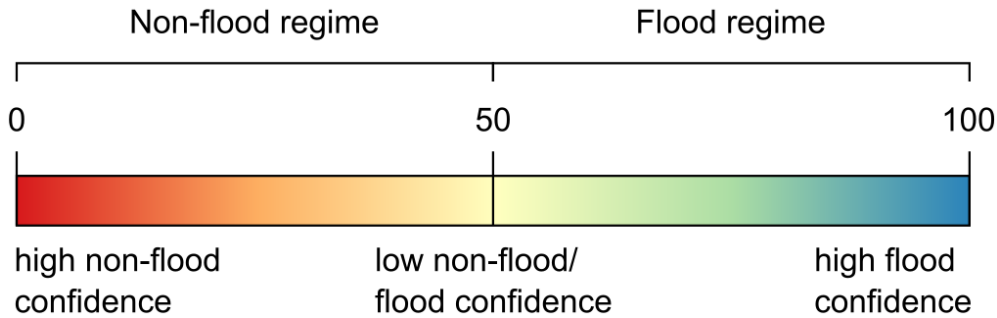
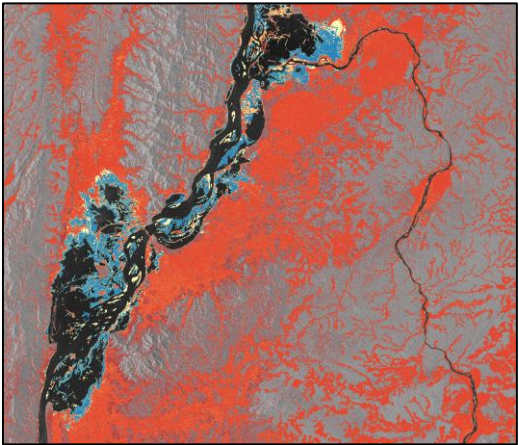
Land cover



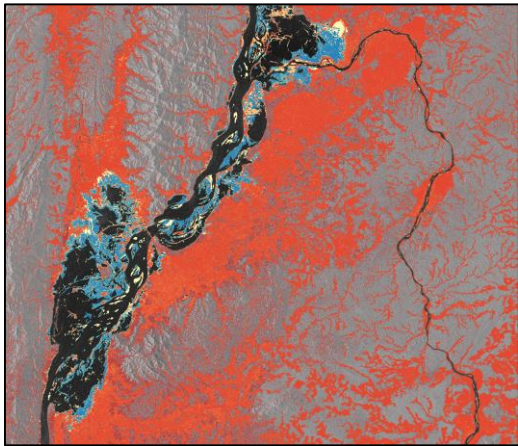
Agriculture Built-up



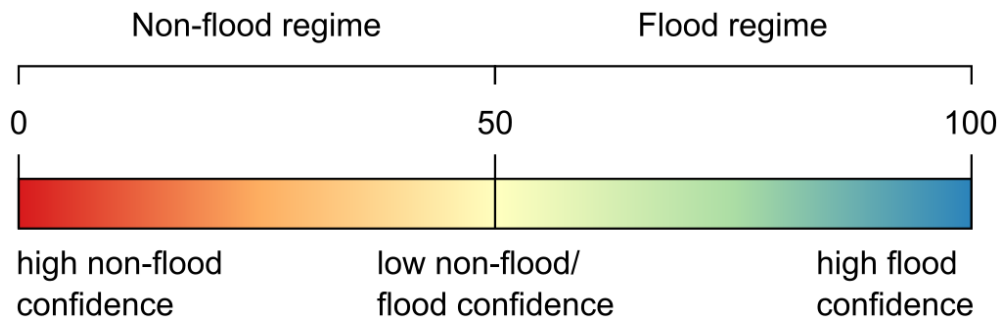
Generation of ensemble likelihoods



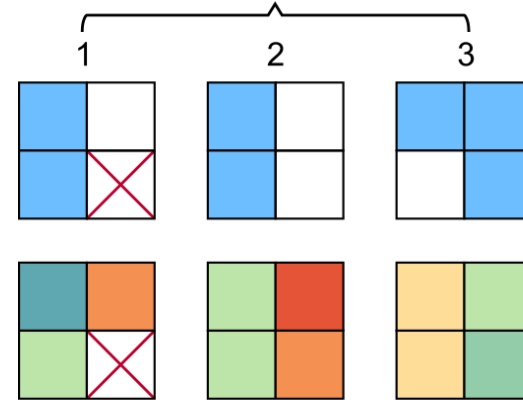
Generation of ensemble likelihoods



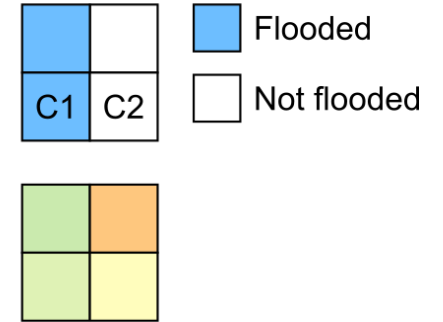
Low High



Inputs generated from algorithms

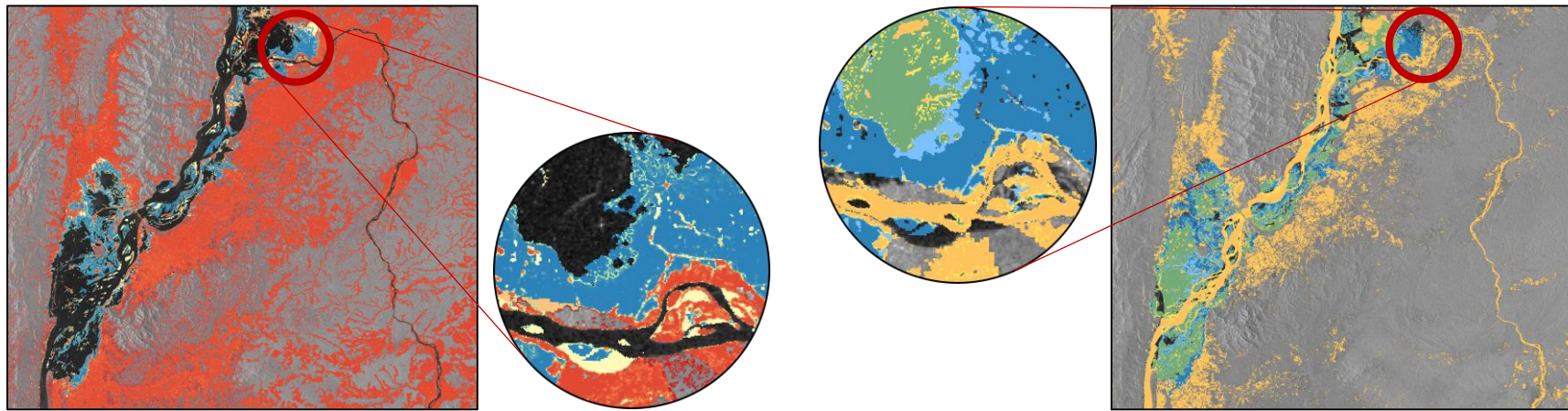


Consent ensemble output

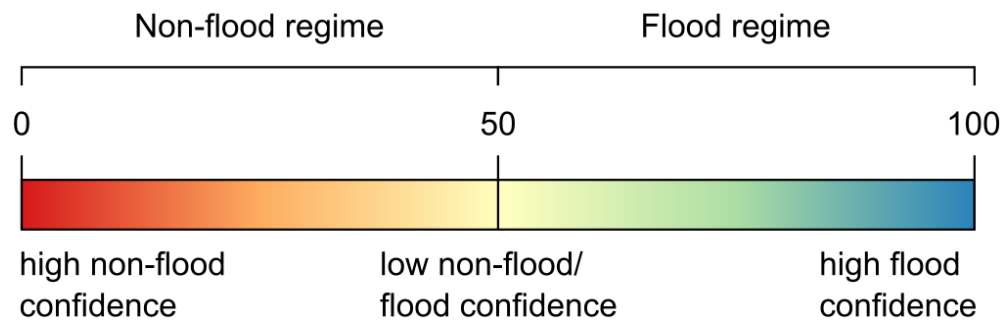


low likelihood high likelihood

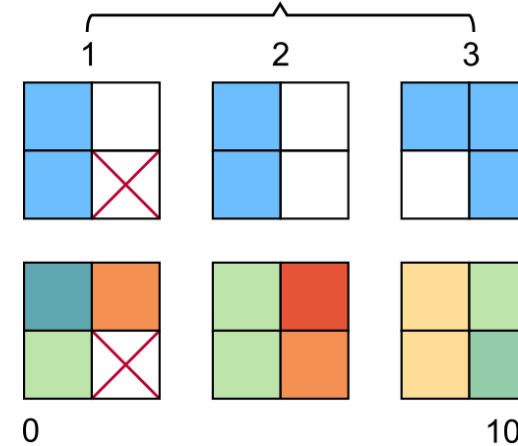
Generation of ensemble likelihoods



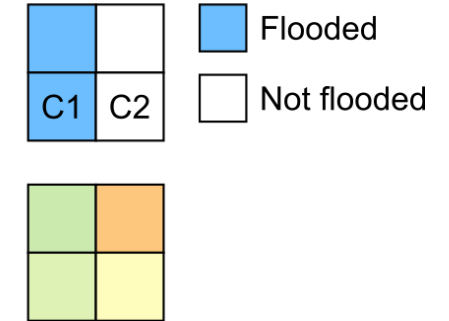
- Flood 3/3
- Flood 2/3
- Split
- Non-flood 3/3



Inputs generated from algorithms

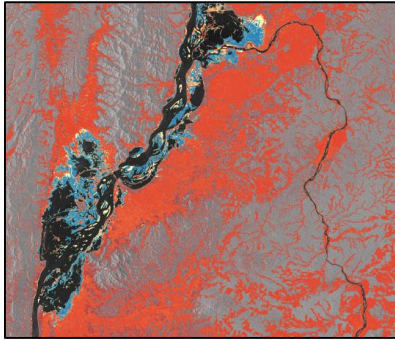


Consent ensemble output

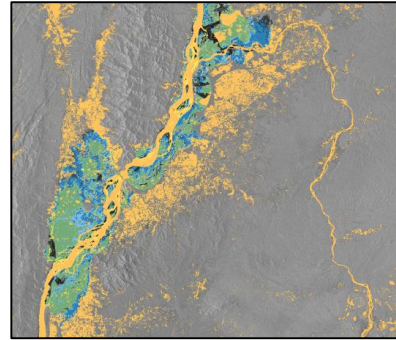


Results

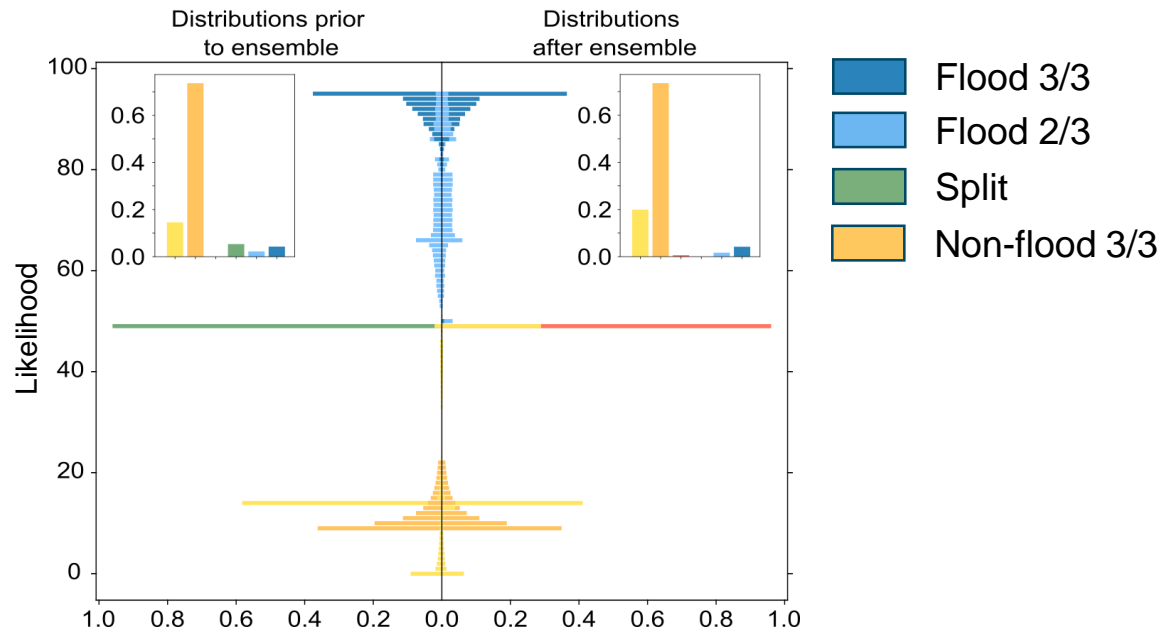
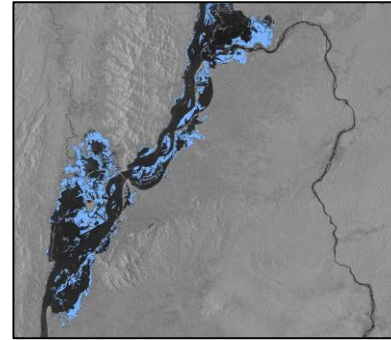
Flood likelihood



Flood classifications

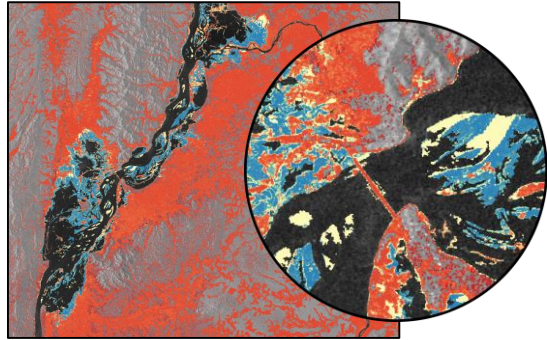


Flood ensemble

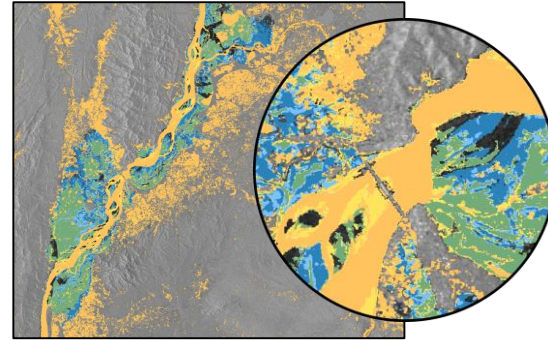


Results

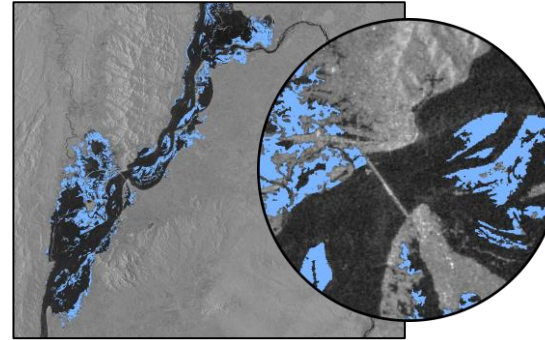
Flood likelihood



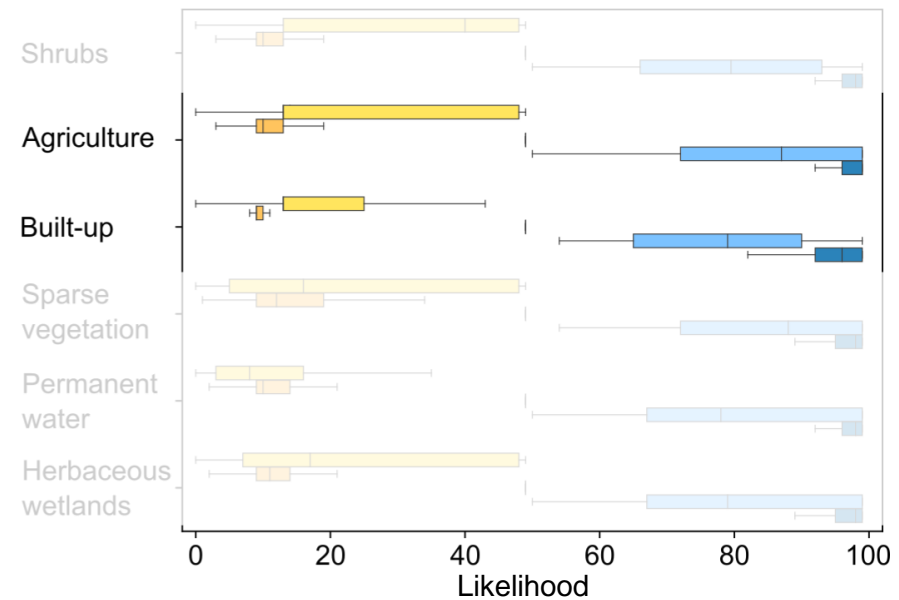
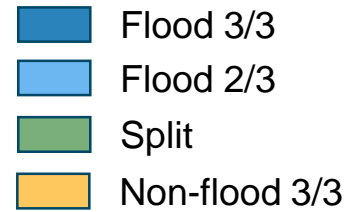
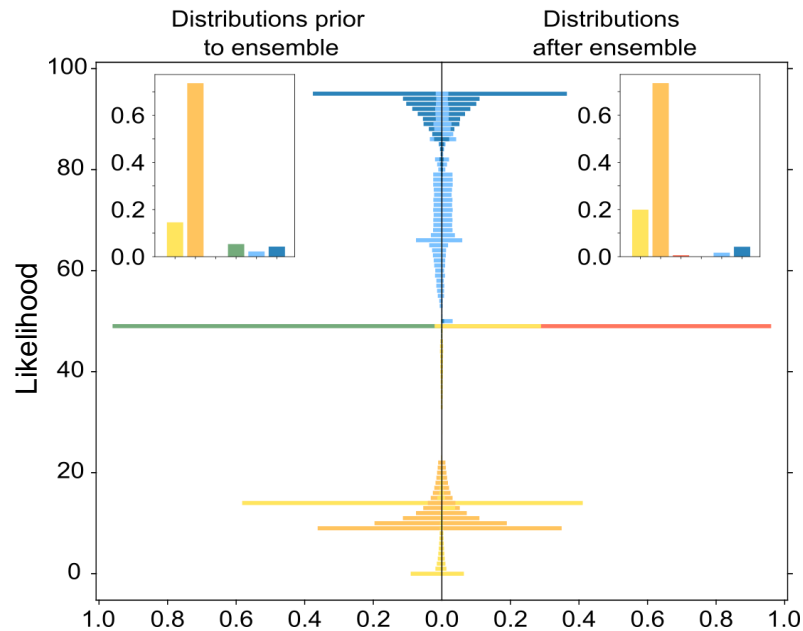
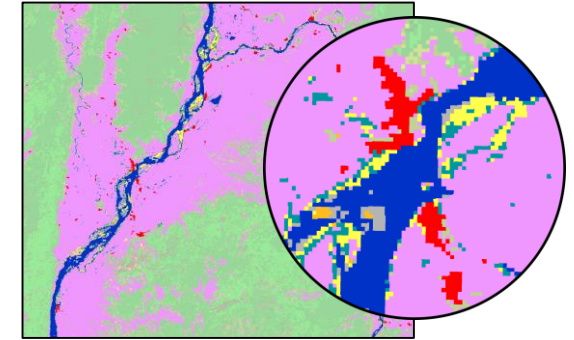
Flood classifications



Flood ensemble



Land cover

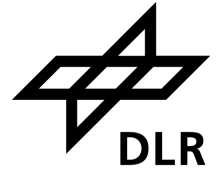


Résumé



- Flood likelihood values guide end-users
- Caution for pixels with low likelihood values
- Low likelihood values can express low statistical robustness
- Agriculture challenges SAR-based flood detection

Thank you for your attention



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Questions?

Contact me via christian.krullikowski@dlr.de.

Read the preprint on <https://arxiv.org/abs/2304.12488>.

GFM Wiki

<https://extwiki.eodc.eu/en/GFM>

Global Flood Awareness System

<https://www.globalfloods.eu/glofas-forecasting/>

