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# Open Data Challenge The GROW Observatory

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# GROW OBSERVATORY



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## The GROW Observatory

To support a movement of citizens generating, sharing and using data and information on **soil, growing and land practices**.

To address urgent climate challenges for science and society.



# Background / Soil Moisture

- Soil moisture is a pivotal element regulating water, energy and carbon fluxes
- Key for land use and food production
- Monitoring soil moisture is challenging because of its high spatial and temporal variability
- In the last decades, microwave sensors onboard satellites have proven capable to estimate soil moisture globally





Sunlight: 77

Temperature: 32 °C

Conductivity: 2 dS/m

Moisture: 25%

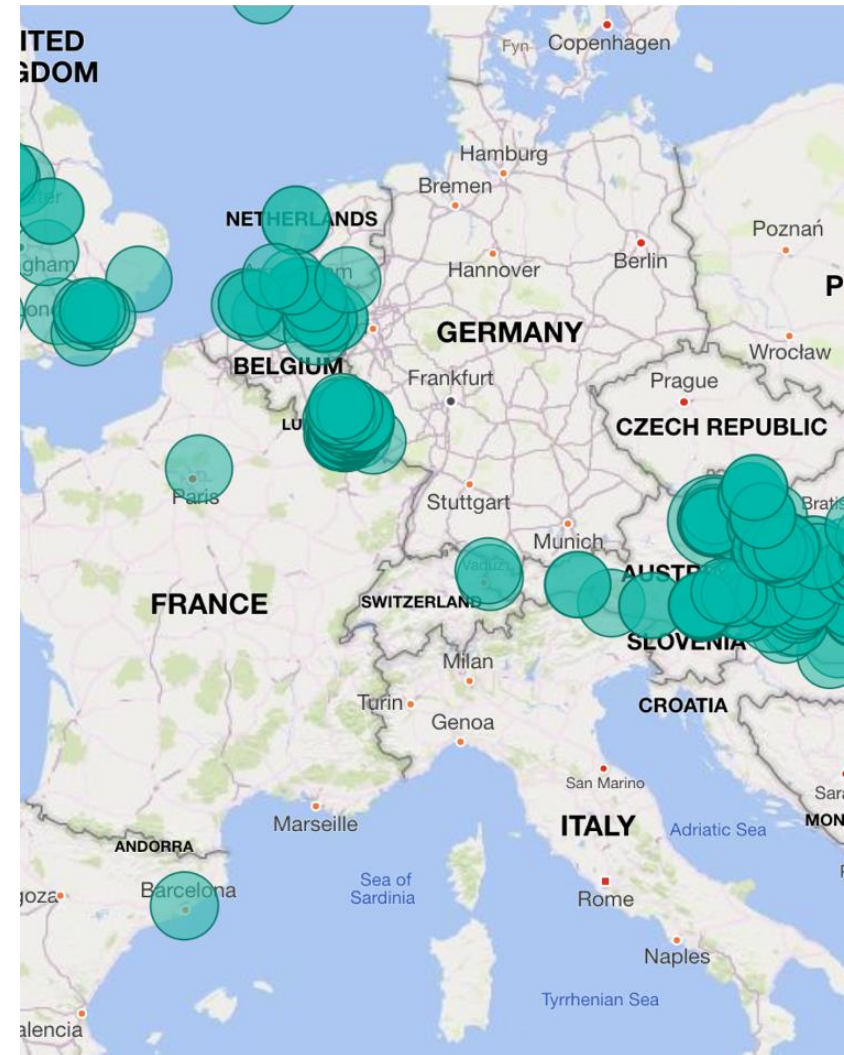


# GROW / Soil Moisture Data

6502 sensors in the ground (2019)

- 24 geographic dispersed GROW places
- Over 500 million rows in the GROW database.
- 4 Parameters: Soil Moisture, Temperature, Light Level, Battery Level
- Time Span: Oct 2016 - Nov 2019

<https://growobservatory.org/grow-observatory-sensor-location-map/>



# GROW / Soil Moisture Data

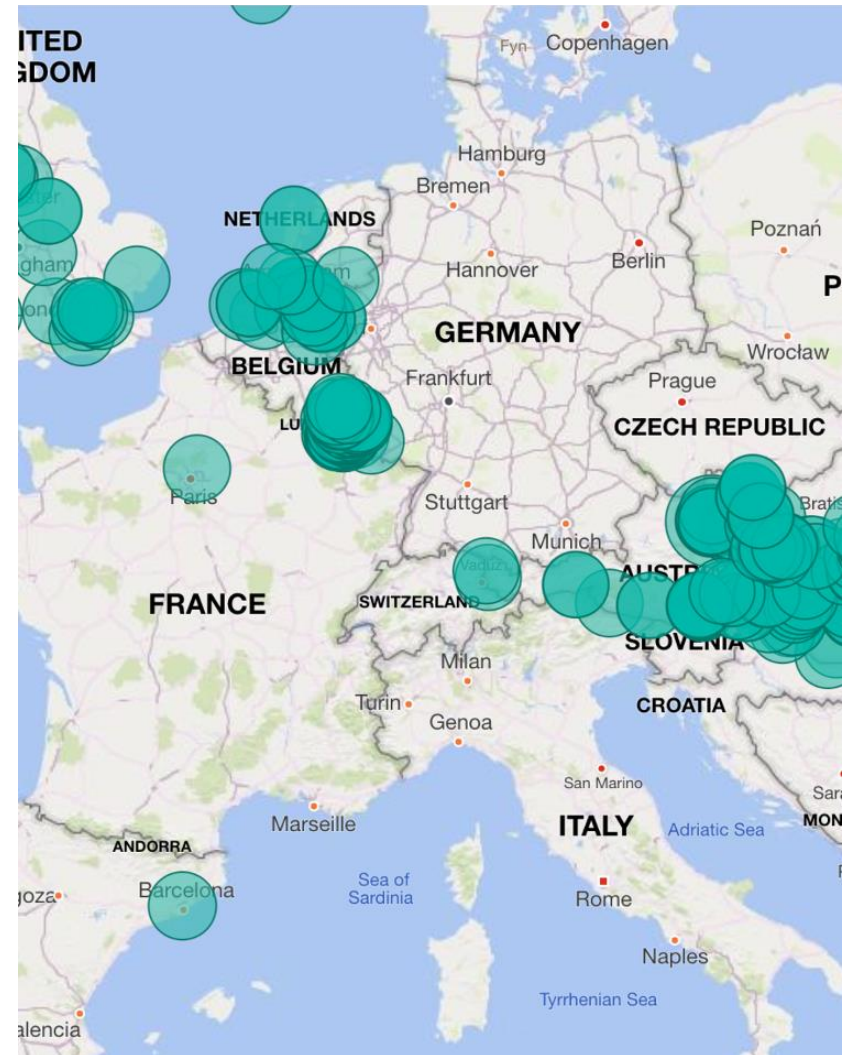
Overall datasets are 14.4 GByte.

You can not view it in Access

It is not normalized so will shrink if done so

Best results if transferred to a Database

Can be viewed from the command line



# GROW / Edible Plant Database

## Overview

- 146 edible plant species
- 15 growing parameters
- 12 European climate zones
- Data includes:
  - Planting dates,
  - Harvesting dates,
  - Two planting date seasons for Spain, France and Greece
  - Dates for indoors or outdoors

215° N, 6.0147° W		Sow indoors / undercover			
		Sow outdoors / plant out			
		Harvest			
		No available data for this site			
Spain (Seville)					
	Season 1				
	Sow indoors / undercover		Sow outdoors / plant out		Harvest
common name	start	end	start	end	start
	2017-12-15	2017-01-30	2017-01-15	2017-06-30	2017-03-15
			2017-03-15	2017-06-30	2017-05-15
	2017-01-15	2017-02-16	2017-02-15	2017-06-16	2017-03-15
			2017-01-15	2017-02-28	2017-04-01
	2017-09-15	2017-09-30	2017-10-15	2017-10-30	2017-04-15
	2017-09-01	2017-09-30	2017-10-01	2017-10-30	2017-04-15
	2017-09-01	2017-09-30	2017-09-15	2017-10-16	2017-01-01
	2017-12-15	2017-12-30	2017-02-01	2017-02-16	2017-04-01
	2017-12-15	2017-01-16	2017-01-15	2017-02-16	2017-04-01
			2017-01-15	2017-02-28	2017-04-01
			2017-02-15	2017-04-16	2017-04-15
	2017-02-01	2017-02-16	2017-02-15	2017-03-16	2017-05-15
	2017-02-01	2017-02-16	2017-02-15	2017-06-30	2017-06-01
	2017-02-15	2017-02-28	2017-03-01	2017-06-30	2017-06-01
	2017-02-01	2017-02-16	2017-02-15	2017-06-30	2017-06-01
	2017-12-01	2017-01-16	2017-01-15	2017-02-16	2017-03-01
	2017-12-01	2017-12-16	2017-02-01	2017-02-16	2017-05-15
			2017-03-01	2017-06-30	2017-05-15
	2017-03-01	2017-03-30	2017-03-15	2017-06-16	2017-07-01
	2017-12-15	2017-01-16	2017-02-15	2017-07-16	2017-04-15
			2017-12-15	2017-05-16	2017-07-01
			2017-12-15	2017-02-16	2017-02-01
	2017-12-01	2017-01-16	2017-03-01	2017-06-16	2017-04-15
			2017-02-15	2017-06-30	2017-05-15
			2017-01-15	2017-02-28	2017-04-15
	2017-12-15	2017-01-30	2017-01-01	2017-02-16	2017-02-15
			2017-02-15	2017-02-16	2017-02-15
LUS	ALN	BOR	NEM	ATN	ALS



# GROW / Edible Plant Database

## Using the data

- Data about the plants is in access database
  - Can be viewed in access
  - Or a Viewer on a Mac
- Planting dates are in an Excel spreadsheet
  - Can be viewed in Excel or Numbers.
  - Multi-tabbed. One tab per climate zone.
- Data may need to be extracted for your purposes

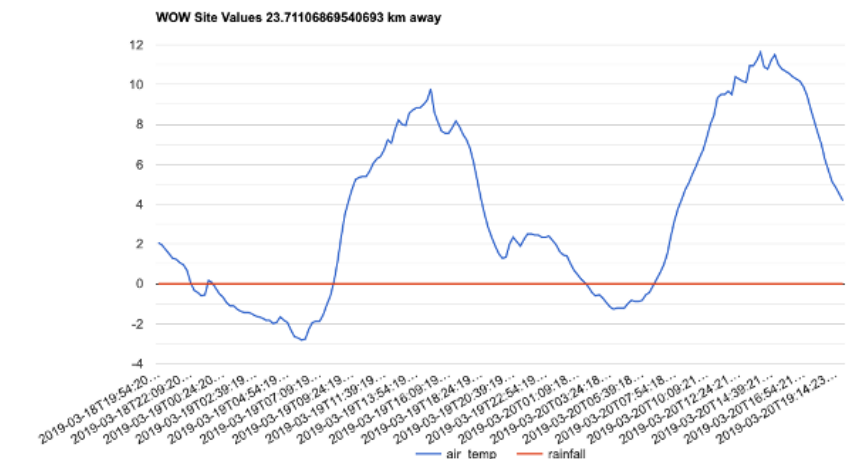
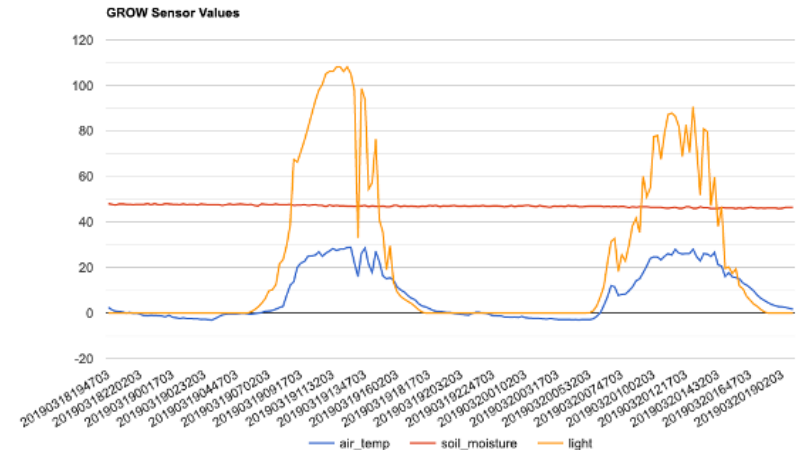
35° N, 6.0147° W		Sow indoors / undercover			
		Sow outdoors / plant out			
		Harvest			
		No available data for this site			
Spain (Seville)					
	Season 1				
	Sow indoors / undercover		Sow outdoors / plant out		Harvest
common name	start	end	start	end	start
	2017-12-15	2017-01-30	2017-01-15	2017-06-30	2017-03-15
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	2017-02-01	2017-02-16	2017-02-15	2017-06-30	2017-06-01
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	2017-12-01	2017-12-16	2017-02-01	2017-02-16	2017-05-15
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	2017-03-01	2017-03-30	2017-03-15	2017-06-16	2017-07-01
	2017-12-15	2017-01-16	2017-02-15	2017-07-16	2017-04-15
			2017-12-15	2017-05-16	2017-07-01
			2017-12-15	2017-02-16	2017-02-01
	2017-12-01	2017-01-16	2017-03-01	2017-06-16	2017-04-15
			2017-02-15	2017-06-30	2017-05-15
			2017-01-15	2017-02-28	2017-04-15
	2017-12-15	2017-01-30	2017-01-01	2017-02-16	2017-02-15
			2017-01-15	2017-02-16	2017-02-15
LUS	ALN	BOR	NEM	ATN	ALS

# GROW / What Can I do with the data?

Enter a start date and end date (max 90 day range) in format of year-mo-daThr:mn:sc  
2019-03-18T19:47:00 End: 2019-03-20T19:47:00  
GROW sensor id to look up data: p10r55vj   
VOIW Data   
JeeAllSensorsPlus

## Soil Moisture

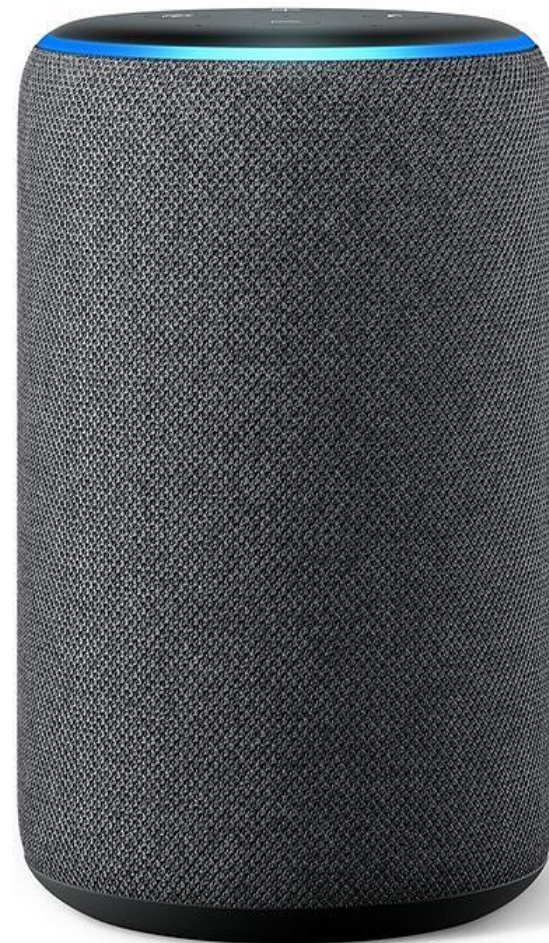
- It is a static data set
- In this picture we have combined soil moisture and rainfall
- Combine it with other data:
  - Air quality
  - Land cover



# GROW / What Can I do with the data?

## Edible Plant Data

- Static dataset
- Can be used standalone to answer questions such as:
  - "What can I plant today"
  - "When will the harvest be ready?"
- Can be combined with other data
- Weather data and the EDP
  - There is a frost coming, cover your crop
  - We've not had rain for days, you might need to water your crop.







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**THANK YOU!**

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*Any Questions?*

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