Monitoring Marine Heat Waves (MHW) around Iceland using Copernicus Marine Service products

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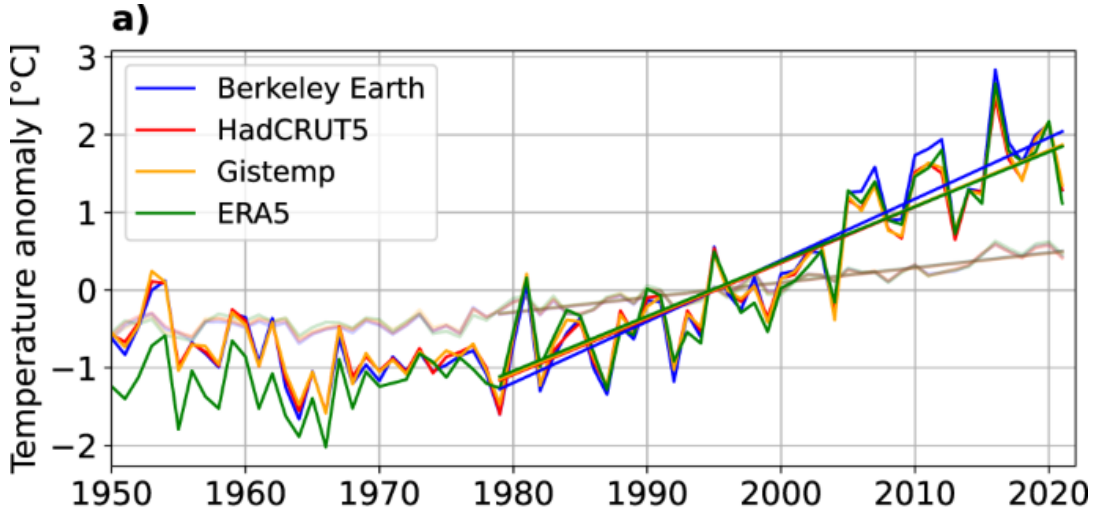
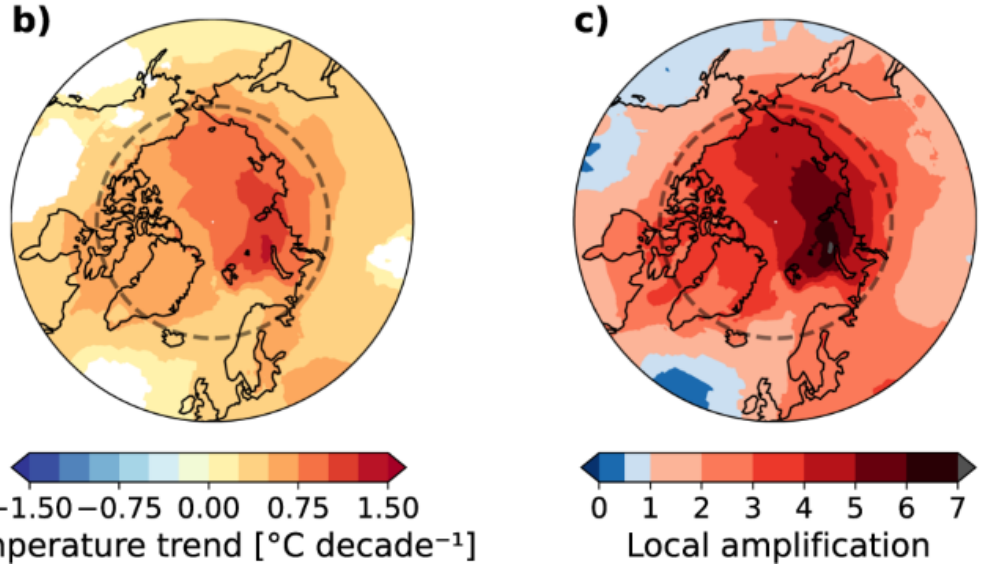
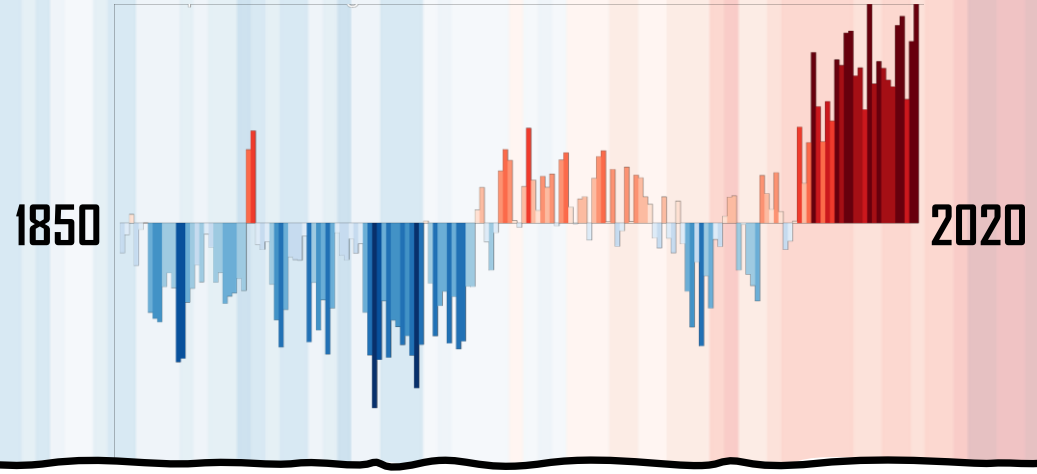




(Rantanen et al., 2022)

Atmospheric temperatures are rising, particularly in the **Arctic**

Sea surface temperatures have shown a remarkable increase

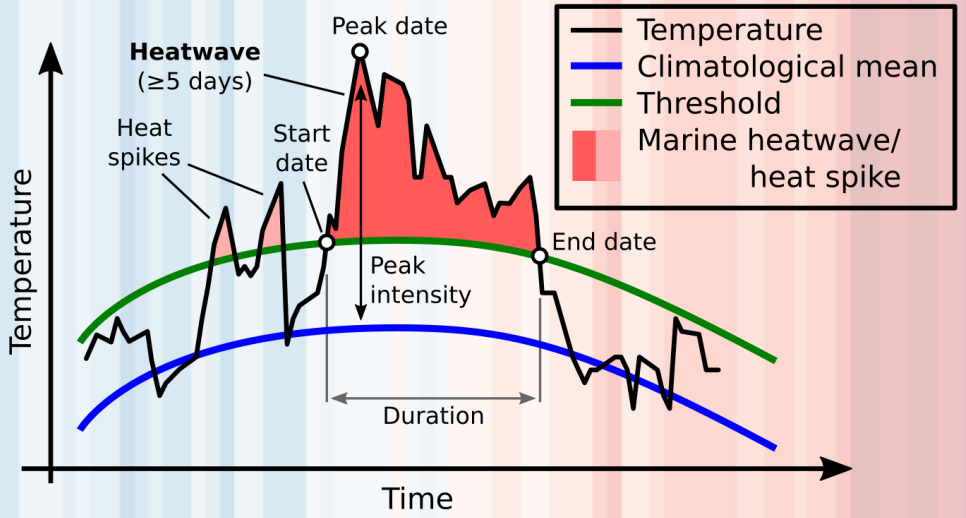


What is a Marine Heat wave?

Definition:

A marine heatwave is a period during which the water temperature is abnormally warm

- We specifically used:
  - Abnormal event where temperatures exceed the 90th percentile of 30-year historic values for five or more days in a row (Hobday et al., 2016).
  - Sea surface temperature
- Opposite for a marine cold spell.



(Hobday et al., 2016).

Datasets Used

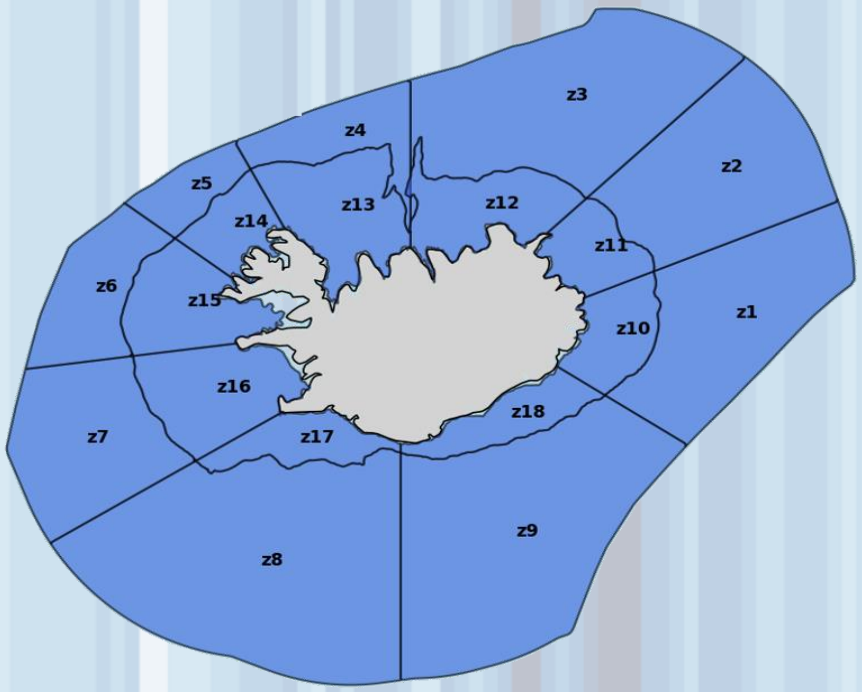
Copernicus Marine Service

- GLORYS12V1 [1993 –today]
  - Global circulation model with reanalysis
  - 1/12° horizontal resolution and 50 vertical levels
- OSTIA [1982-today]
  - Observational satellite based-data
  - 0.05° x 0.05° horizontal grid resolution.
- The climatology is calculated for both datasets.
  - It has the 90th percentile for detecting MHWs, the seasonal average and the 10th percentile for detecting MCSs

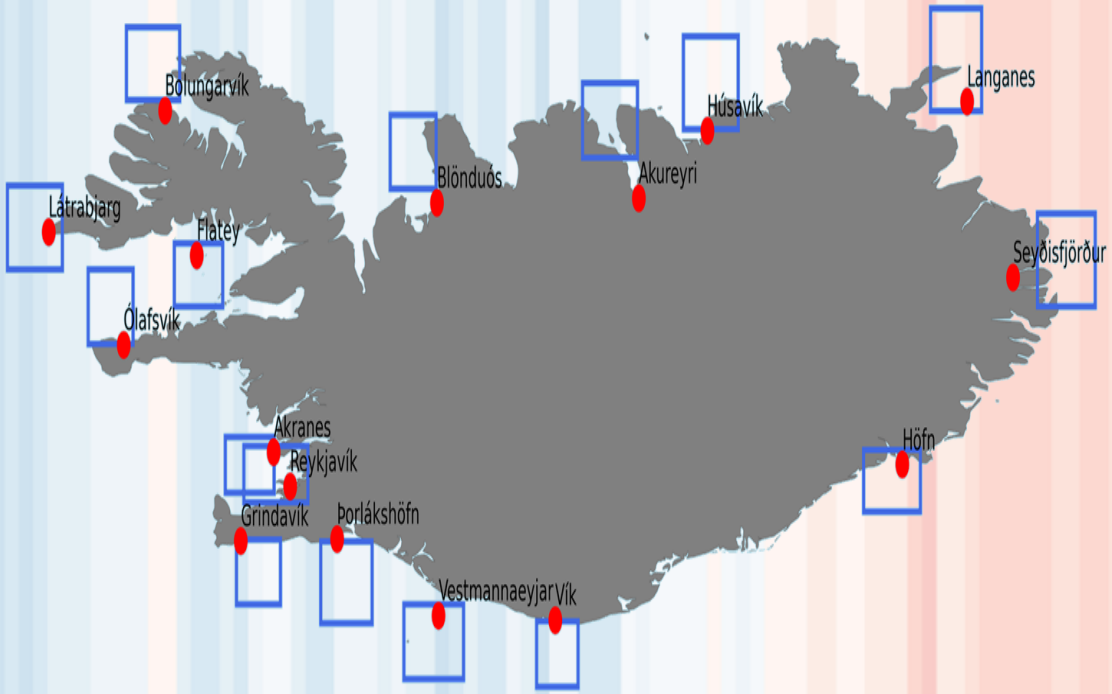
Process

- Two different approaches:

Subregions



Targeted analysis



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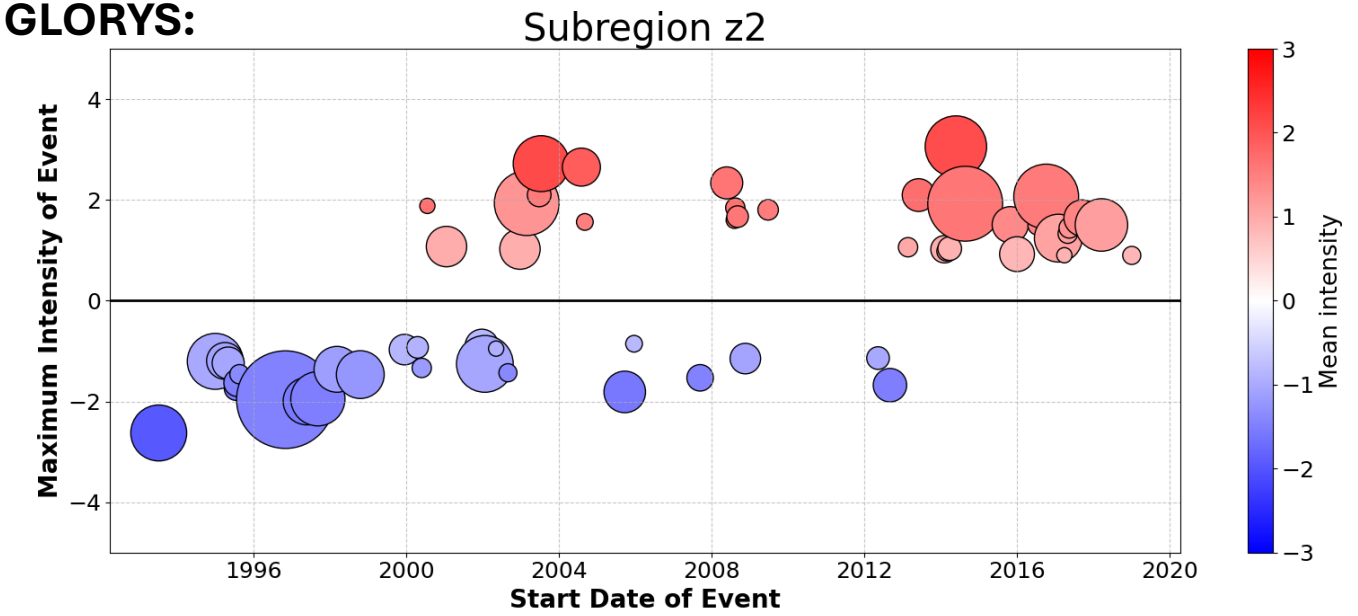

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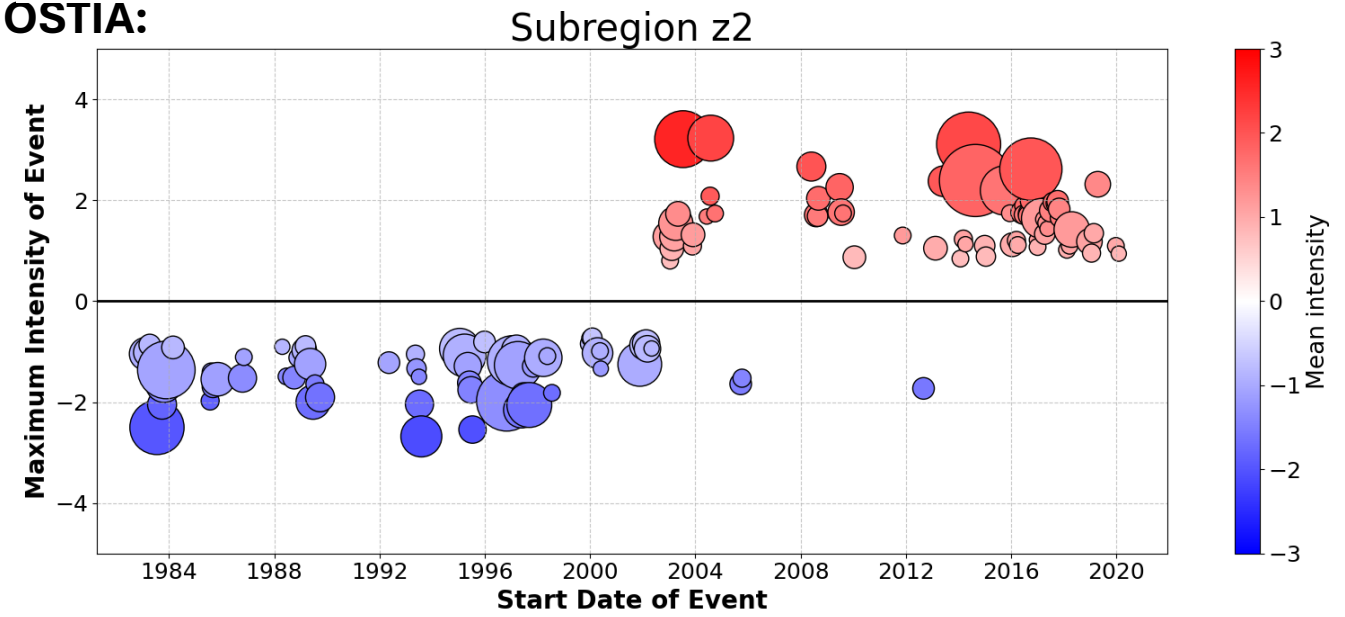

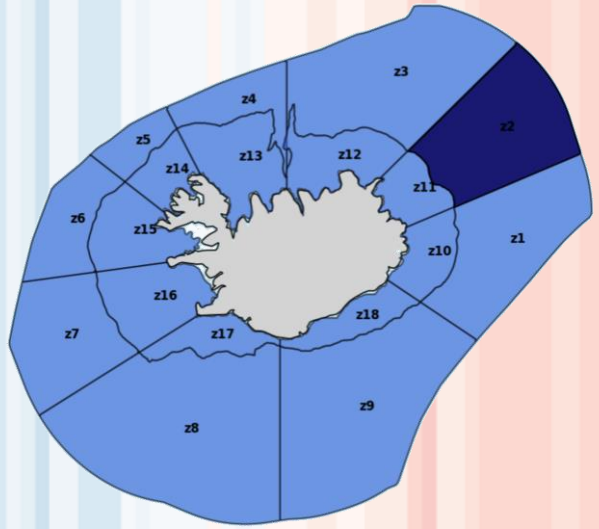

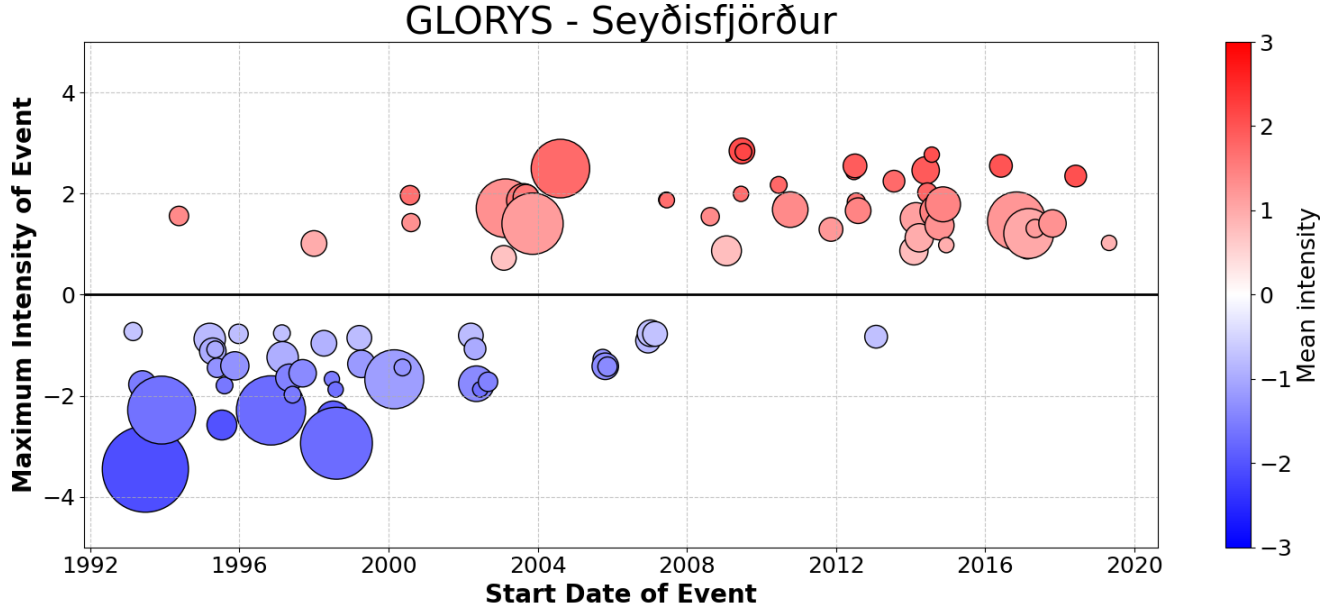
GLORYS - Seyðisfjörður
Maximum Intensity of Event
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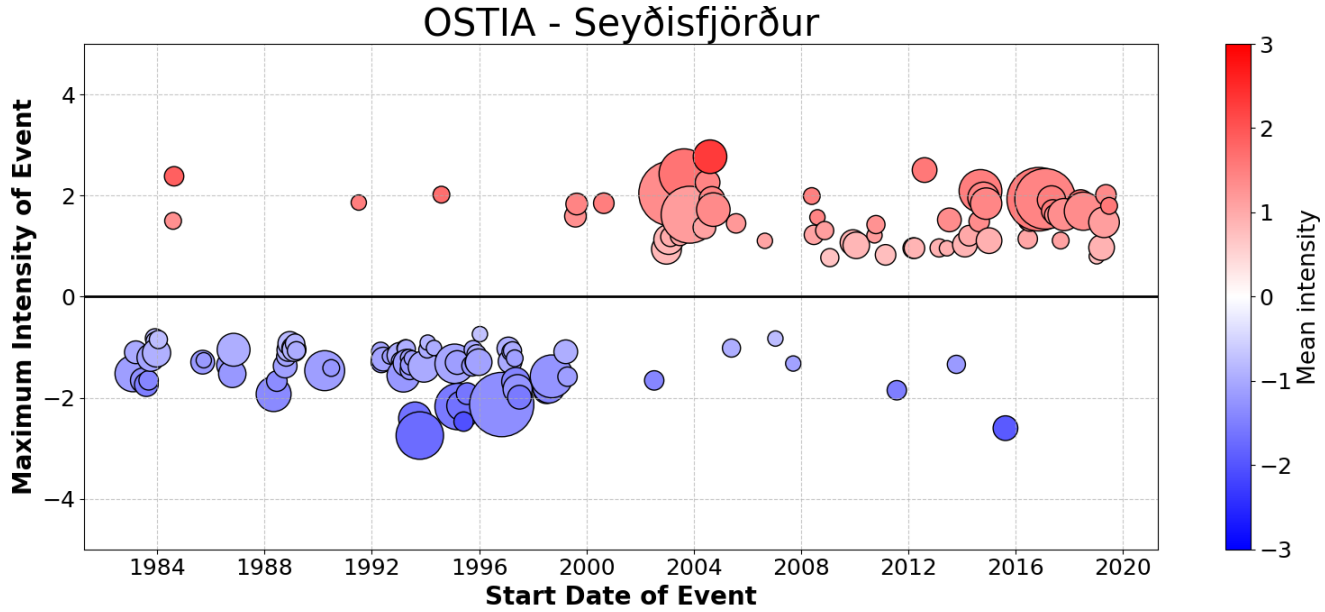
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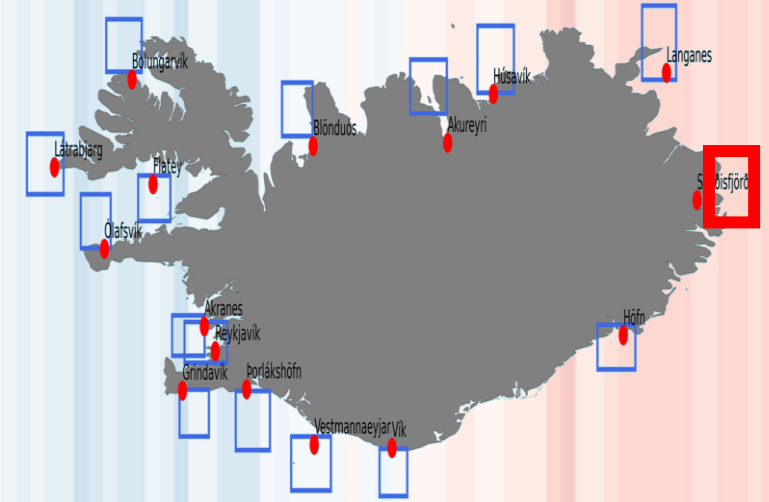
Bolungarvík
Húsavík
Langanes
Blönduós
Akureyri
Látrabjarg
Flatey
Seyðisfjörður
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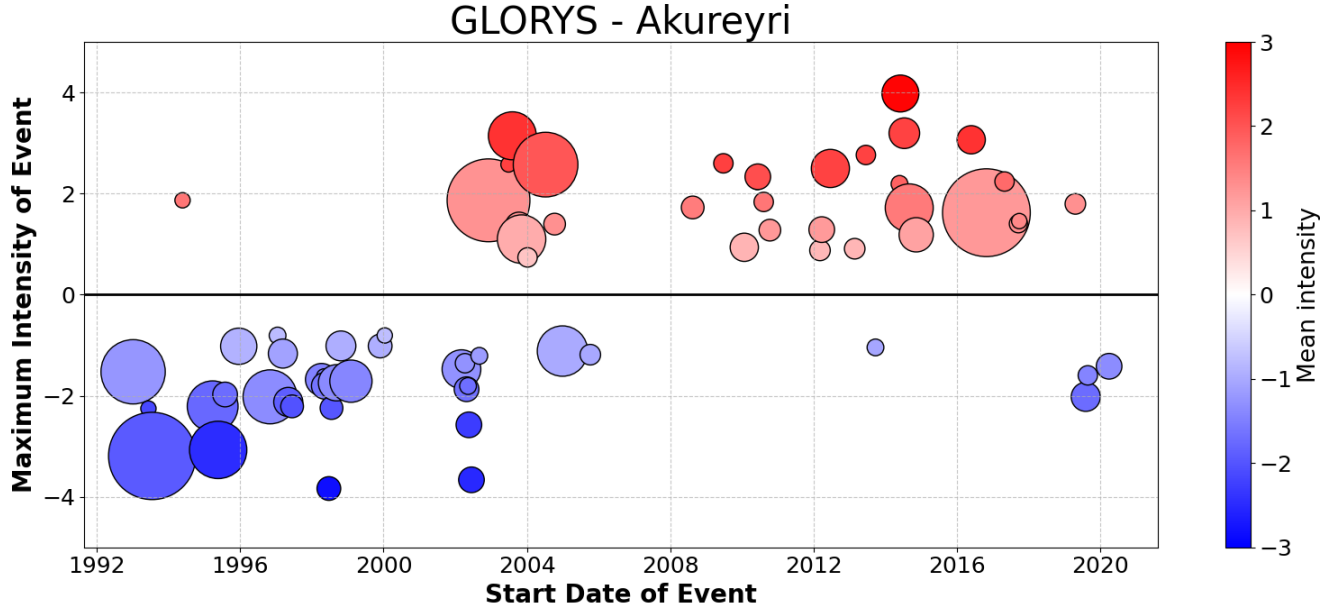
Þorlákshöfn
Vestmannaeyjarvík


GLORYS - Akureyri
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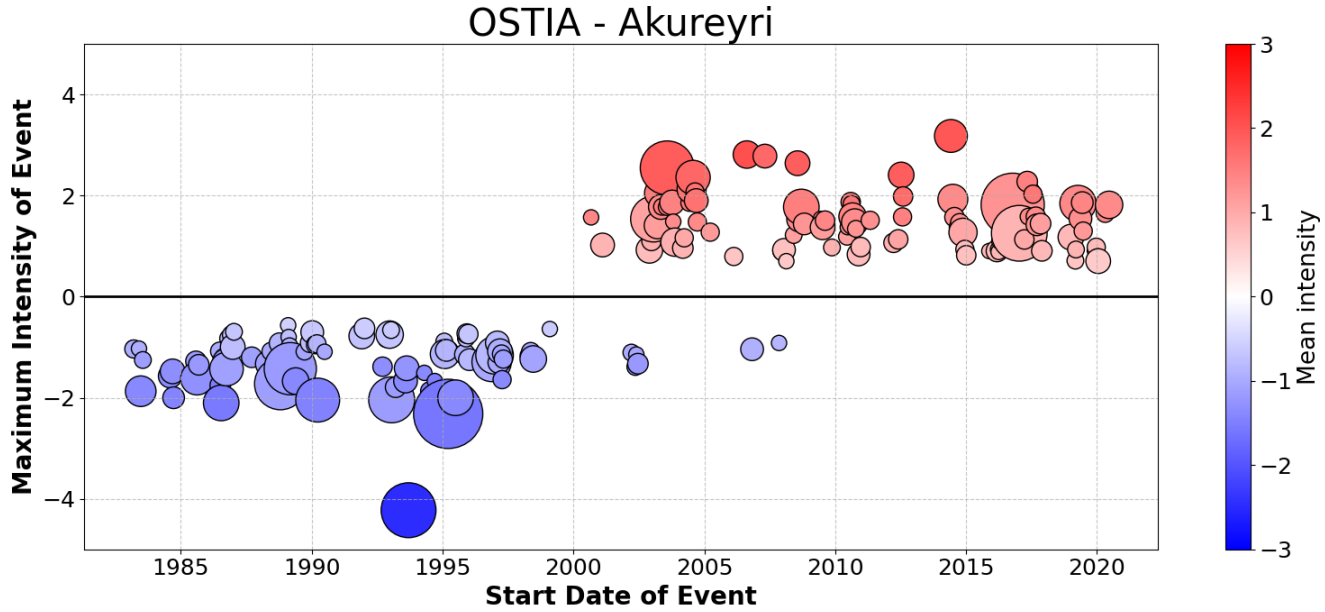
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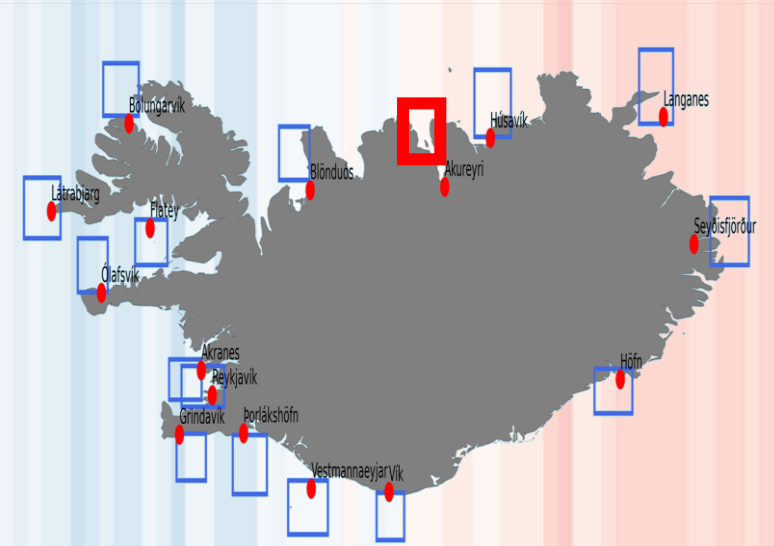
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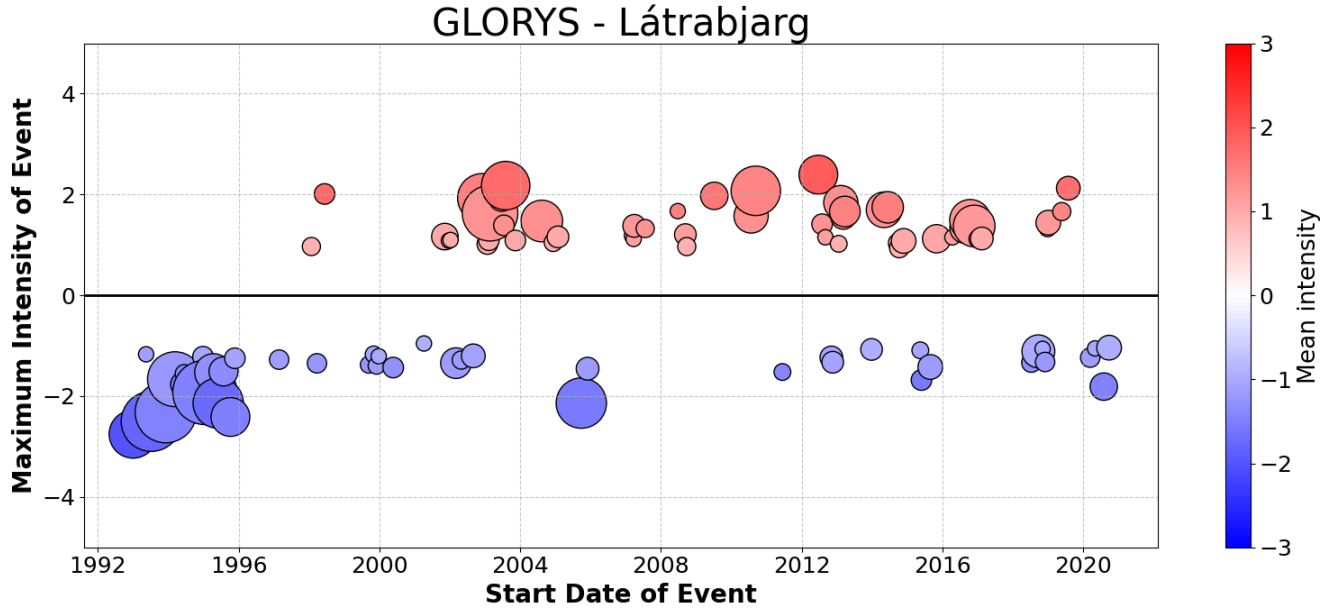
GLORYS - Látrabjarg
Maximum Intensity of Event
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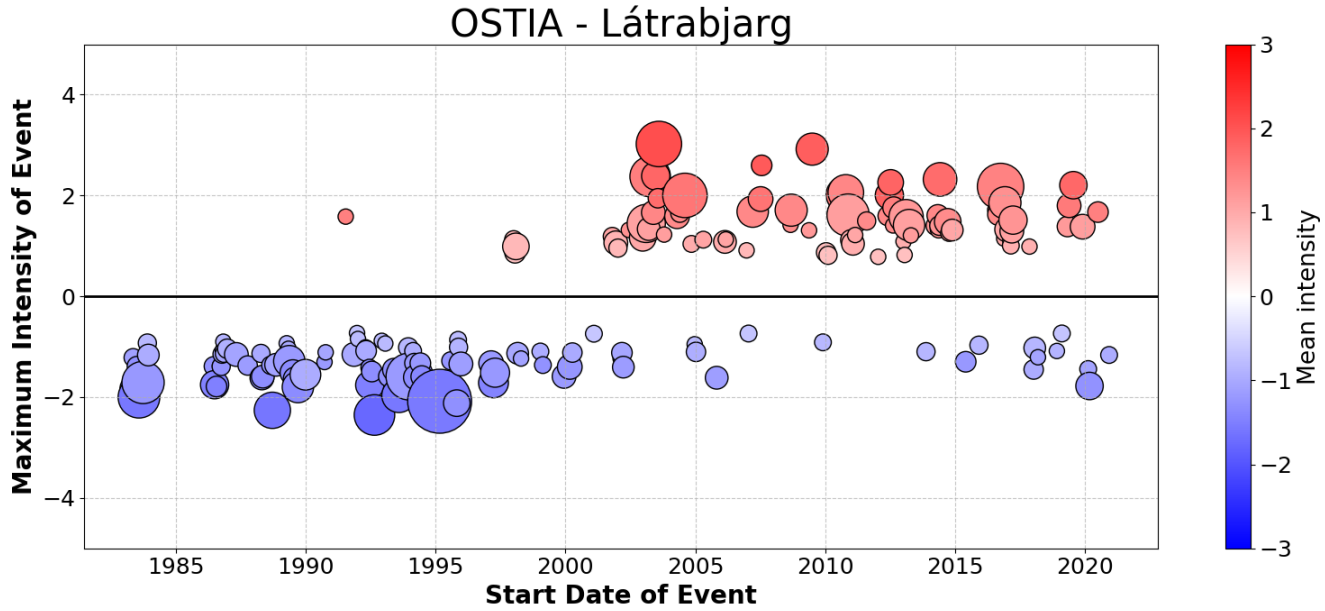
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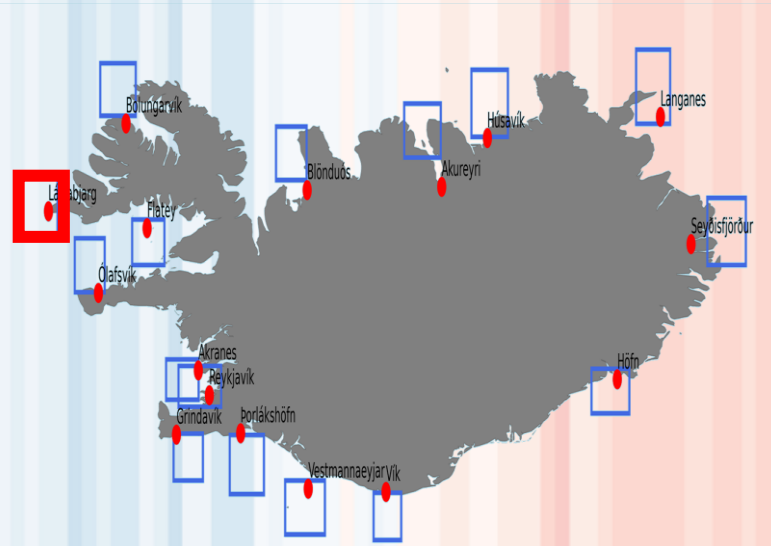
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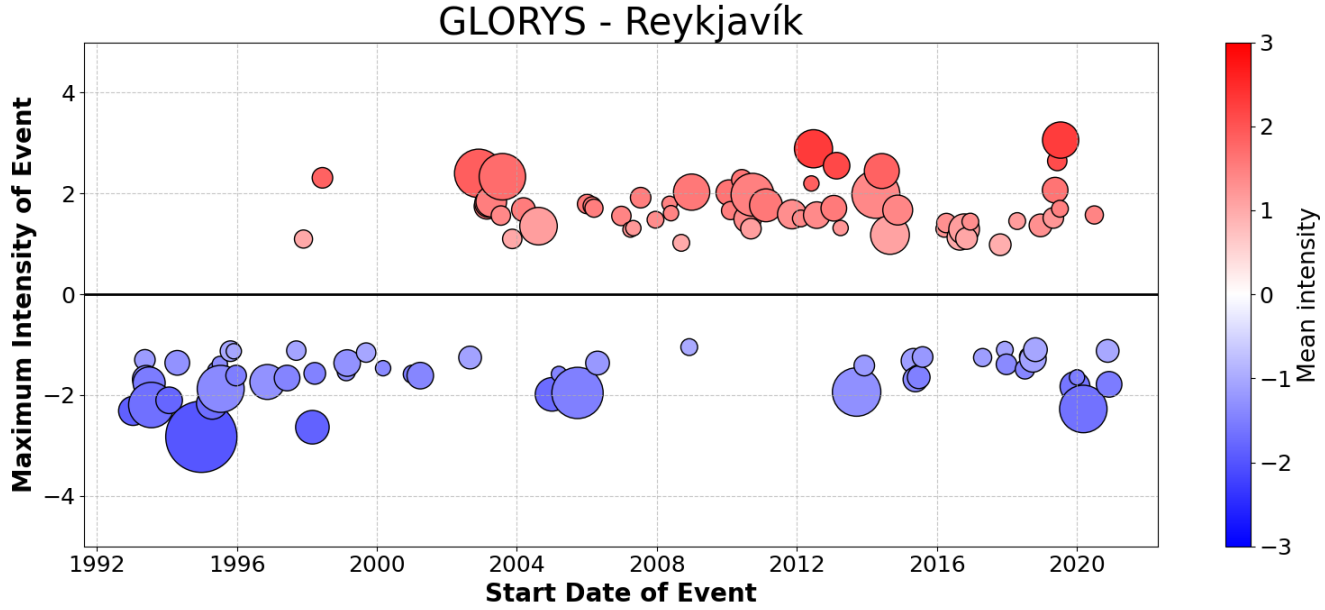
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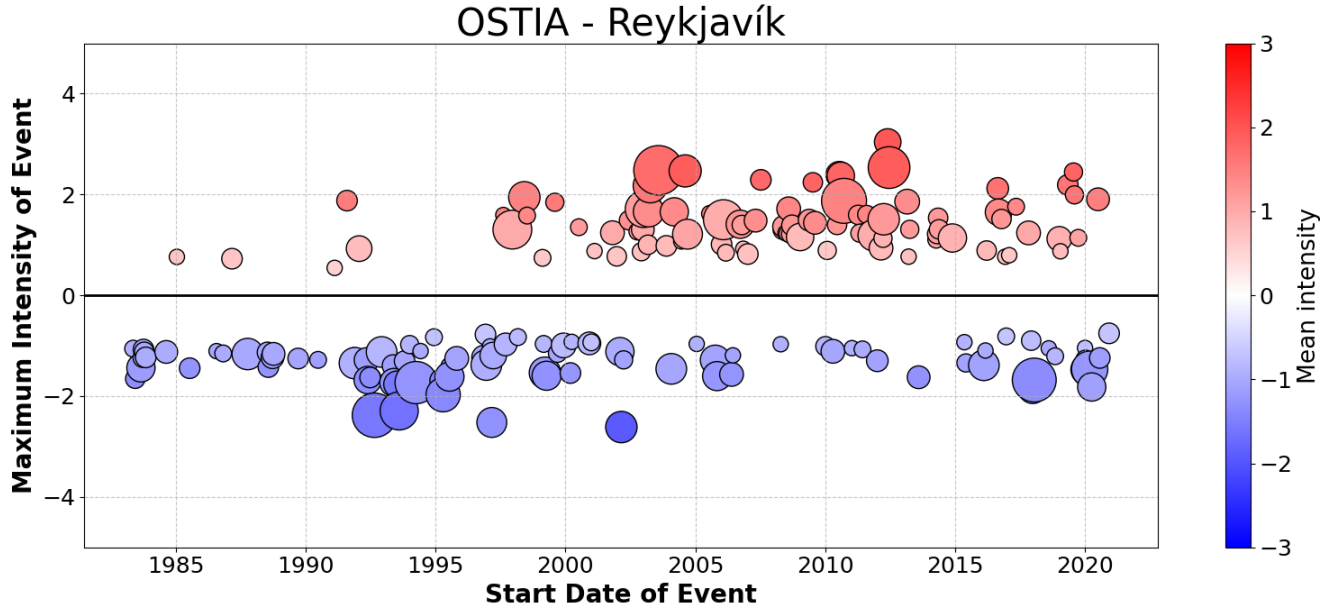
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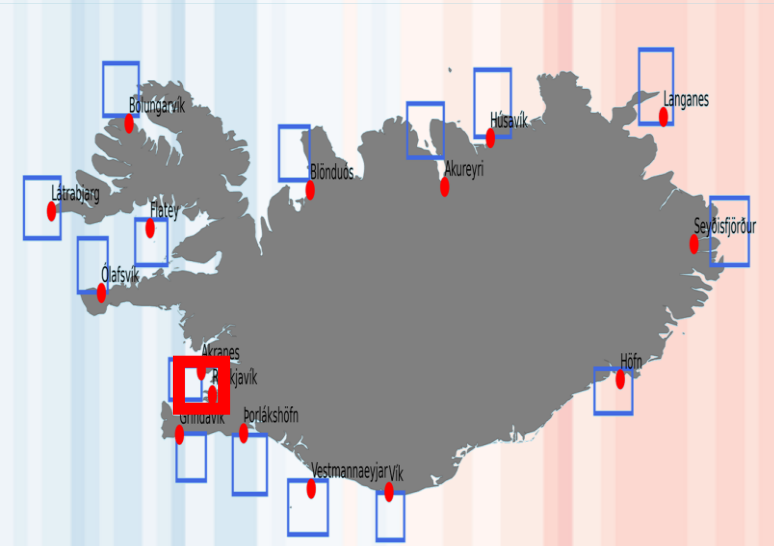
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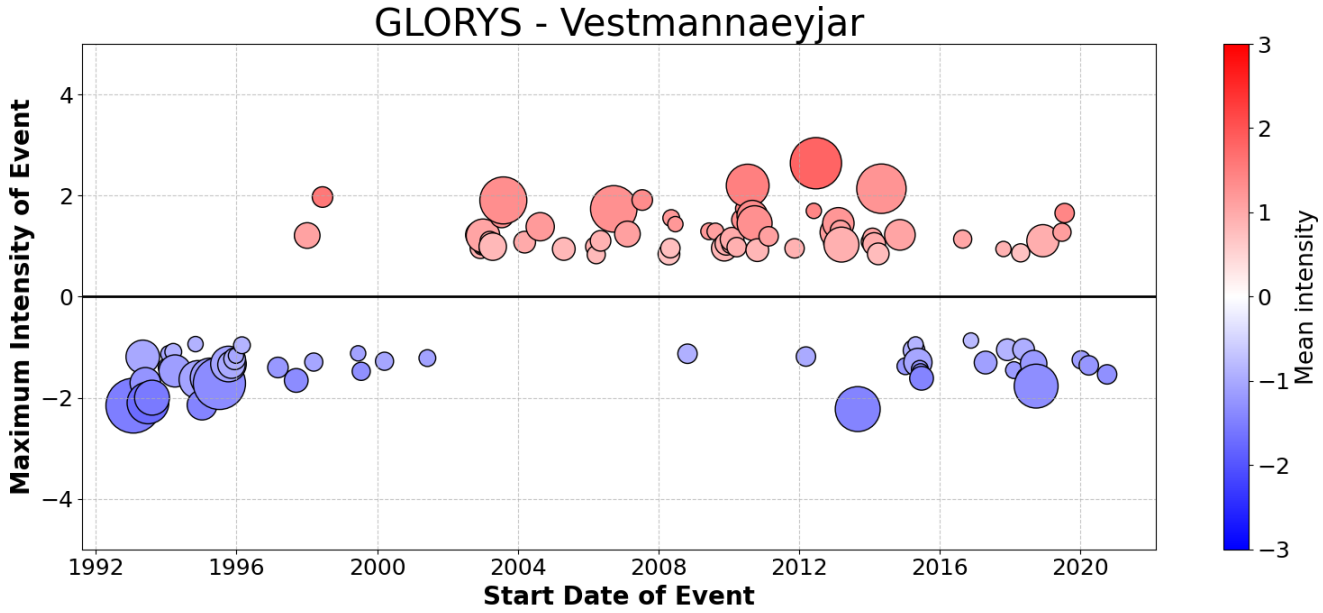
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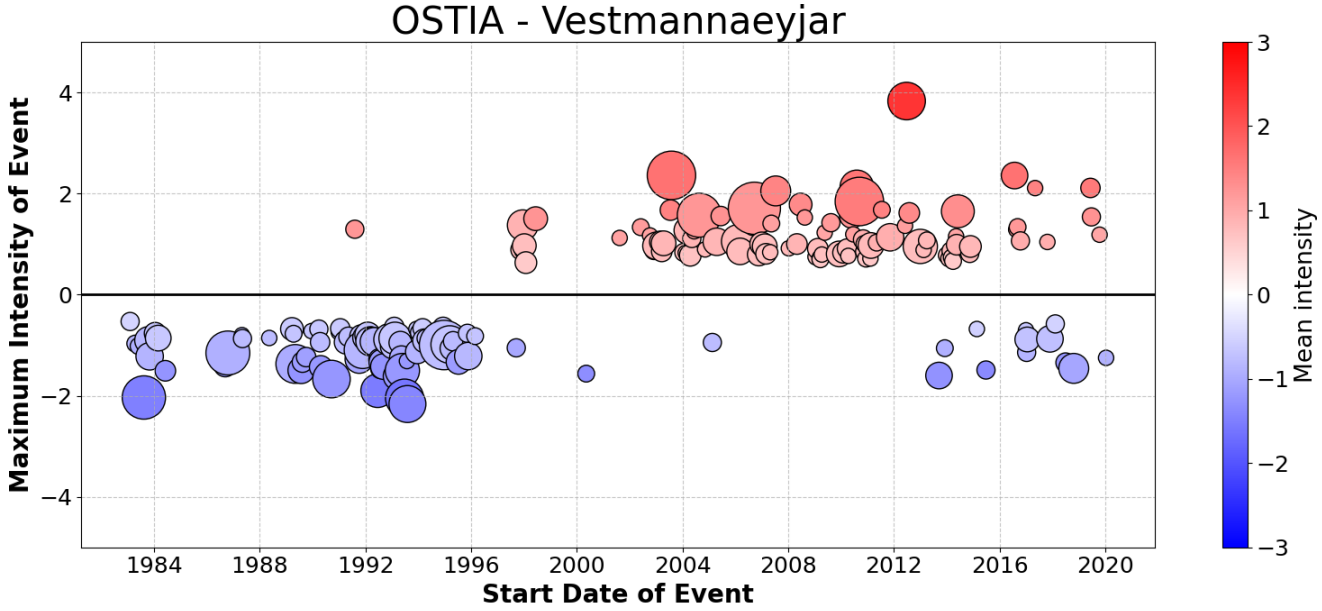
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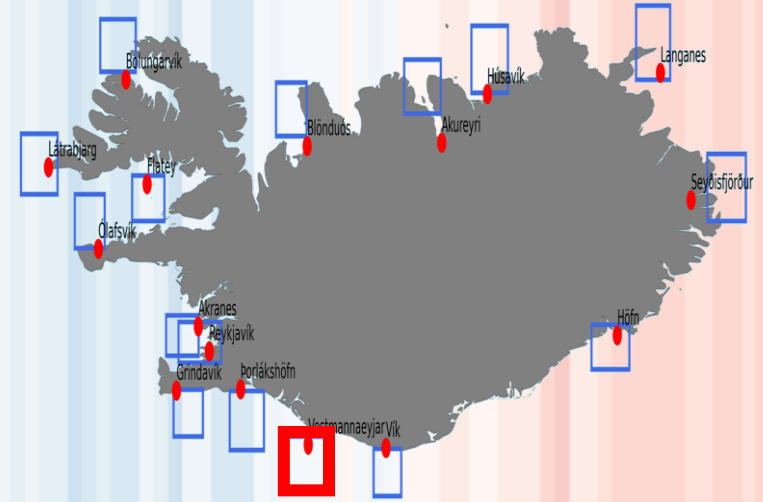
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Overview

- For all cases, there has been a transition from MCS regime to a MHW regime with a tendency of long-lasting MHWs.
- The Heat waves start in the southwest of Iceland
- Recurrences of marine cold spells is intriguing
- GLORYS and OSTIA

Next steps

- Match the dates used for the different datasets
- Forecasting Marine Heat Waves and Marine Cold spells.
- Analyze the Temperature near the Ocean floor.