CAN WE RELY ON CITIZEN WEATHER MEASUREMENTS FOR OPERATIONAL USE?

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Matt Nagle

21st of September, 2021

Structure of Presentation

1. What are Citizen Weather Measurements?
2. Can we trust them?
3. Quality control checks.
4. Project Summary.
5. Conclusions

Citizen Weather Measurements

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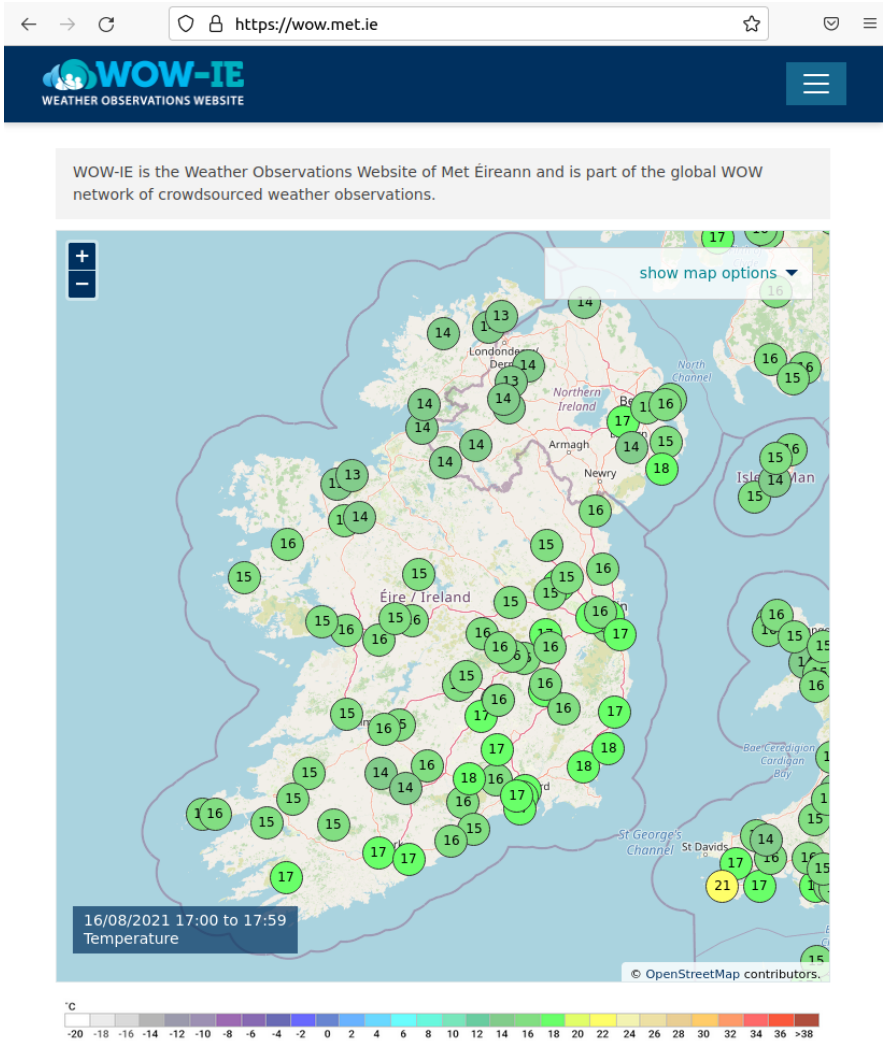

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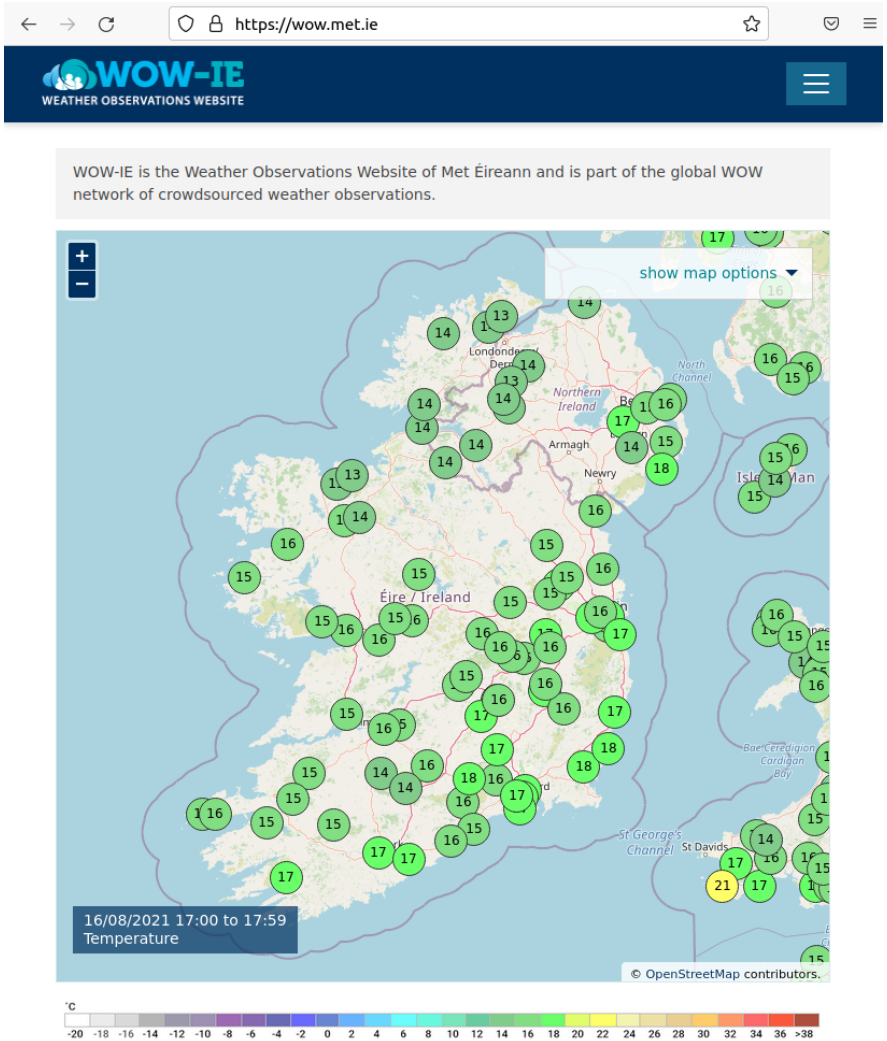

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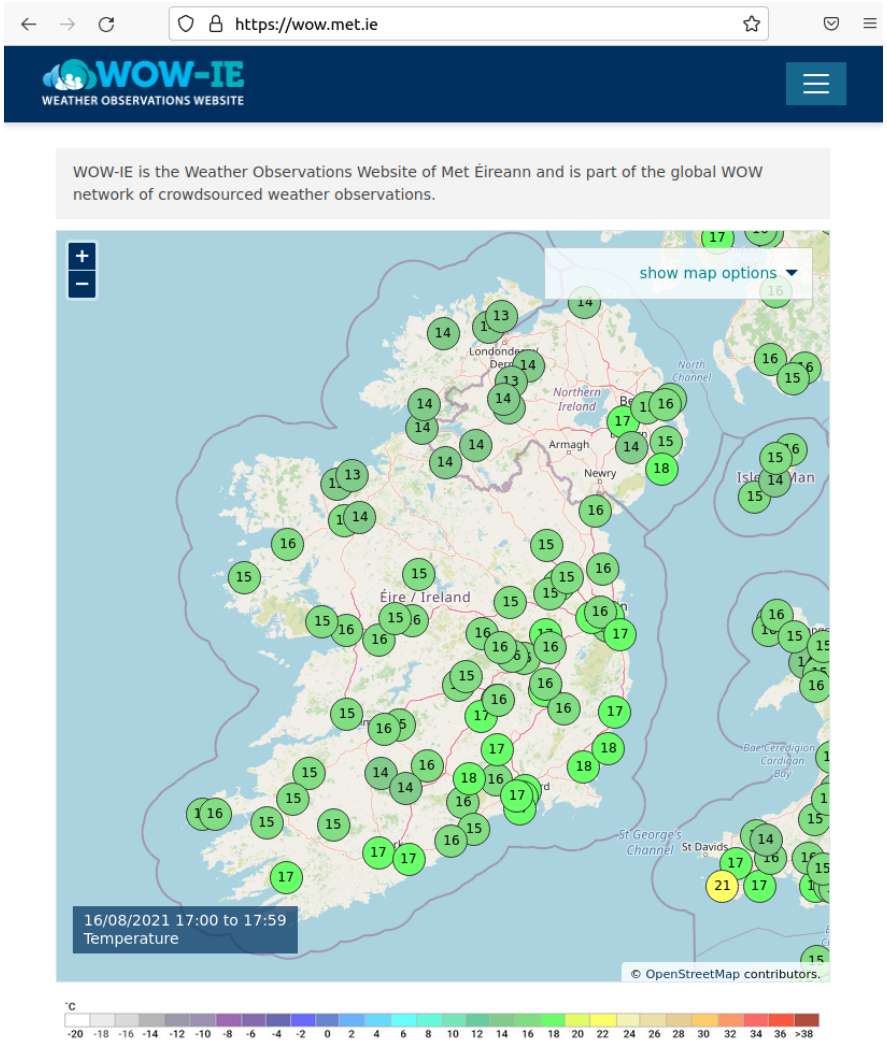

Operational Use Case

- 91 Official Met Éireann stations (May 2021).
- 85 WOW stations (May 2021).

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- More dense network for tracking severe weather.

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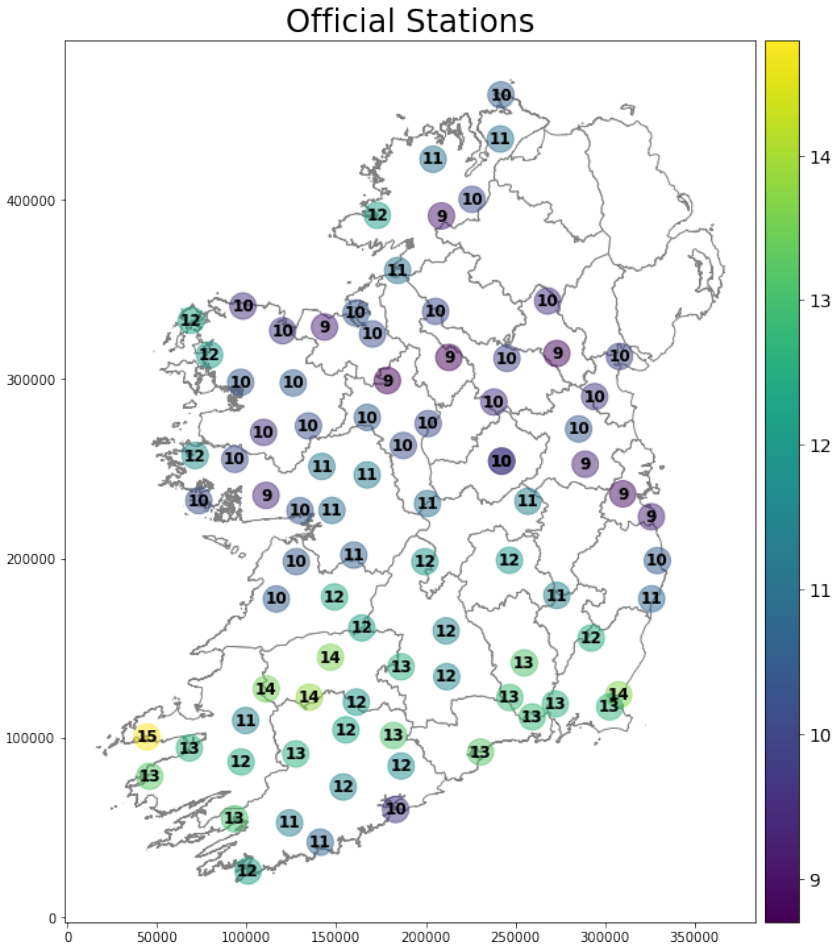

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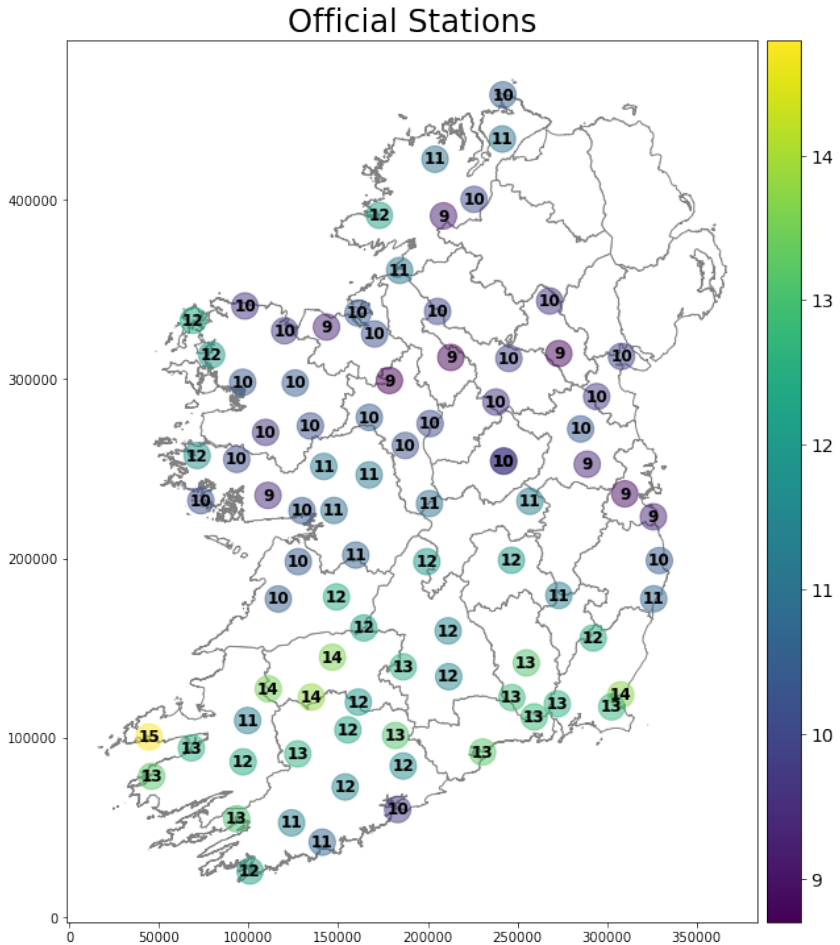

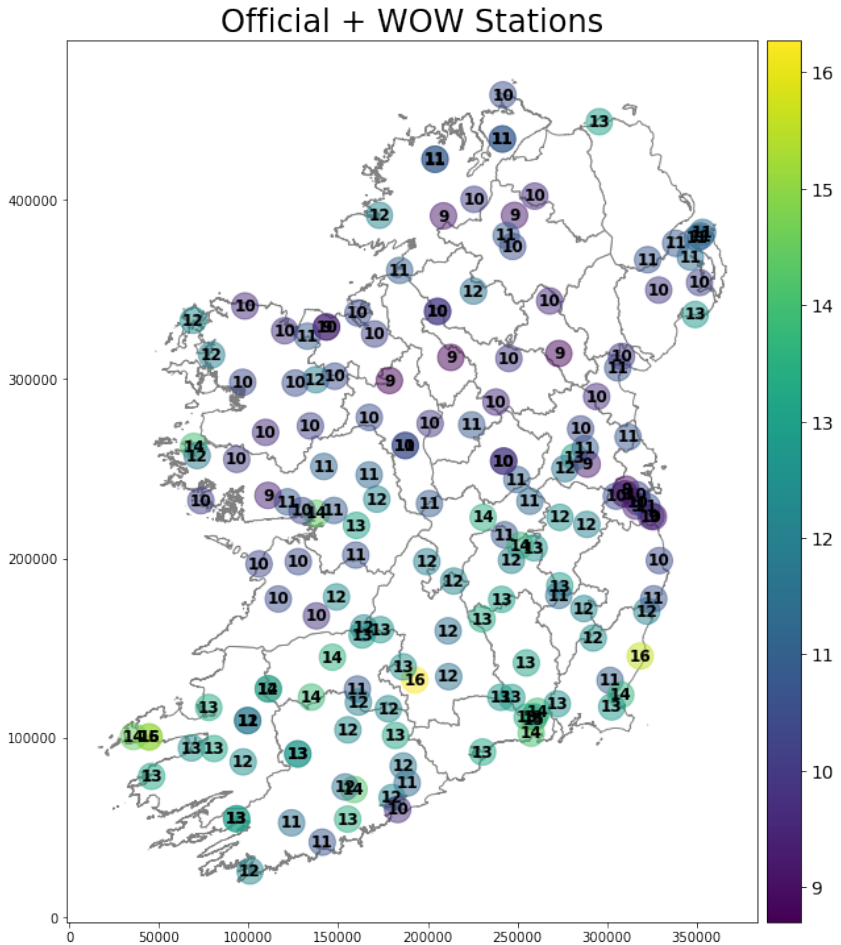

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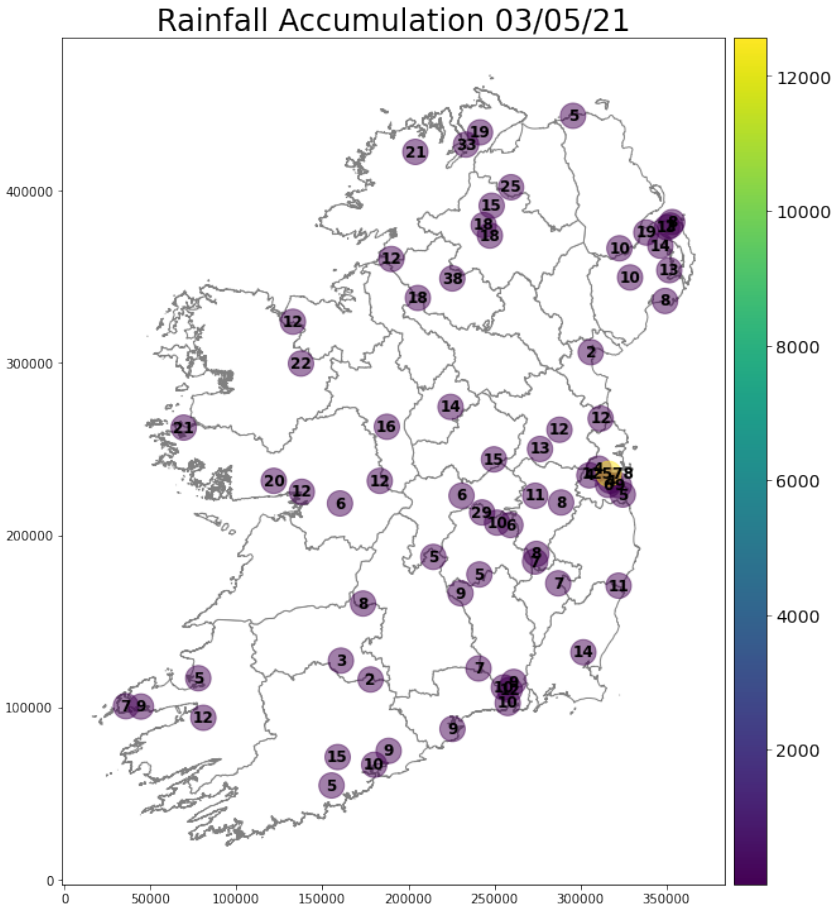

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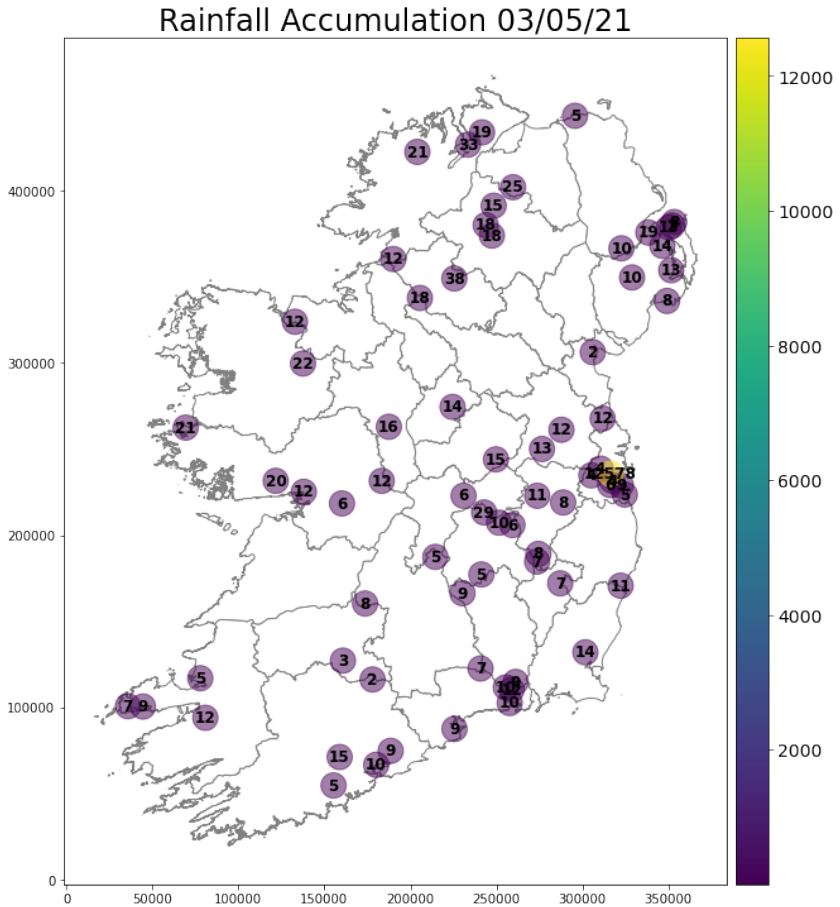

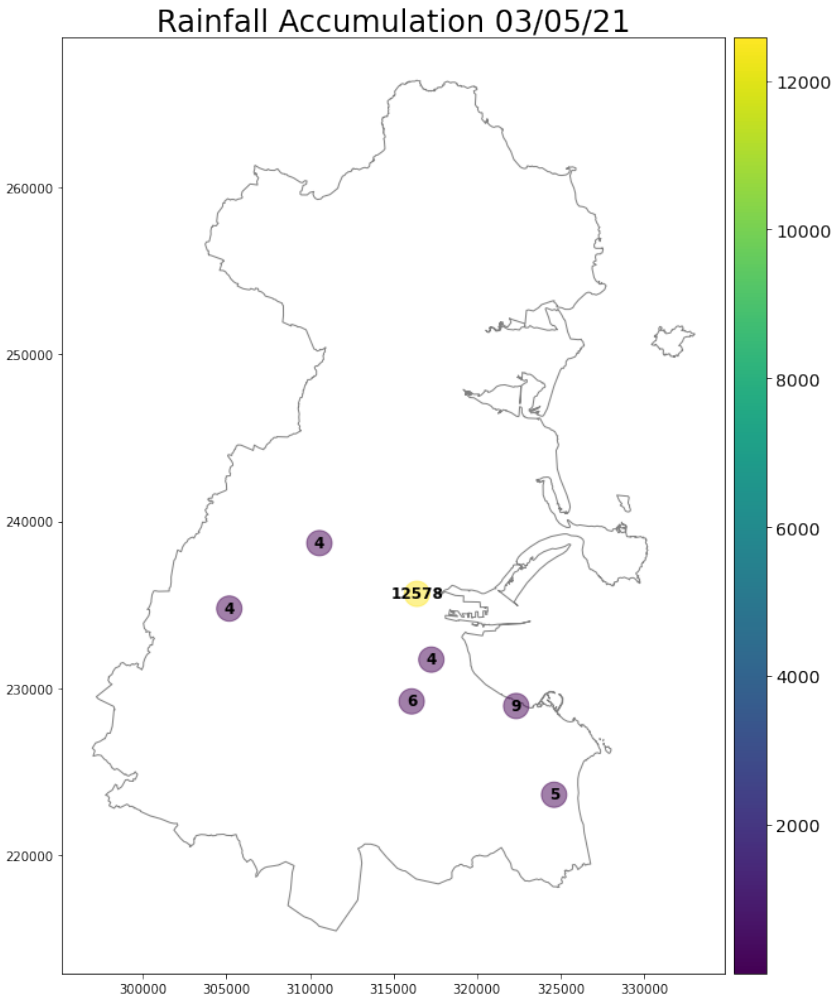

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There are two main types of checks:

1. Range Checks
2. Spatial Consistency Checks

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Example 2: We can use **historical climate values** to perform a range check for a specific location and time.

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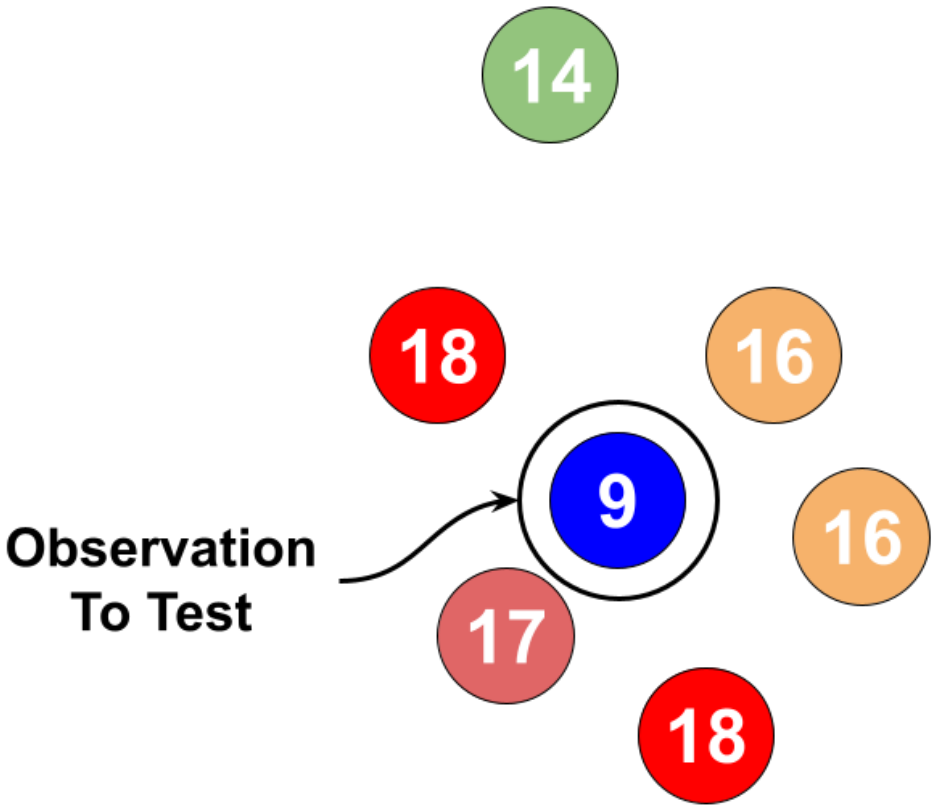
4. Based on a threshold decide if the observation should be flagged.

Spatial Consistency Check - Automatic



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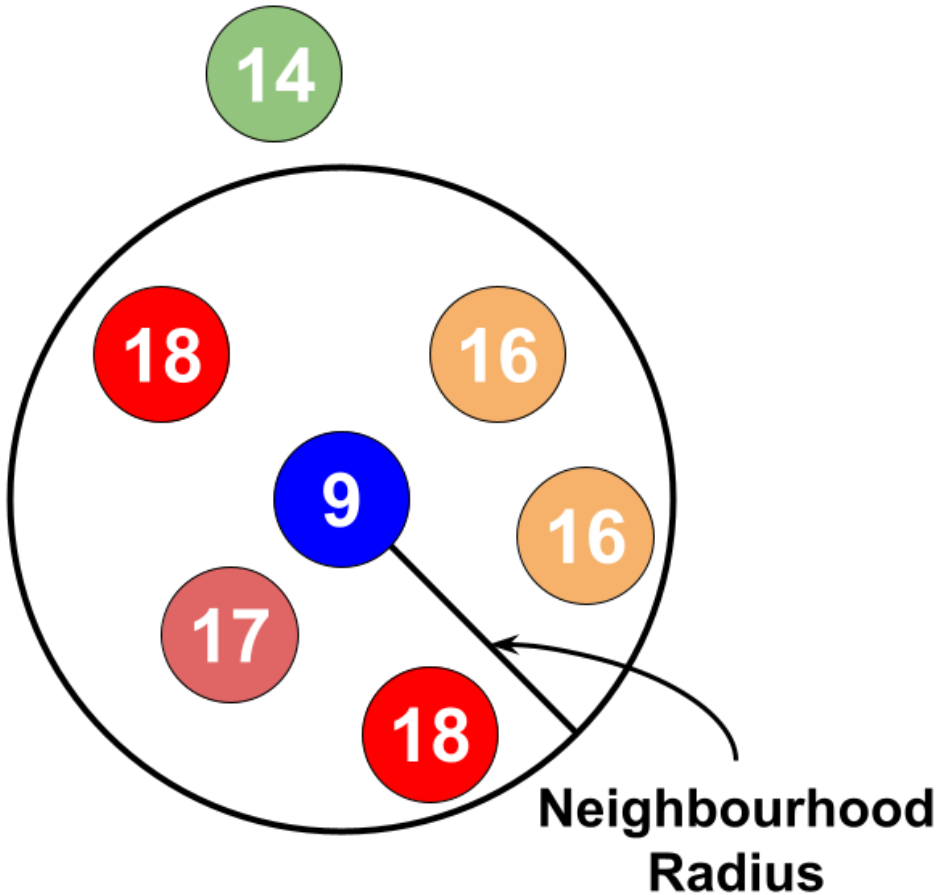

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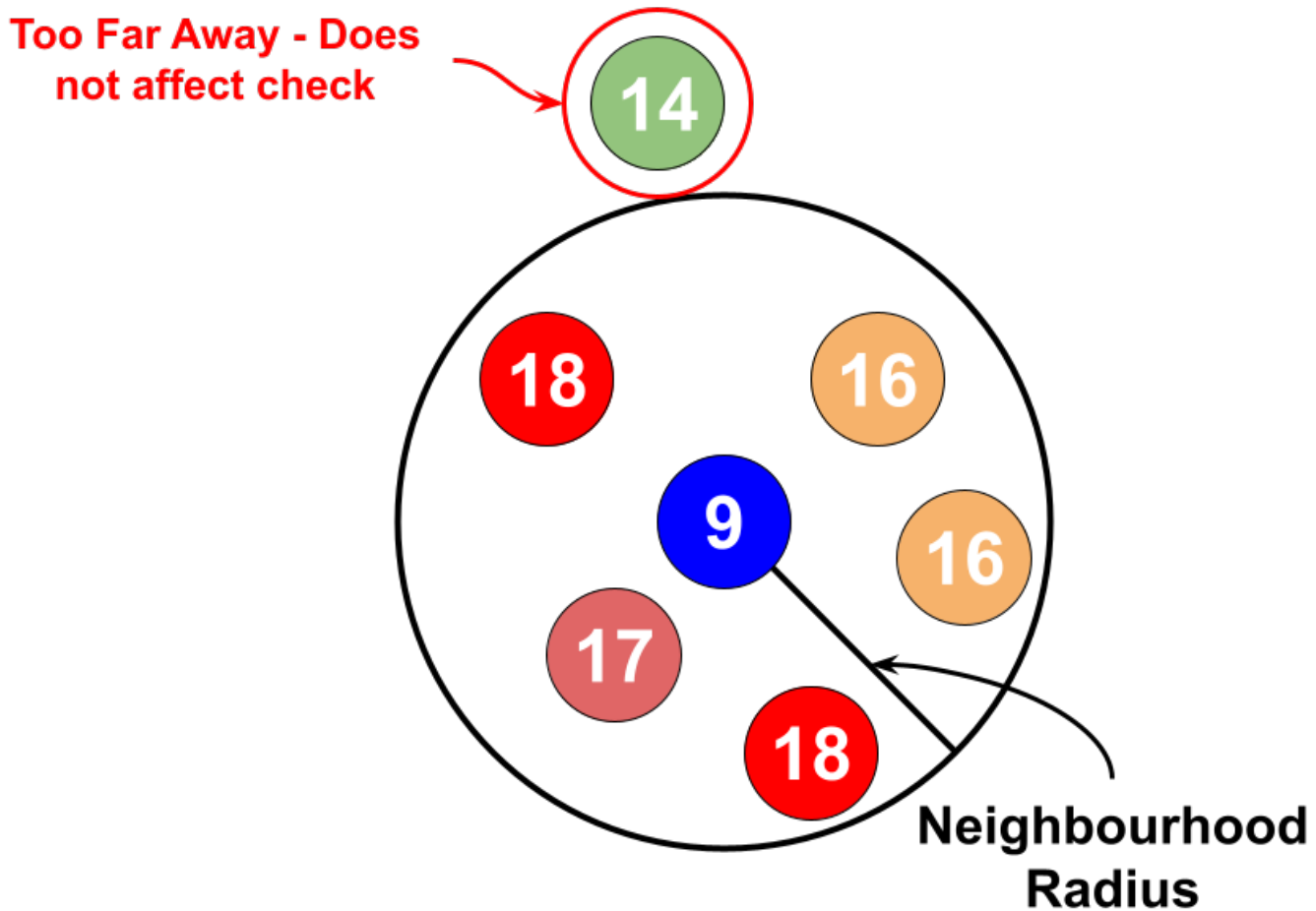

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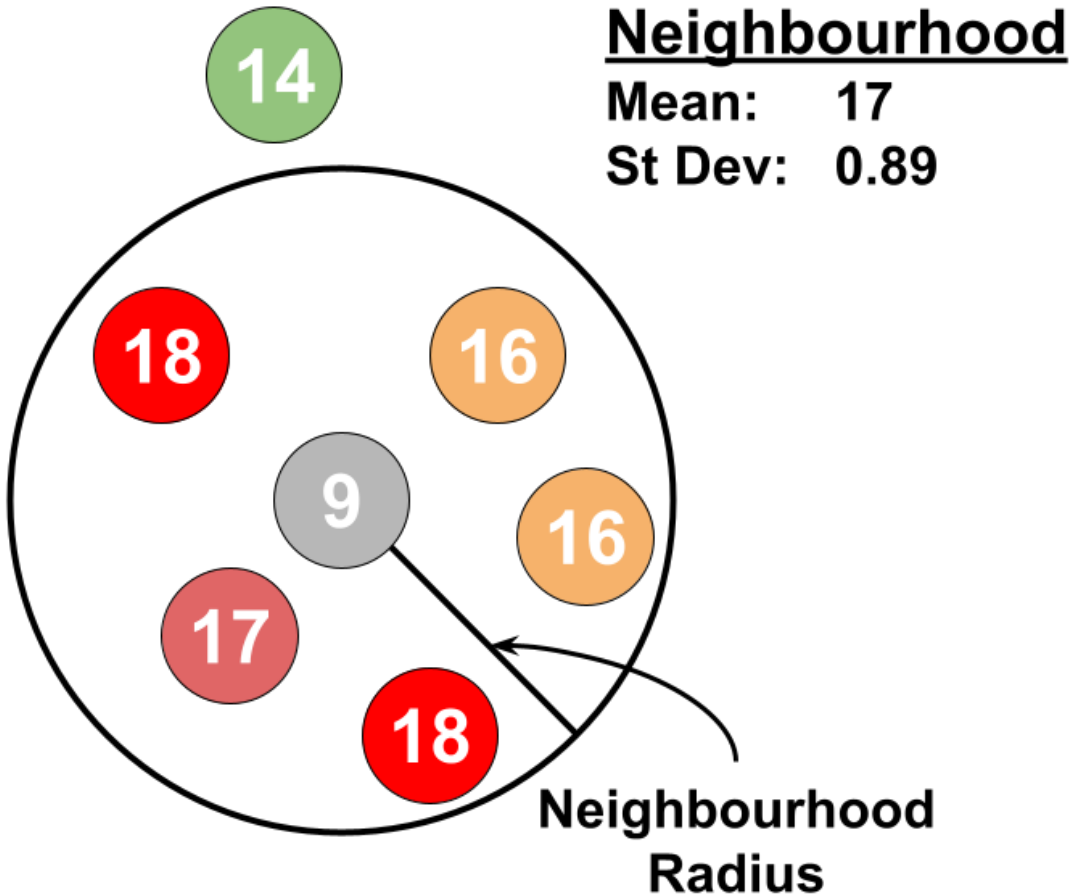

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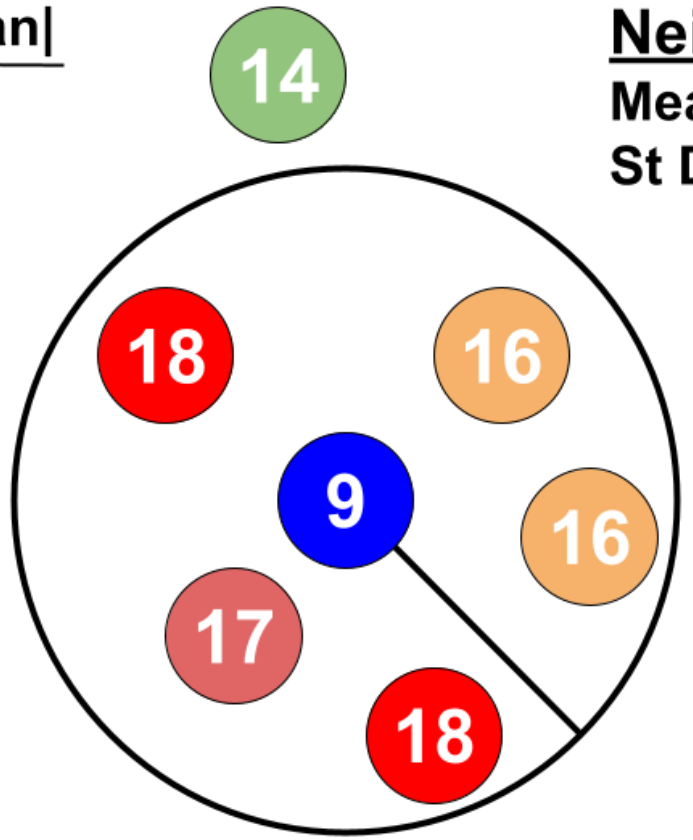

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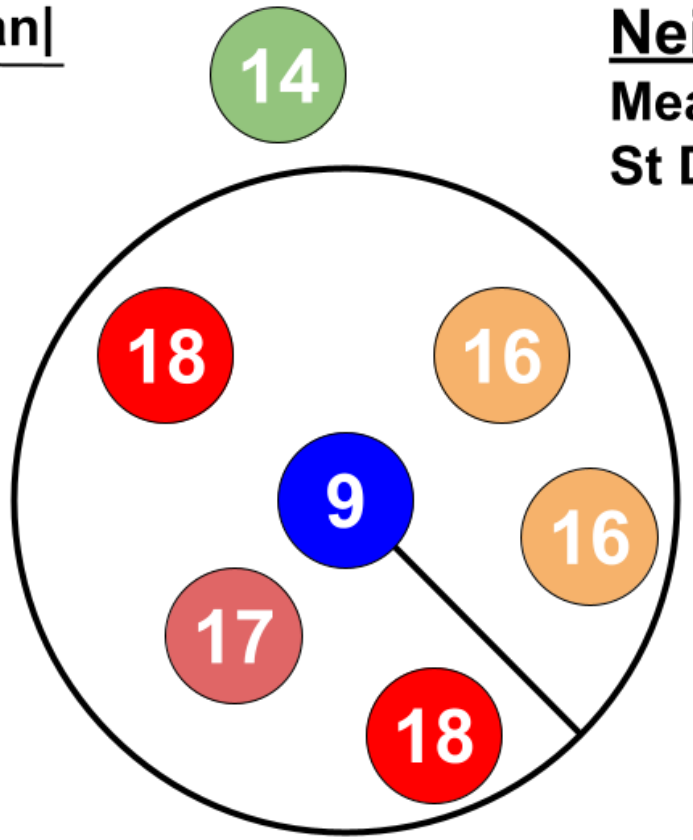

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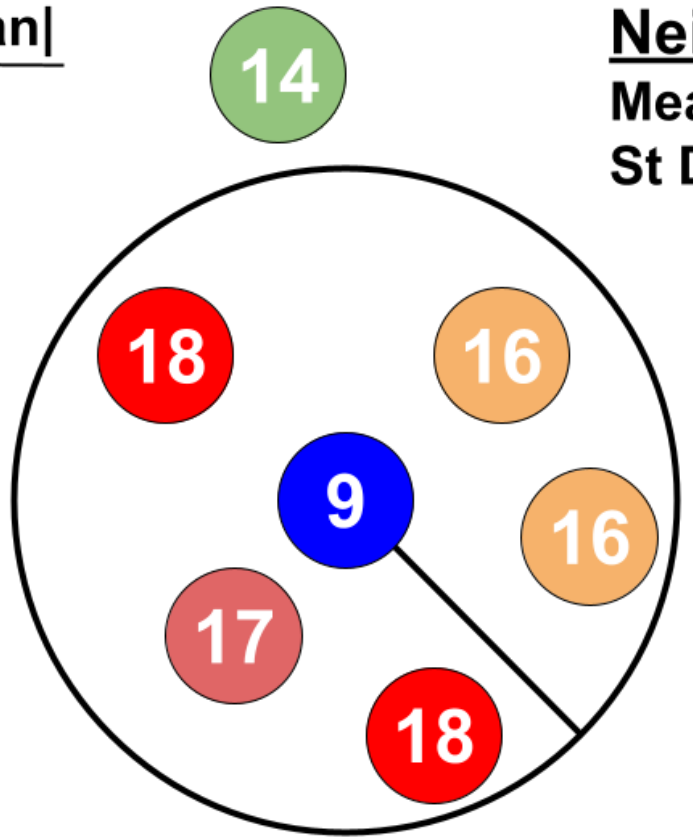

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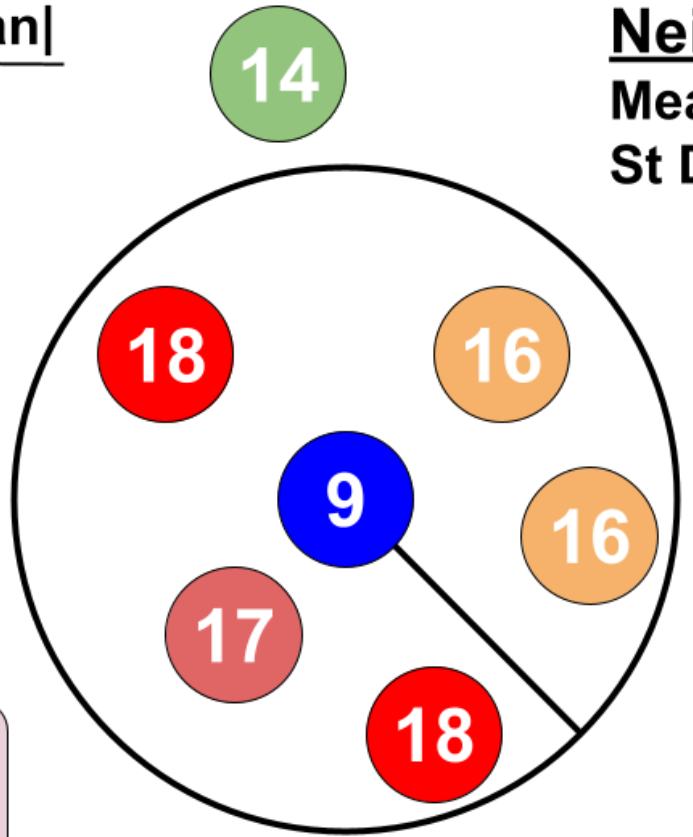

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If $z > \sigma_{thresh}$
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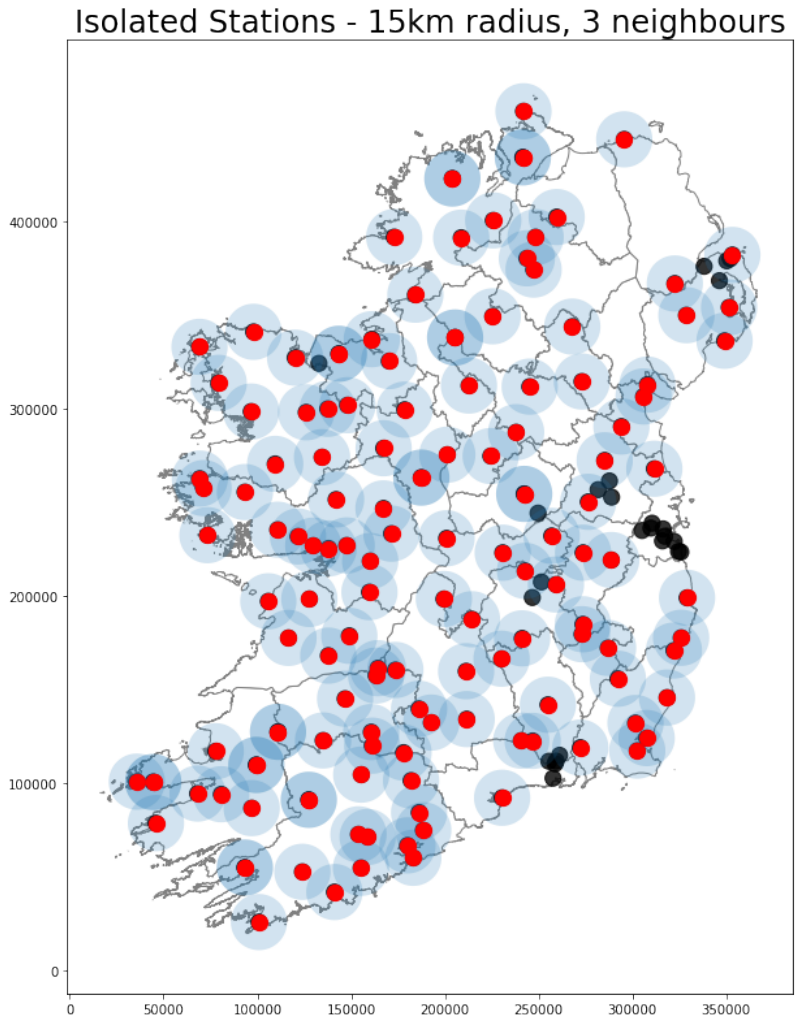

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- Note: Software is currently in an alpha stage.

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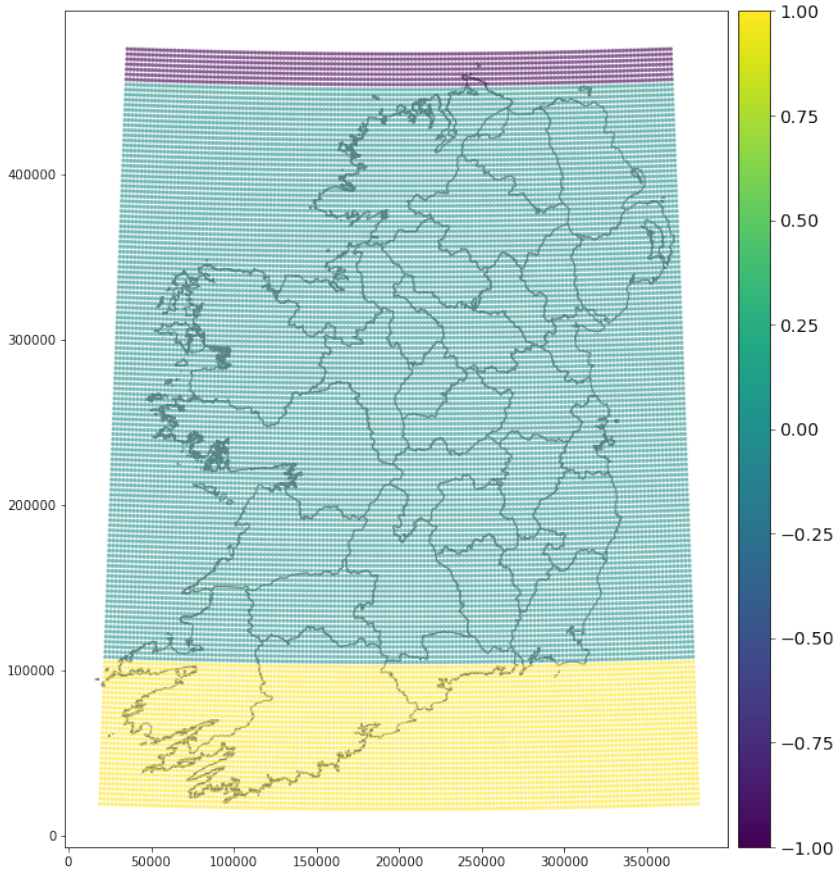
4. Custom scripts to apply the chosen checks sequentially and visualise the results for easier interpretation.

Improvements - Climatology Range Check

TITAN calculates a guess for the mean temp based on Latitude.



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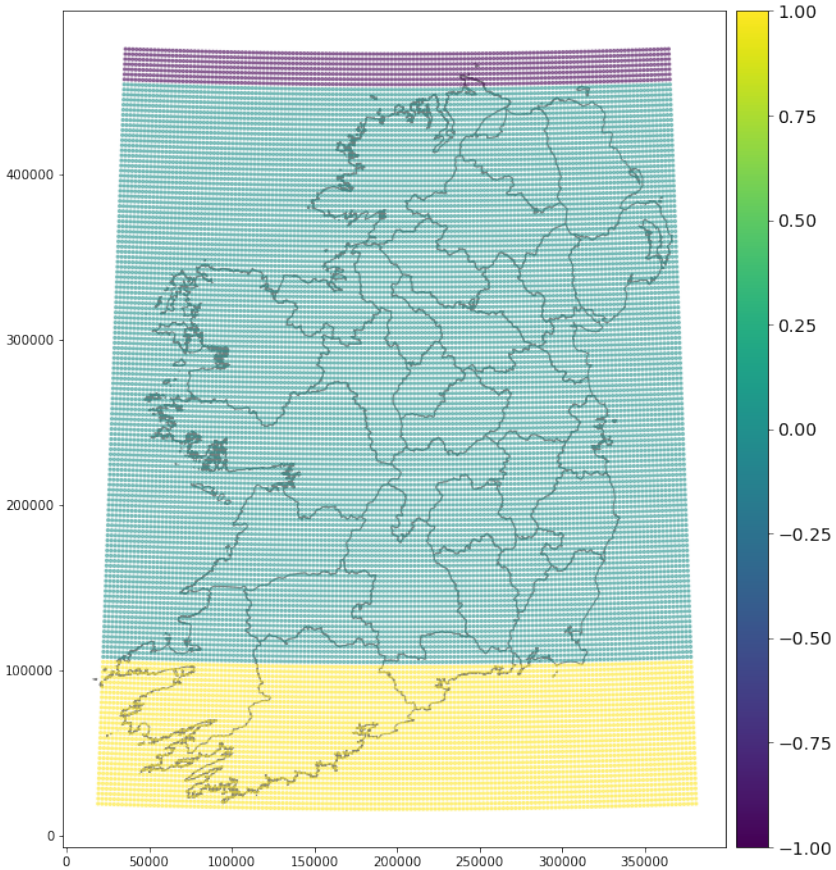

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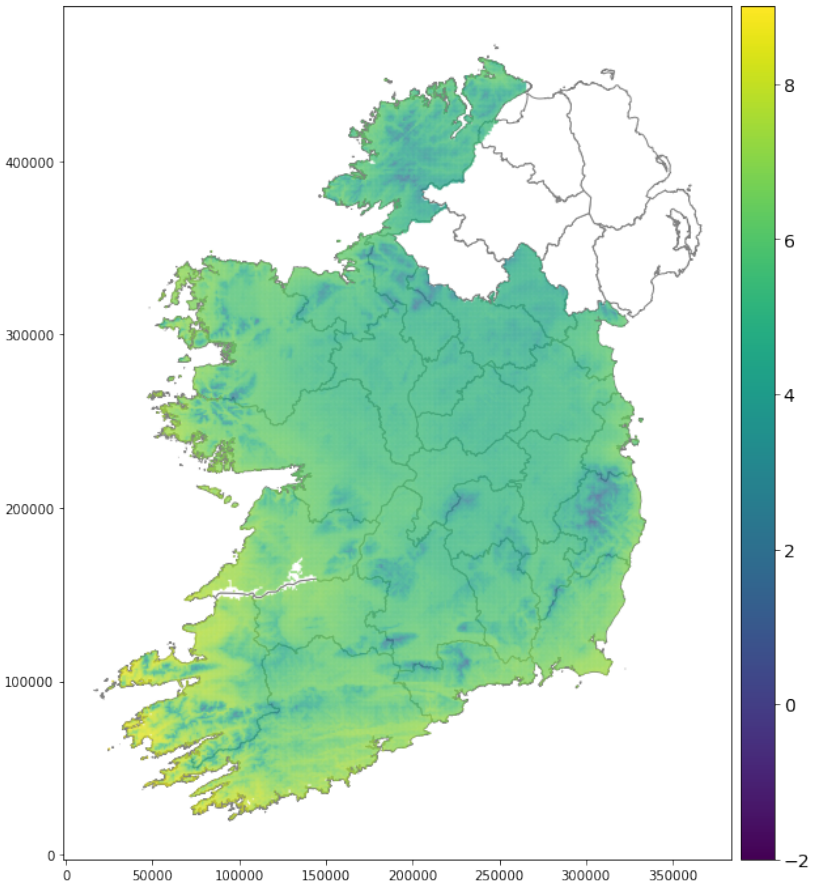

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- TITAN is powerful software written to perform Quality Control checks on citizen weather measurements.
- After performing the improved TITAN range checks, the WOW data can be used as a fairly reliable reference data set.
- In the future **if more stations are added we would be able to reliably perform the more complex checks** and have even more confidence in the resulting data set.

Questions?

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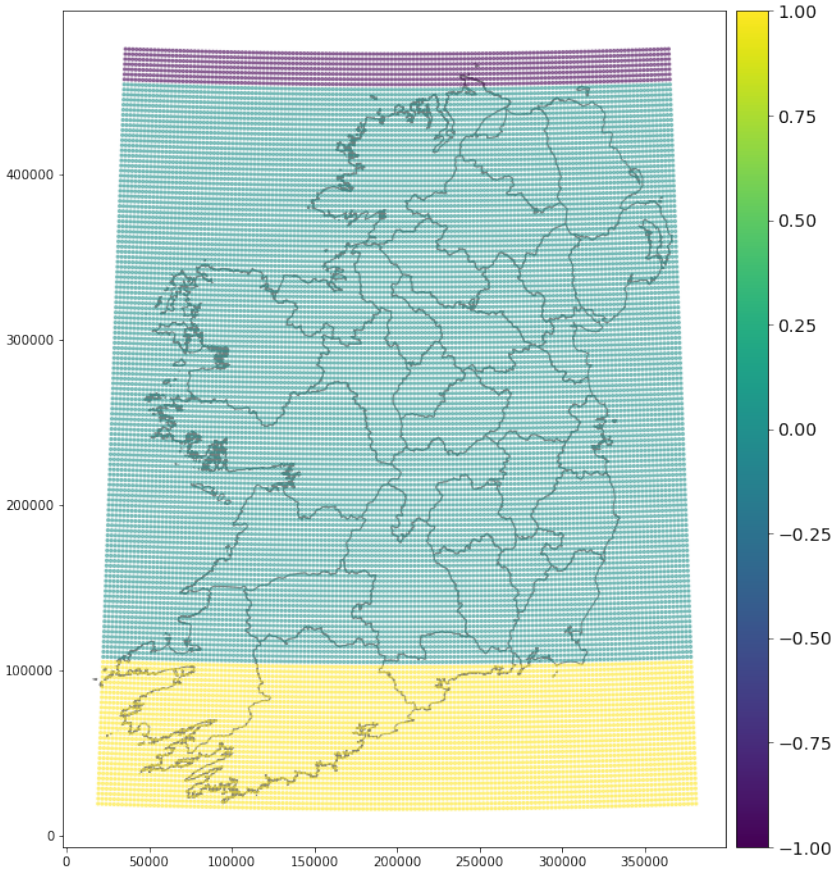

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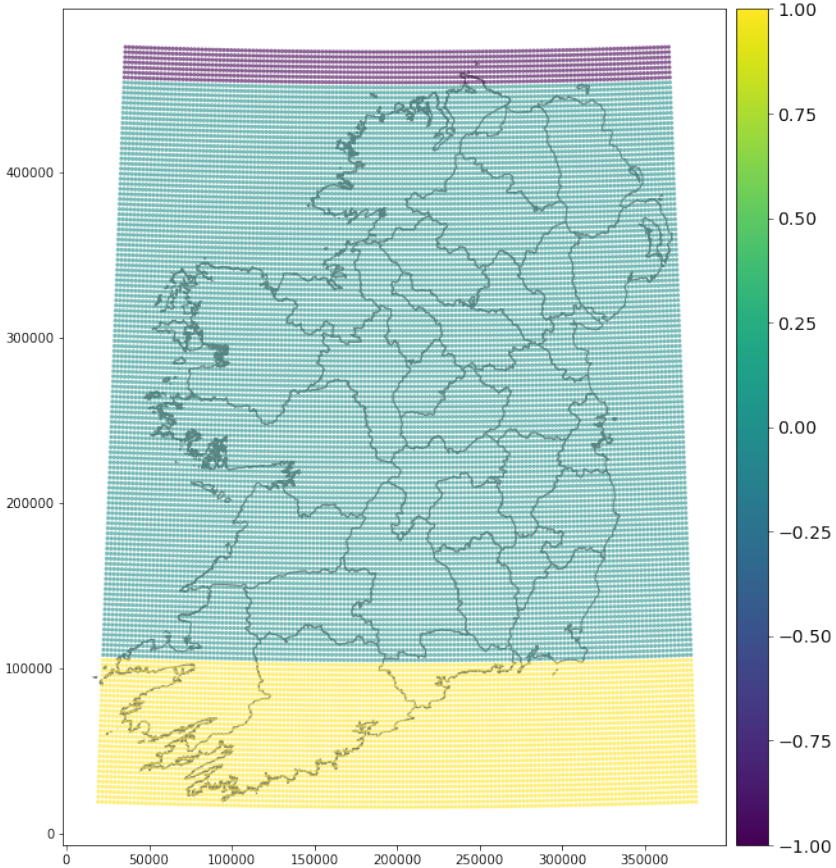

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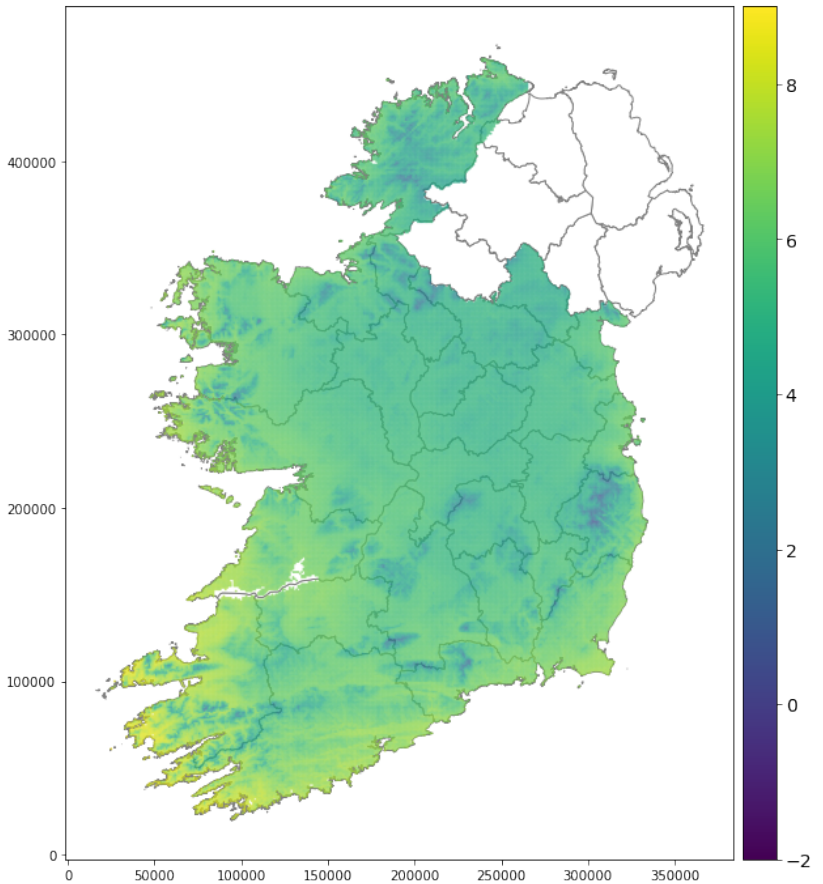

Final Product - Examples

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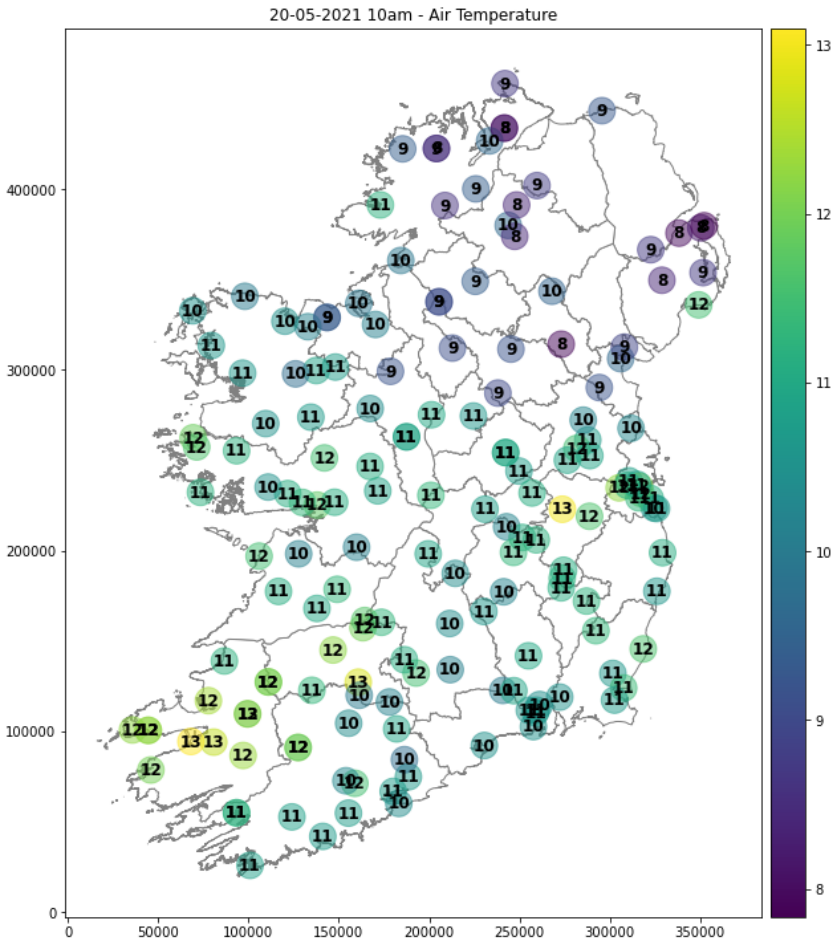

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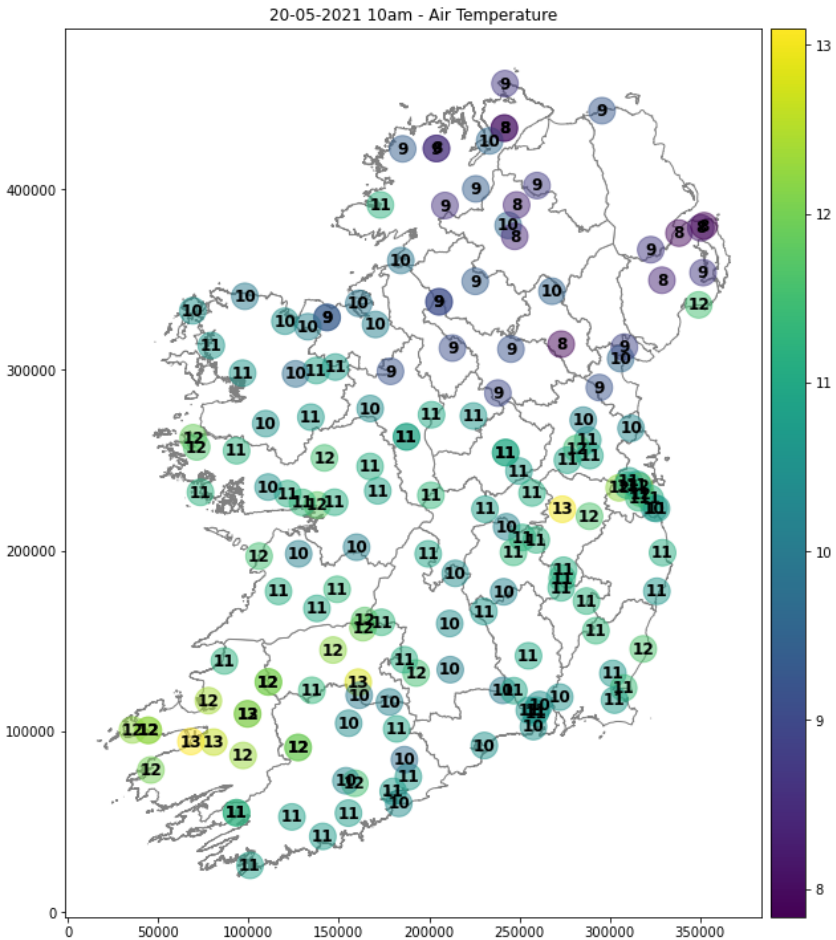

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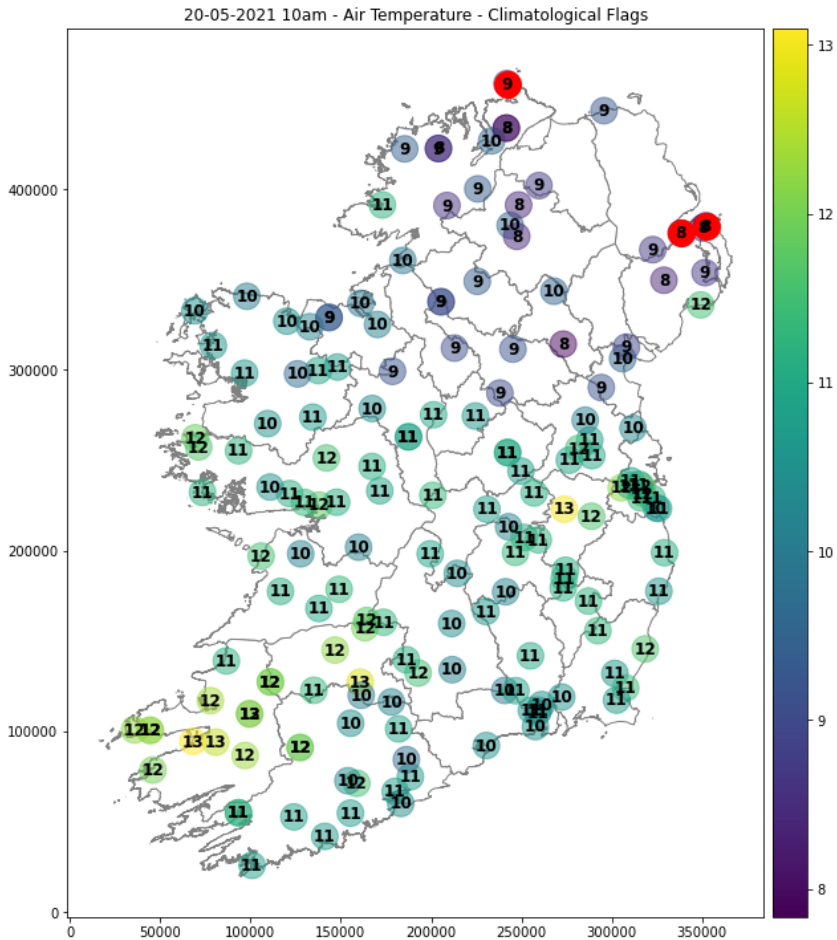

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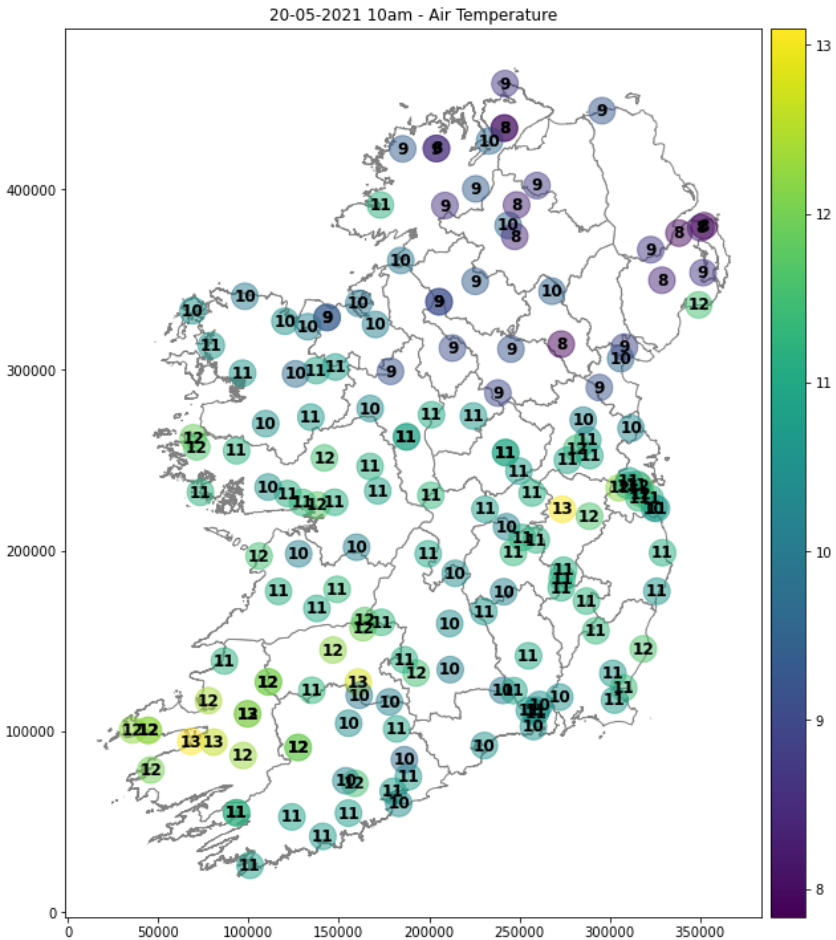
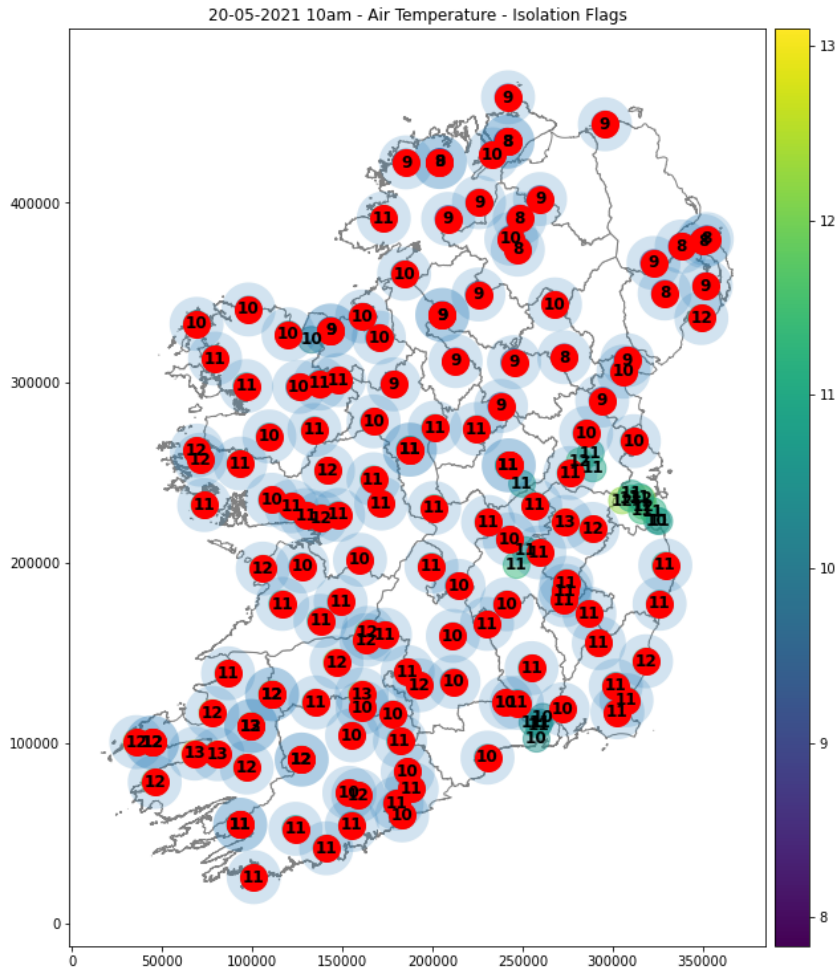


Isolation Check.



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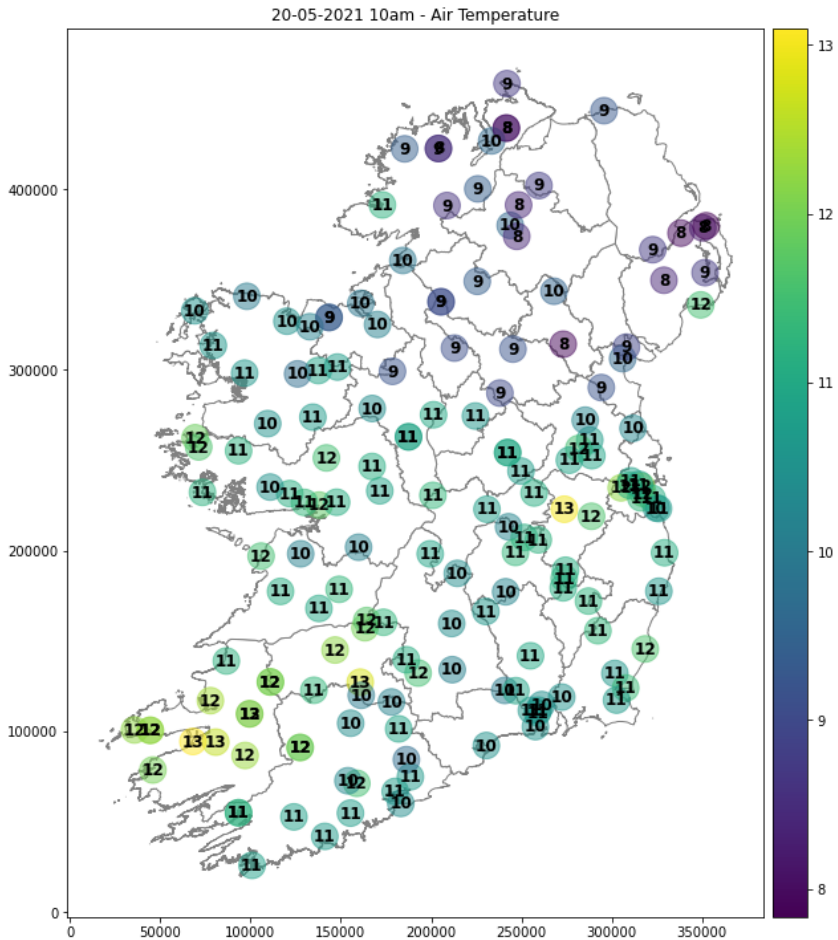

Spatial Consistency Test.