

Michal Tal

Curriculum vitae

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Professional training and appointments

- 2010 – 2022 Assistant Professor, Department of Geography and Department of Earth Science, Aix-Marseille University, Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement ([CEREGE](#)) UMR 7330, Europôle de l'Arbois, BP 80, 13545 Aix-en-Provence cedex 04, France
- 2009 – 2010 Postdoctoral researcher, Laboratoire d'Hydraulique Saint Venant, Ecole des Ponts ParisTech (ENPC), Paris, France
- 2007 – 2009 Postdoctoral researcher, Institut de Physique du Globe de Paris (IPGP), Université Paris Diderot, Paris, France
- 2008 PhD, major Geology, minor Civil Engineering, University of Minnesota, Minneapolis, Minnesota, USA, Thesis: Interactions between riparian vegetation, channel morphology, and flow dynamics," Advisor: Chris Paola
- 1999 B.A., Geography *magna cum laude*, The Hebrew University of Jerusalem, Jerusalem, Israel, Senior project: Experiments on the effect of hydrograph characteristics on vertical grain sorting in gravel bed rivers dynamics," Advisor: Marwan Hassan

Publications

"*" Denotes student advisee or postdoc of MT

Peer-reviewed articles

*Daniel Vázquez-Tarrío, Michal Tal, *Elsa Parrot, Hervé Piégay, Can we incorrectly link armouring to damming? A need to promote hypothesis-driven rather than expert-based approaches in fluvial geomorphology, *Geomorphology*, Volume 413, 2022, 108364, ISSN 0169-555X, <https://doi.org/10.1016/j.geomorph.2022.108364>.

Viparelli, E., Balkus, A., Vázquez-Tarrío, D., Hill, K. M., Tal, M., & Fedele, J., Streamwise and vertical dispersal of tracer stones in an equilibrium bed, 2022, *Water Resources Research*, 58, e2022WR033137. <https://doi.org/10.1029/2022WR033137>

Laura Triplett, Michal Tal, Zachary Wagner, Karin Kettenring, Invasion of a Widespread, Non-Native Grass Causes Downstream Reductions in Bioavailable Silica. *Journal of the American Water Resources Association*, Wiley, 2020, 56 (5), pp.810-819. {10.1111/1752-1688.12868}. {hal-03153035}

*Issa Sakho, Philippe Dussouillez, Doriane Delanghe, Boris Hanot, Guillaume Raccasi, et al.. Suspended sediment flux at the Rhone river mouth (France) based on ADCP measurements during flood events. *Environmental Monitoring and Assessment*, Springer Verlag (Germany), 2019, 191 (8), pp.508. {10.1007/s10661-019-7605-y}. {hal-02317880}

*Vazquez-Tarrío, D., Tal, M., Camenen, B., Piégay, H., 2019, Effects of continuous embankments and successive run-of-the-river dams on bedload transport capacities along the Rhône River, France. *Science of the Total Environment*, Elsevier, 2019, 658, pp.1375-1389.

Coraline Wintenberger, Stéphane Rodrigues, Sabine Greulich, Jean-Gabriel Bréhéret, P. Jugé, et al.. Control of Non-migrating Bar Morphodynamics on Survival of *Populus nigra* Seedlings during Floods. *Wetlands*, Springer Verlag, 2019, 39 (2), pp.275-290. [10.1007/s13157-018-1121-7](https://doi.org/10.1007/s13157-018-1121-7). halshs-02045329

*Vazquez-Tarrio, D., Recking A., Liébault, F., Tal, M., Menéndez-Duarte, R. 2018, Particle transport in gravel-bed rivers: Revisiting passive tracer data. *Earth Surface Processes and Landforms*, Wiley, doi: 10.1002/esp.4484

*Jourdain, C., Belleudy, P., Tal, M., Malavoi, J.R., 2017, The role of hydrology on vegetation removal in a heavily managed gravel bed river: the Isere, Combe de Savoie, France, <http://geomorphologie.revues.org/11761>

Metivier, F., C. Paola, J. L. Kozarek, M. Tal, 2016, Experimental studies and practical challenges in fluvial geomorphology, in *Tools in Fluvial Geomorphology*, Second Edition, Eds. M. Kondolf and H. Piegay, John Wiley & Sons, Ltd, pp 456 – 475.

Bertoldi, W., M. Welber, A.M. Gurnell, L. Mao, F. Comiti, M. Tal, 2015, Physical modeling of the combined effect of vegetation and wood on river morphology, *Geomorphology* 246, 178–187, doi:10.1016/j.geomorph.2015.05.038.

Gran, K. B., Tal, M., Wartman, E.D., 2015, Co-evolution of riparian vegetation and channel dynamics in an aggrading braided river system, Mount Pinatubo, Philippines. *Earth Surf. Process. Landforms*, 40, 1101–1115. doi: 10.1002/esp.3699.

Thomas, R.E., M.F. Johnson, L.E. Frostick, D.R. Parsons, T.J. Bouma, J.T. Dijkstra, O. Eiff, S. Gobert, P-Y. Henry, P. Kemp, S.J. McLelland, F.Y. Moulin, D. Myrhaug, A.Neyts, M. Paul, W. E. Penning, S. Puijalon, S.P. Rice, A. Stanica, D.Tagliapietra, M. Tal, A.Tørnum, M.I. Voudoukas, 2014, Physical modeling of water, fauna and flora: knowledge gaps, avenues for future research and infrastructural needs, *Journal of Hydraulic Research*, DOI: 10.1080/00221686.2013.876453

Triplett, L.D., K.M. Kettenring, M. Tal, C. Smith, 2014, The potential for multiple signatures of invasive species in the geologic record. *Anthropocene*, 10.1016/j.ancene.2014.06.002.

*Wickert, A. D., J. M. Martin, M. Tal, W. Kim, B. Sheets, and C. Paola, 2013, River channel lateral mobility: metrics, time scales, and controls, *J. Geophys. Res. Earth Surf.*, 118, 396–412, doi:10.1029/2012JF002386.

Tal, M., Kim W., Lajeunesse E., Limare A., Métiver F., Frey P., 2012, The use of imagery in flume experiments, in *Fluvial Remote Sensing for Science and Management*, Eds. Patrice Carbonneau and Hervé Piegay, John Wiley & Sons Ltd., West Sussex.

Limare, A., M.Tal., M. Reitz, E. Lajeunesse, F. Metivier, 2011, Optical method for measuring bed topography and flow depth in an experimental flume, *Solid Earth*, 2, 143–154, doi:10.5194/se-2-143-2011

Tal, M., C. Paola, 2010, Effects of vegetation on channel morphodynamics: results and insights from laboratory experiments, *Earth Surface Processes and Landforms*, doi: 10.1002/esp.1908

Tal, M., C. Paola, 2010, Effects of vegetation on channel morphodynamics: results and insights from laboratory experiments, *Earth Surface Processes and Landforms*, doi: 10.1002/esp.1908

Hicks, D.M., Duncan, M.J., Lane, S.N., Tal, M., Westaway, R., 2008, Contemporary morphological change in braided gravel-bed rivers: new developments from field and laboratory studies, with particular reference to the influence of riparian vegetation, in *Gravel Bed Rivers 6; From Process Understanding to River Restoration*, Eds. H. Habersack, H. Piegay, and M. Rinaldi, Elsevier, pp. 557 – 586.

Murray, A.B., M.A.F. Knappen, M. Tal, M.L. Kirwan, 2008, Biomorphodynamics: Physical-biological feedbacks that shape landscapes, *Water Resources Research*, doi: 10.1029/2007WR006410.

Tal, M., Paola, C., 2007, Dynamic single-thread channels maintained by the interactions of flow and vegetation, *Geology*, v. 35, p. 347-350, doi: 10.1130/G23260A.1.

Tal, M., Gran, K., Murray, A.B., Paola, C., Hicks, D.M., 2004, Riparian vegetation as a primary control on channel characteristics in multi-thread rivers, in *Riparian Vegetation and Fluvial Geomorphology: Hydraulic, Hydrologic, and Geotechnical Interactions*, Eds. Sean J. Bennett and Andrew Simon, American Geophysical Union Monograph, pp. 43 – 58.

Scientific reports

Michal Tal, Nicolas Lamouroux, Fred Liebault, *Sadegh Jafarinik, *Jonathan Coutaz, Guillaume Brousse, 2021. Evaluation of the effects of river management and restoration on hydro-sedimentary dynamics and habitat of along the Buëch River downstream of the Saint-Sauveur dam based on morpho-sedimentary monitoring, 1D morphodynamic modeling, and statistical models. Final report for a project funded by the French Water Agency (ZABR-AE 2018 – 2021).

*Alyssa Serlet, Michal Tal. 1D Morphodynamic modeling of the Peage de Roussillon reach, Rhone River, France, 2020. Final report for a research axis funded by the Rhone Sediment Observatory (OSR5 2018 - 2020) ([hal-03293550](#))

Michal Tal, *Daniel Vázquez Tarrío, Philippe Dussouillez, Hervé Piégay, Benoit Camenen, *Amel Ati, Long-term morphodynamic evolution of the Rhone River, France, 2017. Final report for a research axis funded by the Rhone Sediment Observatory (OSR4 2015 - 2017) ([hal-03588697](#))

*E. Parrot, Hervé Piégay, Lise Vaudor, Guillaume Fantino, Michal Tal. Analysis of bed evolution along the Rhone's main channel from Lake Geneva to the Mediterranean Sea, 2014. Action 1. Final report for a research axis funded by the Rhone Sediment Observatory (OSR2 2010 - 2013) ([hal-03446806](#))

*E. Parrot, Hervé Piégay, Lucile Hammou, Guillaume Fantino, Michal Tal. Characterisation of sediment continuity along the Rhone River, 2014. Action 2. Final report for a research axis funded by the Rhone Sediment Observatory (OSR2 2010 - 2013) ([hal-03446810](#))

Advising

Postdocs

2019 – 2022, Alyssa Serlet: 1D morphodynamic modeling of the Rhone River

2018 – 2019, Sadegh Jafarinik: 1D morphodynamic modeling of the Buëch River

2017 – 2018, Daniel Vazquez Tarrío: bedload transport along the Rhone River

2013 – 2014, Issa Sakho: Estimating suspended sediment transport using passive acoustic techniques

PhDs

2016 – 2020 (director)

Jonathan Coutaz, Interactions amongst morphological evolution, sediment transport, and hydraulics along a gravel-bed braided river: The Buëch River, Alpes de Haute-Provence. Aix-Marseille University ([Coutaz, 2021](#))

2013-2017 (co-director)

Camille Jourdain, The impact of floods on sediment and vegetation dynamics in a gravel-bed river: The Isère River, Combe de Savoie. Université Grenoble Alpes ([Jourdain, 2017](#))

2010 – 2015, (co-director)

Elsa Parrot, Spatio-temporal analysis of the morphology of the Rhône River from Lake Geneva to the Mediterranean Sea, Université Jean-Moulin Lyon III ([Parrot, 2015](#)).

Scientific steering and evaluation

PhD thesis committees

2021-2022, Li Jiaz, EDF and Univ. of Tours, Implementation of a novel approach accounting for the influence of vegetation on sediment transport in GAIA

2018, Guillaume Brousse, Univ. Paris Diderot, Restoration efficiency and recovery of altered torrential rivers

2014-2015, Coraline Winterberger, Univ. François Rabelais – Tours, Fluvial dynamics and pioneer woody vegetation of Salicaceae in mixed sand-bed rivers

2013-2014, Sandrine Tacon, Univ. Lyon II, Spatio-temporal analysis of braided river morphology based on LiDAR

2012-2013, Pauline Leduc, IRSTEA – Grenoble, Experimental study of braided river dynamics

2010 - 2012, Margot Chapuis, Aix-Marseille Univ. Mobility of coarse river sediments in a highly managed alpine river: elements for the management of the lower Durance Valley

PhD defense juries

2021, Jules LeGuern, Univ. of Tours, Morphodynamics of a mixed sand-gravel river: Acoustic methods for quantifying bedload and analysis of bedform interactions in river channels

2021, Bas Bodewes, Univ. of Hull, Representing vegetation in experimental models of river systems

2020, Léo Szewczyk, Univ. PSL Paris, Bedload fill of abandoned channels

2020, Gabrielle Seignemartin, Univ. Lyon II, Contemporary evolution of the Rhône River "Girardon dike fields": geohistoric approach based on morpho-sedimentary, geochemical and phytoecological indicators

2020, Guillaume Brousse, Univ. Paris Diderot, Restoration efficiency and recovery of altered torrential rivers

2020, Maxime Morel, Univ. Claude Bernard Lyon I, Intercontinental modeling of the hydraulic geometry of stream reaches and applications for the ecological management of catchments.

[2018, Alyssa Serlet](#), Trento University and Queen Mary University of London, Biomorphodynamics of river bars in channelized, hydropower-regulated rivers

[2018, Borbála Hortobágy](#), Univ. Clermont Auvergne, Multi-scale interactions between riparian vegetation and hydrogeomorphic processes (the lower Allier River)

2017, Pauline Delorme, Institut de Physique du Globe de Paris, Morphology of alluvial fans

[2015, Coraline Winterberger](#), Univ. François Rabelais – Tours, Fluvial dynamics and pioneer woody vegetation of Salicaceae in mixed sand-bed rivers

2012, Margot Chapuis, Aix-Marseille Univ., Mobility of coarse river sediments in a highly managed alpine river: elements for the management of the lower Durance Valley

Collaborations

Research collaborations

University of South Carolina, Columbia, Department of Civil and Environmental Engineering, South Carolina, USA

University of Minnesota – Duluth, Department of Earth & Environmental Sciences, Duluth, Minnesota, USA

University of Texas at Austin, Department of Geological Sciences, Austin, Texas, USA

Aix-Marseille University, Mediterranean Institute of marine and terrestrial Biodiversity and Ecology
CNRS Environment – City – Society Laboratory, UMR 5600, Lyon, France
Univ. Grenoble Alpes, Laboratoire d'Etude des Transferts en Hydrologie et Environnement, Grenoble, France
Gustavus Adolphus College, Department of Geology and Environmental Studies, St Peter, Minnesota, USA
Utah State University, Ecology Center and Department of Watershed Sciences, Quinney College of Natural Resources, Logan, Utah, USA
INRAE Grenoble, ETNA research unit - Torrential Erosion, Snow and Avalanches, Grenoble, France
INRAE Lyon, Interdisciplinary research unit for the management and restoration of river systems and their catchments, Lyon, France
Grenoble Institute of Engineering and Management, Grenoble, France
Grenoble Institute of Environmental Geosciences, Grenoble, France
Polytechnic Institute, Univ. of Tours, Tours, France

Industrial and socio-economic partnerships

[French Water Agency](#)

Electricité de France ([EDF](#))
Compagnie Nationale du Rhône ([CNR](#))
Durance River Basin Syndicate ([SMAVD](#))
Buech River Basin Syndicate ([SMIGIBA](#))
Isere River Basin Syndicate ([SISARC](#))
Bléone River Basin Syndicate ([SMAB](#))

Diverse responsibilities and activities

Rhone Sediment Observatory ([OSR](#)): coordinate multiple research axes on sediment transport and channel morphology

Rhone Basin Long-Term Environmental Research Observatory ([ZABR / RBLTER](#)): Scientific steering committee and CEREGE liaison

Study of consequences of fluvial maintenance operations on [biodiversity in the Mareau-aux-Prés islands](#) (National Reserve of Saint-Mesmin, Loire River, France): proposal evaluation

Expert committee member to evaluate a project for the construction of a [levee between Tarascon and Arles](#), [SYMADREM](#)

Scientific peer review

Nature Geoscience
Earth Surface Processes and Landforms
Geomorphology
Journal of Geophysical Research – Earth Surface
Water Resources Research

ESurf

Outreach

Participation in the Annual Science Festival, CEREGE

Participation in the Annual meeting of university and high school science teachers, CEREGE

Participation in annual meetings of scientific researchers and river managers in the Rhone and Durance river basins