Personal Information

Mail Institut für Ökologie
Universität Innsbruck
Technikerstraße 25
6020 Innsbruck, *Austria*

Phone +43 512 50751738

e-mail lhtalluto@gmail.com

web https://ltalluto.github.io

Citizenship Italy, USA

Languages English (native); French (CEFL B2); German (est. A2)

Education

2013 **Ph.D.**, *University of Wyoming*, Larmie, Ecology
Dissertation: *The evolution of landscape structure: Eco-evolutionary dynamics drive spatial variation in serotiny in lodgepole pine*

2005 **M.S.**, *University of California*, Irvine, Biological Sciences
Thesis: *Shrub-herb interactions in California's coastal sage scrub: Factors affecting establishment of a native understory and historical invasion by annual grasses*

2001 **B.S.**, *California Polytechnic State University*, San Luis Obispo, Ecology and Systematic Biology, *cum laude*

Professional Appointments

2020–pres **University Assistant (postdoc)**, *Department of Ecology, University of Innsbruck*, Innsbruck, Austria

2018–2019 **Postdoctoral Researcher**, *IGB, Leibniz Institute for Freshwater Ecology and Inland Fisheries*, Berlin, Germany

2015–2018 **Postdoctoral Researcher**, *CNRS, Laboratoire d'Écologie Alpine*, Grenoble, France

2013–2015 **Postdoctoral Fellow**, *Département de Biologie, Université du Québec*, Rimouski, Québec, Canada

2009–2013 **Graduate Research Assistant**, *Department of Zoology & Physiology, University of Wyoming*, Laramie, WY, USA

2008–2009 **Lead Biologist**, *Western Riverside County MSHCP Biological Monitoring Program*, Riverside, CA, USA

2006–2008 **Avian Program Lead**, *Western Riverside County MSHCP Biological Monitoring Program*, Riverside, CA, USA

Key Contributions

Talluto, M., del Campo, R., Estévez, E., Altermatt, F., Datry, T. & Singer, G. (2024) Towards (better) fluvial metaecosystem ecology: a research perspective. *npj Biodiversity*, **3**, 3.

In this perspective paper, we outlined a research agenda arguing for a regional perspective for connecting research on fluvial metacommunities to that on biogeochemical fluxes, in particular of carbon. We reviewed the current state of knowledge on how consumer communities and fluvial biogeochemistry interact to influence carbon processing in rivers, and argue that these processes play out in the context of the spatial and physical structure of river networks.

Talluto, M. V.,Boulangeat, I, Vissault, S., Thuiller, W. & Gravel, D. (2017) Extinction debt and colonization credit delay range shifts of eastern North American trees. *Nature Ecology and Evolution*, **1**, 0182.

We developed a novel range dynamics model for testing the degree to which species distributions of forest trees in eastern North America are out of equilibrium with the theoretical preciction that species' equilibrium ranges can be defined as regions where local colonisation rates exceed extinction rates. Our findings indicate that many species' current distributions are out of equilibrium, and many climatic optima have shifted northward relative to current range limits. We also showed that responsiveness (i.e., the rate with which colonisation-extinction dynamics can shift the range back into equilibrium) is much greater at southern range limits than northern limits, implying that range contraction in the south could occur faster than range expansion in the north.

Copenhaver-Parry, P. E., Carroll, C. J. W., Martin, P. H. & **Talluto, M. V.** (2020) Multi-scale integration of tree recruitment and range dynamics in a changing climate. *Global Ecology and Biogeography*, **29**, 102–116.

We combined species distribution models with recruitement and survival models to improve future predictions of tree species ranges. The incorporation of the regeneration niche into an SDM reduced uncertainty in model predictions in most cases. However, uncertainty in future predictions was highest at the range limits, in part due to high uncertainty about the climatic dependence of recruitement, identifying an important data and conceptual gap.

Publications

26. Fuß, T., Thuile Bistarelli, L., Walther, F., Vitecek, S., **Talluto**, **L.** & Singer, G. (in press) Geodiversity of a river network controls metacommunity structure and function of periphytic algae. *Communications Earth and Environment*.

25. Pereira, H. M. et al. (2024) Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050. *Science*, **384**, 458–465 [**L. Talluto** is author 51 of 57].

24. **Talluto**, **M.**, del Campo, R., Estévez, E., Altermatt, F., Datry, T. & Singer, G. (2024) Towards (better) fluvial metaecosystem ecology: a research perspective. *npj Biodiversity*, **3**, 3.

23. Fandos, G., **Talluto**, **M.**, Fiedler, W., Robinson, R. A., Thorup, K. & Zurell, D. (2023) Standardised empirical dispersal kernels emphasise the pervasiveness of long-distance dispersal in European birds. *Journal of Animal Ecology*, **92**, 158–170.

22. Martini, J., Walther, F., Schenekar, T., Birnstiel, E., Wüthrich, R., Oester, R., Schindelegger, B., Schwingshackl, T., Wilfling, O., Altermatt, F., **Talluto**, **M. V.**, Singer, G. & Vitecek, S. (2023) The last hideout: Abundance patterns of the not-quite-yet extinct mayfly Prosopistoma pennigerum in the Albanian Vjosa River network. *Insect Conservation and Diversity*, **16**, 285–297.

21. Catalán, N., Campo, R. d., **Talluto**, **M.**, Mendoza-Lera, C., Grandi, G., Bernal, S., Schiller, D. v., Singer, G. & Bertuzzo, E. (2022) Pulse, Shunt and Storage: Hydrological Contraction Shapes Processing and Export of Particulate Organic Matter in River Networks. *Ecosystems*.

20. Datry, T. et al. (2021) Securing Biodiversity, Functional Integrity, and Ecosystem Services in Drying River Networks (DRYvER). *Research Ideas and Outcomes*, **7**, e77750 [**L. Talluto** is author 53 of 62].

19. Knoflach, B., Ramskogler, K., **Talluto**, **M.**, Hofmeister, F., Haas, F., Heckmann, T., Pfeiffer, M., Piermattei, L., Ressl, C., Wimmer, M. H., Geitner, C., Erschbamer, B. & Stötter, J. (2021) Modelling of Vegetation Dynamics from Satellite Time Series to Determine Proglacial Primary Succession in the Course of Global Warming—A Case Study in the Upper Martell Valley (Eastern Italian Alps). *Remote Sensing*, **13**.

18. Thuile Bistarelli, L., Poyntner, C., Santín, C., Doerr, S. H., **Talluto**, **M. V.**, Singer, G. & Sigmund, G. (2021) Wildfire-Derived Pyrogenic Carbon Modulates Riverine Organic Matter and Biofilm Enzyme Activities in an In Situ Flume Experiment. *ACS ES&T Water*, **1**, 1648–1656.

17. Copenhaver-Parry, P. E., Carroll, C. J. W., Martin, P. H. & **Talluto**, **M. V.** (2020) Multi-scale integration of tree recruitment and range dynamics in a changing climate. *Global Ecology and Biogeography*, **29**, 102–116.

16. Münkemüller, T., Gallien, L., Pollock, L. J., Barros, C., Carboni, M., Chalmandrier, L., Mazel, F., Mokany, K., Roquet, C., Smyčka, J., **Talluto**, **M. V.** & Thuiller, W. (2020) Dos and don'ts when inferring assembly rules from diversity patterns. *Global Ecology and Biogeography*, **29**, 1212–1229.

15. Pollock, L. J., O'Connor, L. M. J., Mokany, K., Rosauer, D. F., **Talluto**, **M. V.** & Thuiller, W. (2020) Protecting Biodiversity (in All Its Complexity): New Models and Methods. *Trends in Ecology & Evolution*.

14. Vissault, S., **Talluto**, **M. V.**, Boulangeat, I. & Gravel, D. (2020) Slow demography and limited dispersal constrain the expansion of north-eastern temperate forests under climate change. *Journal of Biogeography*.

13. Carboni, M., Guéguen, M., Barros, C., Georges, D., Boulangeat, I., Douzet, R., Dullinger, S., Klonner, G., Kleunen, M. van, Essl, F., Bossdorf, O., Haeuser, E., **Talluto**, **M. V.**, Moser, D., Block, S., Conti, L., Dullinger, I., Münkemüller, T. & Thuiller, W. (2018) Simulating plant invasion dynamics in mountain ecosystems under global change scenarios. *Global Change Biology*, **24**, e289–e302.

12. Haeuser, E., Dawson, W., Thuiller, W., Dullinger, S., Block, S., Bossdorf, O., Carboni, M., Conti, L., Dullinger, I., Essl, F., Klonner, G., Moser, D., Münkemüller, T., Parepa, M., **Talluto**, **M. V.**, Kreft, H., Pergl, J., Pyšek, P., Weigelt, P., Winter, M., Hermy, M., Van der Veken, S., Roquet, C. & Kleunen, M. van (2018) European ornamental garden flora as an invasion debt under climate change. *Journal of Applied Ecology*, **55**, 2386–2395.

11. **Talluto**, **M. V.**, Mokany, K., Pollock, L. J. & Thuiller, W. (2018) Multifaceted biodiversity modelling at macroecological scales using Gaussian processes. *Diversity and Distributions*, **24**, 1492–1502.

10. van Kleunen, M. et al. (2018) The changing role of ornamental horticulture in alien plant invasions. *Biological Reviews*, **93**, 1421–1437 [**L. Talluto** is author 28 of 29].

9. **Talluto**, **M. V.**, Boulangeat, I., Vissault, S., Thuiller, W. & Gravel, D. (2017) Extinction debt and colonization credit delay range shifts of eastern North American trees. *Nature Ecology and Evolution*, **1**, 0182.

8. Benkman, C. W., Jech, S. & **Talluto**, **M. V.** (2016) From the ground up: biotic and abiotic features that set the course from genes to ecosystems. *Ecology and evolution*, **6**, 7032–7038.

7. **Talluto**, **M. V.**, Boulangeat, I., Ameztegui, A., Aubin, I., Berteaux, D., Butler, A., Doyon, F., Drever, C. R., Fortin, M.-J., Franceschini, T., Liénard, J., McKenney, D., Solarik, K. A., Strigul, N., Thuiller, W. & Gravel, D. (2016) Cross-scale integration of knowledge for predicting species ranges: a metamodelling framework. *Global Ecology and Biogeography*, **25**, 238–249.

6. **Talluto**, **M. V.** & Benkman, C. W. (2014) Conflicting selection from fire and seed predation drives fine-scaled phenotypic variation in a widespread North American conifer. *Proceedings of the National Academy of Sciences of the United States of America*, **111**, 9543–9548.

5. **Talluto**, **M. V.** & Benkman, C. W. (2013) Landscape-scale eco-evolutionary dynamics: selection by seed predators and fire determine a major reproductive strategy. *Ecology*, **94**, 1307–1316.

4. Benkman, C. W., Fetz, T. & **Talluto**, **M. V.** (2012a) Variable resource availability when resource replenishment is constant: The coupling of predators and prey. *The Auk*, **129**, 115–123.

3. Benkman, C. W., Smith, J. W., Maier, M., Hansen, L. & **Talluto**, **M. V.** (2012b) Consistency And Variation In Phenotypic Selection Exerted By A Community Of Seed Predators. *Evolution*, **67**, 157–169.

2. **Talluto**, **M. V.** & Suding, K. N. (2008) Historical change in coastal sage scrub in southern California, USA in relation to fire frequency and air pollution. *Landscape Ecology*, **23**, 803–815.

1. **Talluto**, **M. V.**, Suding, K. N. & Bowler, P. A. (2006) Factors affecting understory establishment in coastal sage scrub restoration. *Madroño*, **53**, 55–59.

Selected Work in Progress

5. Fuß, T., Thuile Bistarelli, L., **Talluto**, **L.**, del Campo, R., Altermatt, F., Masese, F. & Singer, G. (in revision) River size drives community assembly processes in river networks. *Proceedings of the National Academy of Sciences of the USA*.

4. Rittweg, T. D., Trueman, C., Wiedenbeck, M., Fietzke, J., Wolter, C., **Talluto**, **L.**, Dennenmoser, S., Nolte, A. & Arlinghaus, R. (in revision) Variable habitat use supports fine-scale population differentiation of a freshwater piscivore (northern pike, *Esox lucius*) along salinity gradients in brackish lagoons. *Oecologia*.

3. Thuile Bistarelli, L., Fuß, T., Walther, F., Zoccarato, L., **Talluto**, **L.**, Romaní, A. M., Grossart, H. & Singer, G. A. (in review) Strong large-scale structure-function coupling in benthic bacteria is mediated by algae in a geodiverse river network. *Limnology and Oceanography*.

2. **Talluto**, **M.**, del Campo, R., Estévez, E., Fuss, T., Thuile-Bistarelli, L., Martini, J. & Singer, G. (2024) Modelling Biological and Resource Fluxes in Fluvial Meta-Ecosystems. *BioRxiv*.

1. Lukas, P. M., Thuiller, W., **Talluto**, **M. V.** & 80 additional authors (2023) Including Biotic Interactions in Species Distribution Models Improves the Understanding of Species Niche: A Case of Study with the Brown Bear in Europe. *BioRxiv*, 2023.03.10.532098.

Grants

3. Talluto, M. V. (2018) Processing of terrigenous organic carbon in partly intermittent river networks under future hydrological scenarios. *SMIRES (Science and Management of Intermittent Rivers and Ephermeral Streams) COST Action—Short Term Scienctific Mission*, **€1370**.

2. Benkman, C. W. & Talluto, M. V. (2011) The role of red squirrels (*Tamiasciurus hudsonicus*) in shaping spatial patterns of serotiny in lodgepole pine (*Pinus contorta*) forests. *University of Wyoming-National Park Service Small Grants Program*, **US$5000**.

1. Talluto, M. V. (2011) Spatial heterogeneity in selection on serotiny from red squirrel (*Tamiasciurus hudsonicus*) predation on lodgepole pine (*Pinus contorta*). *American Society of Mammalogists*, **US$1500**.

Awards

2015 **Excellence Award**, *Quebec Centre for Biodiversity Science*, (CA$2,000)
2014 **Excellence Award**, *Quebec Centre for Biodiversity Science*, (CA$2,500)
2013 **Dissertation Augmentation**, *University of Wyoming Graduate School*, (US$1,400)
2012 **George E. Menkins Memorial Scholarship**, *University of Wyoming*, (US$30,000)
2010 **L. Floyd Clarke Greater Yellowstone Scholarship**, *University of Wyoming*, (US$2,000)
2009 **Program in Ecology Fellowship**, *University of Wyoming*, (US$19,500)
2005 **Brython Davis Scholarship**, *University of California, Irvine*, (US$6,600)

Presentations (Selected first-author)

13. Talluto, M. V., del Campo, R., Estévez, Edurne, Fuß, T., Thuile Bistarelli, L. & Singer, G. A. (2022) "A model coupling dispersal and resource fluxes in fluvial meta-ecosystems". *SIL: Congress of the International Society of Limnology*.

12. Talluto, M. V. (2019) "Macroecology, data science, and the future of environmental management". *School of Biological Sciences, Queen's University Belfast*.

11. Talluto, M. V., Fuß, T. & Singer, G. A. (2019) "Modelling ecosystem metabolism at the scale of entire river networks". *Symposium for European Freshwater Sciences*.

10. Talluto, M. V. (2017a) Climatic disequilibrium in tree species distributions in North American forests. *Department of Evolutionary Biology and Environmental Studies, University of Zürich*.

9. Talluto, M. V. (2017b) Critical transitions and lagged response to climate change in eastern North American forests. *Alpine Ecology Lab, Grenoble, France*.

8. Talluto, M. V. (2017c) Improving biodiversity models by integrating multiple information sources. *Ecological Society of America Annual Meeting*.

7. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2017) Critical transitions and lagged response to climate change in eastern North American forests. *Department of Bioscience - Ecoinformatics and Biodiversity, Aarhus University, Denmark*.

6. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2016) Local dynamics slow the response of species ranges to climate change in eastern North American forests. *French Ecological Society Annual Meeting*.

5. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2015) Local colonization-extinction dynamics gen- erate lags in the response to climate change in eastern North American forests. *American Geophysical Union Annual Fall Meeting*.

4. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2014a) A framework for cross-scale integration for predicting tree range shifts under climate change. *7th Eastern CANUSA conference in forest science*.

3. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2014b) A framework for cross-scale integration for predictive modeling of species' ranges. *Ecological Society of America Annual Meeting*.

2. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2014c) A state-transition approach to estimating the migration rate of the temperate-boreal forest transition under climate change. *Quebec Centre for Biodiversity Science Annual Symposium*.

1. Talluto, M. V., Boulangeat, I., Vissault, S. & Gravel, D. (2012) Effects of natural selection from seed predation on serotiny: The role of red squirrels in determining forest structure in lodgepole pine. *Ecological Society of America Annual Meeting*.

Mentoring

M.Sc. 2024 (expected) **Antonia Dill**, *University of Innsbruck*, (co-advised with G. Singer)

B.Sc. 2024 **Lukas Prader**, *University of Innsbruck*, (co-advised with G. Singer)

M.Sc. 2022 **Franziska Walther**, *Humboldt-Universität Zu Berlin*, (co-advised with T. Krüger)

M.Sc. 2016 **Steve Vissault**, *Université du Québec à Rimouski*, (co-advised with D. Gravel)

B.S. 2005 **Jocelyn Oakley**, *University of California, Irvine*, (co-advised with K. Suding)

B.S. 2005 **Kimberly Kurcab**, *University of California, Irvine*, (co-advised with K. Suding)

Teaching Appointments

2020–Pres. **Instructor**, University of Innsbruck, Innsbruck, Austria
Courses Taught: Bayesian Statistics (Ph.D.), Data Analysis (M.Sc), Macroecology (M.Sc), Field Ecology Excursion (M.Sc), Data Management and Statistics (B.Sc)

2018–2021 **Instructor**, IGB, Leibniz Institute for Freshwater Ecology and Inland Fisheries, Berlin, Germany
Courses Taught: Introductory Bayesian statistics for ecologists

2017–2018 **Guest Instructor**, *Department of Biology*, Sherbrook University, Sherbrooke, Canada
Courses Taught: Bayesian Statistics for Ecologists (summer school)

2012 **Instructor**, *Department of Geography*, University of Wyoming, Laramie, Wyoming, USA
Courses Taught: Biogeography

2007 **Adjunct Professor**, *Department of Environmental Studies*, Mt. San Jacinto College, San Jacinto, California, USA
Courses Taught: Introduction to Environmental Studies

2005–2008 **Instructor**, *Department of Ecology and Evolutionary Biology*, University of California, Irvine, California, USA
Courses Taught: California Natural History; Experimental Biology Laboratory

2002–2005 **Teaching Assistant**, *Department of Ecology and Evolutionary Biology*, University of California, Irvine, California, USA
Courses Taught: Experimental Biology Laboratory; Processes in Ecology and Evolution; Patterns of Diversity, Ecology, and Evolution; Way Your Body Works (Human Physiology); COSMOS: High School Summer Program for Math and Science

Service & Professional Activities

2017 **Symposium Co-organizer (with LJ Pollock and K Mokany)**, *New Approaches and Challenges for the Next Generation of Biodiversity Models*, Ecological Society of America Annual Meeting

2012 **Judge for student presentations**, Ecological Society of America Annual Meeting

2012 **Student webmaster**, University of Wyoming Department of Zoology & Physiology

2012 **Student representative to faculty meetings**, University of Wyoming Department of Zoology & Physiology

2010 **Judge**, Wyoming State High School Science Fair

Reviewing

Conservation Biology, Diversity and Distributions, Ecological Modelling, Ecology Letters, Ecography, Global Ecology and Biogeography, Journal of Biogeography, Journal of Ecology, Methods in Ecology and Evolution, NSF Division of Environmental Biology, PLoS One, The American Naturalist