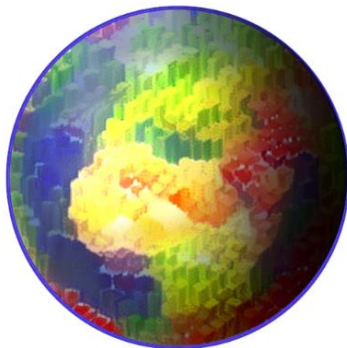
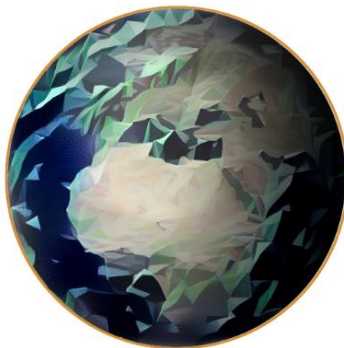


EarthNet2021



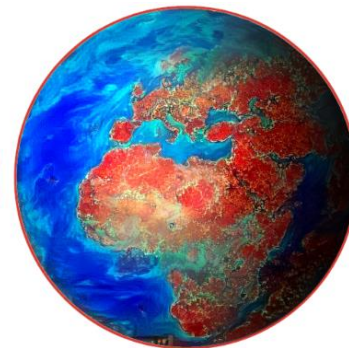
Climate
Simulation



High Resolution
Context



Artificial
Intelligence



Future Earth
Surface Spectral

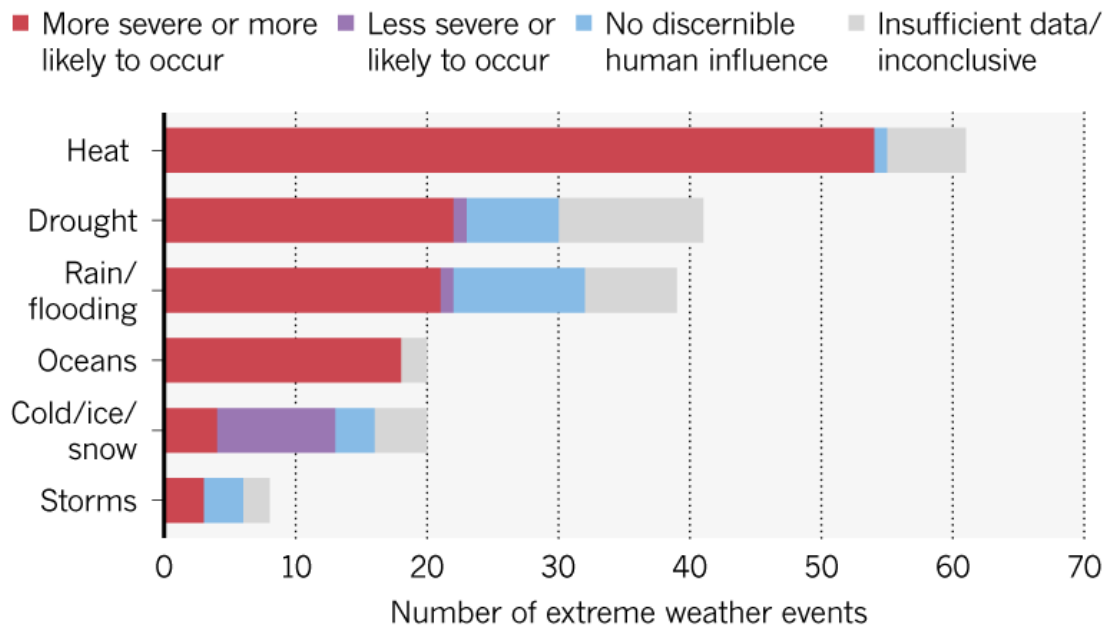
A novel large-scale **dataset** and **challenge** for forecasting **localized climate impacts**

Christian Requena-Mesa, Vitus Benson, Jakob Runge, Joachim Denzler, Markus Reichstein

Max Planck Institute for Biogeochemistry. In Cooperation with the Computer Vision Group, FSU Jena and the German Aerospace Center (DLR).

12/11/2020 Tackling Climate Change with Machine Learning @NeurIPS2020

Climate change increases frequency of extreme events.

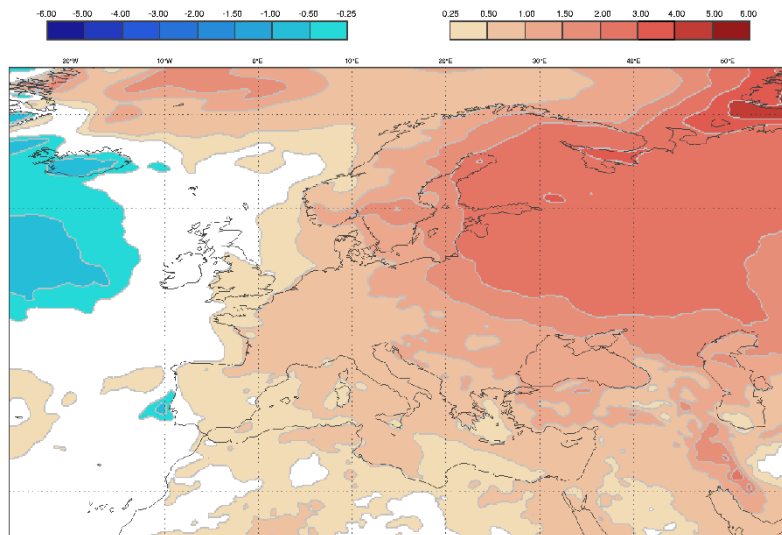


©Nature 10.1038/d41586-018-05849-9

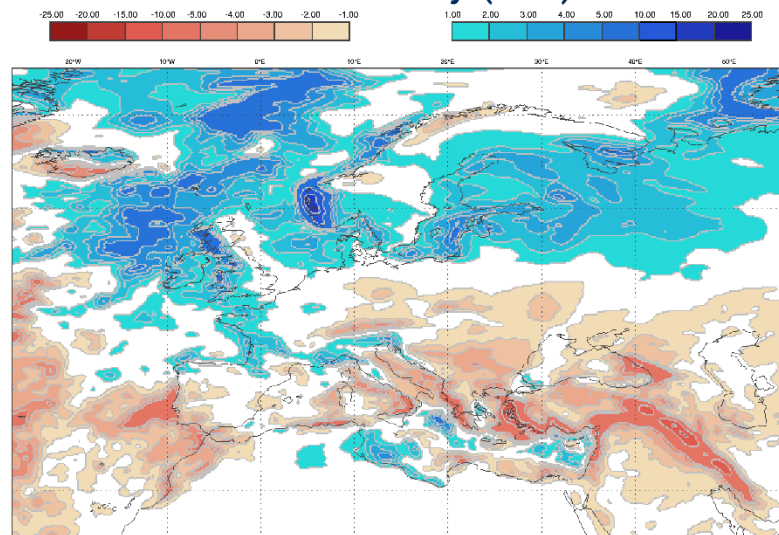
Seasonal weather prediction

January 2021

Temperature anomaly (Celcius)

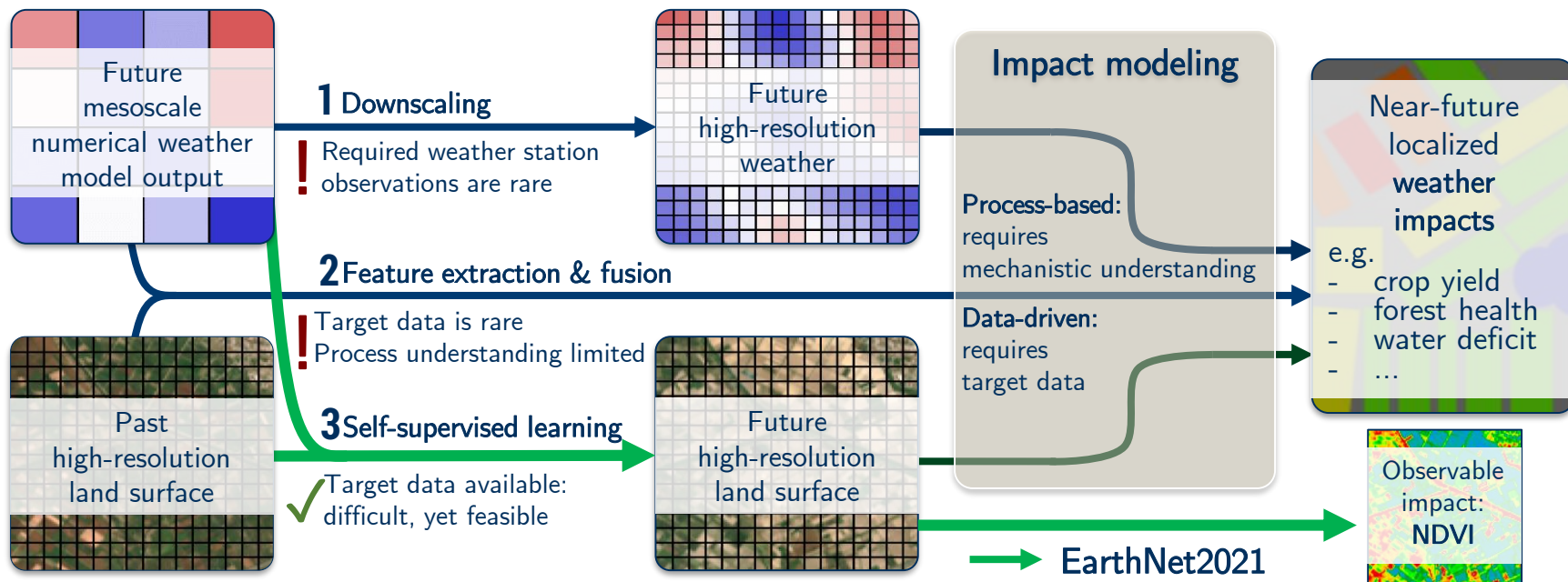


Rain anomaly (mm)



Maps processed by EFFIS System based on ECMWF Seasonal Forecast

Localized climate impact forecasting



Impacts materialize at a very local scale

Spring

Summer

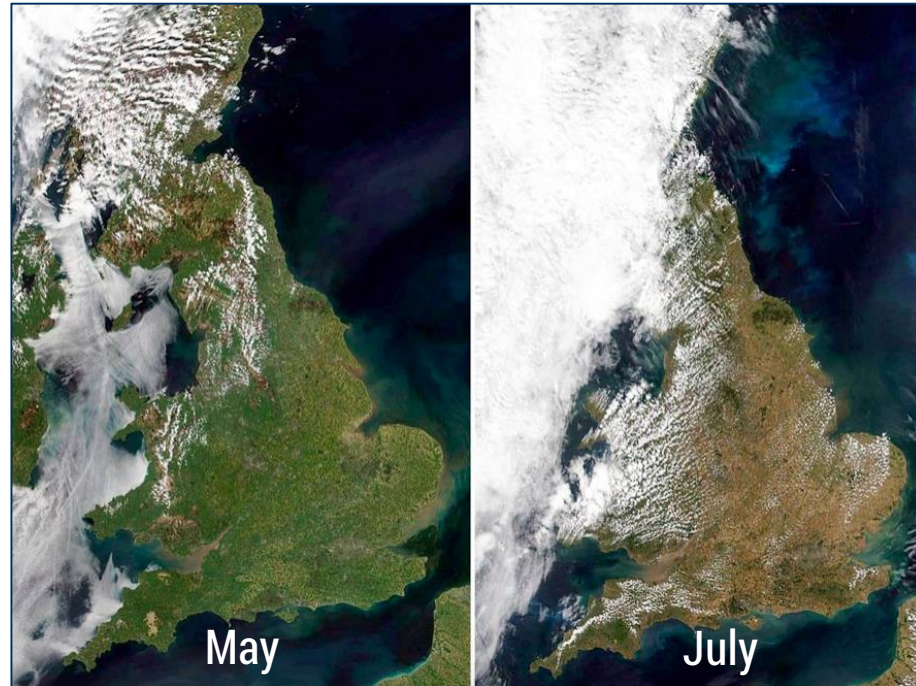
2019



2018

2018 summer heat wave

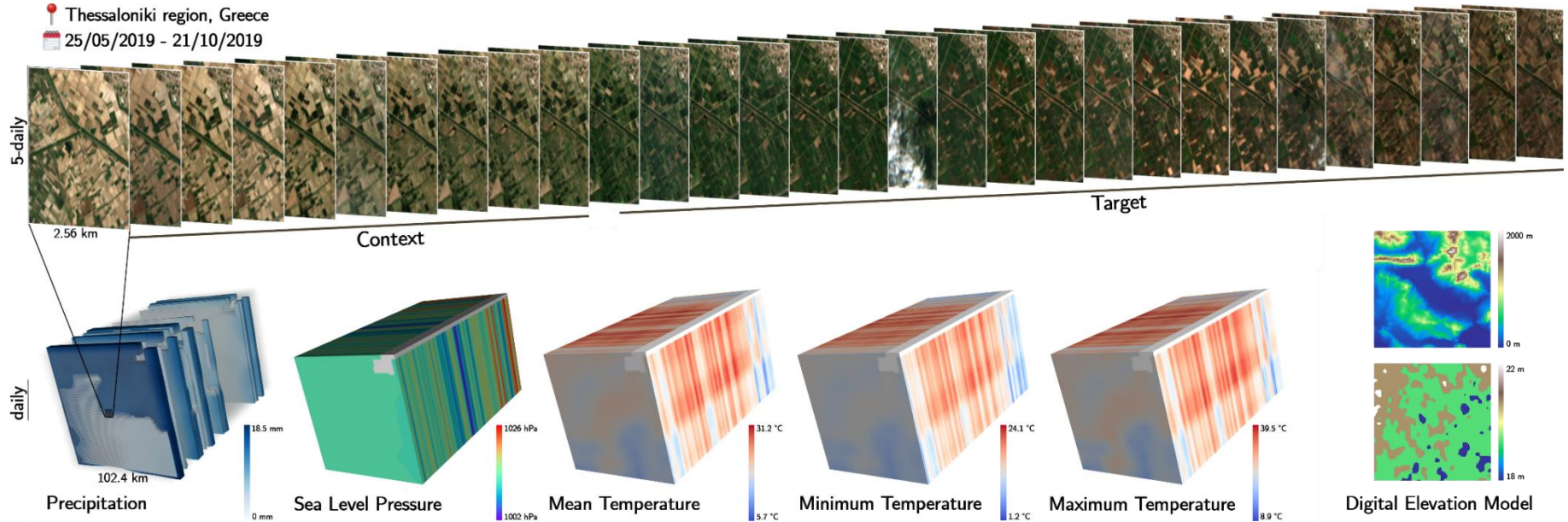
High-res imagery embeds the local impacts



2018 British Isles heat wave

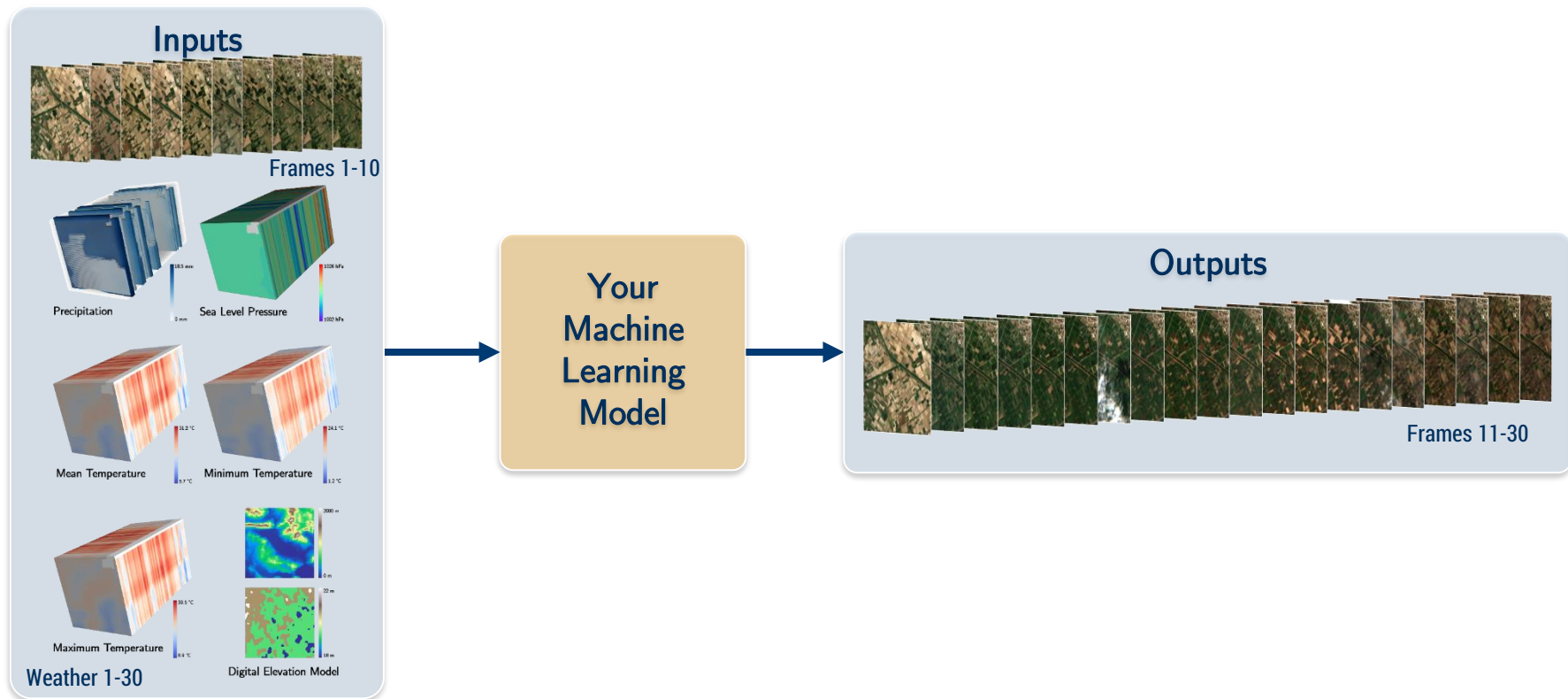
A challenge to **predict future land surface**, as seen
from space, given coarse weather projections.

EarthNet2021 Dataset



Visualization single sample of the EarthNet2021 dataset

Machine learning setting



Challenge tracks

SPECIAL TRACKS

Main track
IID test

Robustness
OOD test



Evaluation metric: EarthNetScore

EarthNetScore is a composed metric that evaluates 4 subtasks:

Component	Metric
Overall accuracy	Median Absolute Deviation
temporal trend of vegetation state	Ordinary Least Squares
Temporal distribution of vegetation state	Earth Mover Distance
Spatial perceptual similarity	Structural Similarity Index

EarthNet2021

A machine learning challenge and dataset for land surface and localized impact forecasting.

[Latest release v1.0.0](#)

[Install Now](#)



Land surface forecasting

Using Machine Learning to forecast the dynamics of Earth's surface, we can predict crop yield, forest health, the effects of a drought and more.

[Learn more](#)



Deep learning templates

Any method is welcome in the challenge. Our toolkit provides functional templates for Pytorch and Tensorflow developers.

[Learn more](#)



Open source

The EarthNet toolkit and dataset are free to access, modify and distribute.

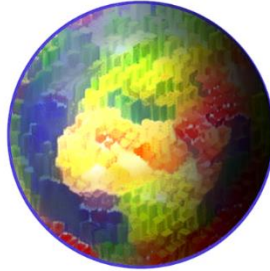
[Star](#) 0

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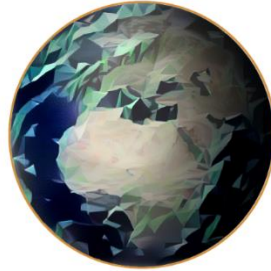
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Thank you



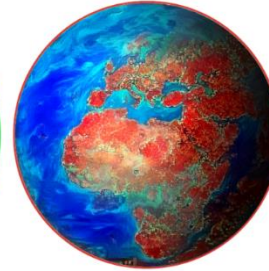
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See you on the leaderboard!

{crequ, vbenson}@bgc-jena.mpg.de

Sample visualization

