INVITATION

The EFLUM has the pleasure to announce seminar

Monday, April 6th
12h15 - Room GRA0435
(http://plan.epfl.ch/?lang=en&room=GRA0435)

Blending field studies, wind tunnel models and theory to understand and predict stable flows on forested hills

Prof. John Finnigan
CSIRO Marine and Atmospheric Research, Canberra, Australia

This tale of discovery illustrates the powerful role that can be played by abstracting complex flows from the field and reproducing their essential features in the wind tunnel. To model these flows physically we are forced to consider carefully which physical features are essential and which can be traded off to allow us to reproduce the flow in the tunnel. In turn we are rewarded by insights from the controlled environment that natural variability in the real environment together with the much lower measurement density that is possible there usually obscure.

These insights include the confirmation that turbulent transport collapses suddenly in the canopy as Fr falls but that turbulent fluctuations do not. It has allowed us to quantify the relationship between the Froude number and the onset of the gravity flow and told us that the gravity current starts as a thin layer near the ground and deepens to fill the canopy as Fr falls. It also warns us that the thermal wind term, which we tend to ignore at the canopy scale, can be a first order term in the momentum balance and will play a key role in timing the onset of the gravity current and its evolution through the night.