

Towards the prediction of large wildfire occurrence from synoptic circulation patterns?



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A growing “*large wildfire*” problem

nature
ecology & evolution

ARTICLES

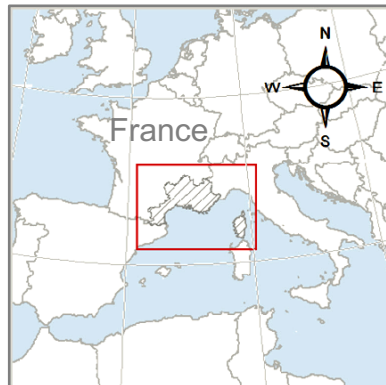
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Human exposure and sensitivity to globally extreme wildfire events

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Rognac-Vitrolles, August 2016

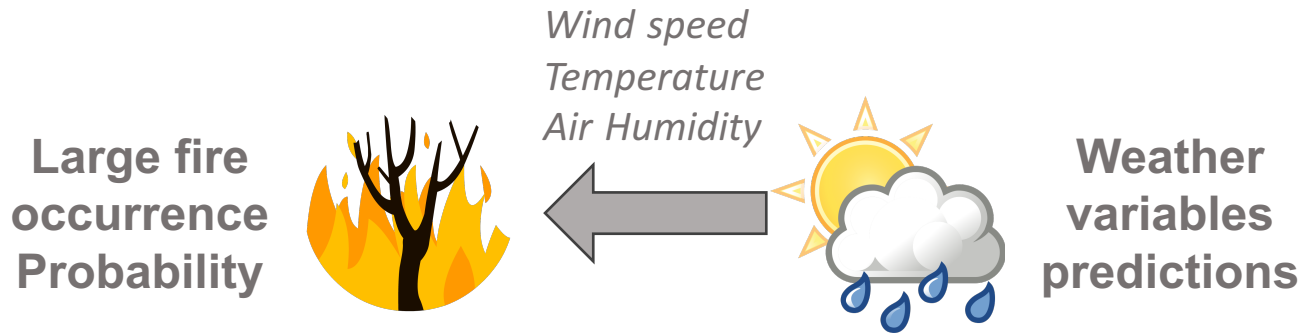


Study area

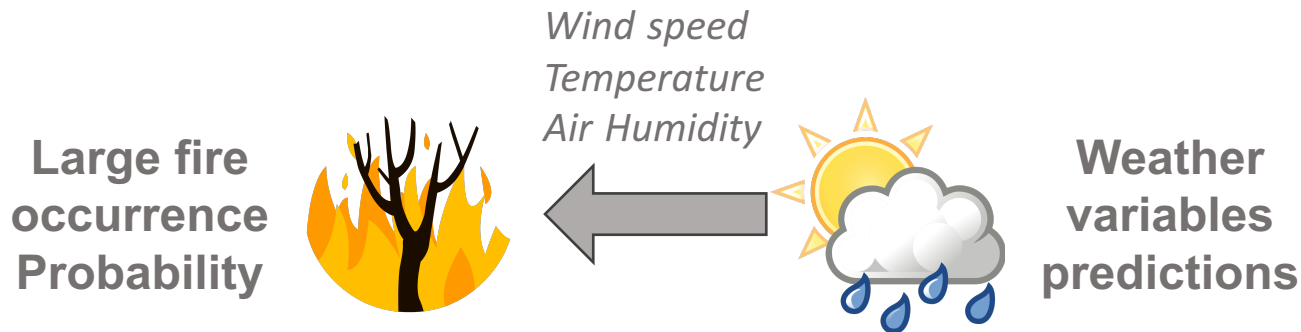


Calanques, September 2016

Today's focus: Large Fire Forecasting and Projection



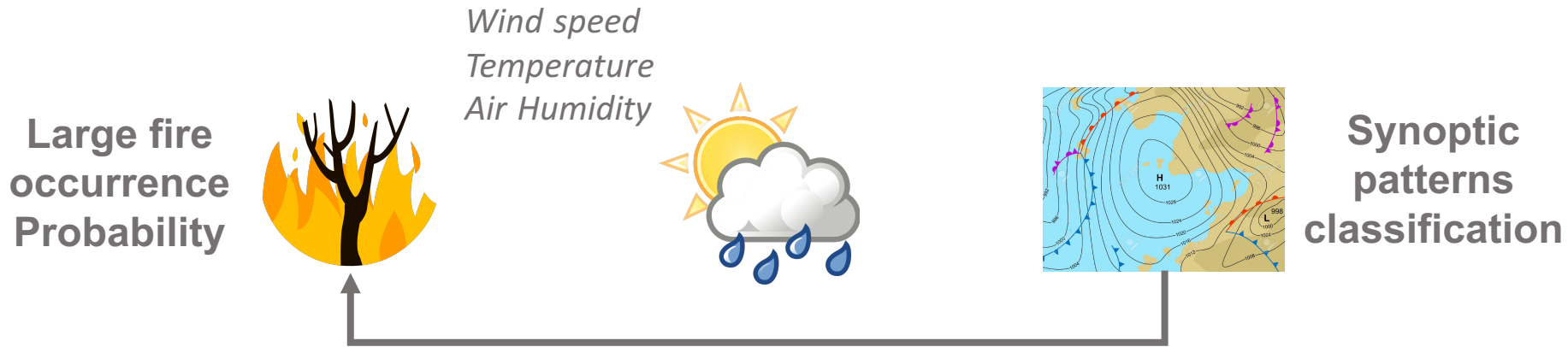
Today's focus: Large Fire Forecasting and Projection



Main issues

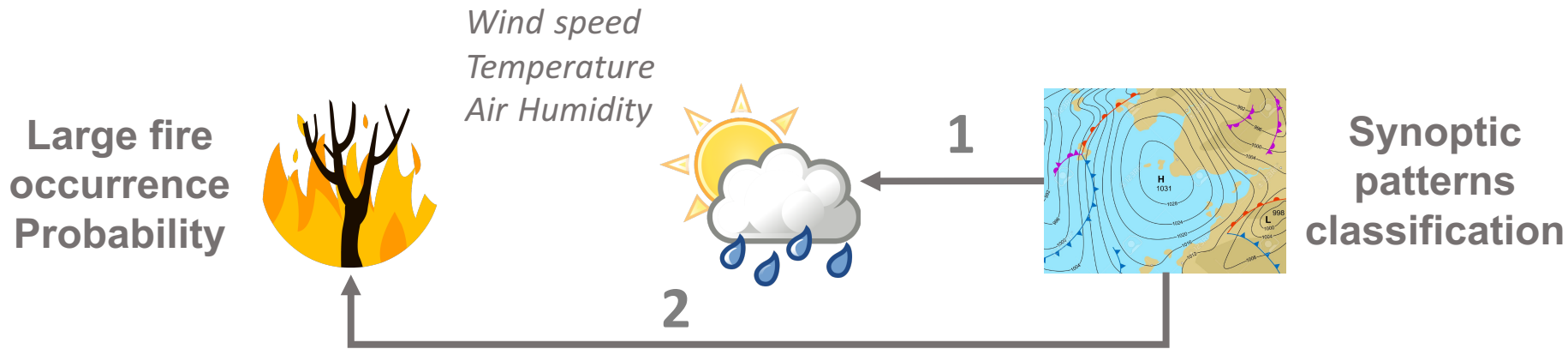
- Relies on local predictions of surface climatic variables
- Limited understanding of the fire-climate relationship

Today's focus: Large Fire Forecasting and Projection



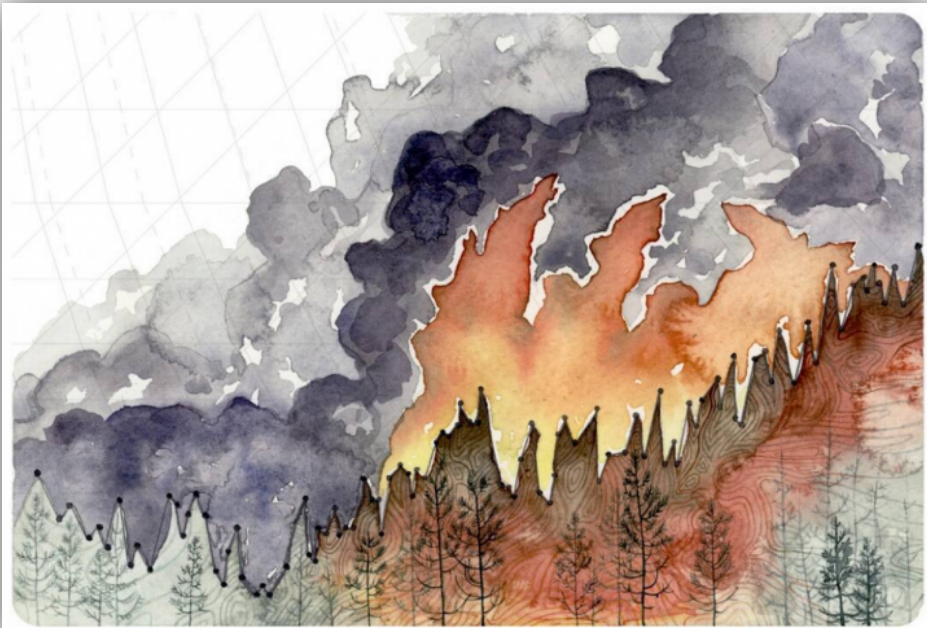
A classification of synoptic scale variables might be used to predict large fires

Today's focus: Large Fire Forecasting and Projection



Objectives

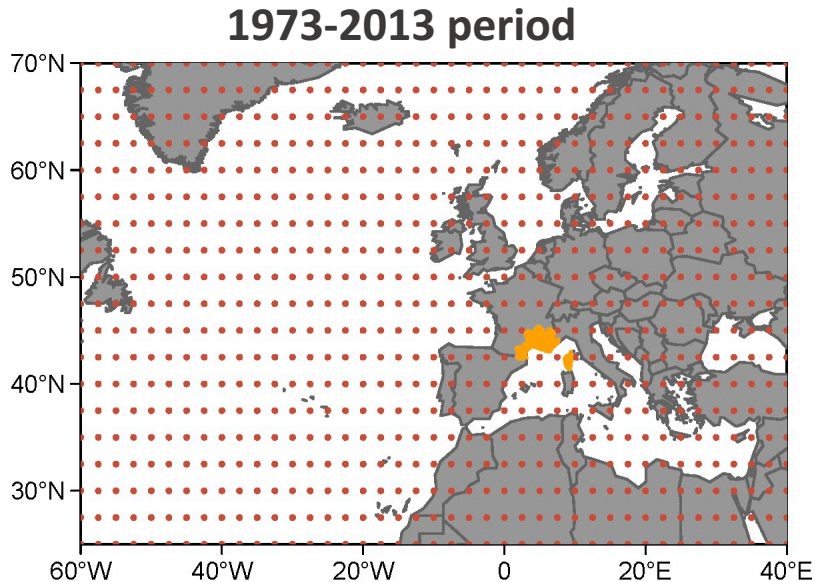
1. Can we relate synoptic patterns to fire weather?
2. Can synoptic patterns be used to predict large fire probability?



Drawing credit: Jill Pelto, 2016

1. Are synoptic patterns related to fire weather

A parsimonious discretization of summer synoptic-scale conditions



Summer daily **sea level pressure** and **winds at 925 hpa**
NCEP/NCAR (2.5 x 2.5 °)

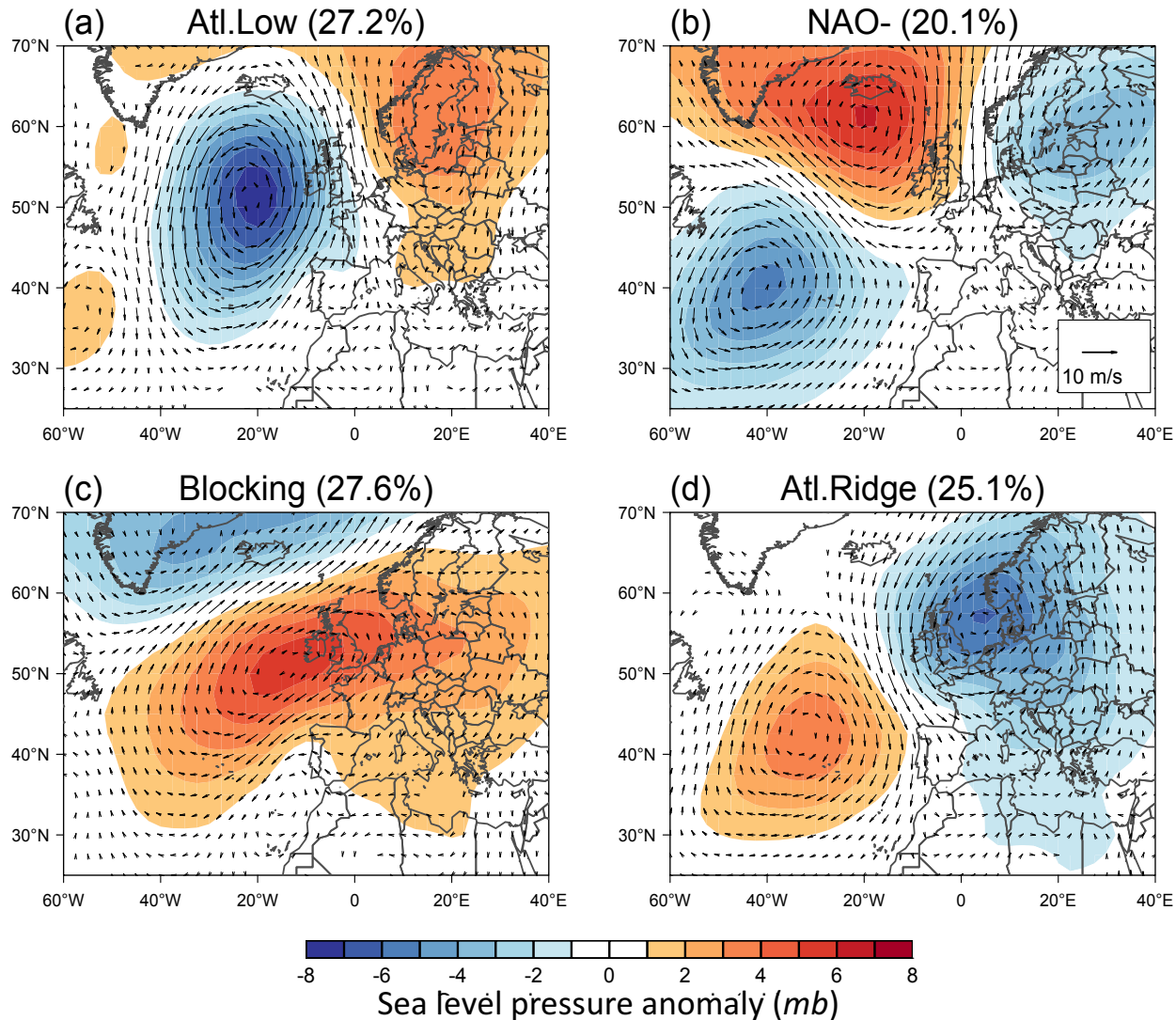
2460 maps



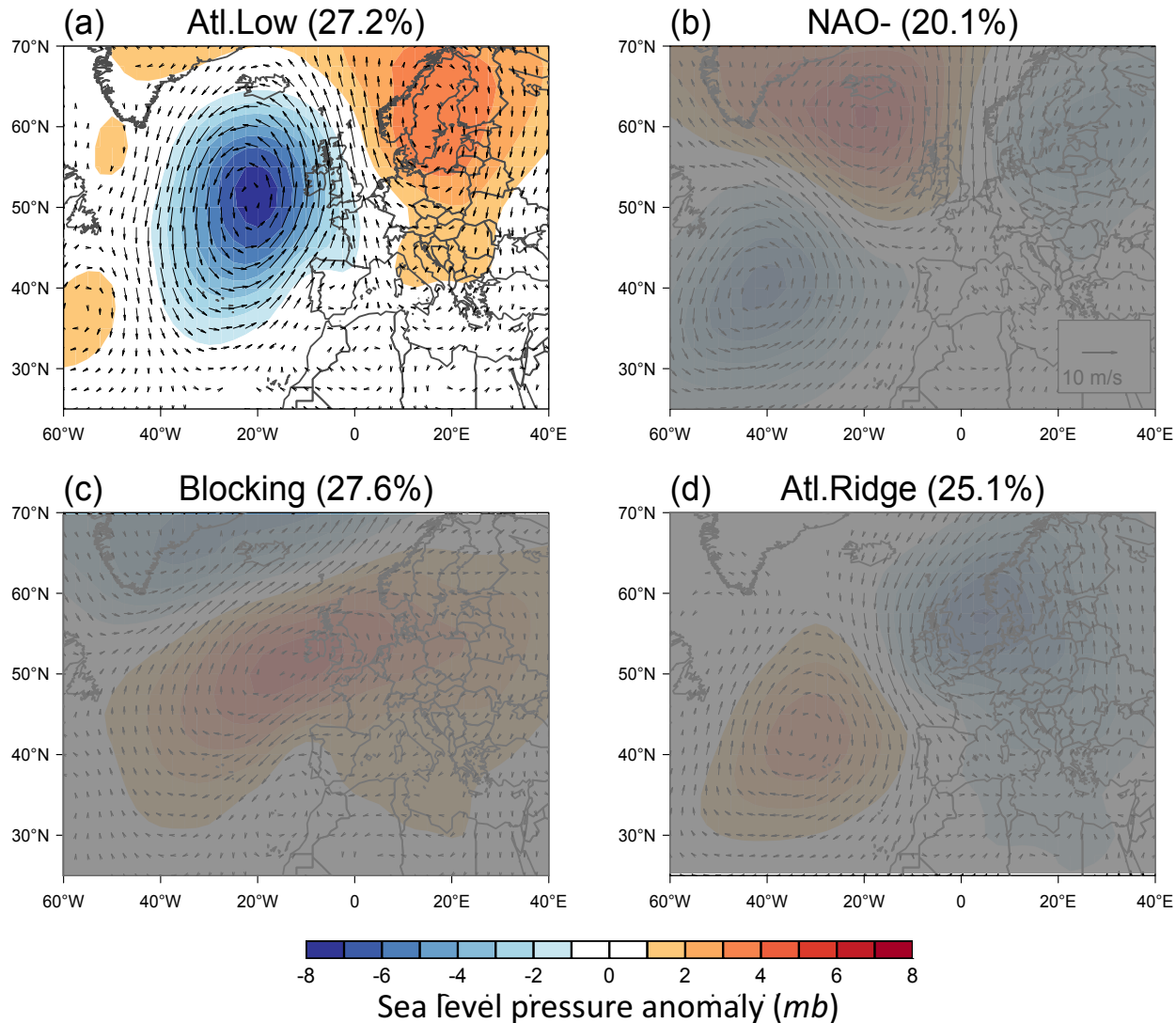
Classification method
(PCA+Kmeans)

4 Weather Types

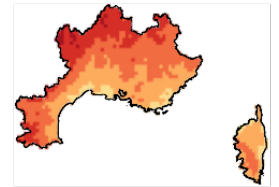
Four Weather Types with contrasted patterns



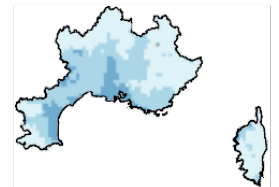
Atlantic Low : Warm and humid



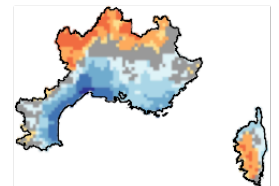
Temp anomaly



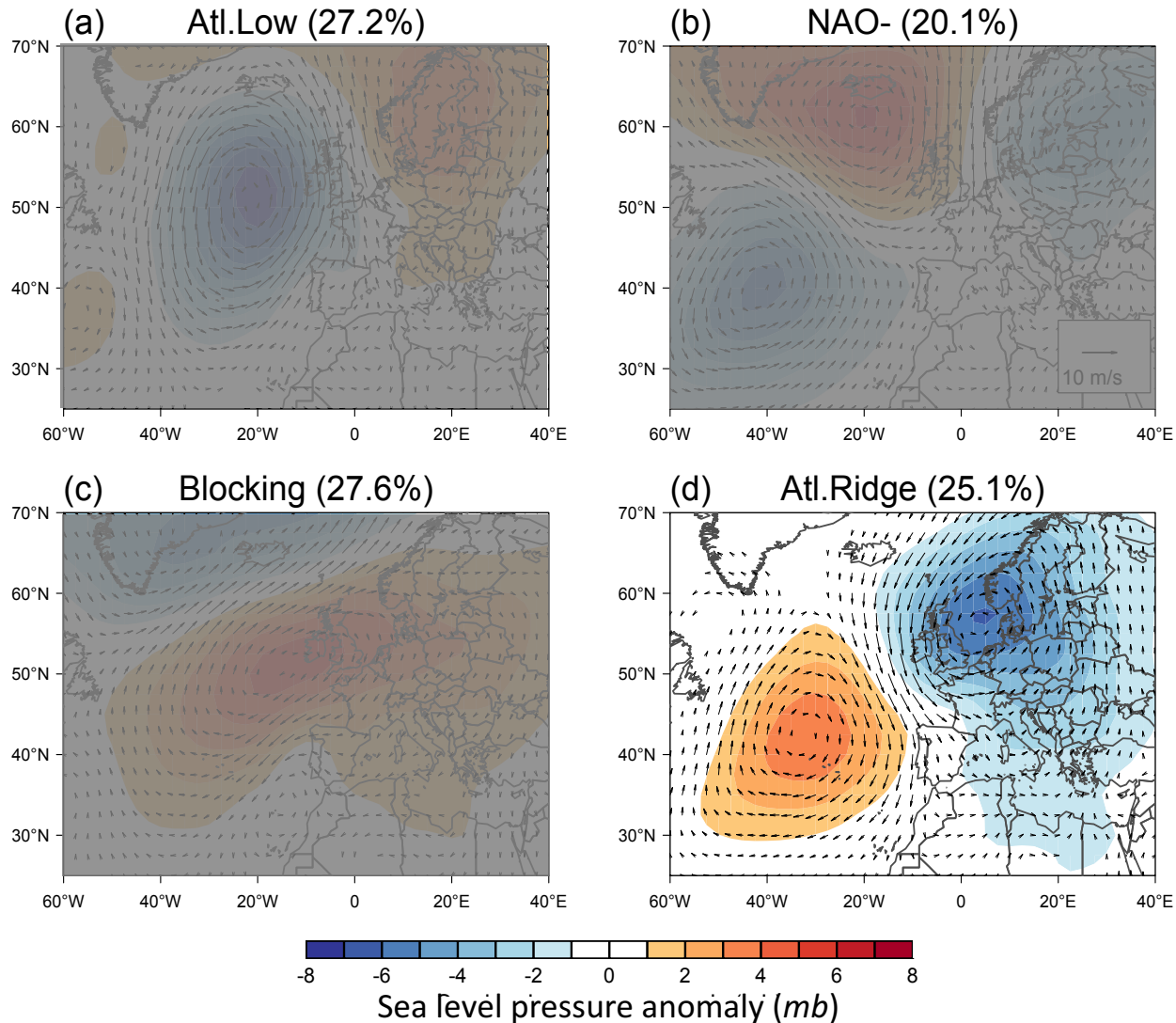
Wind anomaly



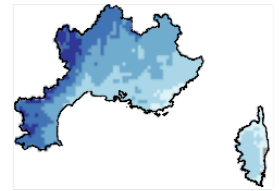
humidity anomaly



Atlantic Ridge : windy, dry and cold

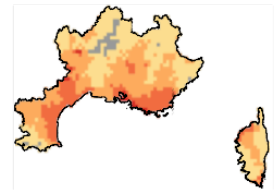


Temp anomaly

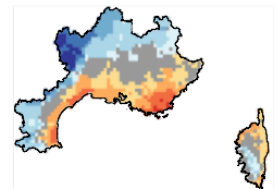


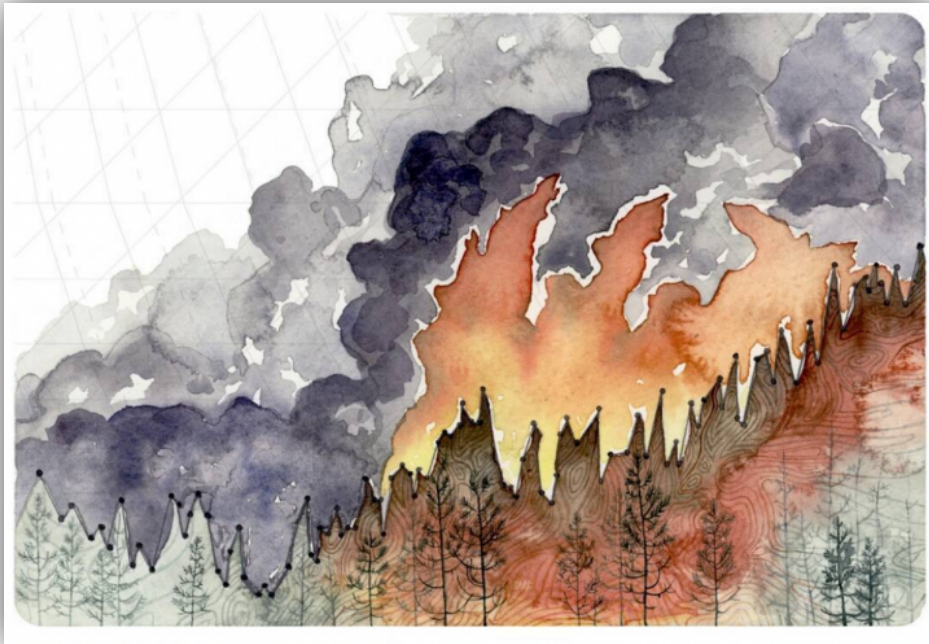
5

Wind anomaly



humidity anomaly

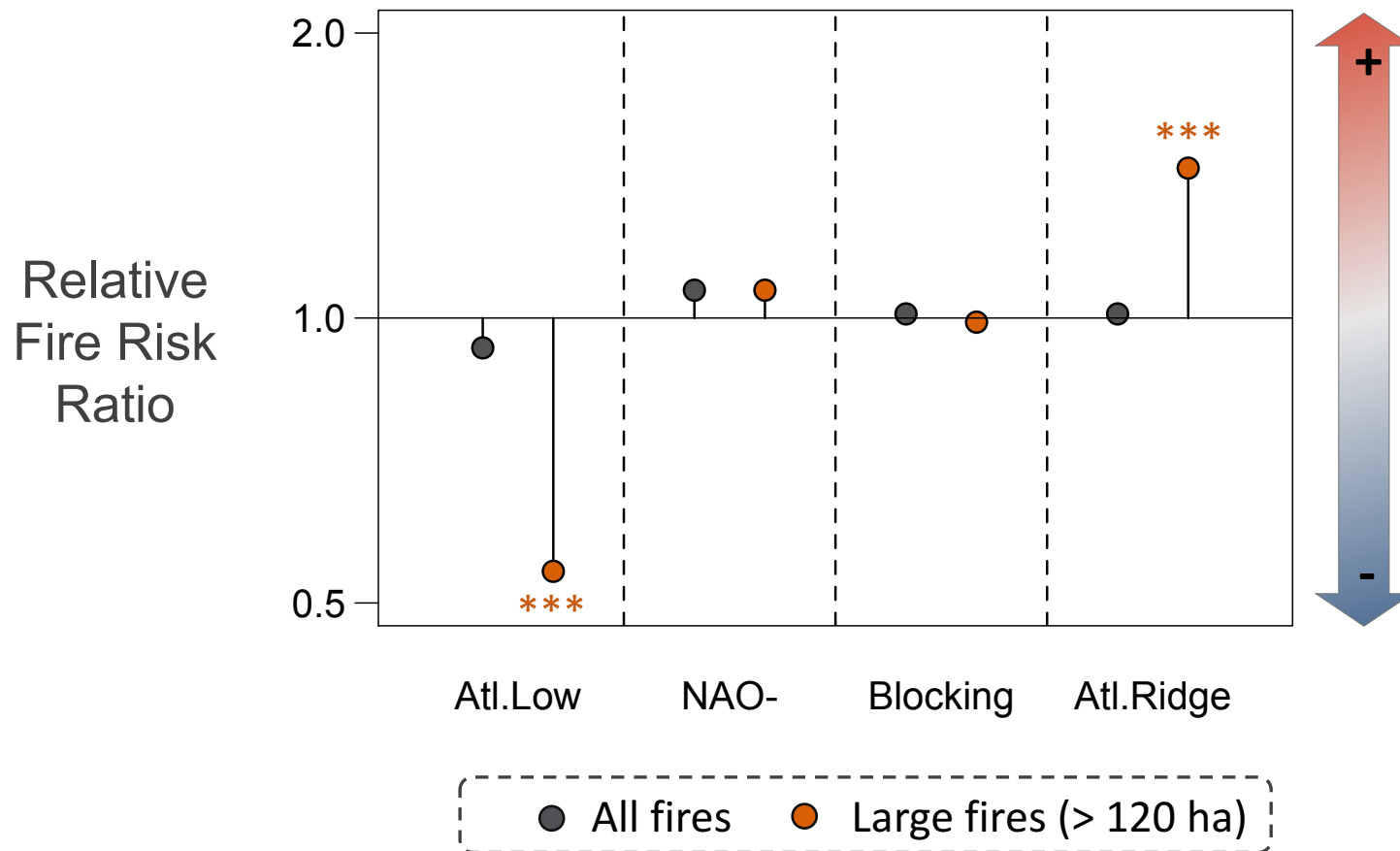




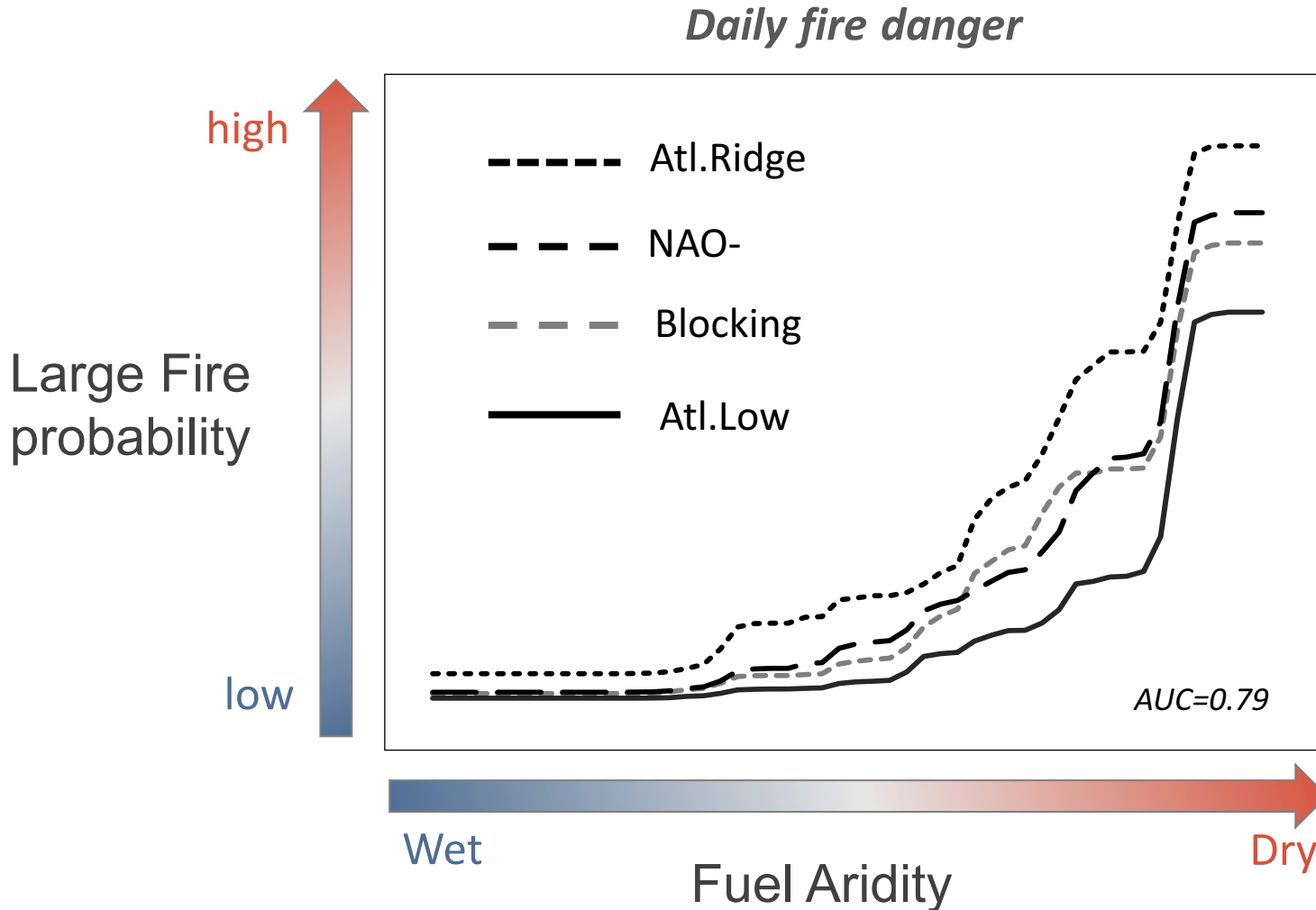
Drawing credit: Jill Pelto, 2016

2. Are Weather Types related to large fire probability ?

Large fires preferentially occur under some specific Weather Types



Combining Weather types drought estimations to forecast daily fire danger in Mediterranean France



Conclusions and perspectives

Weather types are related to fire weather and can be used to **predict large fire** occurrence

Should we use WTs for large fire impact studies ?

- Evaluate the predictive capacity of WTs
- Drought estimations?