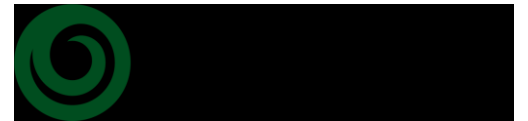
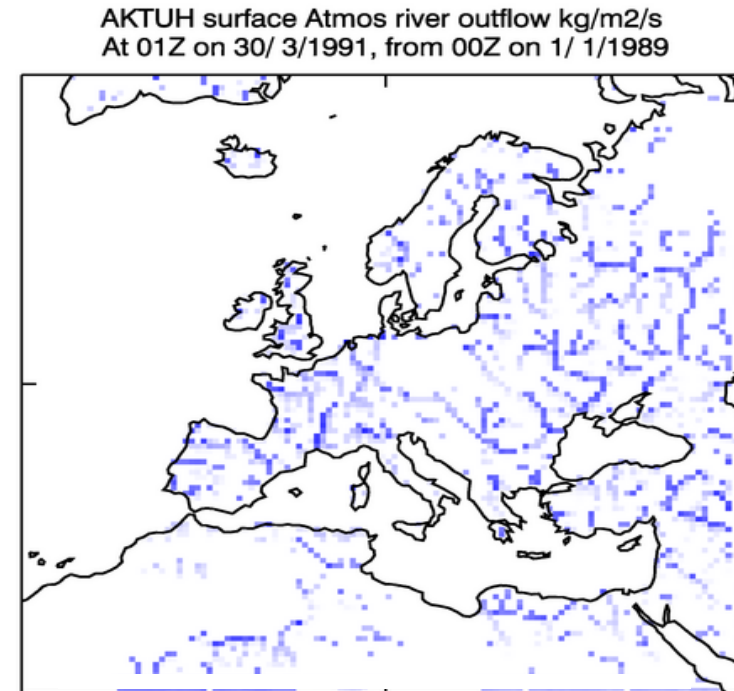
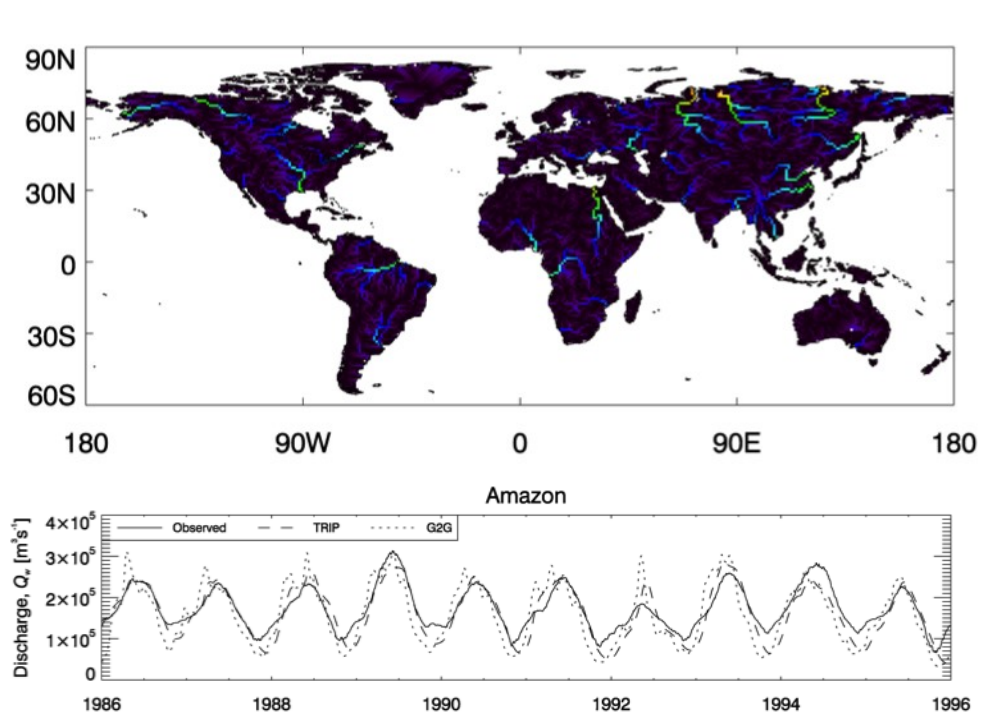

JULES Inundation JPEG

Simon Dadson, Toby Marthews, Eddie C-P, Doug Kelley, Nic Gedney, Sarah Chadburn, Douglas Clark, Eleanor Burke, Garry Hayman, Joy Singarayer, Charlie Williams, Olivia Becher, Homero Paltan, Rob Parker...



Background

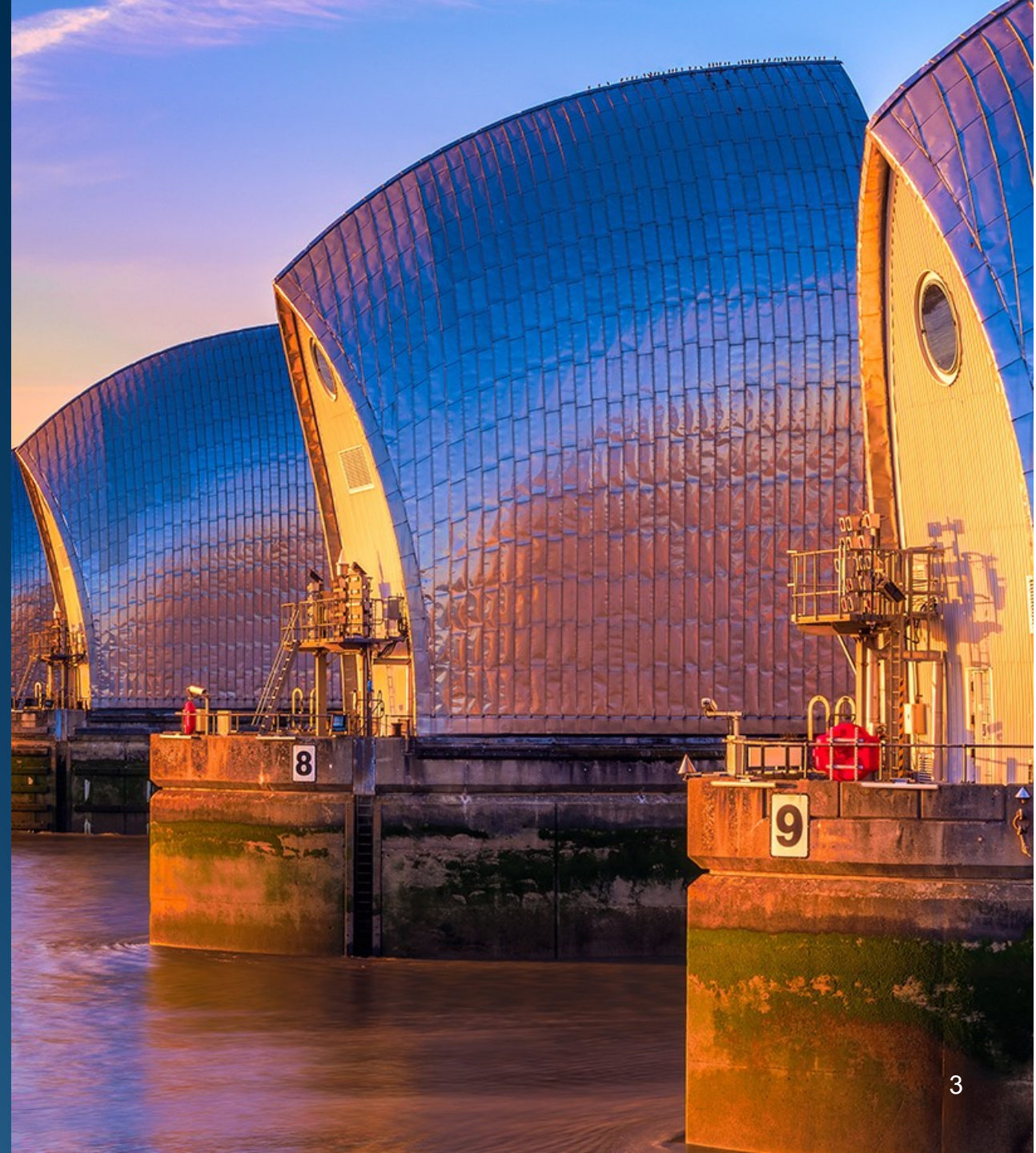


Dadson, S. J. et al., 2011, *J. Hydrology*.

- Land surface models underpin results in climate change and Earth system science
- Hydrological models are needed to make reliable predictions
- Converging on commensurable scales (0.5° Global; 1 km National)

Inundation in natural hazard applications

- Flood inundation and hazard mapping
- Coupled fluvial, pluvial, groundwater and coastal flooding
- NWP applications in data-sparse areas



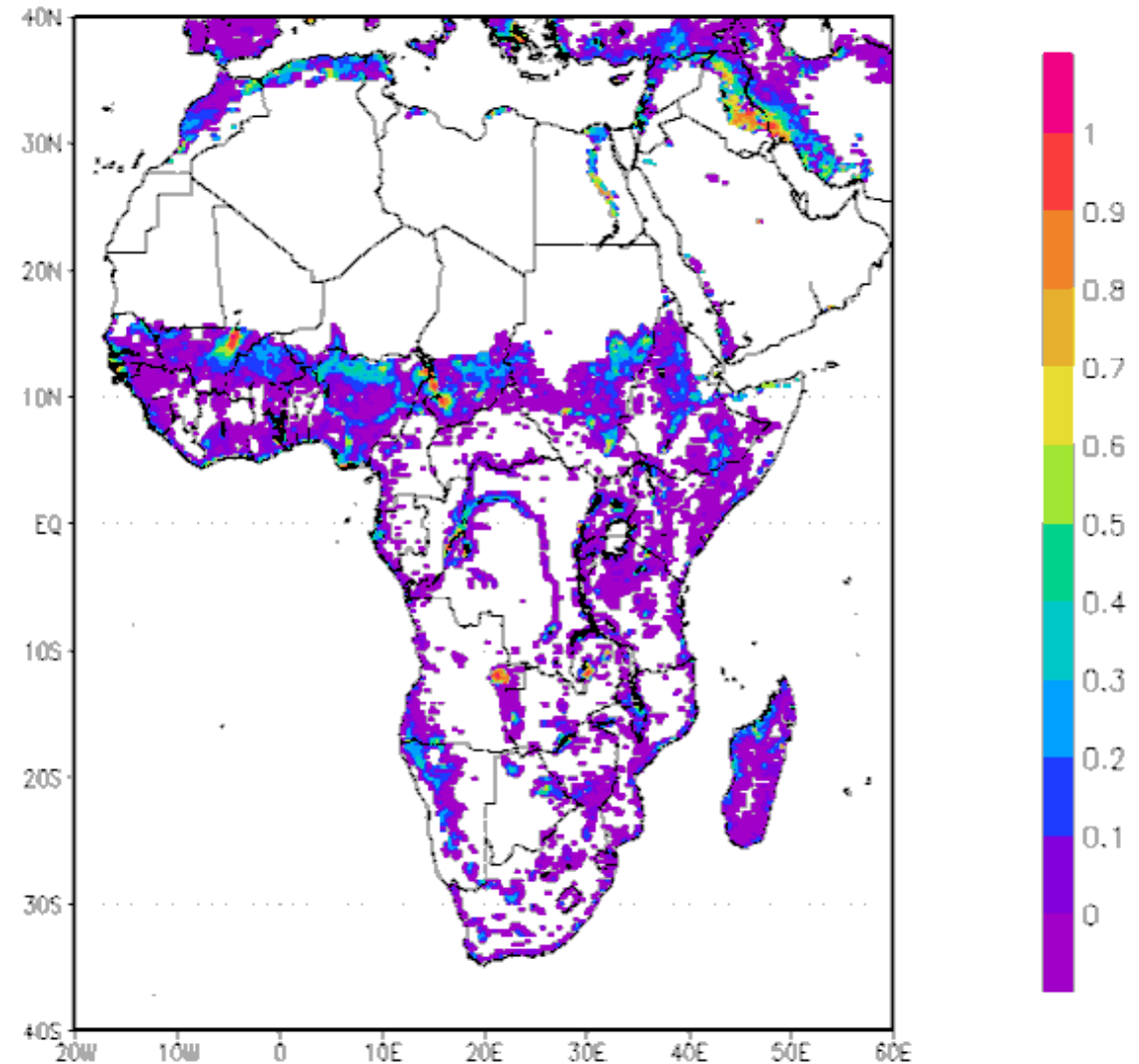
Inundation in Earth System studies

- Inundation, open water and land-surface feedbacks
- Inundation impacts on terrestrial BGC
- Methane emissions from wetlands



Developments in JULES

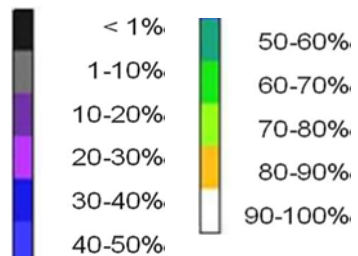
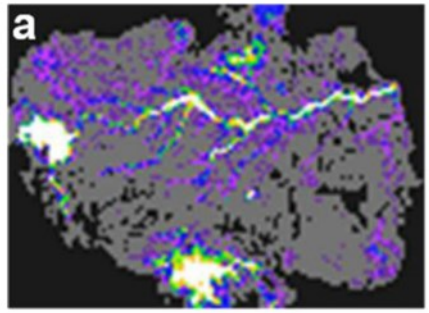
- JULES – TRIP, RFM
- Overbank inundation in RFM
- Other models...



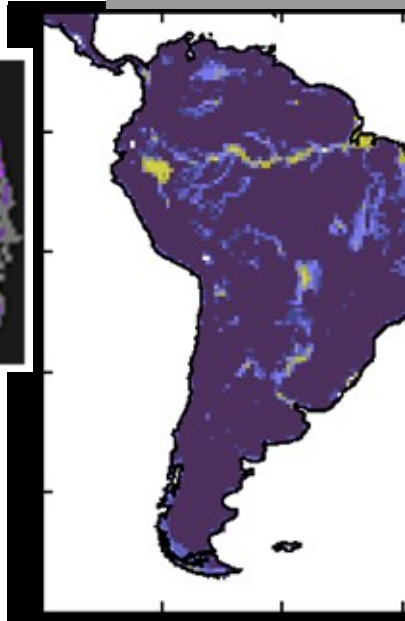
Present day wetlands in South America

Nic Gedney: nicola.gedney@metoffice.gov.uk

OBS inundation, Amazon
(%) Hess et al 2015



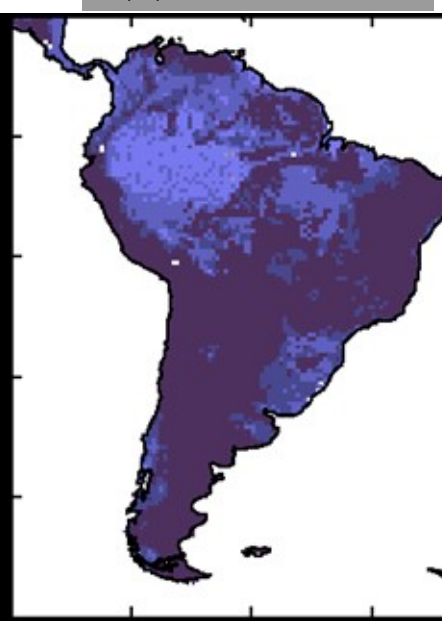
SWAMPS Obs inundation
(%)



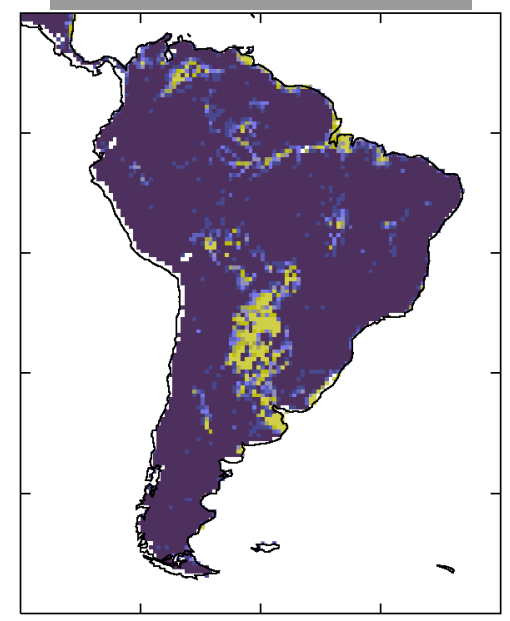
groundwater inundation
(%) JULES



groundwater inundation
(%) JULES + ferralsols



Overbank inundation
(%) JULES



5 10 20 30 40 50 60

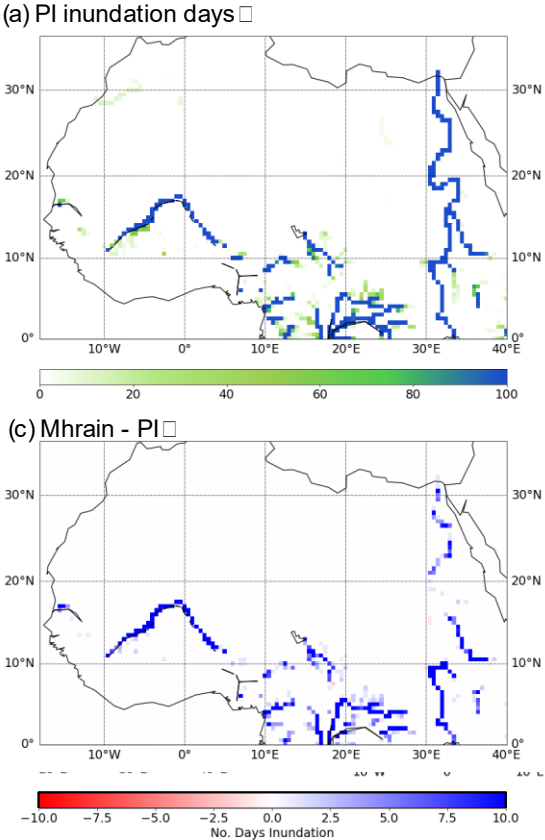
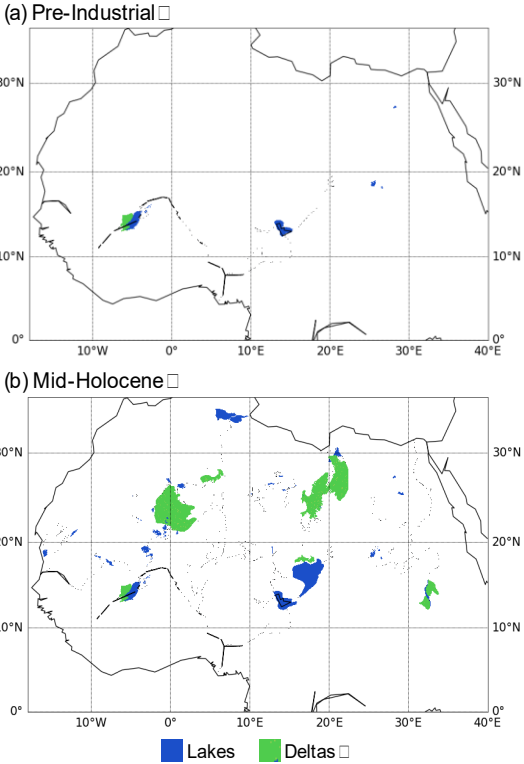
- Considerable observational uncertainty
- Tropical soils improves JULES simulation
- Overbank inundation would improve further

Overbank inundation (%):
Dadson et al 2010
with parameters fitted
along Amazon main stem

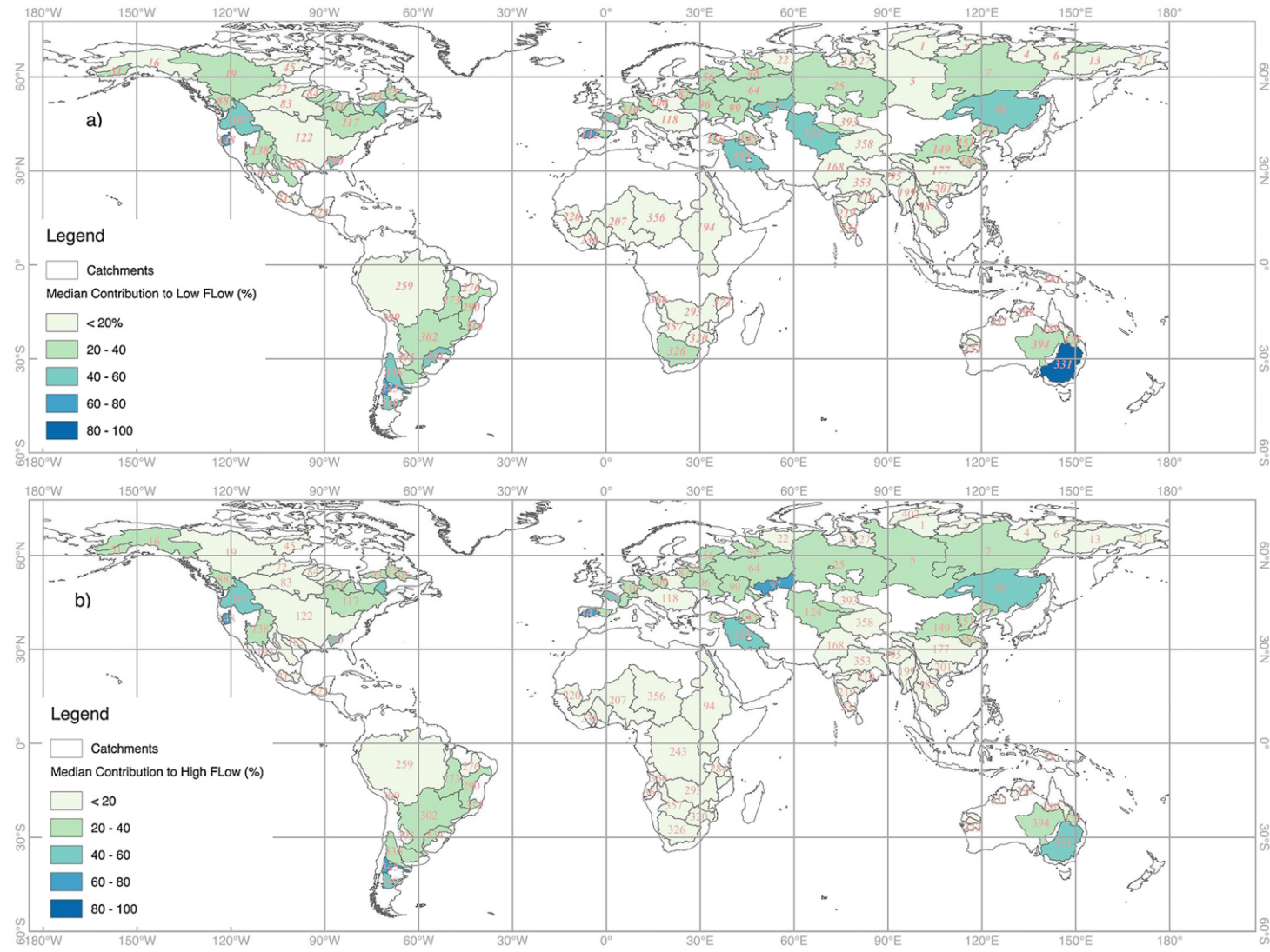
Palaeo-inundation modelling over Africa

Joy Singarayer (Univ. Reading), Charlie Williams (Univ. Bristol), Simon Dadson (CEH)
Contact: j.s.singarayer@reading.ac.uk

Data



JULES and Atmospheric Rivers...



- Global floods and water availability
- Driven by atmospheric rivers
- Collaboration with NASA JPL and Univ. Tokyo

Paltan, H., Waliser, D., Lim, W. H., Guan, B., Yamazaki, D., Pant, R., & Dadson, S. (2017). Global floods and water availability driven by atmospheric rivers. *Geophysical Research Letters*, 44, 10,387–10,395. <https://doi.org/10.1002/2017GL074882>

Q&A

Simon Dadson
(sjdad@ceh.ac.uk)

@SimonDadson
www.hydro-jules.org

