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### Summary

I am a Research Associate at the University of Bristol within the Global Mass team ([globalmass.eu](http://globalmass.eu)). We are combining information about different contributions to sea-level variability in a Bayesian Hierarchical Model framework to better understand the sea-level budget at a local and regional scale. I am leading the Oceans work package, which uses tide gauge, satellite altimetry and steric sea surface data sets. Understanding the treatment of these data and in particular, the quantification of uncertainties, is imperative in gaining useful information on the components of sea-level variability.

My PhD focused on investigating storm surge and tide forecasting and open ocean to coastal mean sea level variability using a variety of statistical and machine learning methods. I built on that work investigating sea level variability around Australia at the University of Tasmania. We used the characteristics of sea-level trend and residual noise to understand whether observed trends are emerging from the intrinsic noise. Our uncertainty estimates included best estimates of coloured noise and allowed for inter-annual and decadal natural variability (El Nino and the Pacific Decadal Oscillation). Also, I have used satellite altimetry data re-analysed for coastal regions to investigate the characteristics of sea level variability between open ocean and coastal locations.

I am interested in a range of earth science fields that contribute to sea-level change; ice sheet mass balance, geodesy, gravitational change, physical oceanography (dynamics, circulation changes, propagation of disturbances). During time spent at BAS, we replicated the dynamic response (speed up) of tributary glaciers following the collapse of Larsen A ice shelf. I also retain an interest in high frequency variability such as tides, oceanic waves and storm surge.

### Memberships

#### Organisations

[School of Geographical Sciences](#)

#### Research groups

- [Bristol Glaciology Centre](#)

#### Links

-  [ORCID](#)

#### Recent publications

- Royston, S, Watson, CS, Legrésy, B, King, MA, Church, JA & Bos, MS, 2018, '[Sea-Level Trend Uncertainty With Pacific Climatic Variability and Temporally-Correlated Noise](#)'. *Journal of Geophysical Research: Oceans*, vol 123., pp. 1978-1993
- Vishwakarma, BD, Royston, S, Chuter, S, Sha, Z, Westaway, R, Rougier, J & Bamber, J, 2018, '[GlobalMass: a Bayesian modelling approach for closing the sea-level budget](#)'.
- Royston, S & Gudmundsson, GH, 2016, '[Changes in ice-shelf buttressing following the collapse of Larsen A Ice Shelf, Antarctica, and the resulting impact on tributaries](#)'. *Journal of Glaciology*, vol 62., pp. 905-911
- Hibbert, A, Royston, SJ, Horsburgh, KJ, Leach, H & Hisscott, A, 2015, '[An empirical approach to improving tidal predictions using recent real-time tide gauge data](#)'. *Journal of Operational Oceanography*, vol 8., pp. 40-51

- Royston, S, Lawry, J & Horsburgh, K, 2013, '[A linguistic decision tree approach to predicting storm surge](#)'. *Fuzzy Sets and Systems*, vol 215., pp. 90-111
- Royston, SJ, Horsburgh, K & Lawry, J, 2012, '[Application of rule based methods to predicting storm surge](#)'. *Continental Shelf Research.*, pp. 79?91

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