

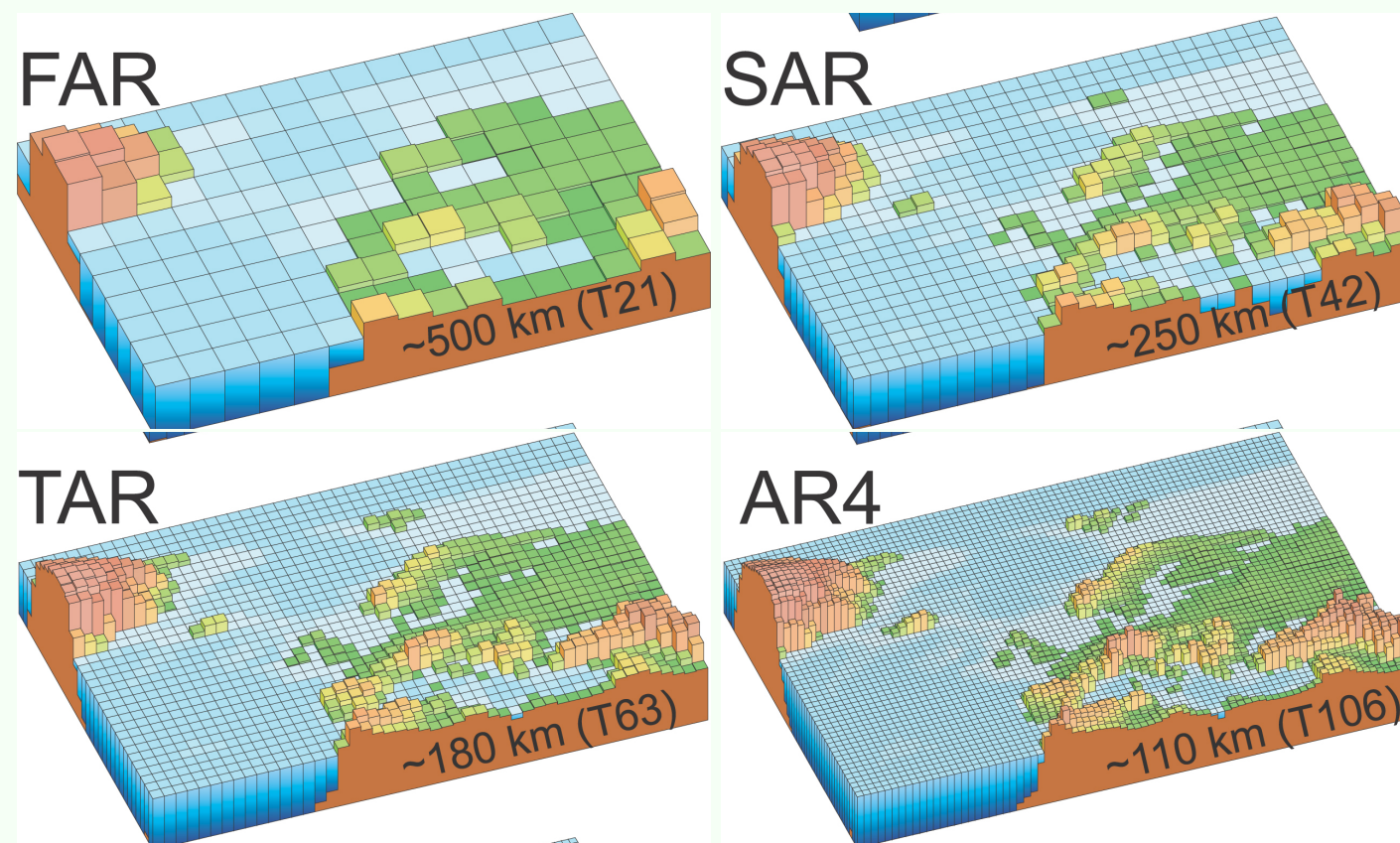
# ***Dynamical downscaling of the Copernicus atmospheric re-analysis data***

Ólafur Rögnvaldsson – or@belgingur.is



# Dynamical downscaling

- **The idea behind dynamical downscaling is relatively simple**
  - **Take data from a (relatively) coarse resolution model and use it to provide initial and boundary data to a local area atmospheric model that is run at a higher resolution**
  - **As resolution is increased, processes governed by the interaction of the large-scale flow and topography become better resolved by the models**



Depiction of horizontal grid resolution of several global models, used for the IPCC climate evaluation reports over the years

# ***Atmospheric re-analysis data-series***

- ***Dates back more than twenty years***
- ***Started out with ERA40 (or even ERA15 ...)***
  - ***Using the MM5 atmospheric model for downscaling [8km res.]***
- ***Moving on to the ERA-Interim***
  - ***Using the WRF atmospheric model, two separate data series created (RÁV [3km res.] and RÁV2 [2km res.])***
- ***And finally ERA5/ERA5-Land***
  - ***Again using WRF, creating the IceBox data series [2km res.]***
  - ***IceBox is being extended semi-routinely. Current series ranges from 1 September 1990 to 1 April 2024***
  - ***Work is under way to extend the IceBox series to 1 October 2024***

# Data availability

- **RÁV and RÁV2 data are available as netCDF files**
  - [http://rav.betravedur.is/LOKS\\_Data/](http://rav.betravedur.is/LOKS_Data/)
  - <http://rav.betravedur.is/RAV2/>
- **The RÁV2 data can also be viewed for chosen stations on**
  - <https://urdur.belgingur.is>
- **The IceBox data can be accessed (for academic use) via API**
  - `curl --dump-header /dev/stderr -H 'WOD-Auth: LOGIN:KEY'`  
`https://wod.belgingur.is/api/v2/data/archive/icebox/latlon/64.1578,-21.8648/vars/air_temperature_at_2m_agl,wind_speed_at_10m_agl/dates/2020-10-01,2020-10-02.json`
  - **This API interface can also be used to access CARRA data for Iceland**

### Allar veðurstöðvar

**Akrafjall**  
Stöð virk: 29/01/2009 - 30/12/2019  
Mælingar:  
Lofthiti, Vindhraði, Vindhviðuhraði, Rakastig

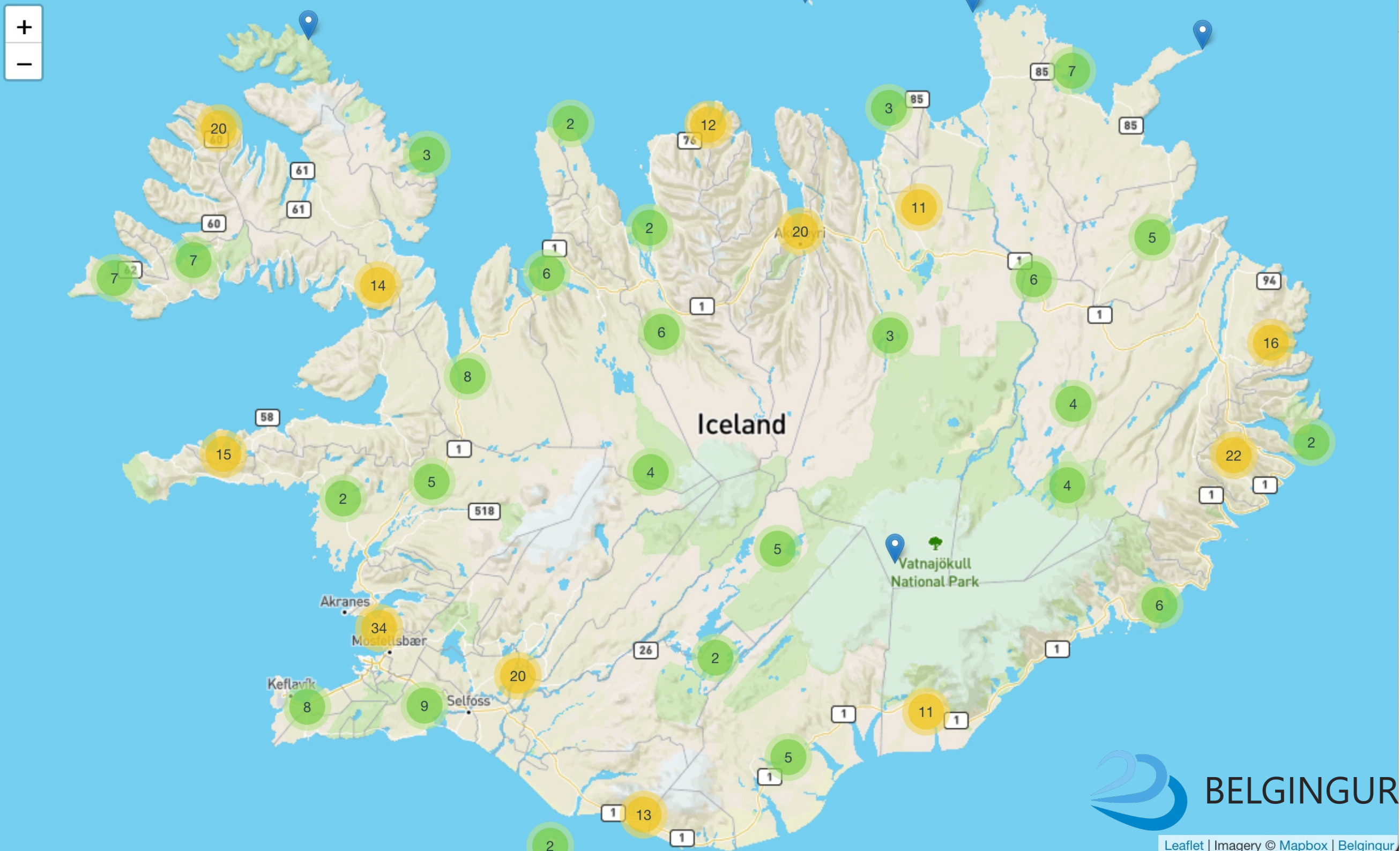
**Akureyri**  
Stöð virk: 01/01/1979 - 30/12/2019  
Allar mælingar

**Akureyri - Krossanesbraut**  
Stöð virk: 05/11/2005 - 30/12/2019  
Allar mælingar


**Andakílsárvirkjun**  
Stöð virk: 01/01/1979 - 30/12/2019  
Mælingar:  
Úrkoma

**Arnarnesvegur**  
Stöð virk: 22/12/2016 - 26/11/2019  
Mælingar:  
Lofthiti, Vindhraði, Vindhviðuhraði, Rakastig

**Arnkatla**  
Stöð virk: 06/12/2013 - 30/12/2019



# <https://urdur.belgingur.is>

Heim Um Urði

### Allar veðurstöðvar

#### Akrafjall

Stöð virk: 29/01/2009 - 30/12/2019

Mælingar: Lofthiti, Vindhraði, Vindhviðhraði, Rakastig

#### Akureyri

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Allar mælingar

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Allar mælingar

#### Andakílsárvirkjun

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Mælingar: Úrkoma

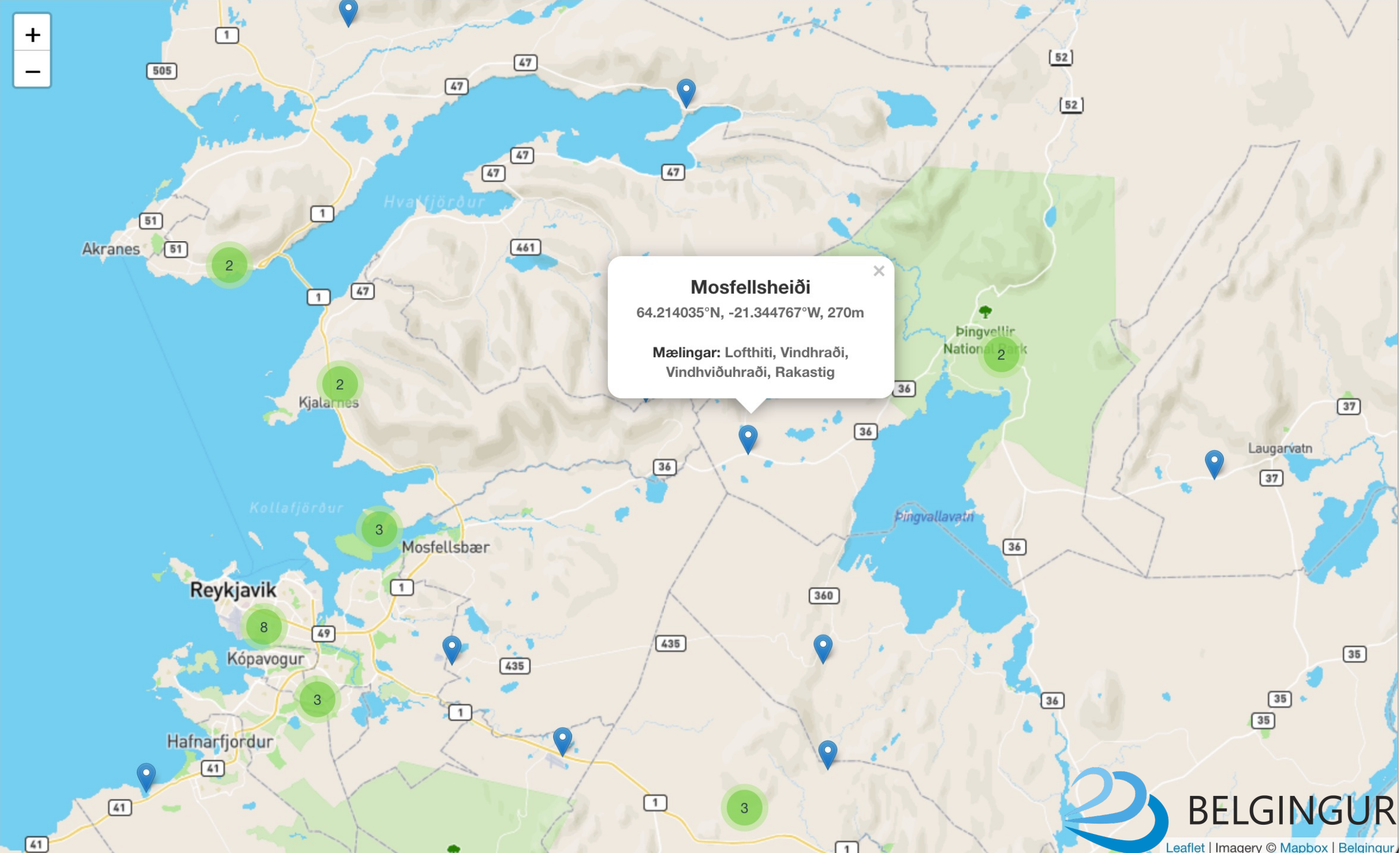
#### Arnarnesvegur

Stöð virk: 22/12/2016 - 26/11/2019

Mælingar: Lofthiti, Vindhraði, Vindhviðhraði, Rakastig

#### Arnkátla

Stöð virk: 06/12/2013 - 30/12/2019



**Mosfellsheiði**  
64.214035°N, -21.344767°W, 270m

Mælingar: Lofthiti, Vindhraði, Vindhviðhraði, Rakastig

Leaflet | Imagery © Mapbox | Belgingur

## Mosfellsheiði vi.vegagerdin.31591

Stöð virk: 08/02/2012 - 30/12/2019

Mælingar: Lofthiti, Vindhraði, Vindhviðuhraði, Rakastig

Graf

Tafla

Allar mælingar

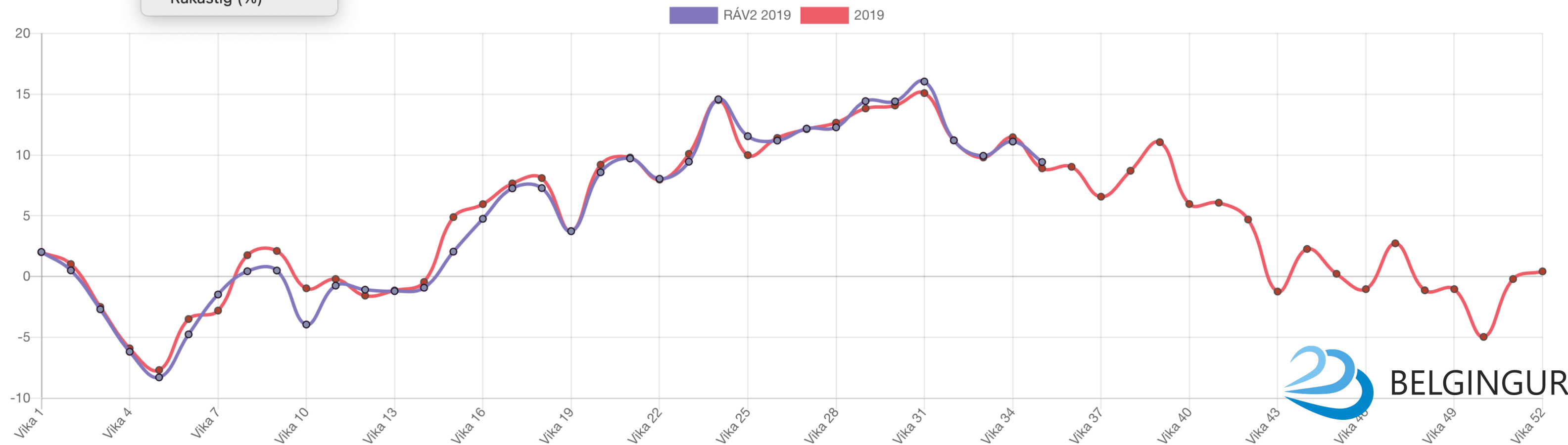
### Samanburður á árabilum

Meðaltal af: Viku

Veldu mælingu:  Lofthiti (°C) ?

Veldu ár: RÁV2

- Vindhraði (m/s)
- Vindhviðuhraði (m/s)
- Rakastig (%)



## Mosfellsheiði vi.vegagerdin.31591

Stöð virk: 08/02/2012 - 30/12/2019

Mælingar: Lofthiti, Vindhraði, Vindhviðuhraði, Rakastig

- Graf
- Tafla
- Allar mælingar

### Allar mælingar og reiknuð meðaltöl

Gögn:  Mælingar

RÁV2 Vikumeðaltal

RÁV2 Mánaðarmeðaltal

Mælingar Vikumeðaltal

Mælingar Mánaðarmeðaltal

Gagnasnið: json

SÆKJA

## sheiði vi.vegagerdin.31591

- 30/12/2019

dhraði, Vindhviðuhraði, Rakastig

Allar mælingar

### ngar og reiknuð meðaltöl

Lofthiti

Vindhraði

Vindhviðuhraði

Úrkoma

Loftprýstingur við sjávarmál

Loftprýstingur á yfirborði

Rakastig

Daggarmarkshiti

Helstu mælingar

Allar mælingar

Gagnasnið: json

SÆKJA

## Mosfellsheiði vi.vegagerdin.31591

Stöð virk: 08/02/2012 - 30/12/2019

Mælingar: Lofthiti, Vindhraði, Vindhviðuhraði, Rakastig

- Graf
- Tafla
- Allar mælingar

### Allar mælingar og reiknuð meðaltöl

Gögn: Mælingar

Veldu mælingu: Lofthiti

Tíðni mælinga:  Klukku tíma

- 3 klukku tíma
- 6 klukku tíma
- 12 klukku tíma
- Daglega
- Vikulega

Gagnasnið: json

SÆKJA

## neiði vi.vegagerdin.31591

12/2019

vi, Vindhviðuhraði, Rakastig

Allar mælingar

### ar og reiknuð meðaltöl

Tíðni mælinga: Klukku tíma

Gagnasnið:  json

SÆKJA



# Summary

- ***We have used re-analysis (and operational analysis for that matter) from the ECMWF/Copernicus for over two decades as input to regional atmospheric models in order to create high-resolution data-series of atmospheric condition for Iceland and surrounding waters***
- ***Data is available in various formats (netCDF and API) for many of these data-series***
- ***We are gradually working on improving data access for academic and commercial use***