Ilaria Prosdocimi - Curriculum Vitae 2021

Education

Faculty of Sciences, K.U. Leuven, Belgium

PhD, *Mathematics - Statistics*, November 2010

Faculty of Statistical Sciences, University of Padova, Italy

Second level degree (Master), *Statistical, Social and Demographical Sciences*, October 2006

First level degree (Bachelor), *Statistics, Population and Society*, June 2004

Work Experience - Academic

Department of Environmental Sciences, Informatics and Statistics - Ca' Foscari University of Venice, Italy

Montalcini Lecturer in Statistics *January 2019 - present*

Department of Mathematical Sciences - University of Bath, UK

Lecturer in Statistics *April 2016 - January 2019*

Centre for Ecology & Hydrology, Natural Environment Research Council, UK

Statistician *July 2012 - March 2016*

Work Experience - Other

Janssen Pharmaceutica, Pharmaceutical Companies of Johnson & Johnson, Belgium

Phase 1 Statistician *January 2011 - May 2012*

Faculty of Sciences, K.U. Leuven, Belgium

Consulting Statistician *November 2009 - December 2010*

Summary of Scientific Achievements

Research proposal

Awarded:

- Levi Montalcini Fellowship: a fellowship from the italian government to enable scientists who are settled abroad to take up an academic post in Italy.
- DIFFER: Developing Innovative Flood Frequency Estimation for a Resilient nation - National Productivity Investment Fund (NPIF) Fellowship covering full salary from January 2018 to June 2021 (3.5 years). Award not completed due to the move to Italy.

Selected papers in international and peer reviewed journals

1. Giuntoli, Prosdocimi and Hannah (2021) Going beyond the ensemble mean: assessment of future floods from global multi-models. *Water Resources Research*, 57.3, doi:10.1029/2020WR027897
2. Kjeldsen and Prosdocimi (2021) Assessment of trends in hydrological extremes using regional magnification factors. *Advances in Water Resources*, 149, doi:10.1016/j.advwatres.2021.103852
3. Hesarkazzazi, ..., Prosdocimi Castellarin and Sitzenfrei (2021). Stationary vs non-stationary modelling of flood frequency distribution across northwest England. *Hydrological Sciences Journal*, 66, 4, 729–744, doi:10.1080/02626667.2021.1884685
4. Prosdocimi and Kjeldsen (2021) Parametrisation of change-permitting extreme value models and its impact on the description of change. *Stochastic Environmental Research and Risk Assessment*, **35**, 307–24, doi:10.1007/s00477-020-01940-8
5. Barnes, Santos, Garijo, Mediero, Prosdocimi, McCullen and Kjeldsen (2019) Identifying the origins of extreme rainfall using storm track classification. *Journal of Hydroinformatics*; **22**(2), 296–309. doi:10.2166/hydro.2019.164

6. Prosdocimi, Dupont, Augustin, Kjeldsen, Simpson and Smith (2019) Areal models for spatially coherent trend detection: The case of British peak river flows. *Geophysical Research Letters*, **46**, doi:10.1029/2019GL085142
7. Brady, Faraway and Prosdocimi (2019) Attribution of long-term changes in peak river flows in Great Britain. *Hydrological Sciences Journal*, **64**, 10, 1159–1170, doi:10.1080/02626667.2019.1628964
8. Slater, Thirel, Harrigan, Delaigue, Hurley, Khouakhi, Prosdocimi, Vitolo, and Smith (2019) Using R in hydrology: a review of recent developments and future directions, *Hydrology and Earth System Sciences*, 23, 2939–2963, doi:10.5194/hess-23-2939-2019
9. Kjeldsen, Prosdocimi and Ahn (2018). Mixture Gumbel models for extreme series including infrequent phenomena.*Hydrological Sciences Journal*, **63**, 1927–1940,
10. Prosdocimi (2018). German tanks and historical records: the estimation of the time coverage of ungauged extreme events. *Stochastic Environmental Research and Risk Assessment*, **32**, 607–622, doi:10.1007/s00477-017-1418-8
11. Formetta, Prosdocimi, Stewart and Bell (2018). Estimating the index flood with continuous hydrological models: an application in Great Britain. *Hydrology Research*, **49**, 123–133, doi:10.2166/nh.2017.251
12. Kjeldsen and Prosdocimi (2018). Assessing the element of surprise of record-breaking flood events. *Journal of Flood Risk Management*, **11**, 5541–5553, doi:10.1111/jfr3.12260
13. Bachmair, Svensson, Prosdocimi, Hannaford and Stahl (2017). Developing drought impact functions for drought risk management, Natural Hazards and Earth System Sciences (NHESS), **17**, 1947–1960, doi:10.5194/nhess-17-1947-2017
14. Kjeldsen, Ahn and Prosdocimi (2017). On the use of a four-parameter kappa distribution in regional frequency analysis. *Hydrological Sciences Journal*, **62**, *9*, 1354-1363, doi:10.1080/02626667.2017.1335400
15. Prosdocimi, Stewart and Vesuviano (2017). A Depth-Duration-Frequency analysis for Short Duration Rainfall Events in England and Wales, *Hydrology Research*, **48**, 1624–1638, doi:10.2166/nh.2017.140.
16. Svensson, Hannaford and Prosdocimi (2017). Statistical distributions for monthly aggregations of precipitation and streamflow in drought indicator applications, *Water Resources Research*. **53**, 999–1018 doi:10.1002/2016WR019276
17. Requena, Prosdocimi, Kjeldsen and Mediero (2017). A bivariate trend analysis to investigate the effect of increasing urbanisation on flood characteristics, *Hydrology Research*. **48**(3), 802–821, doi:10.2166/nh.2016.105
18. Prosdocimi, Kjeldsen and Miller (2015). Detection and attribution of urbanization effect on flood extremes using nonstationary flood-frequency models, *Water Resources Research*, **51**, 4244–4262, doi:10.1002/2015WR017065. **Note**: this paper was short-listed for the STAHY (Statistical Hydrolgy) Best Paper Award in 2019.
19. Kjeldsen and Prosdocimi (2015). A bivariate extension of the Hosking and Wallis goodness-of-fit measure for regional distributions. *Water Resources Research*, **51**, 896–907, doi:10.1002/2014WR015912.
20. Keller, Tanguy, Prosdocimi *et al.* (2015). CEH-GEAR: 1 km resolution daily and monthly areal rainfall estimates for the UK for hydrological and other applications, *Earth System Science Data*, **7**, 143–155, doi:10.5194/essd-7-143-2015.
21. Prosdocimi, Kjeldsen and Svensson (2014). Non-stationarity in annual and seasonal series of peak flow and precipitation in the UK. *Natural Hazards and Earth System Sciences*, **14**, 1125–1144. doi:10.5194/nhess-14-1125-2014
22. Macdonald, Kjeldsen, Prosdocimi and Sangster (2014). Reassessing flood frequency For the Sussex Ouse, Lewes: the Inclusion of historical Flood Information since AD 1650. *Natural Hazards and Earth System Sciences*, **14**, 2817–2828, doi:10.5194/nhessd-1-7615-2013.
23. Gijbels and Prosdocimi (2012). Flexible Mean and Dispersion Function Estimation in Extended Generalized Additive Models, Communications in Statistics-Theory and Methods, 41, 3259–3277, doi:10.1080/03610926.2012.654881.
24. Croux, Gijbels and Prosdocimi (2011). Robust estimation of mean and dispersion functions in Extended Generalized Additive Models. *Biometrics*, **68**, 31–44, doi:10.1111/j.1541-0420.2011.01630.x.

25. Gijbels and Prosdocimi (2010). Loess, Wiley Interdisciplinary Reviews: Computational Statistics, 2, 590–599, doi:10.1002/wics.104.
26. Gijbels and Prosdocimi (2010). Smooth estimation of mean and dispersion function in extended Generalized Additive Models with application to Italian Induced Abortion data. *Journal of Applied Statistics*, **38**, 2391–2411, doi:10.1080/02664763.2010.550039.
27. Gijbels, Prosdocimi and Claeskens (2010). Nonparametric estimation of mean and dispersion functions in extended Generalized Linear Models. *Test*, **19**, 580–608, doi:10.1007/s11749-010-0187-1.

Conference Proceedings

1. Prosdocimi and Gaetan (2020) Trends in rainfall extremes in the Venice lagoon catchment. *Book of short papers - SIS 2020 - ISBN:9788891910776*
2. Brady, Faraway and Prosdocimi (2018) Attribution of large-scale drivers of peak river flows in Ireland. *Proceedings of the 33rd International Workshop on Statistical Modelling, Bristol UK.*
3. Prosdocimi, Stewart, Faulkner, and Mitchell (2016). FEH Local: Improving flood estimates using historical data. E3S Web of Conferences, 7 doi:10.1051/e3sconf/20160701006

Reports for government bodies

- Dixon, Faulkner, Fry *et al.* (2017). *Making better use of local data in flood frequency estimation*, ISBN 978-1-84911-387-8, – report to the Environment Agency for project SC130009/R. (Contributor for the statistical methods in the report)
- Prosdocimi, Vesuviano, Stewart, Svensson. *Depth-duration-frequency analysis for short-duration rainfall events* – report to the Environment Agency for project SC090031 "Estimating flood peaks and hydrographs for small catchments (Phase 2)". (Lead Author)
- HR Wallingford, *HR Wallingford for the ASC: Updated projections for water availability for the UK* - report to the Adaptation Subcommittee, available at http://bit.ly/1OiqUOz. (Contributor).

Invited presentations (selection)

- May 2021, Chalmers University, Sweden, invited seminar within the Statistics Seminar series of the Department of Mathematical Sciences. Presentation title: *Statistical models for the detection of changes in peak river flow in the UK*
- January 2021, University of Edinburgh, UK, invited seminar within the Statistics Seminar series of the School of Mathematics. Presentation title: *Statistical models for the detection of changes in peak river flow in the UK*
- December 2020, American Geophysical Union Fall Meeting, invited presentation within the session Hydrometeorologic Extremes: Prediction, Simulation, and Change III (H185): *Non-stationary statistical models for extremes: the impact of modelling choices on the description of change*
- December 2018, University of Cardiff, UK, invited seminar within the Statistics e Operational Research Seminar series of the School of Mathematics. Presentation title: *Detecting coherent changes in flood risk in Great Britain*
- November 2017, University of Bristol, UK, invited seminar within the Statistics Seminar series of the School of Mathematics. Presentation title: *The use of historical data to estimate the frequency of rare events: some practical challenges*
- May 2017, Lancaster University, UK, invited seminar within the Statistics Seminar series of the Department of Mathematics and Statistics. Presentation title: *The use of historical data to estimate the frequency of rare events: some practical challenges*
- October 2015, T.U. Wien, Austria, invited presentation at the Symposium on Regional Floods Effects of Changes in the River System. Presentation title: *Detection and attribution of changes in flood risk: ideas from a urban catchment case study*
- December 2013, K.U. Luven, Belgium, invited presentation at the 25^{th} anniversary of LStat. Presentation title: *Flood frequency estimation at CEH Wallingford*

PhD supervision

- Supervised (together with Julian Faraway) Aoibheann Brady who graduated in November 2019 with a PhD in Statistical Applied Mathematics at the University of Bath, UK.

Scientific software
I strive to make the code which underlies all my papers available and usable by other scientists. Mostly the code is developed in the statistical computing language R and is shared as an R package. At present my main contribution to the development and maintenance of scientific software are:

- Creator and maintainer of the R package `winfapReader`, a package which allows to download and pre-process river peak flow data for the UK. The package is on CRAN (the main repository for R packages).
- Maintainer of the R package `rnrfa`, a package which allows to interact with the national River Flow Archive (UK) data. The package is on CRAN.
- Creator and maintainer of the R package `ilaprosUtils`: the package collects several of the methods presented in paper which I have lead on the topic of extreme value analysis
- Creator and maintainer of the R package `GOFmeas`, which implements the methods described in Kjeldsen and Prosdocimi (2015)
- Creator and maintainer of the R package `DoubleRobGam`, which implements the methods described in Croux et al (2011) and Gijbels and Prosdocimi (2010)

Editorial activity and professional services

Since 2020: Associate editor of the journal Hydrological Sciences Journal

Reviewer for (selection): *Nature*, *Environmental Research Letters*, *Geophysical Research Letters*, *Journal of the Royal Statistical Society - Series C*, *Computational Statistics & Data Analysis*, *Water Resources Research*, *Stochastic Environmental Research and Risk Assessment*, *Royal Society Open Science*, *Hydrology and Earth System Sciences*, *Journal of Hydrology*, *Advances in Water Resources*

(Elected) Secretary of the International Commission on Statistical Hydrology of the International Association of Hydrological Sciences

Society membership

- Belgian Statistical Society
- British Hydrological Society