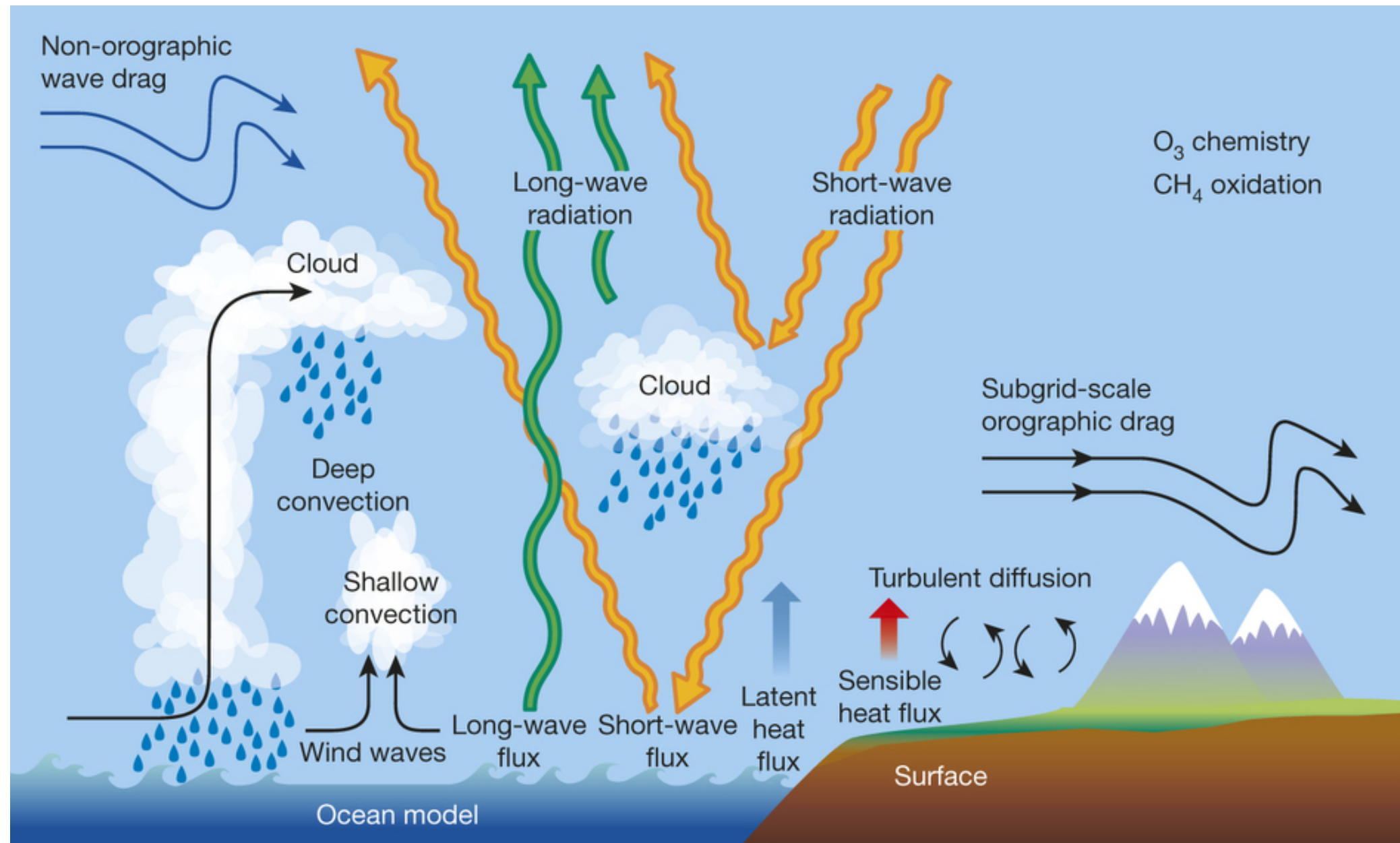


Weather prediction: Why is it hard?



Bauer et al. Nature 2015

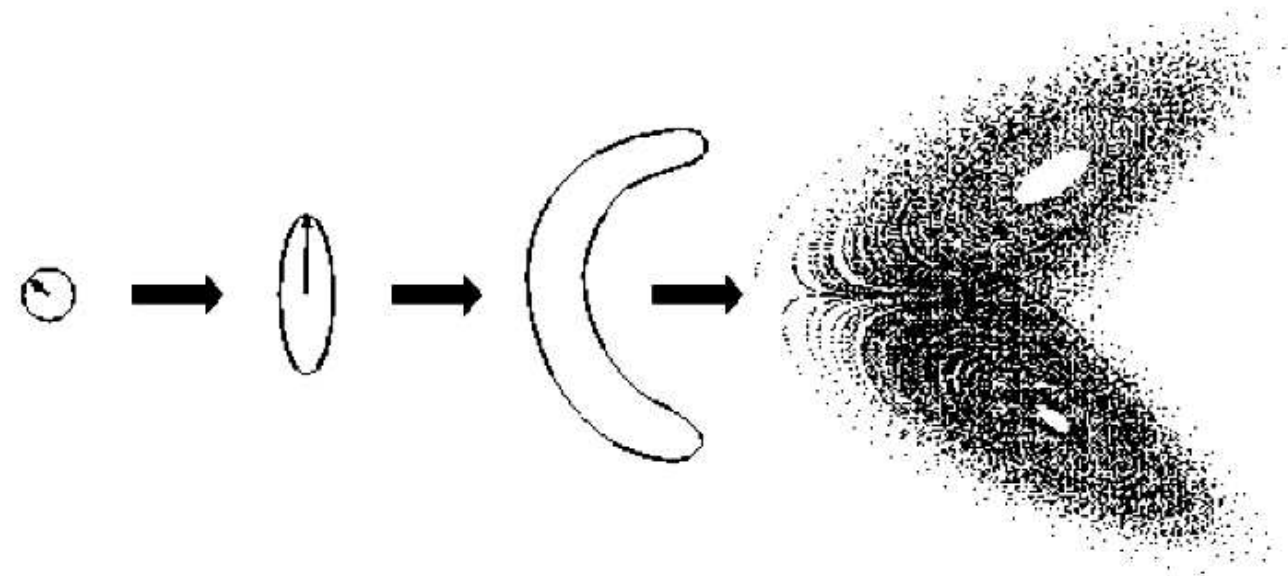
Ensembles and stochasticity

Problem

- Weather forecasting attempts to predict a highly chaotic dynamical system.
- Initial condition errors will grow exponentially.

Solution

- Propagate an ensemble of initial conditions forward to (hopefully) include the truth in the distribution of possible answers.
- Random elements are added to the model to increase spread. e.g. SPPT, SKEBS, SPT.



Initial Short-range (linear) Medium-range (non-linear) Loss of predictability

Source: ECMWF IFS documentation

