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Risk assessment of BTV-3 incursion from Sardinia by wind dispersal of Culicoides midges

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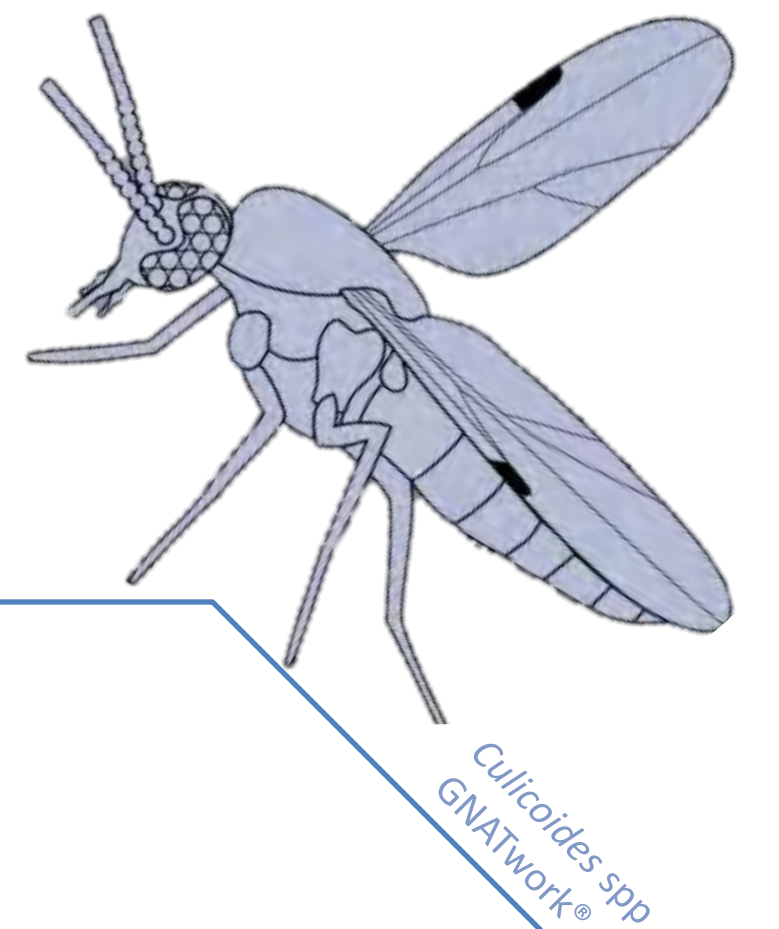
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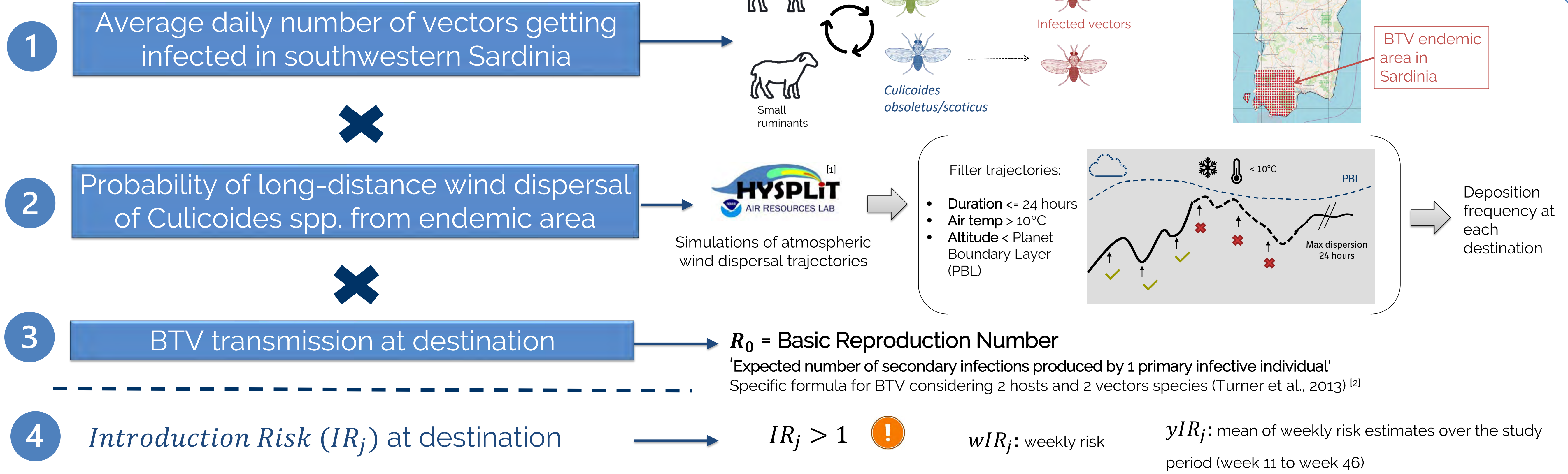
Risk assessment of BTV-3 incursion from Sardinia by wind dispersal of *Culicoides* midges

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- Bluetongue virus (BTV) is a major veterinary public health concern. The BTV serotype 3 (BTV-3) first appeared in 2018 on the island of Sardinia (Italy), at the doorstep of mainland Europe.
- Long-distance wind dispersal of flying vectors is a known pathway of BTV introduction.
- *What is the risk of BTV incursion into mainland Europe from Sardinia ?*



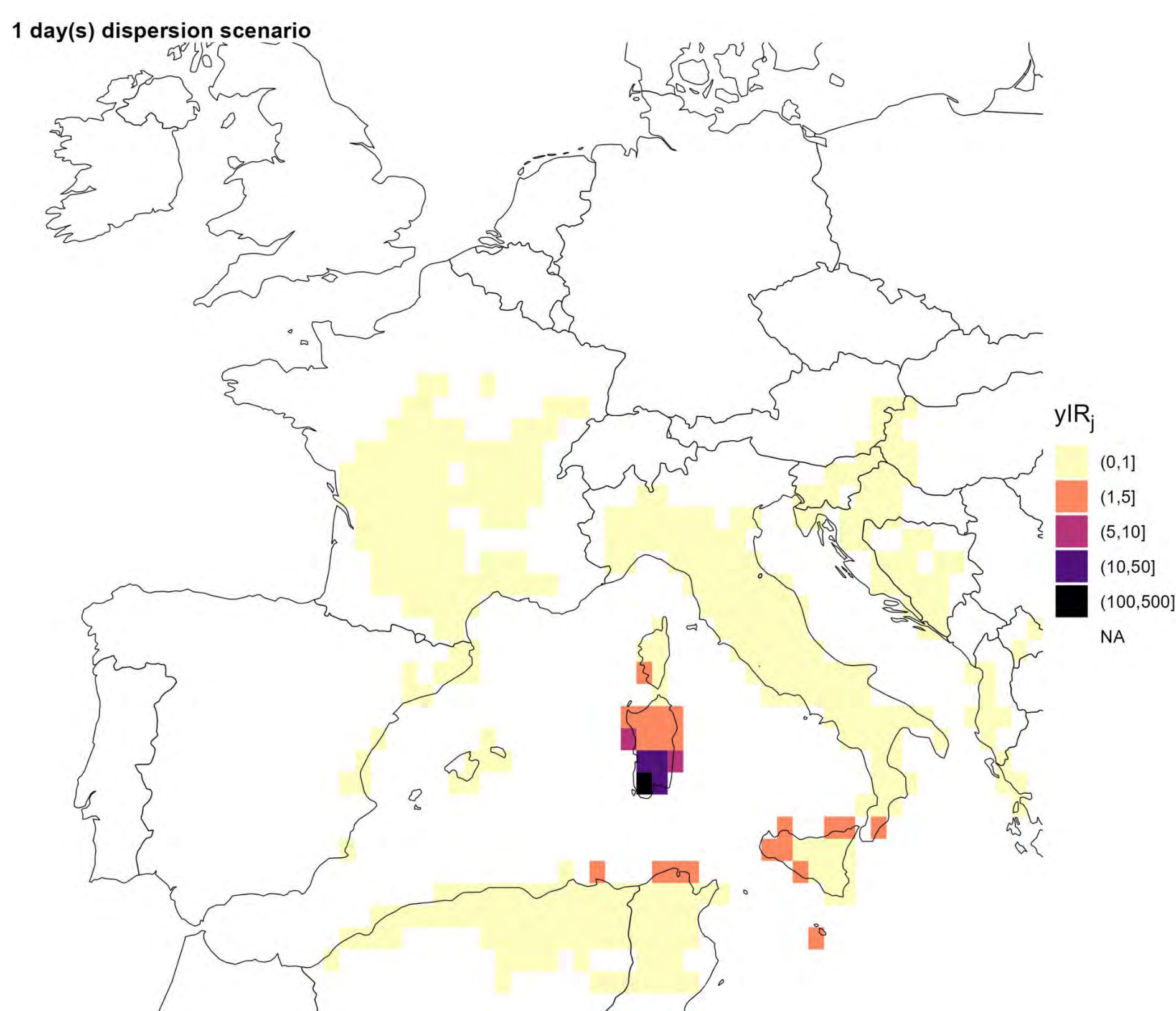
Risk Assessment Model Framework



Results

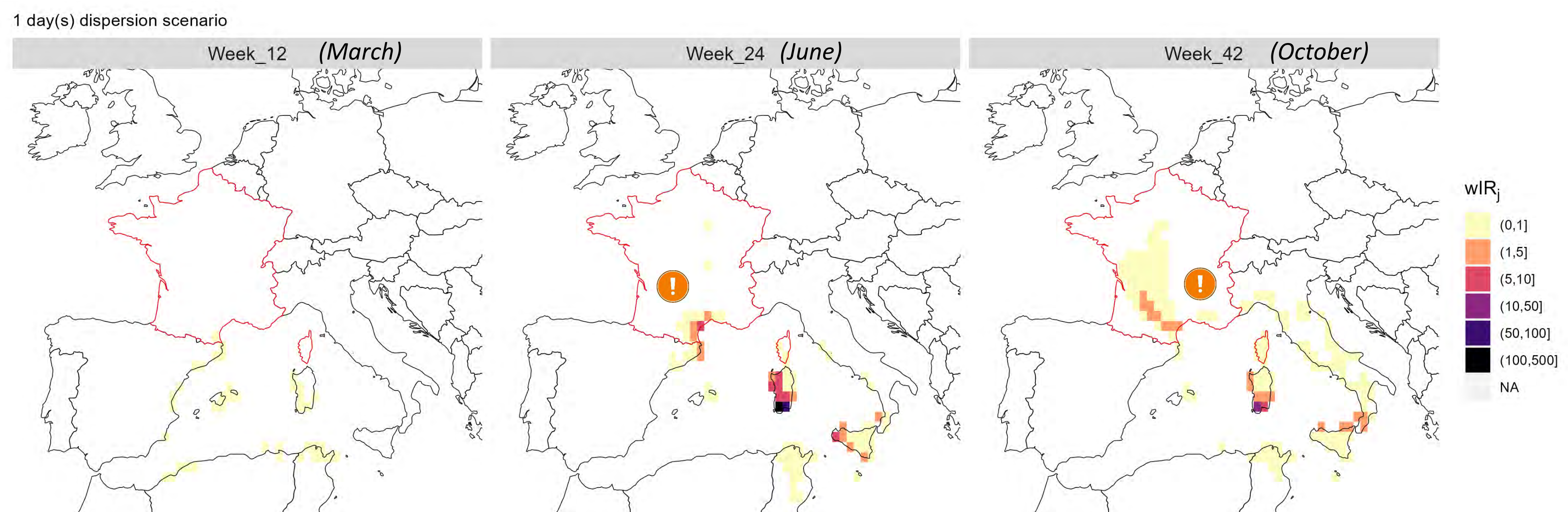
At-risk destinations of BTV incursion

Mean risk over study period (W11 to W46)



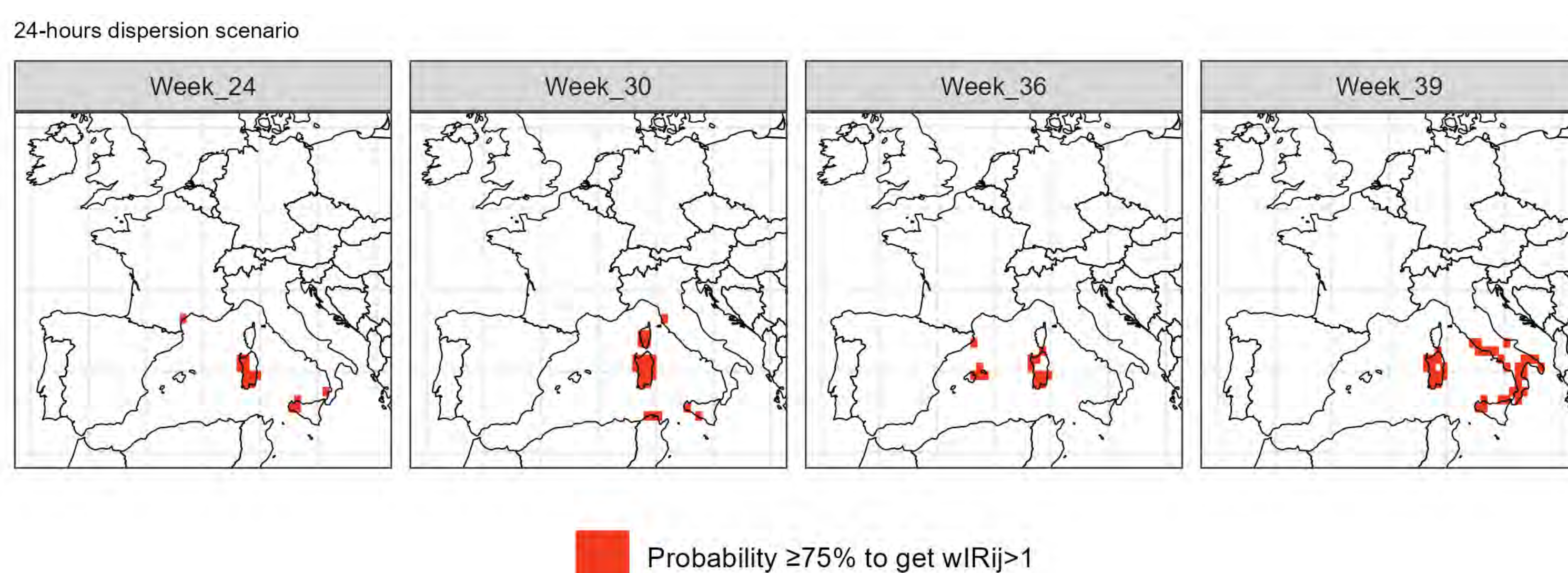
- Mean introduction risk >1 mostly limited to Sicily, southeastern point of Italy and Corsica (1-day dispersion scenario)
- Continental France: mean yearly risk <1, but sporadic weekly risk >1 in spring (June) and autumn (Oct) along mediterranean coast and southwestern region

Weekly risk estimates – 3 maps to illustrate temporal variations in France



Uncertainty in risk estimates

Areas with at least 75% probability to get a weekly risk >1



- High-risk destinations mostly limited to the southern Mediterranean Basin
- But high spatio-temporal variations of weekly risk estimates
- Risk for continental France and Balearic Islands increases as duration of atmospheric simulation increases (2 and 3 days)
- Better knowledge about flight conditions of midges and *Obsoletus*-specific parameters for BTV-3 transmission could improve the model robustness

Next step: extend the model to include other introduction pathways

References DOI: [1] 10.1175/bams-d-14-00110.1; [2] 0.1371/ journal.pone.0053128

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