Impact of air masses origin and trajectory on atmospheric phenomena

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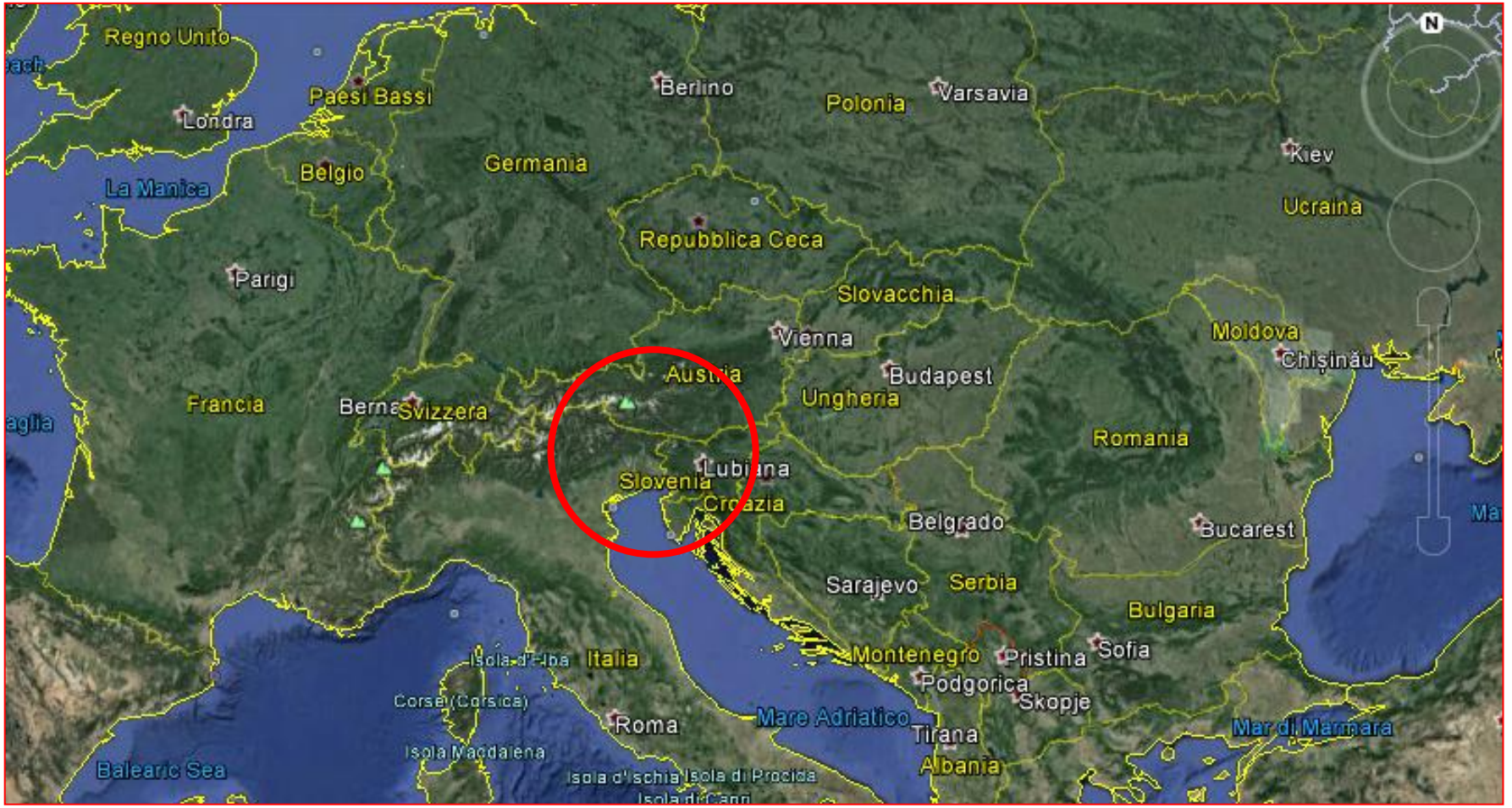
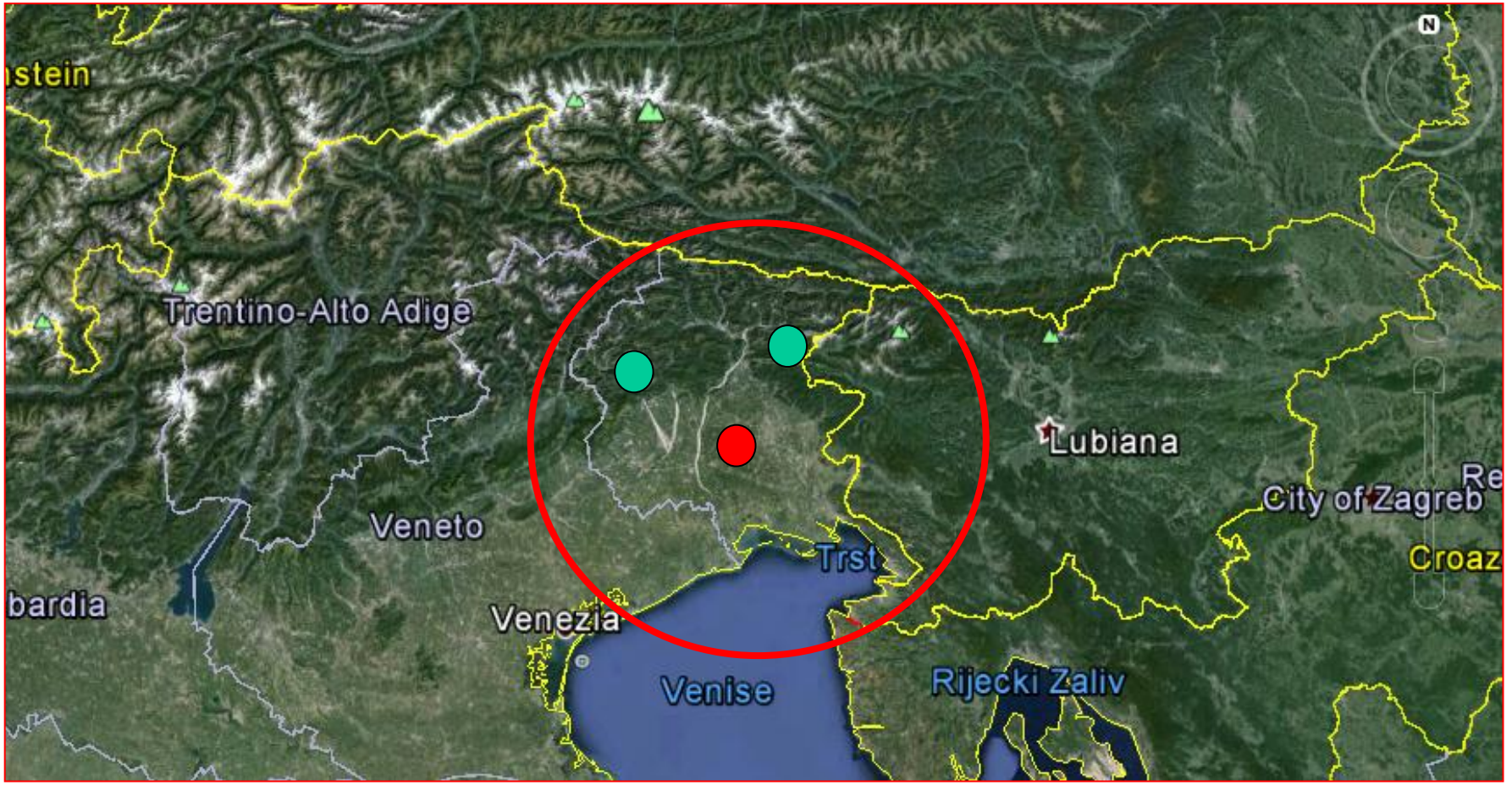
Conclusions

- High (relatively) **SO2** concentrations in Friuli Venezia Giulia are associated to air masses coming from **eastern Europe**
- High **PM10** concentrations in Friuli Venezia Giulia are associated to air masses coming from west (**Po Valley**) and in the previous days air masses have to remain stick to the ground and be **subject to subsidence**
- High **O3** concentrations do not have a privileged direction of air masses, but air masses have to remain relatively **stick to the ground** for a long time
- **Heavy rain** episodes are characterized by the **“Adriatic” alley** direction in the previous days

The study area (where Friuli Venezia Giulia is)



The study area



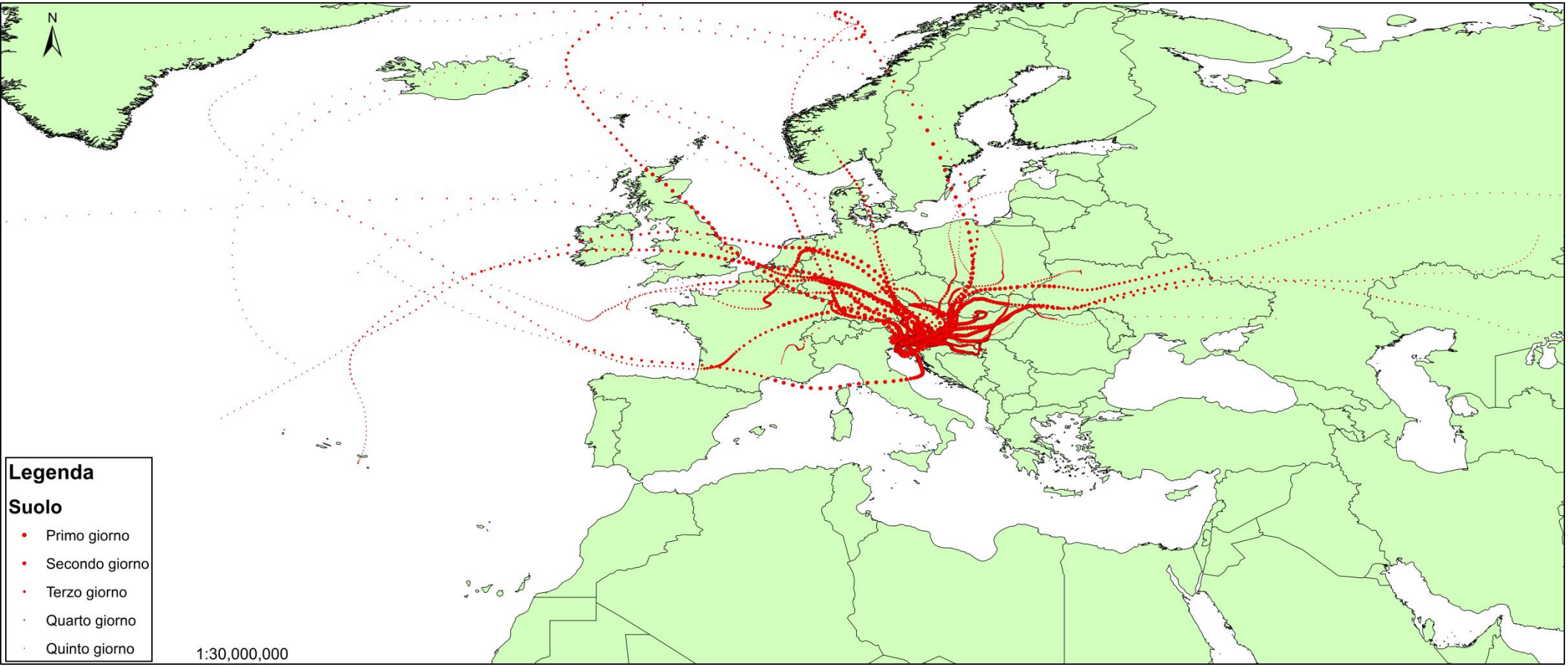
Heavy rain events

Pollution episodes (SO2, PM10, O3)

Materials and methods

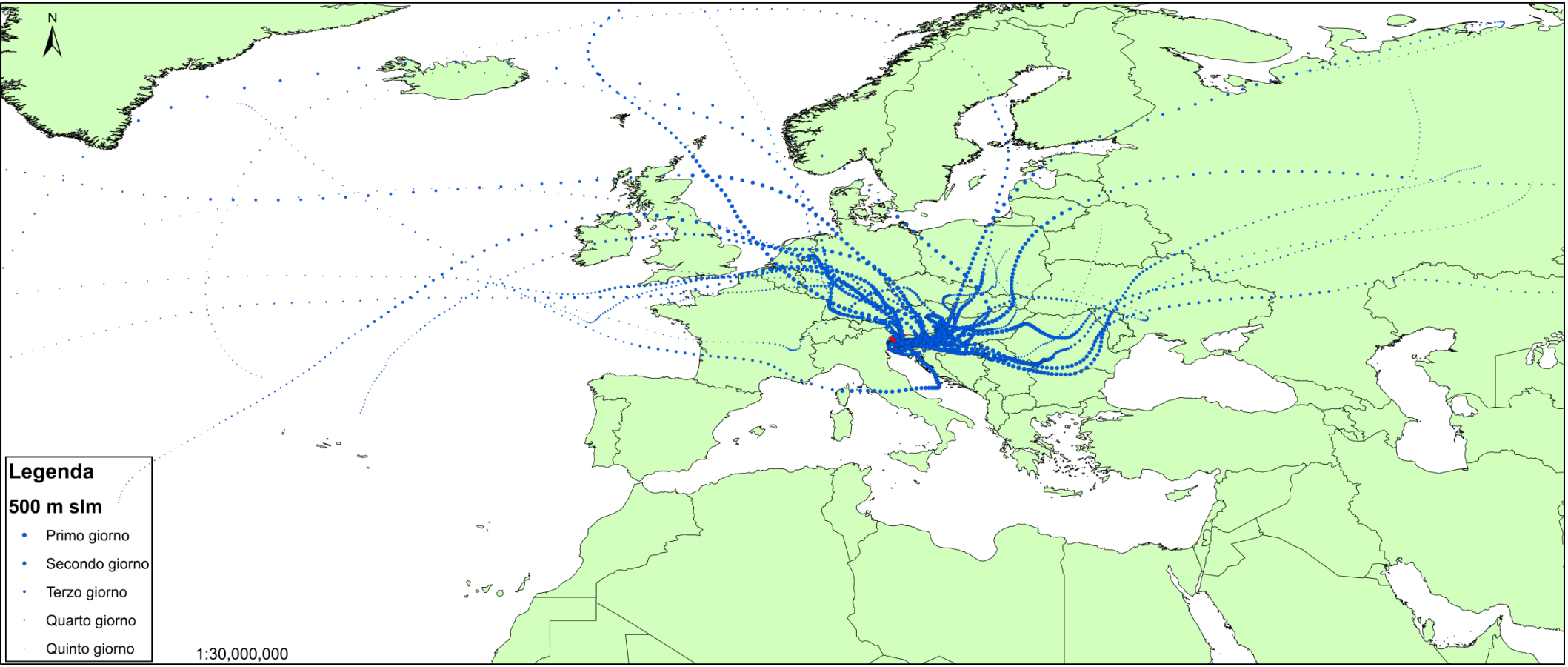
- Significant episodes chosen on a daily basis
- Episodes spanning from 2005 up to 2014
- Air masses trajectories determined through the HYSPLIT model (http://www.arl.noaa.gov/HYSPLIT_info.php)
- Meteorological data used obtained from GDAS archive (https://ready.arl.noaa.gov/gdas1.php)
- Tree 120 hours backward trajectories (SFC, 500 and 1000 m ASL) centered at 12:00 UTC in the day of the event

SO2



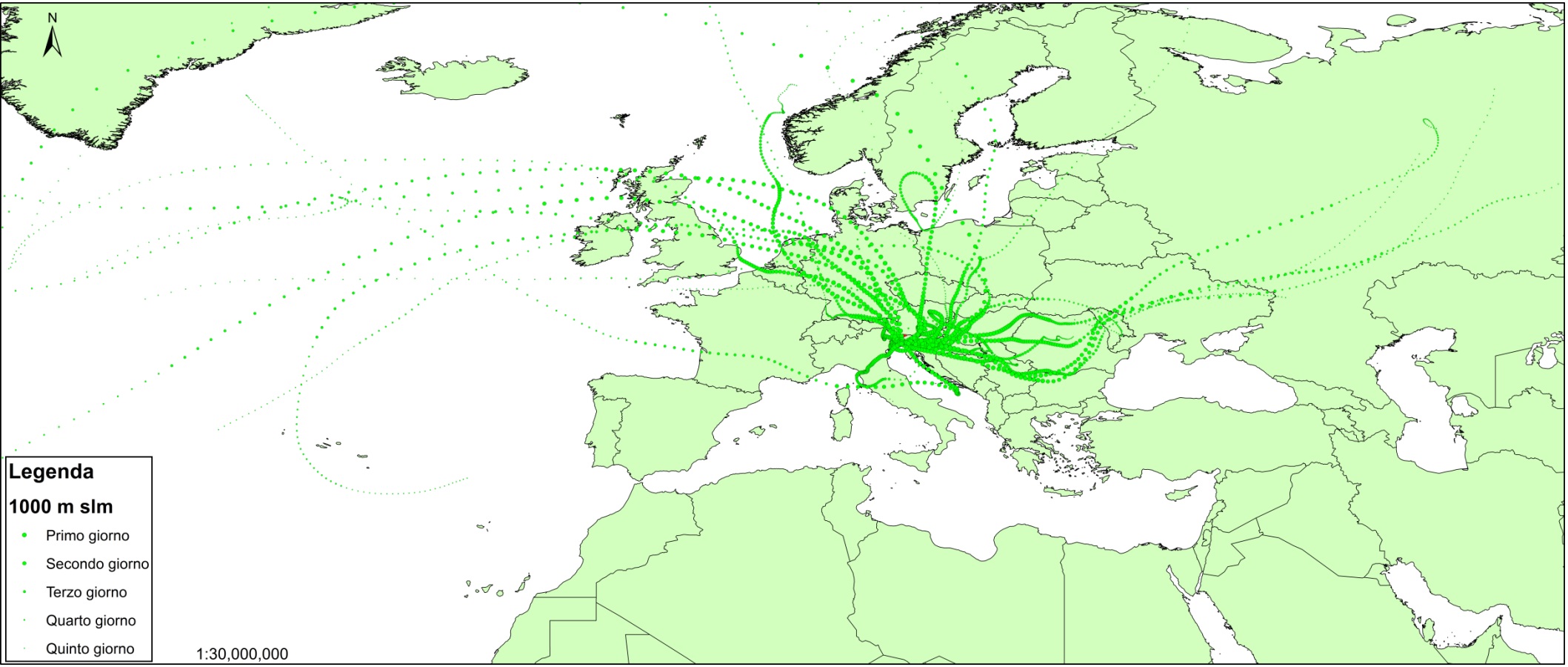
Backward trajectories that were at SURFACE level at the day of the event

SO2



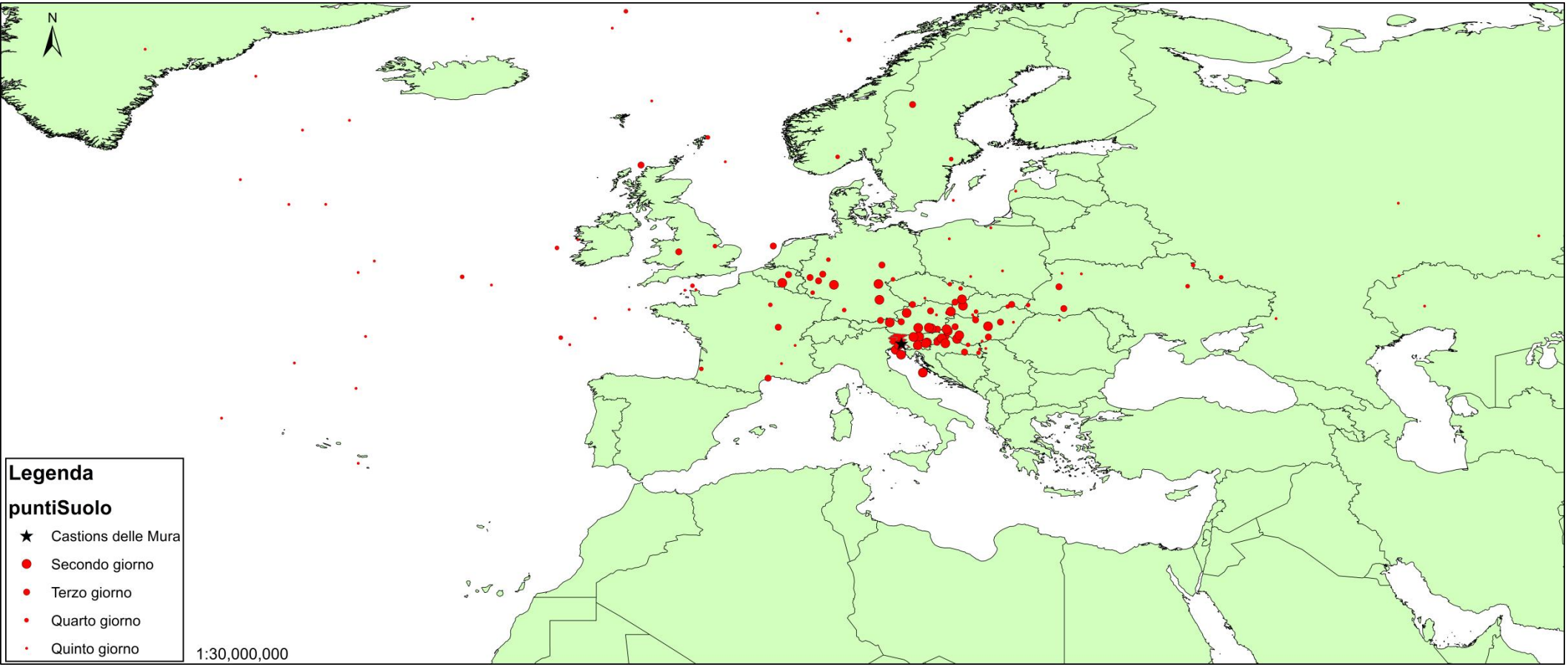
Backward trajectories that were at 500 m above mean level at the day of the event

SO2



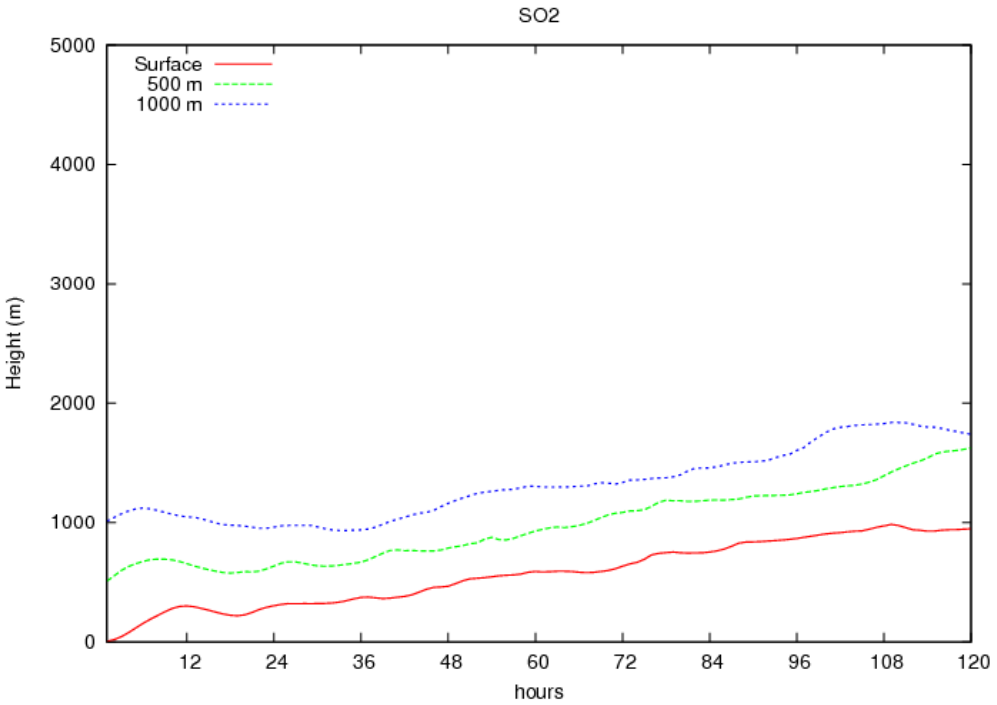
Backward trajectories that were at 1000 m above surface level at the day of the event

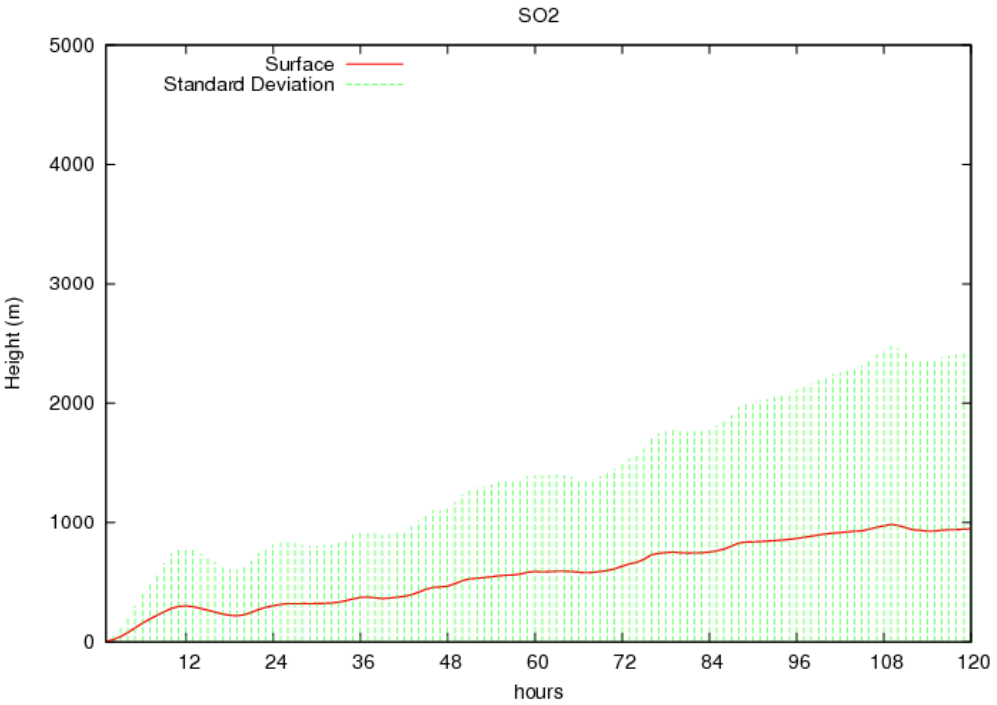
SO2



Largest dots indicate the position of air mass one day before the event
Smallest dots indicate the position of air mass five days before the event

SO2

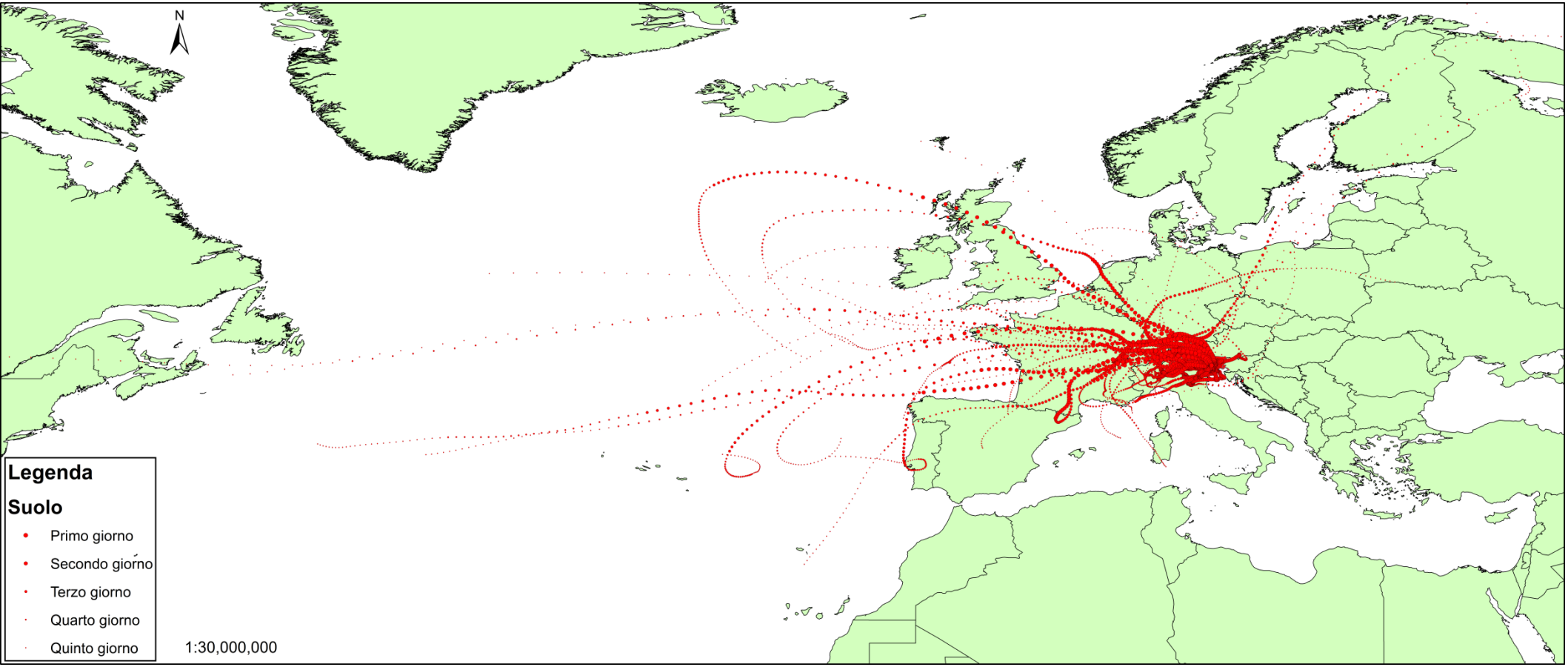




Left panel – Air masses average vertical height (0 is the day of the event)

Left panel - Surface air mass average vertical height and standard deviation

PM10



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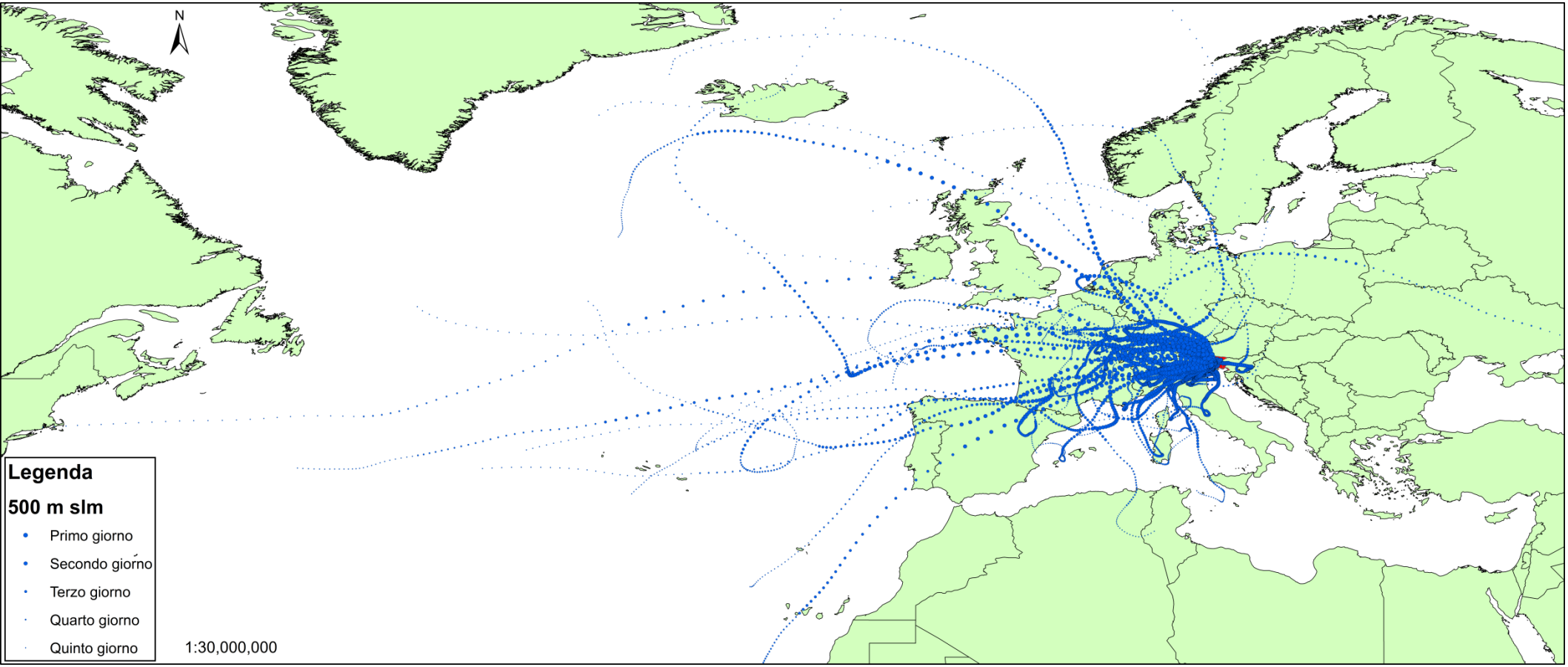
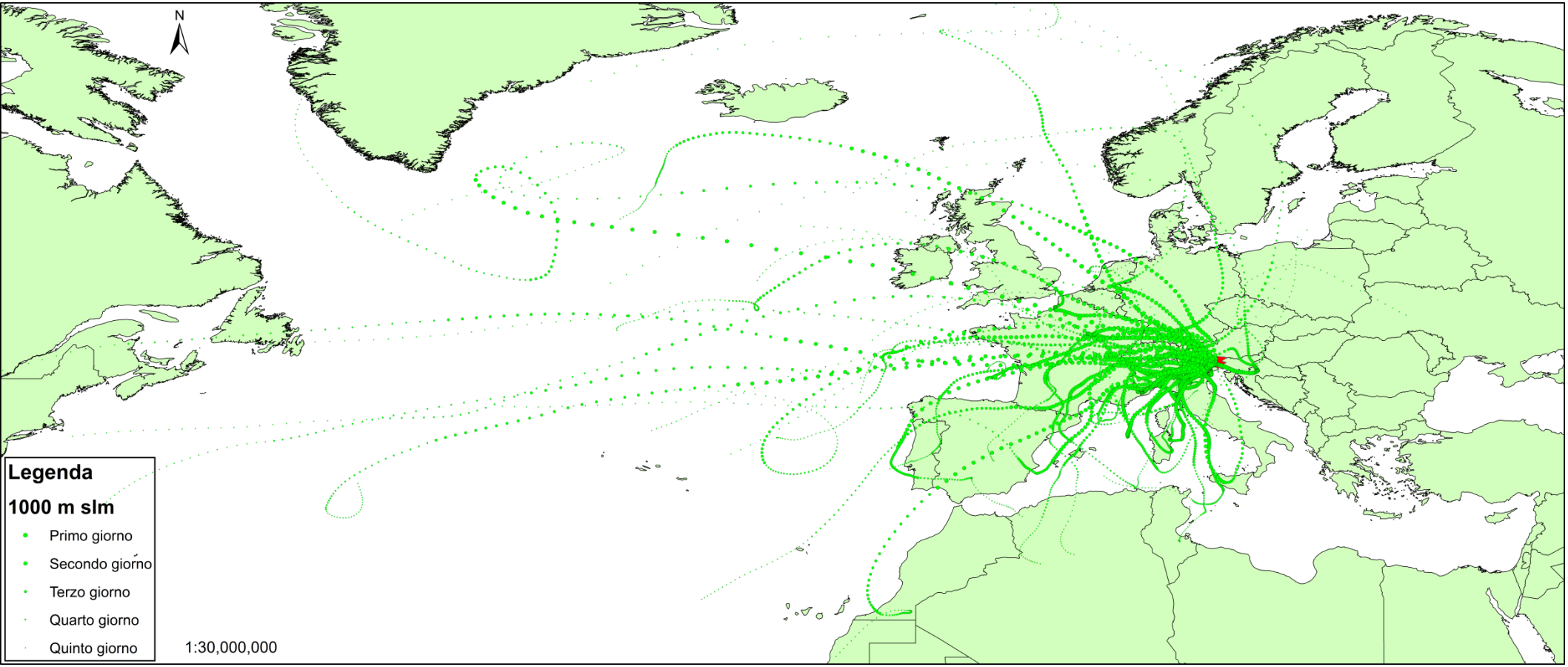
PM10



Backward trajectories that were at 1000 m above surface level at the day of the event

PM10



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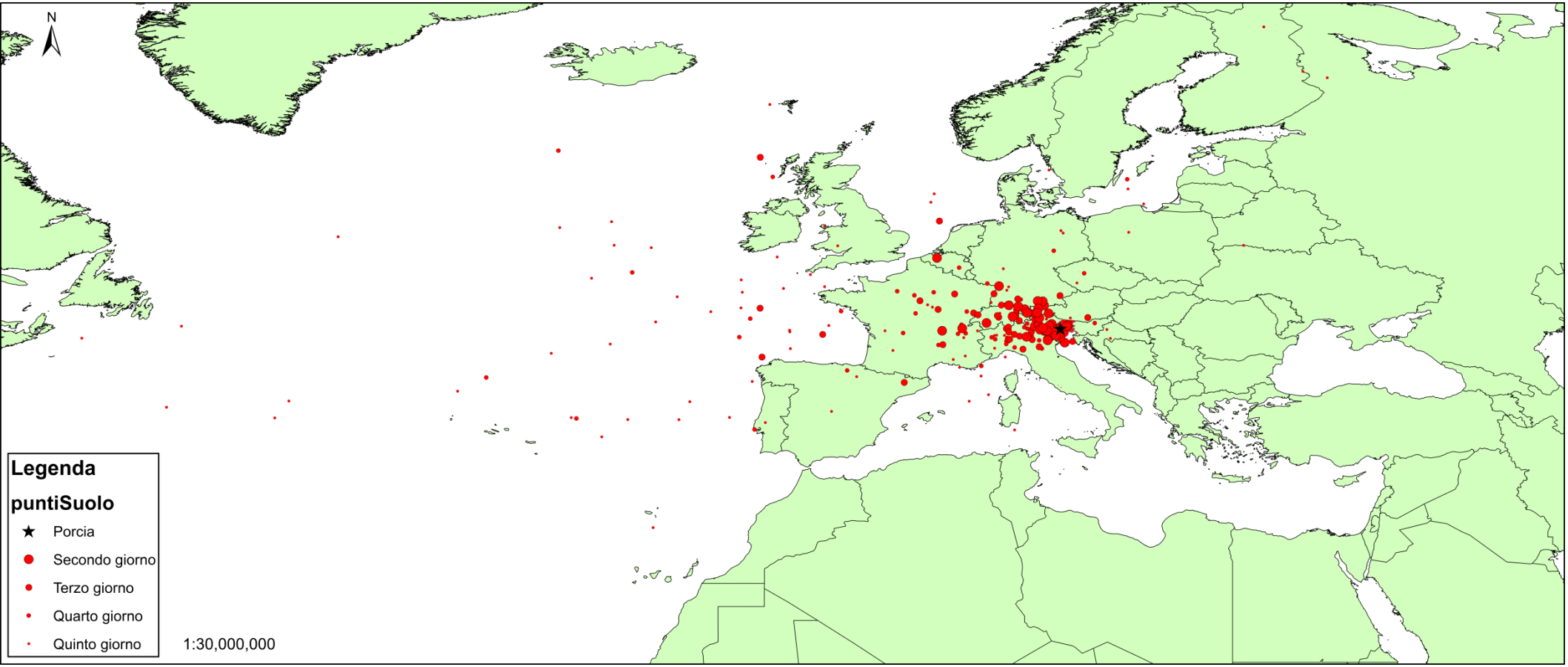
PM10



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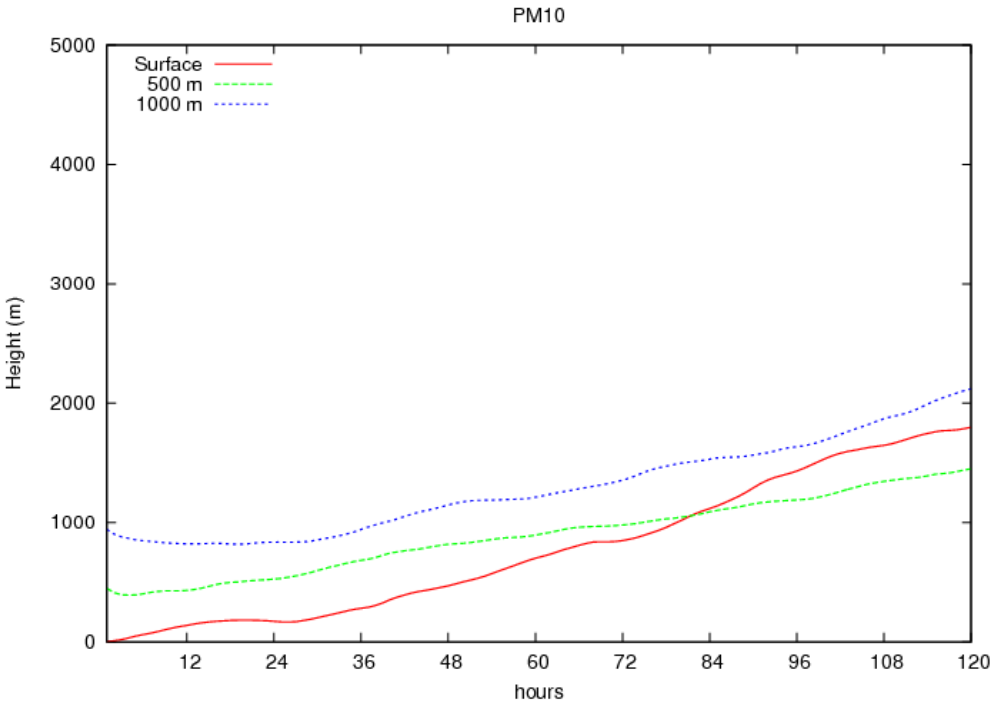

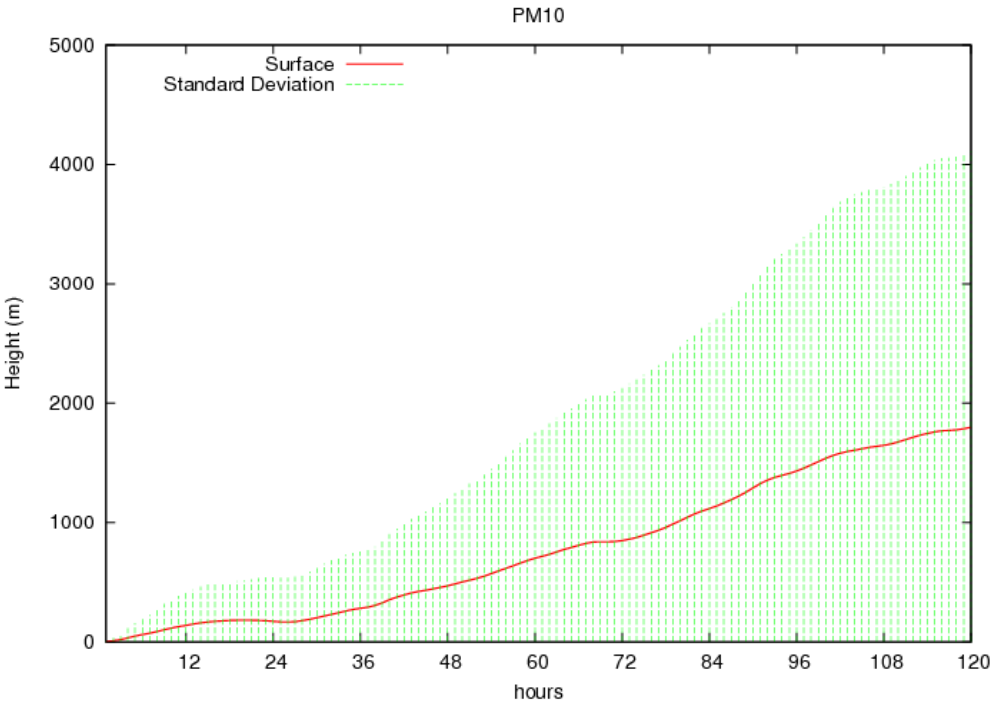

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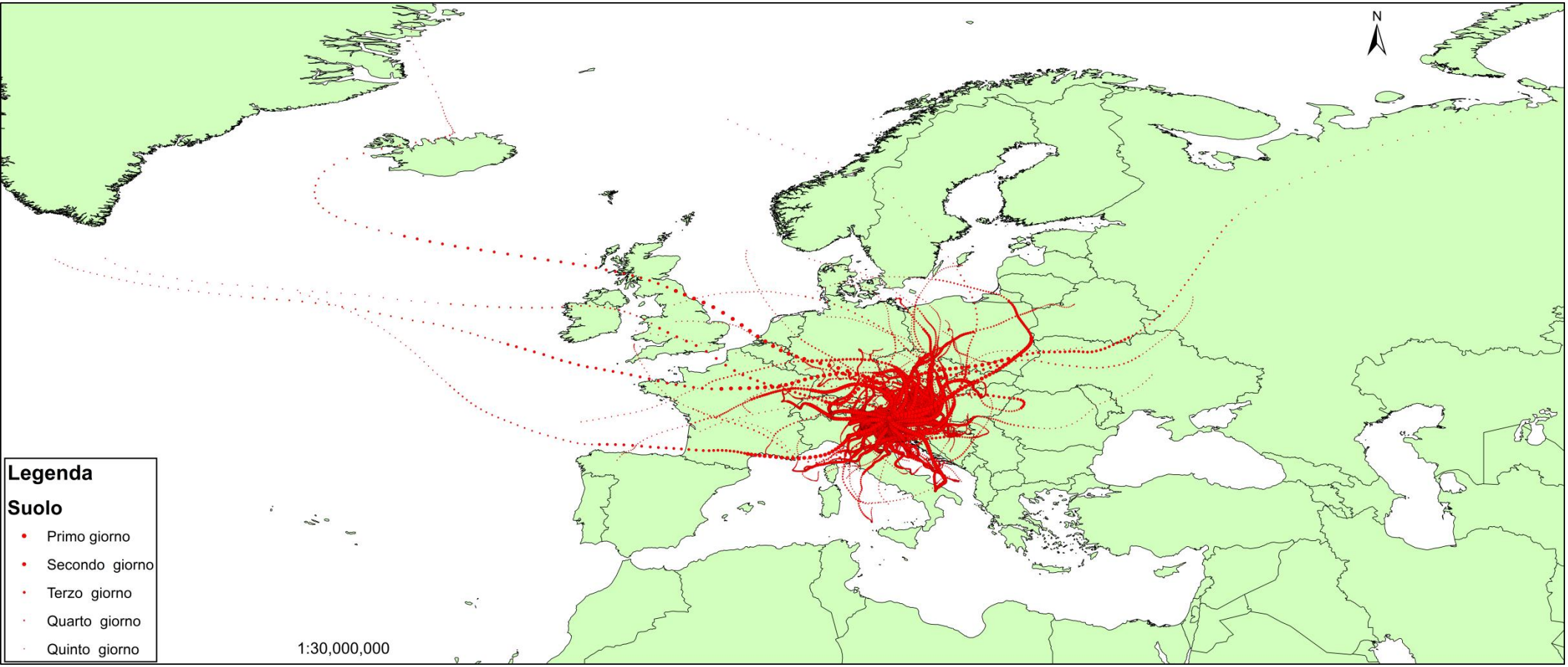
O3



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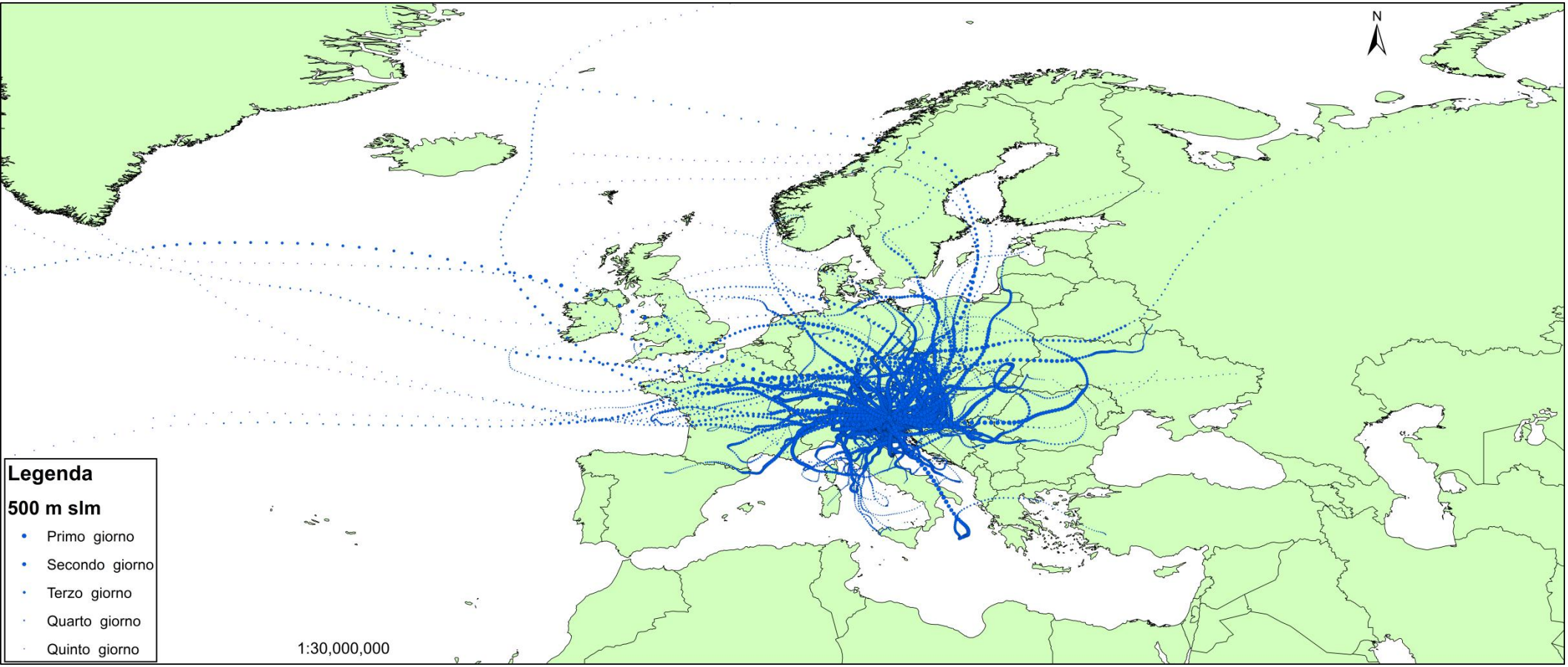
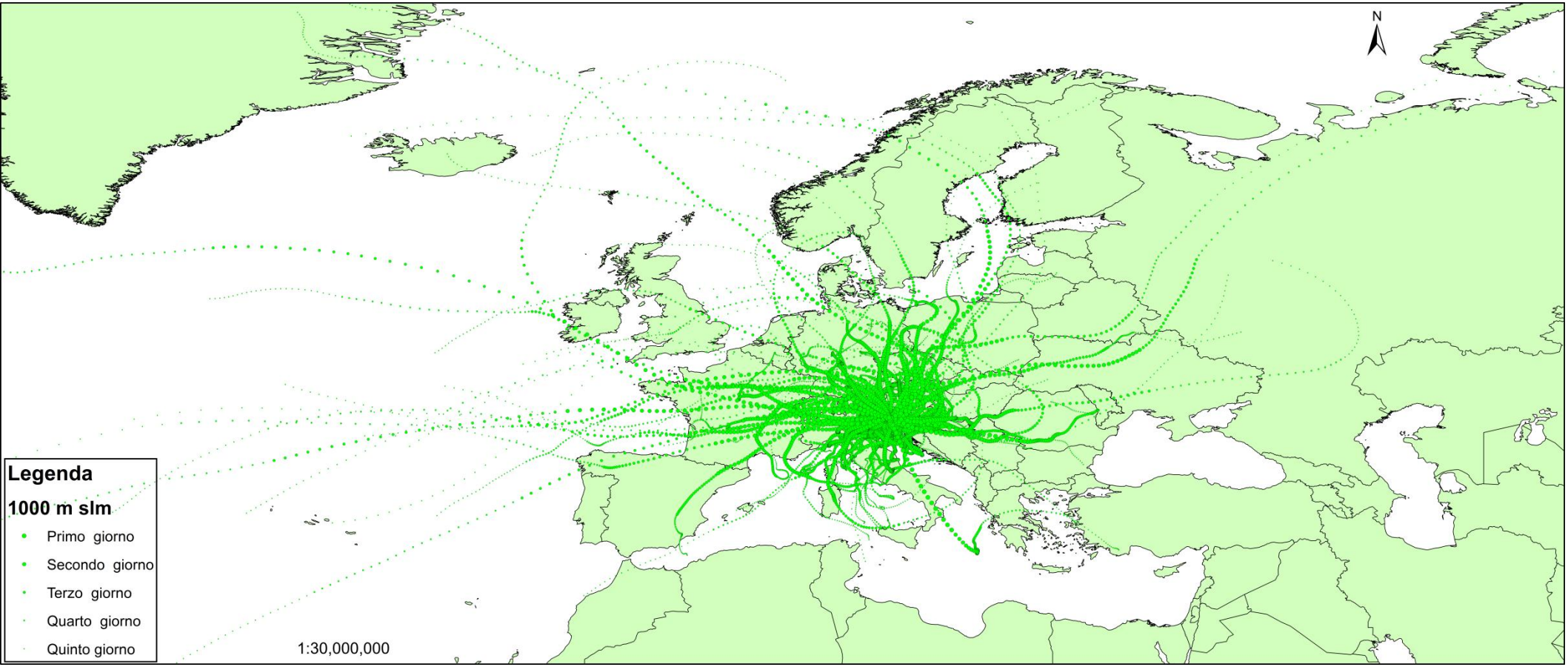
O3



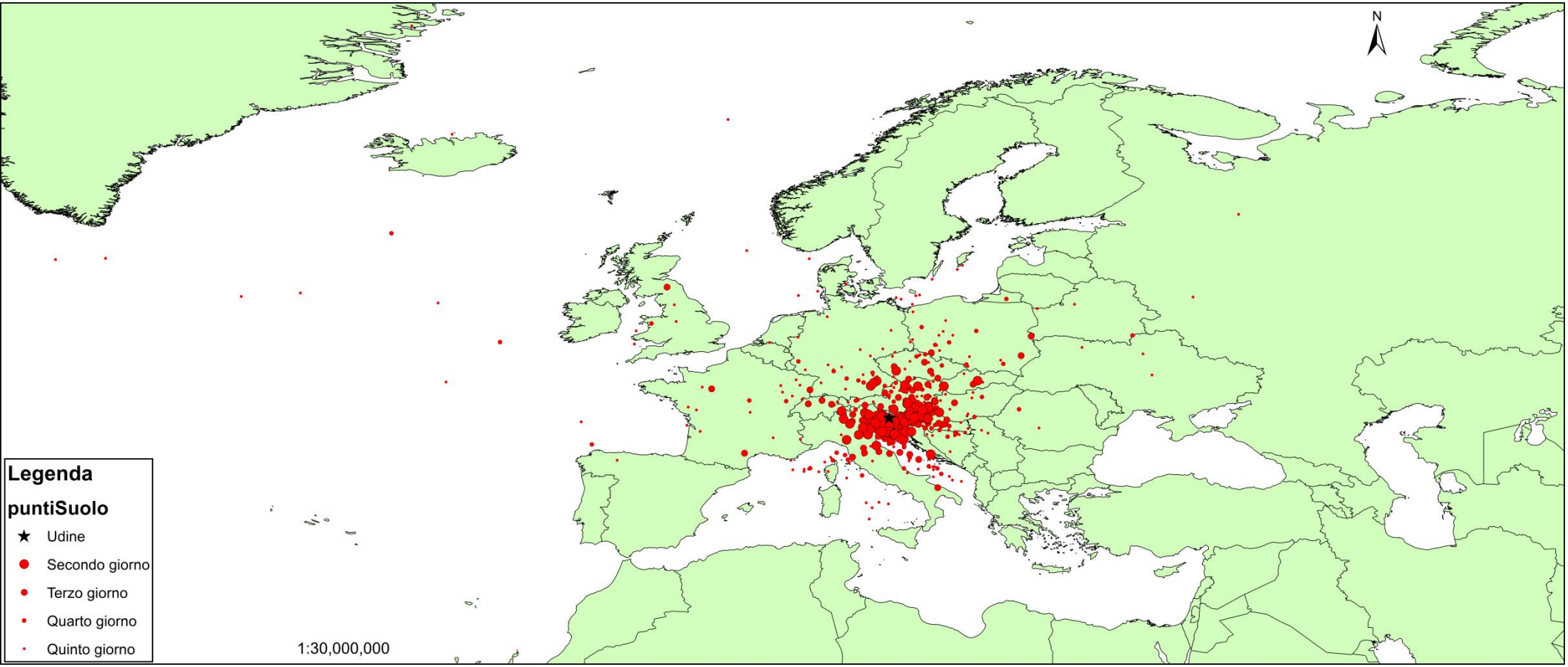
Backward trajectories that were at 500 m above mean level at the day of the event

O3



Backward trajectories that were at 1000 m above surface level at the day of the event

O3



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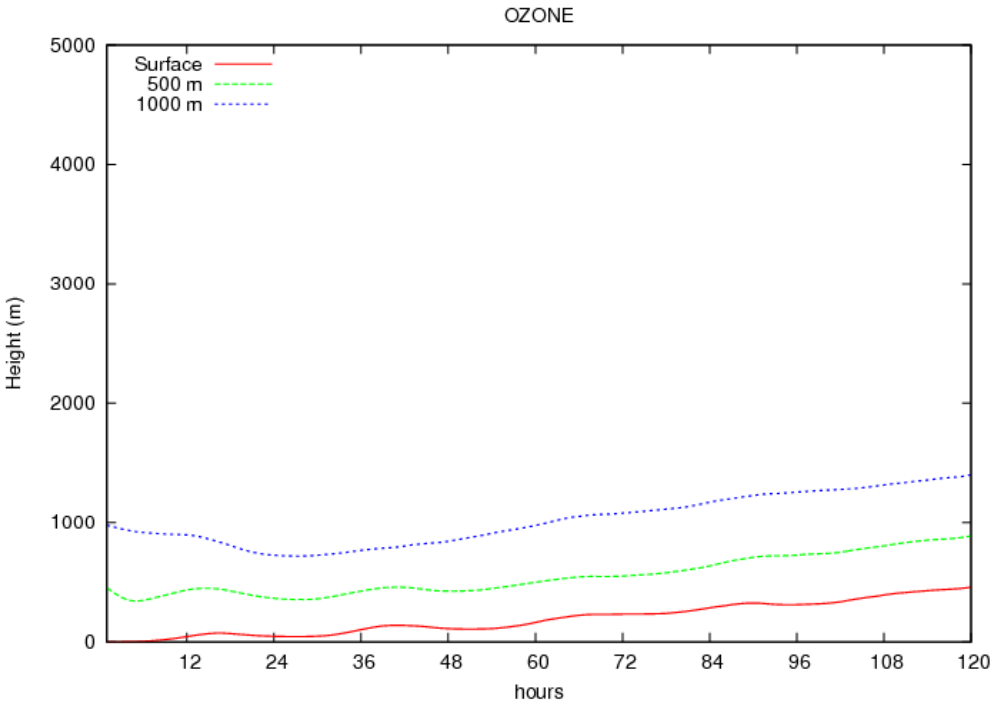

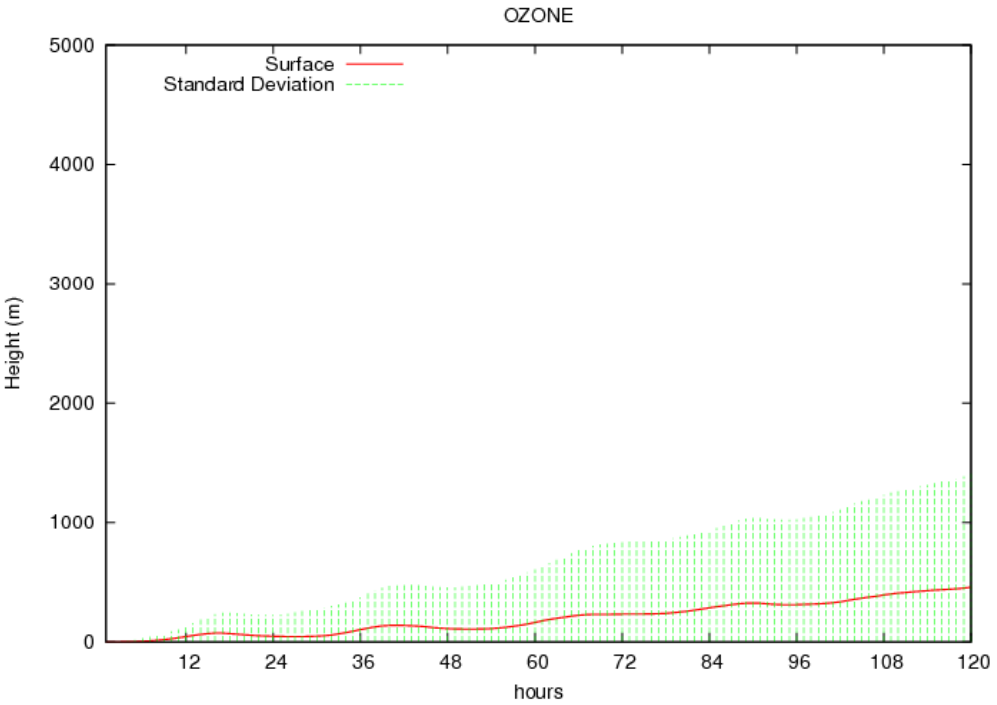

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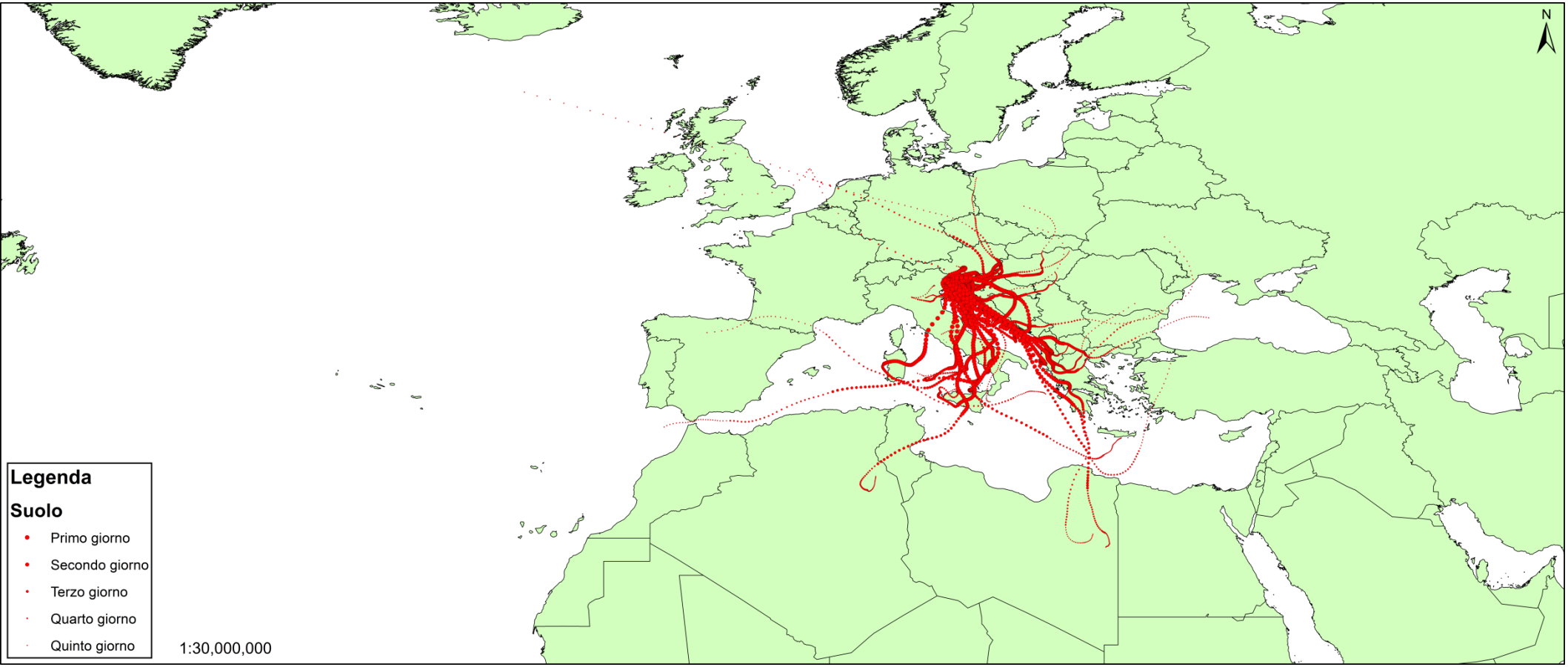
Heavy rain



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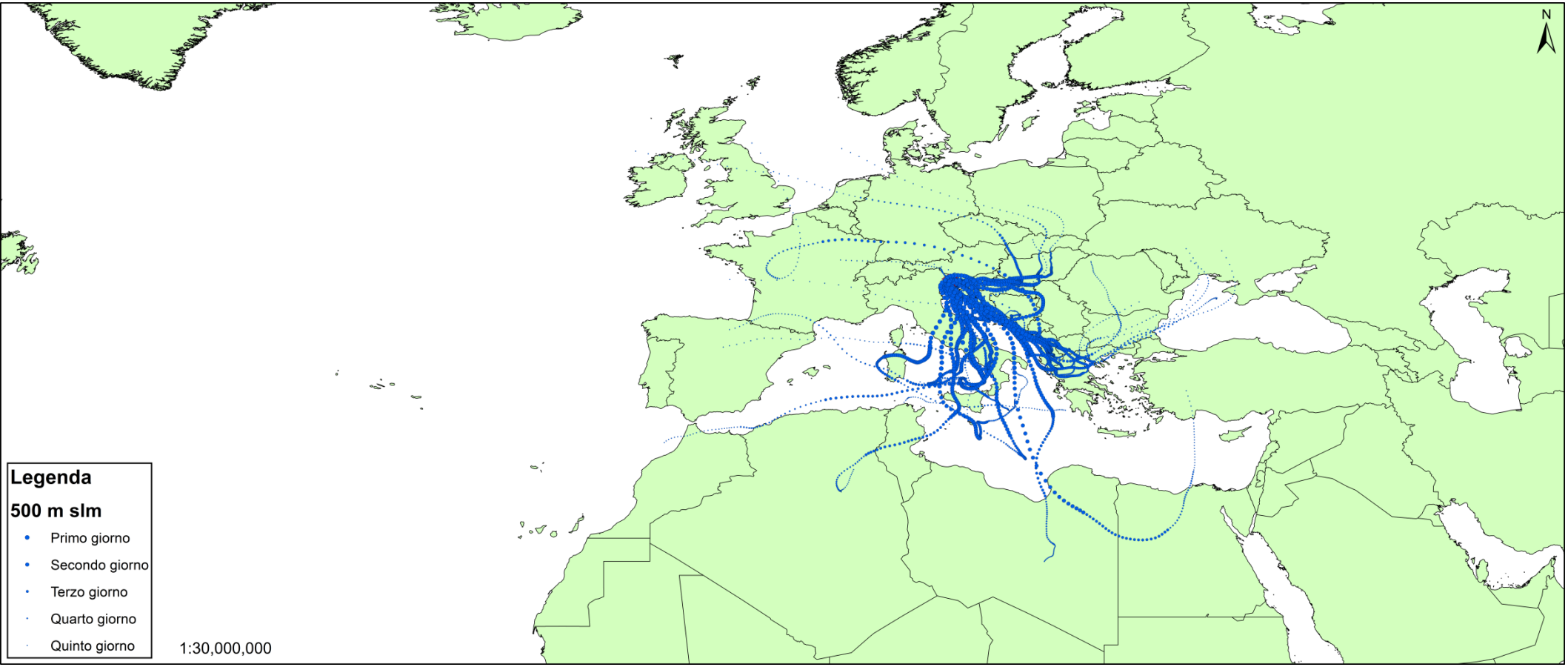

Backward trajectories that were at 500 m above mean level at the day of the event

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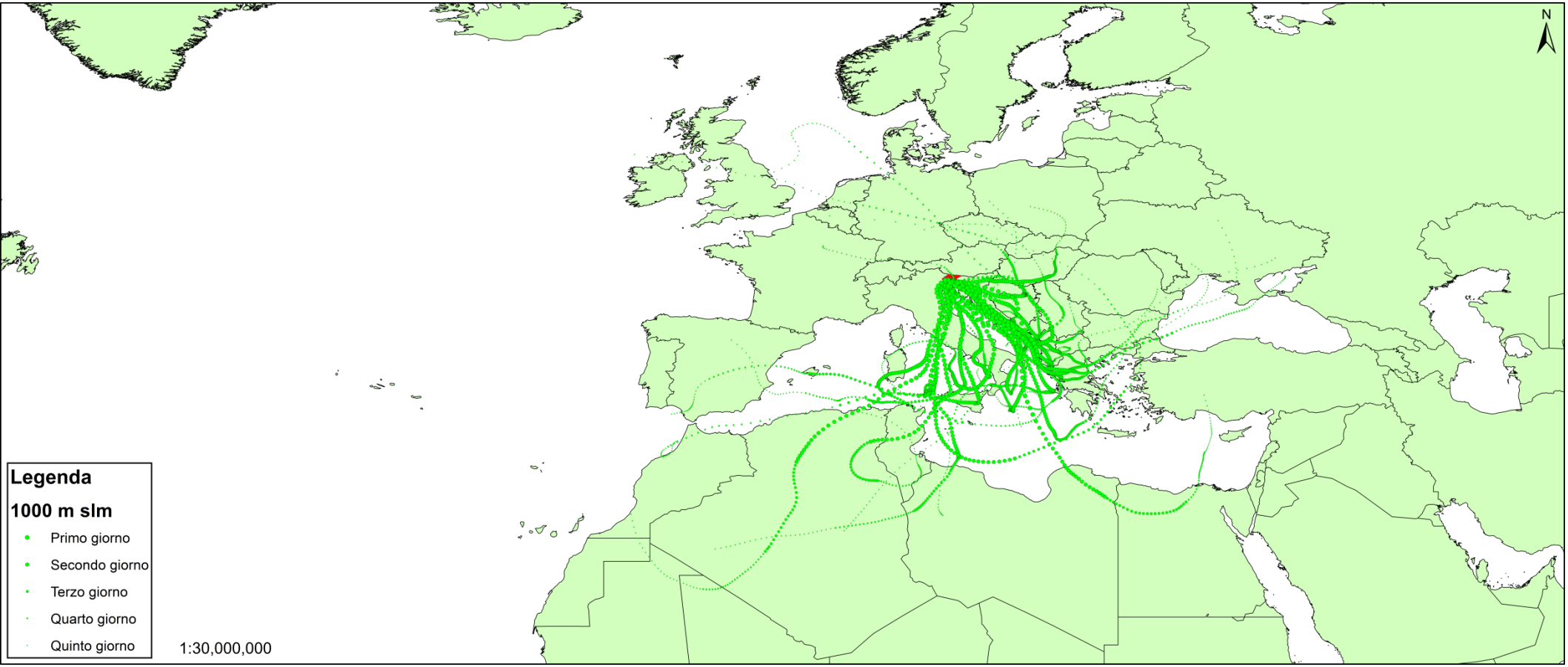

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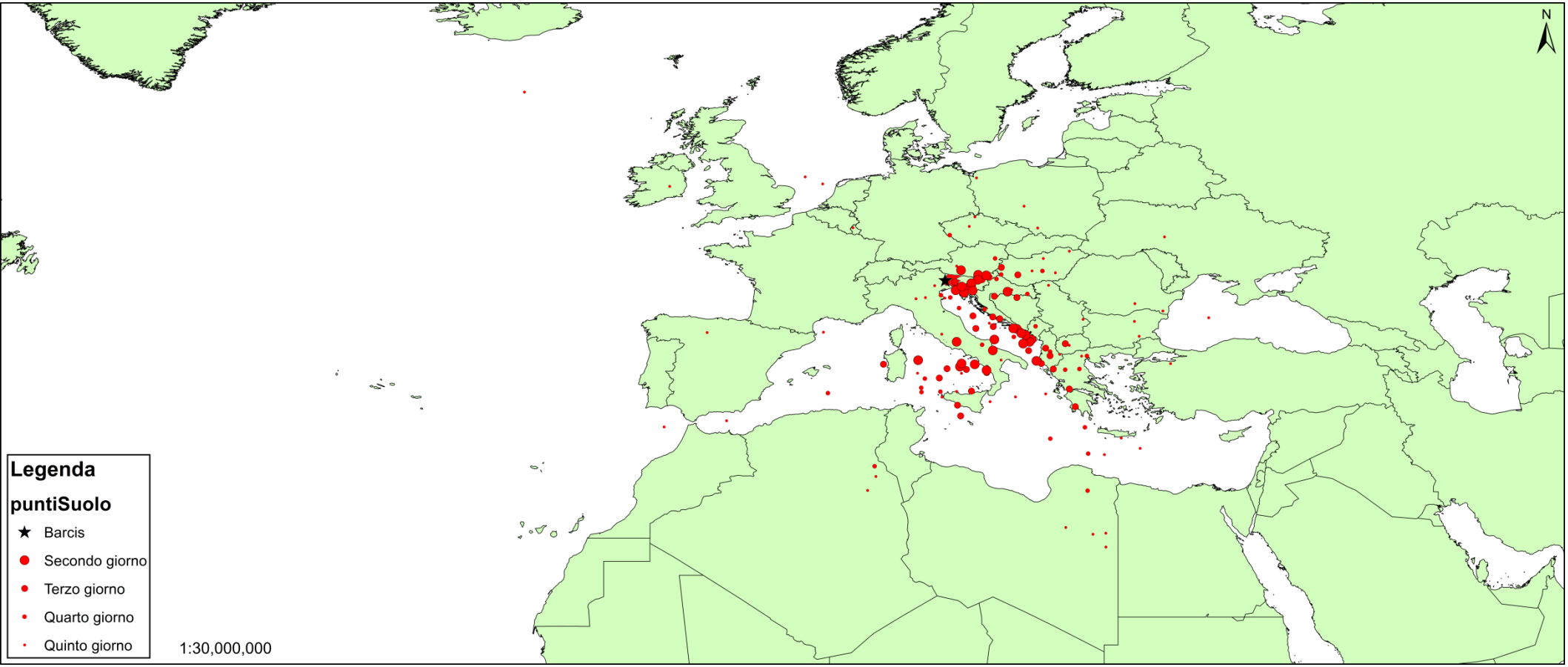

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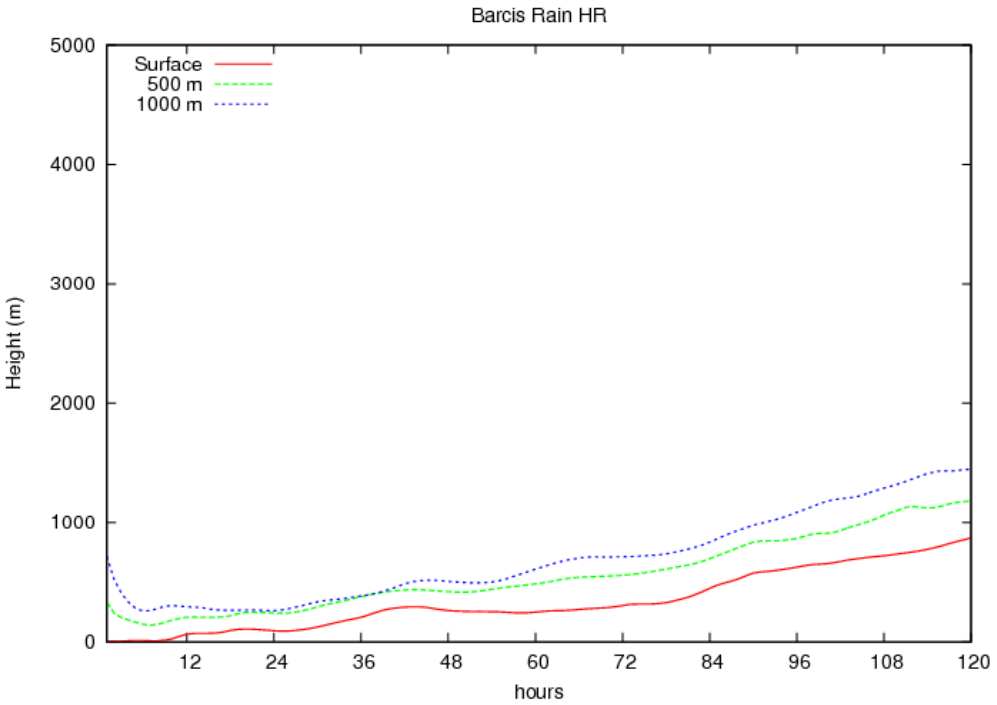

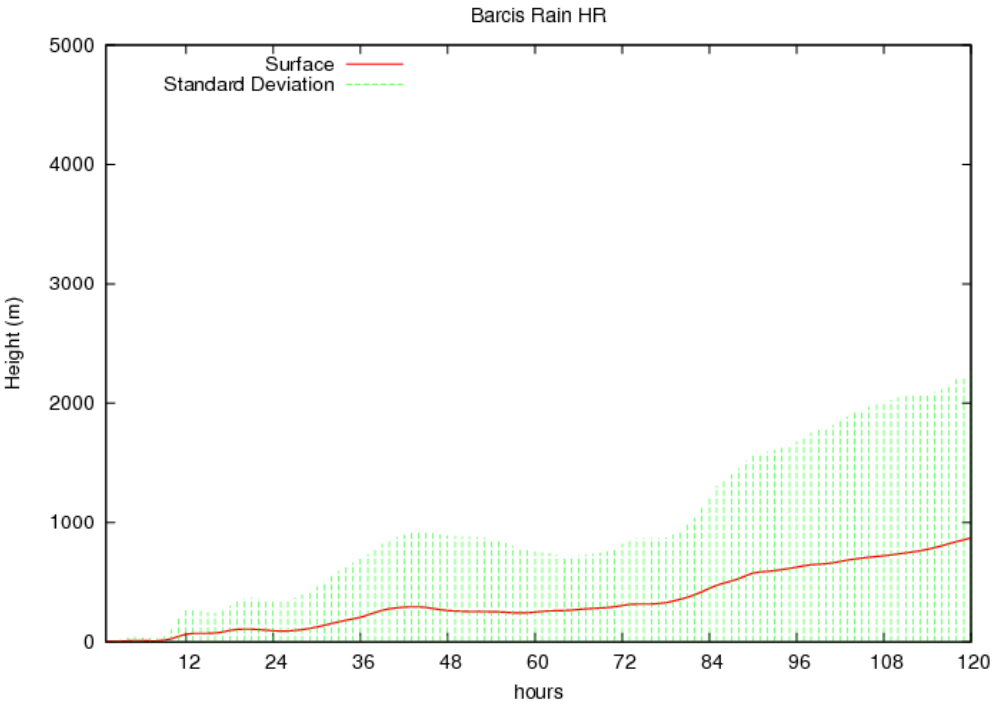

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Thanks for your attention

Благодаря