Seminar Jeudi AMAP

Jordi Martinez-Vilalta is a senior scientist at CREAF (Ecological and Forestry Applications Research Centre), Barcelona, Spain, and associate professor at the Autonomous University of Barcelona.

Email: Jordi.Martinez.Vilalta@uab.cat
Personal website: /http://www.creaf.cat/staff/jordi-martinez-vilalta

Tuesday 26 March 2019
11h00 – 11h40

Salle 201, Bâtiment PS2, CIRAD-UMR AMAP, Boulevard de la Lironde

How can we predict drought-induced forest mortality?

presented by

Dr. Jordi Martinez-Vilalta

UMRAMAP – INRA, Montpellier, France

ABSTRACT:

Drought ‐ induced tree mortality has major impacts on ecosystem carbon and water cycles, and is expected to increase in forests across the globe with climate change. A large body of research in the past decade has advanced our understanding of plant water and carbon relations under drought. However, despite intense research, we still lack generalizable, cross ‐ scale indicators of mortality risk. I will review recent progress in mortality prediction, focusing on the reasons why progress has been limited. I will also propose that a more explicit consideration of water pools (e.g., the relative water content, RWC) could improve our ability to monitor and anticipate mortality risk. Measures of plant water content are likely to have a strong mechanistic link with mortality and to be integrative, threshold ‐ prone and relatively easy to measure and monitor at large spatial scales, and may complement current mortality metrics based on water potential, loss of hydraulic conductivity and nonstructural carbohydrates.

KEY WORDS: forest, drought, mortality, NSC, hydraulic conductivity

Invited and animated by:	Dr. Alexia Stokes (UMR AMAP)
Type:	Research results
Oral language:	English
Language of PPT:	English

Recent publications

Martinez-Vilalta J., Anderegg W.R.L., Sapes G., Sala A. (2019) *Greater focus on water pools may improve our ability to understand and anticipate drought-induced mortality in plants.* New Phytologist. : 0-0.

Alfaro Reyna T., Retana J., Martínez-Vilalta J. (2018) *Is there a substitution of Pinaceae by Fagaceae in temperate forests at the global scale?.* Global and Planetary Change. 166: 41-47.

Cabon A., Martínez-Vilalta J., Martínez de Aragón J., Poyatos R., De Cáceres M. (2018) *Applying the eco-hydrological equilibrium hypothesis to model root distribution in water-limited forests.* Ecohydrology. : 0-0.

Fernández-Pérez L., Villar-Salvador P., Martínez-Vilalta J., Toca A., Zavala M.A. (2018) *Distribution of pines in the Iberian Peninsula agrees with species differences in foliage frost tolerance, not with vulnerability to freezing-induced xylem embolism.* Tree Physiology. 38: 507-516.

Lloret F., Sapes G., Rosas T., Galiano L., Saura-Mas S., Sala A., Martínez-Vilalta J. (2018) *Non-structural carbohydrate dynamics associated with drought-induced die-off in woody species of a shrubland community*. Annals of Botany. 121: 1383-1396.

Martínez-Vilalta J. (2018) *The rear window: Structural and functional plasticity in tree responses to climate change inferred from growth rings.* Tree Physiology. 38: 155-158.

Poyatos R., Aguadé D., Martínez-Vilalta J. (2018) *Below-ground hydraulic constraints during drought-induced decline in Scots pine.* Annals of Forest Science. 75: 0-0.

Poyatos R., Sus O., Badiella L., Mencuccini M., Martínez-Vilalta J. (2018) *Gap-filling a spatially explicit plant trait database: Comparing imputation methods and different levels of environmental information*. Biogeosciences. 15: 2601-2617.

Roces-Díaz J.V., Vayreda J., Banqué-Casanovas M., Cusó M., Anton M., Bonet J.A., Brotons L., De Cáceres M., Herrando S., Martínez de Aragón J., de-Miguel S., Martínez-Vilalta J. (2018) *Assessing the distribution of forest ecosystem services in a highly populated Mediterranean region.* Ecological Indicators. 93: 986-997.

Roces-Díaz, J.V., Vayreda, J., Banqué-Casanovas, M., Díaz-Varela, E., Bonet, J.A., Brotons, L., de-Miguel, S., Herrando, S., Martínez-Vilalta, J. (2018) *The spatial level of analysis affects the patterns of forest ecosystem services supply and their relationships.* Science of the Total Environment. 626: 1270-1283.

Serra-Maluquer X., Mencuccini M., Martínez-Vilalta J. (2018) *Changes in tree resistance, recovery and resilience across three successive extreme droughts in the northeast Iberian Peninsula.* Oecologia. : 1-12.

Stojnić S., Suchocka M., Benito-Garzón M., Torres-Ruiz J.M., Cochard H., Bolte A.,…Delzon S. (2018) *Variation in xylem vulnerability to embolism in European beech from geographically marginal populations*. Tree Physiology. 38: 173-185.