## **Presentation of ESM2025**

#### EU-H2020 funded project



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement n° 101003536



#### Climate change research, modelling & climate policy

#### - two sides of the same coin



### Main goals

#### ESM2025 ultimate goal

 to develop a novel generation of Earth system models tailored to deliver underpinning scientific support on mitigation actions targeting a successful realisation of the Paris Agreement.



#### Long-term implication of the Paris Agreement - Move towards emission-driven modelling (ZEC, LongRunMIPs, etc)



## Improve the representation of Earths system feedbacks

- Develop the coupling between realms AND not only the realm themselves



⇒ Uncertainties from biogeochemical feedbacks are poorly integrated/represented in the current generation of ESMs



Williamson et al., 2019 Nature

⇒ The chain of processes from emissions to clouds and/or radiative feedbacks is not represented in the current generation of models

#### Bridge the gap between modelling platforms - Improve linkages between climate change (ESMs) and air quality (CTMs)







- ⇒ The level of integration between climate change & air quality is rather poor in the current generation of ESMs
- ⇒ Science-based information guiding air quality policy may support ambitious climate policies (short-term benefits on health)

Xie et al., in revision PNAS

#### Bridge the gap between modelling platforms

- Improve the geophysical representation of the land between ESMs and IAMs

The capacity and the resilience to climate change of Land-based Nature base solutions (afforestion/BECCS) is one of the largest mitigation uncertainty BUT our confidence is currently NOT informed by comprehensive models Policy Target

- $\Rightarrow$  The geophysical properties are NOT taken into account by IAMs
- $\Rightarrow$  The NBS are not represented in ESMs



# ESM2025 & international initiatives

IPCC and WCRP lighthouse activities Our proposal to move forward











## ESM2025 in brief

Main information & goals



#### ID Card

- The team : 20 partners
- Duration : 4 years
- Project start: June 1rst 2021
- Project end : May 31th 2025
- ▶ **EU budget** : 11,333 M€





#### Coordinating the project...

In colleagues' minds



Reality check



#### Merci! 🙂



Project 

Research Science-policy Education



News

#### Climate research in support of the Paris Agreement

ESM2025 - Earth system models for the future is an ambitious European research project on Earth System modelling that will build a novel generation of Earth system models fitted to support the development of mitigation and adaptation strategies in line with the commitments of the Paris Agreement.

+ MORE ABOUT THE PROJECT

Let's have a look on the ESM2025's website : <u>https://www.esm2025.eu</u>