



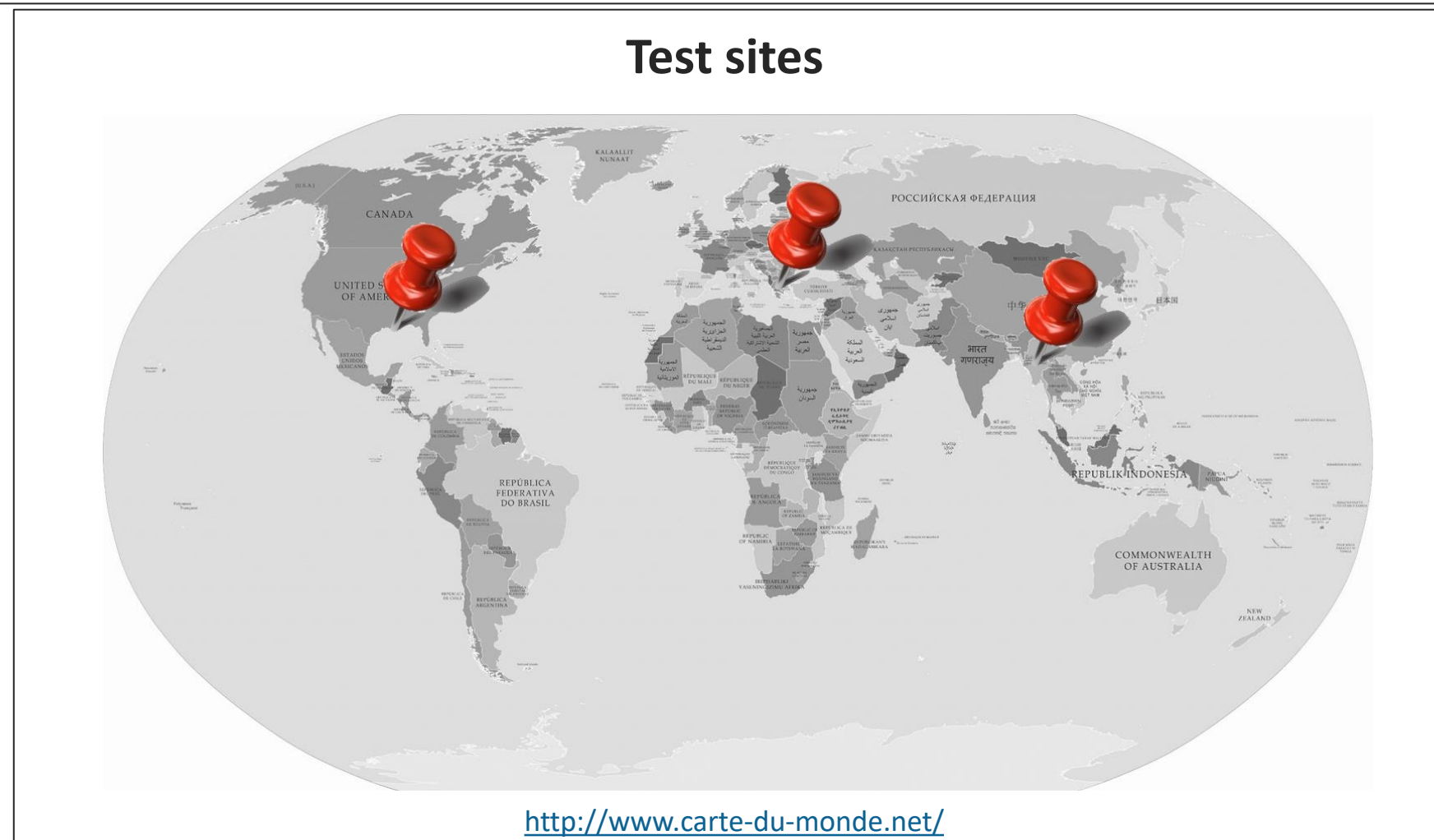
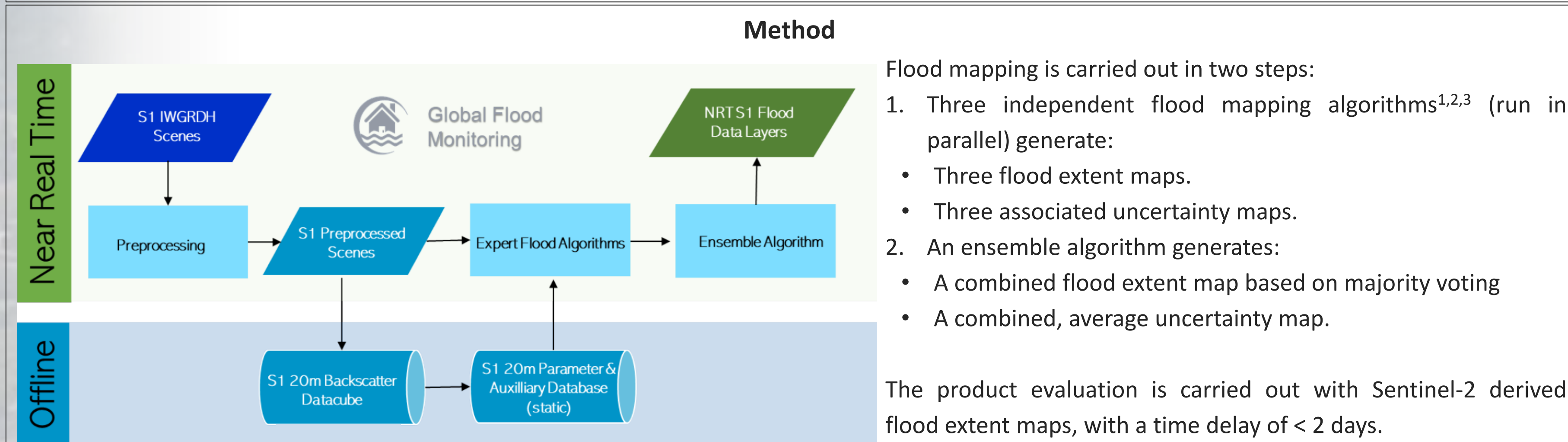
A first evaluation of the new CEMS systematic global flood monitoring product



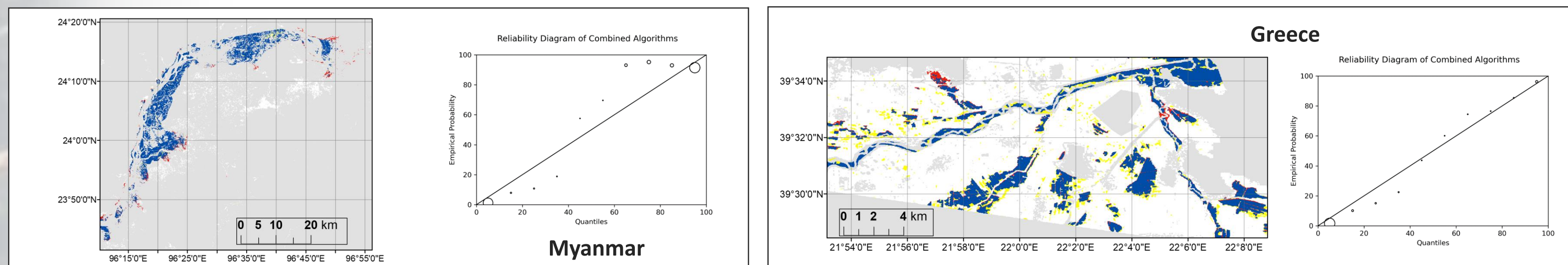
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Abstract

The Global Flood Monitoring (GFM) product of the Copernicus Emergency Management Service (CEMS) will soon deliver global, near-real time flood extent maps for each newly acquired Sentinel-1 Interferometric Wide Swath image. The GFM product output will be available within a maximum of 8 hours following image acquisition. It will consist of 11 output layers including maps of observed water and flood extent, together with classification uncertainty. In this study, we evaluate the observed flood extent layer with the associated classification uncertainty information.



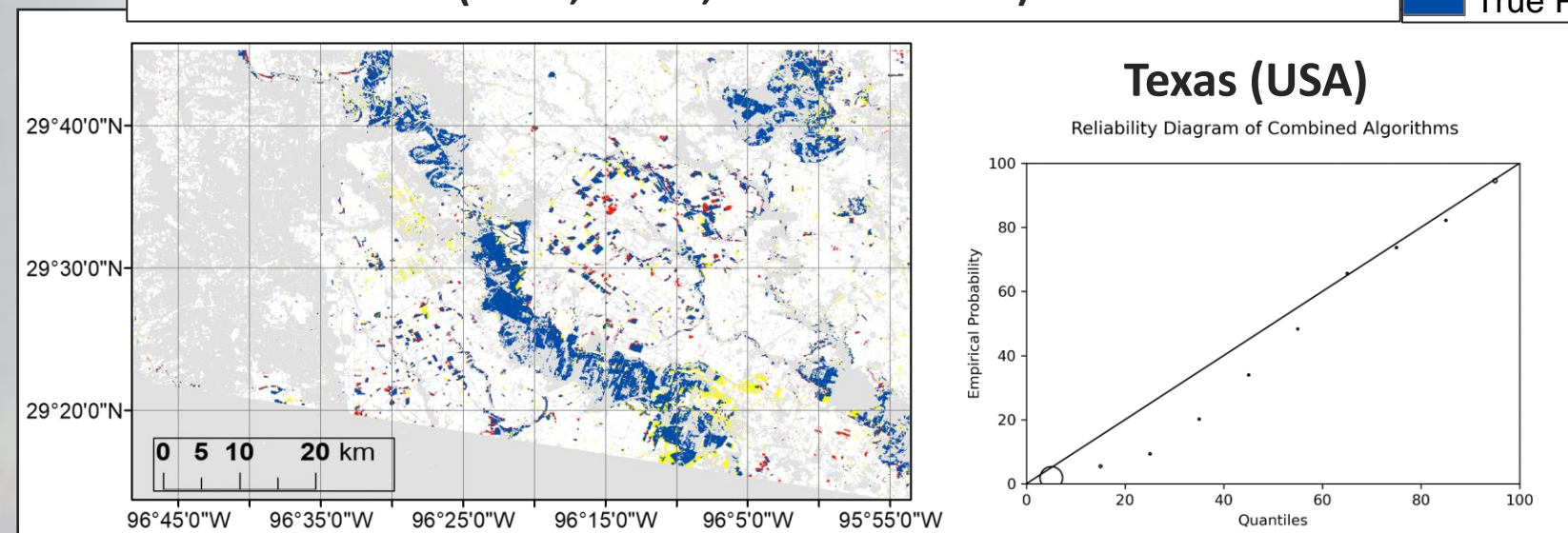
Results: Contingency maps, reliability diagrams and classification accuracy over the three test sites



Grey pixels in the contingency maps correspond to the exclusion layer i.e. areas where flood occurrence is very unlikely (hills, mountains...) and where SAR intensity does not allow for surface water detection (cities, forest, radar shadow...)

Legend

White	True Negative
Yellow	False Negative
Red	False Positive
Blue	True Positive



Test site	Critical Success Index (CSI)				Overall Accuracy (OA)				Weighted RMSD - Reliability Diagram (%)			
	Flood mapping algorithm:				Flood mapping algorithm:				Flood mapping algorithm:			
	#1	#2	#3	Comb.	#1	#2	#3	Comb.	#1	#2	#3	Comb.
Myanmar	0.91	0.91	0.73	0.91	0.97	0.97	0.89	0.95	3.2	11.8	20.6	11.2
Texas	0.7	0.7	0.72	0.72	0.95	0.95	0.95	0.95	5.5	4.7	6.4	4.9
Greece	0.67	0.69	0.75	0.7	0.93	0.94	0.94	0.94	3.6	4	15.4	4.7

Conclusions

- The GFM flood extent maps generated with the ensemble approach exhibit a high level of accuracy over the three test sites (CSI > 0.7, OA > 0.94).
- The classification uncertainty is reliably estimated.
- The CSI of the combined flood extent maps generally outperforms those of the individual algorithms.

References

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