Earth System Viz:
Enabling Discovery of Science at Scale
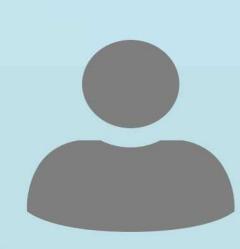
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- This project is working to develop reproducible and inspiring images and animations from the E3SM Water Cycle simulations using open source software.
- As part of the development of the project deliverables, using Paraview, we explore colormaps that are proven to be intuitive and lend themselves to better scientific interpretations. Additionally, we explore atmospheric variables associated with the Water Cycle and the different features (e.g., hurricanes, atmospheric rivers, orographic precipitation) visible within these fields.
- Presented here are images from a single time-step of regridded monthly output of the the E3SM v1 High Resolution Water Cycle Simulations (theta.20180906.branch_noCNT.A_WCYCL1950S_CMIP6_HR.ne120_oRRS18v3_ICG simulation).

Colormaps and scientific animations

- Extended cool-warm and blue-orange divergent both have high resolving power (**Wares et al., 2019**):
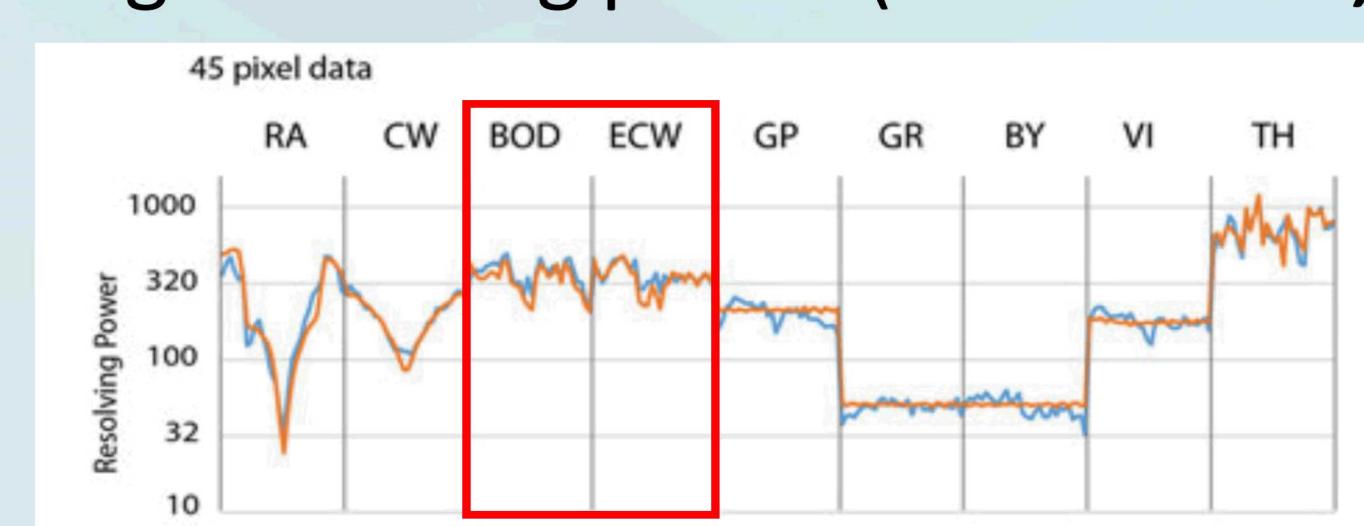
- Rainbow is the least effective colormap for interpreting magnitude in climate data (**Dasgupta et al., 2018**):
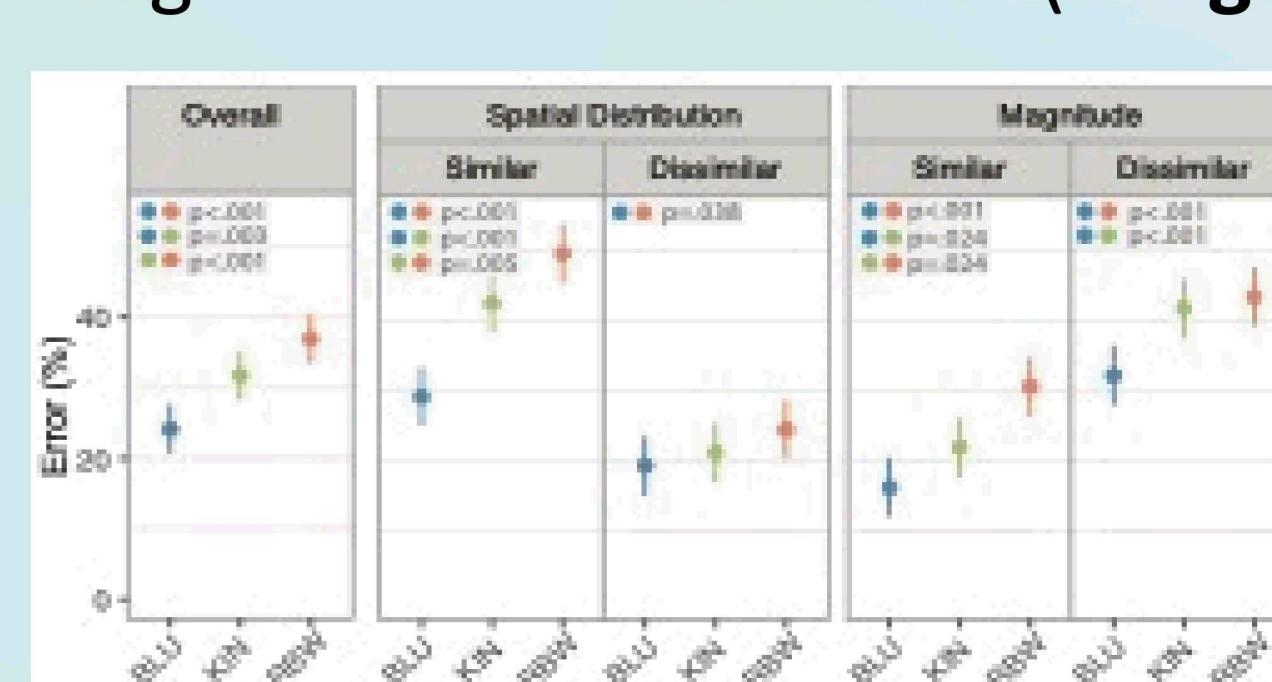

- Plotting more than 2 variables is difficult and can reduce the effectiveness of communication.

PATH FORWARD

- We need 4D data.
- We are working towards visualizing NGD SCREAM Thunderstorm.


*Cloud total & Net solar flux at surface*

Rainbow desaturated

Viridis

Cool-warm

Blue-orange divergent
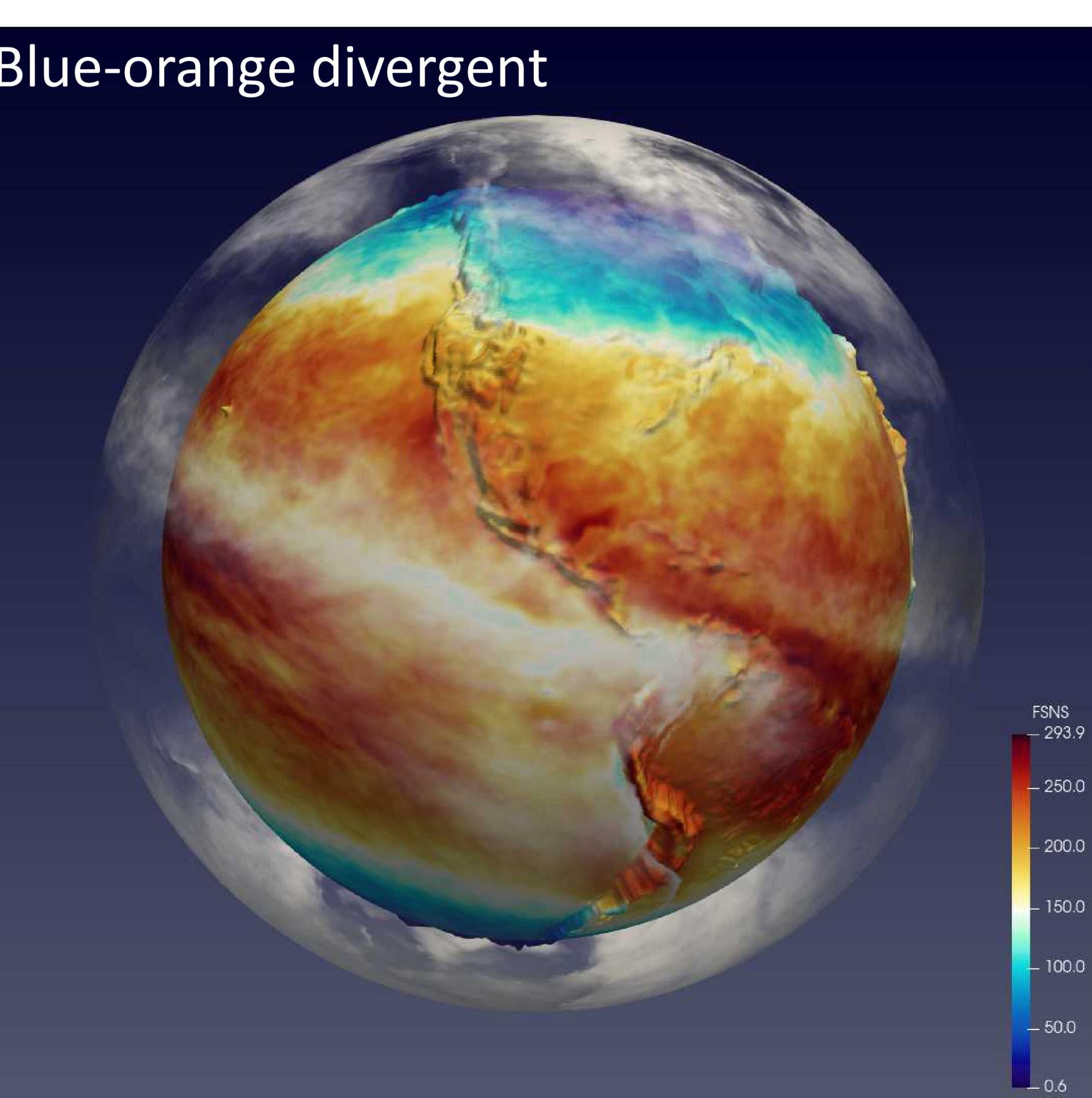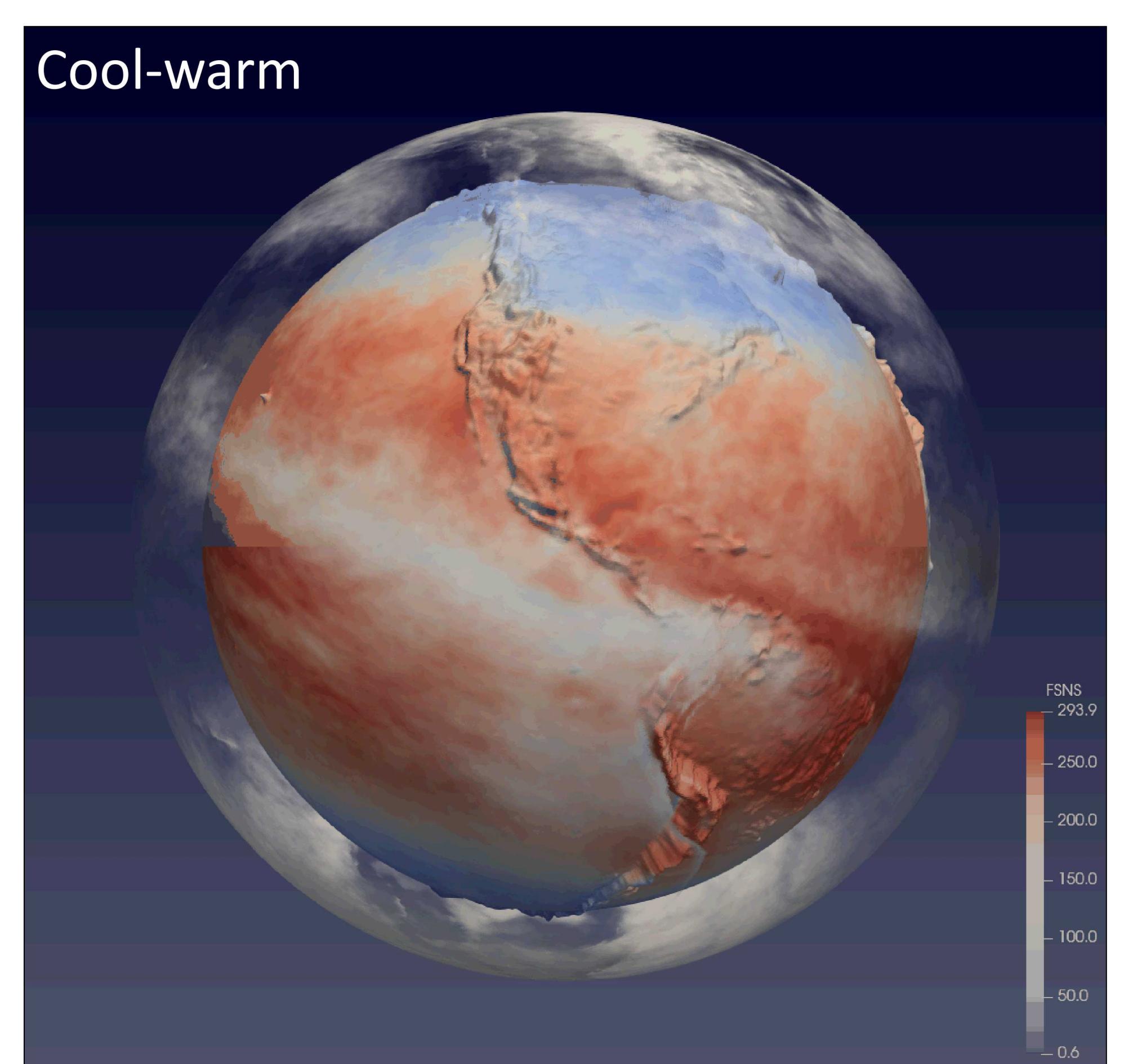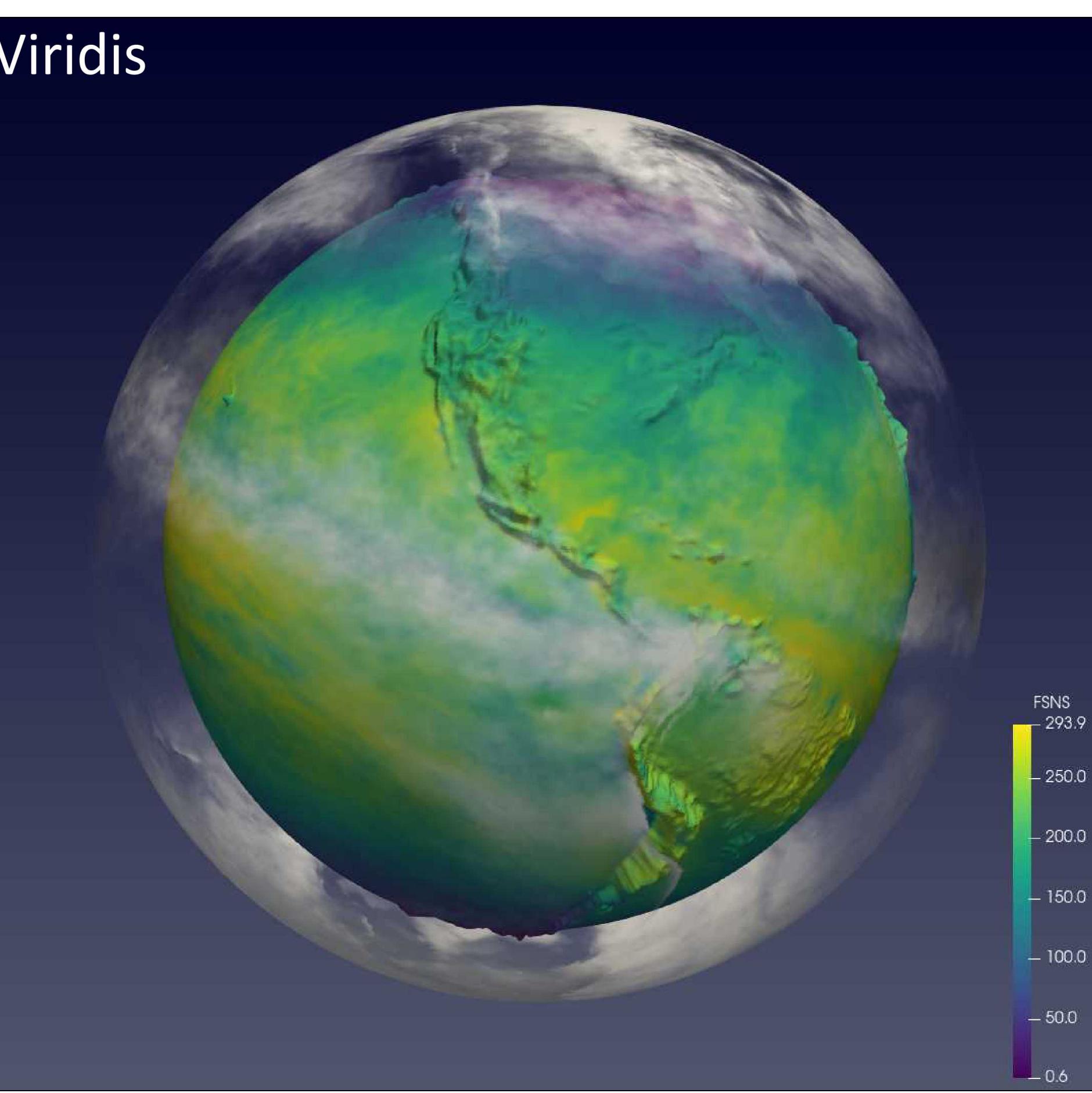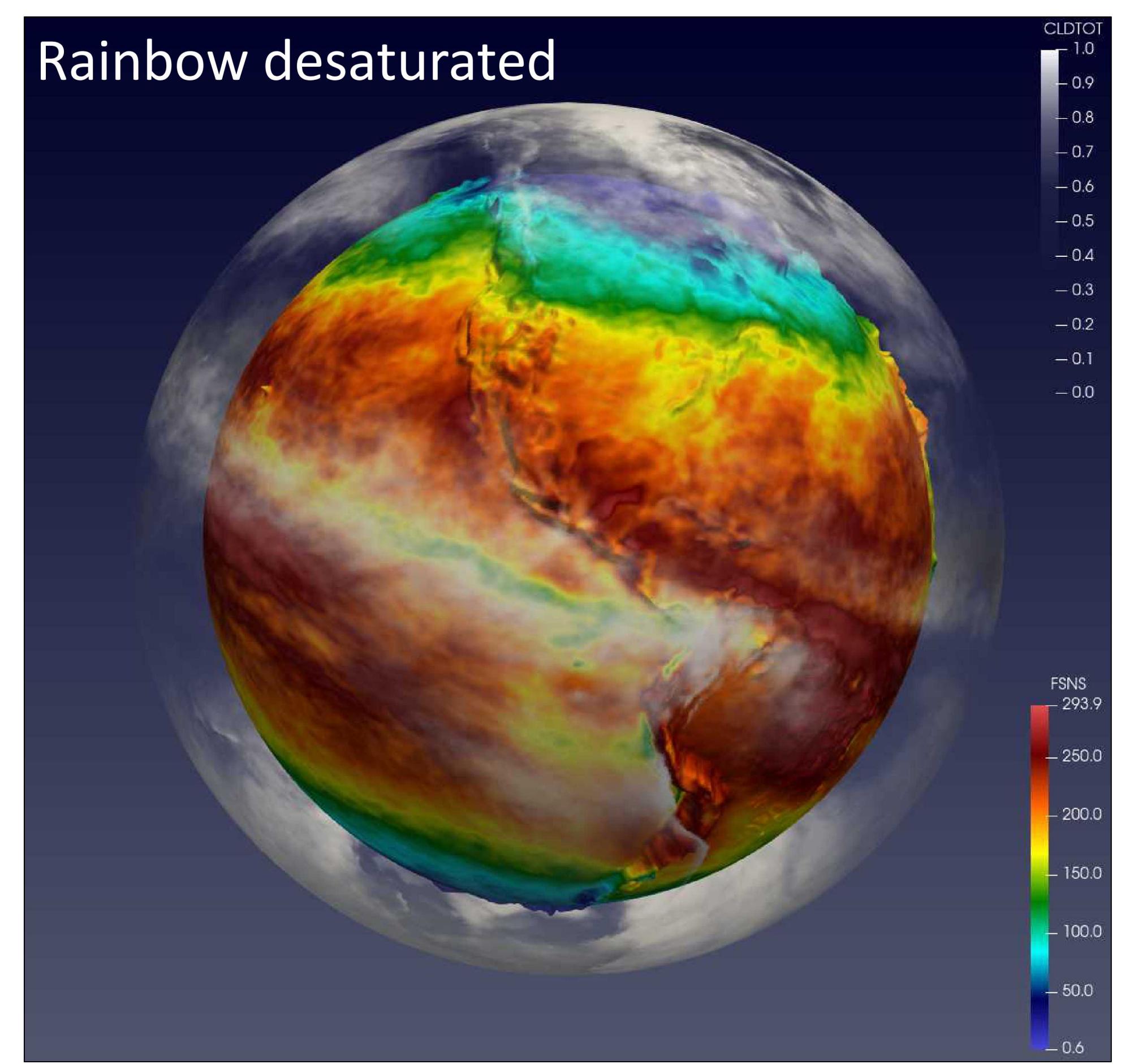
**Augmented Reality (AR):** Ask me how to use this figure to view simulated hurricanes make landfall along the East Coast!
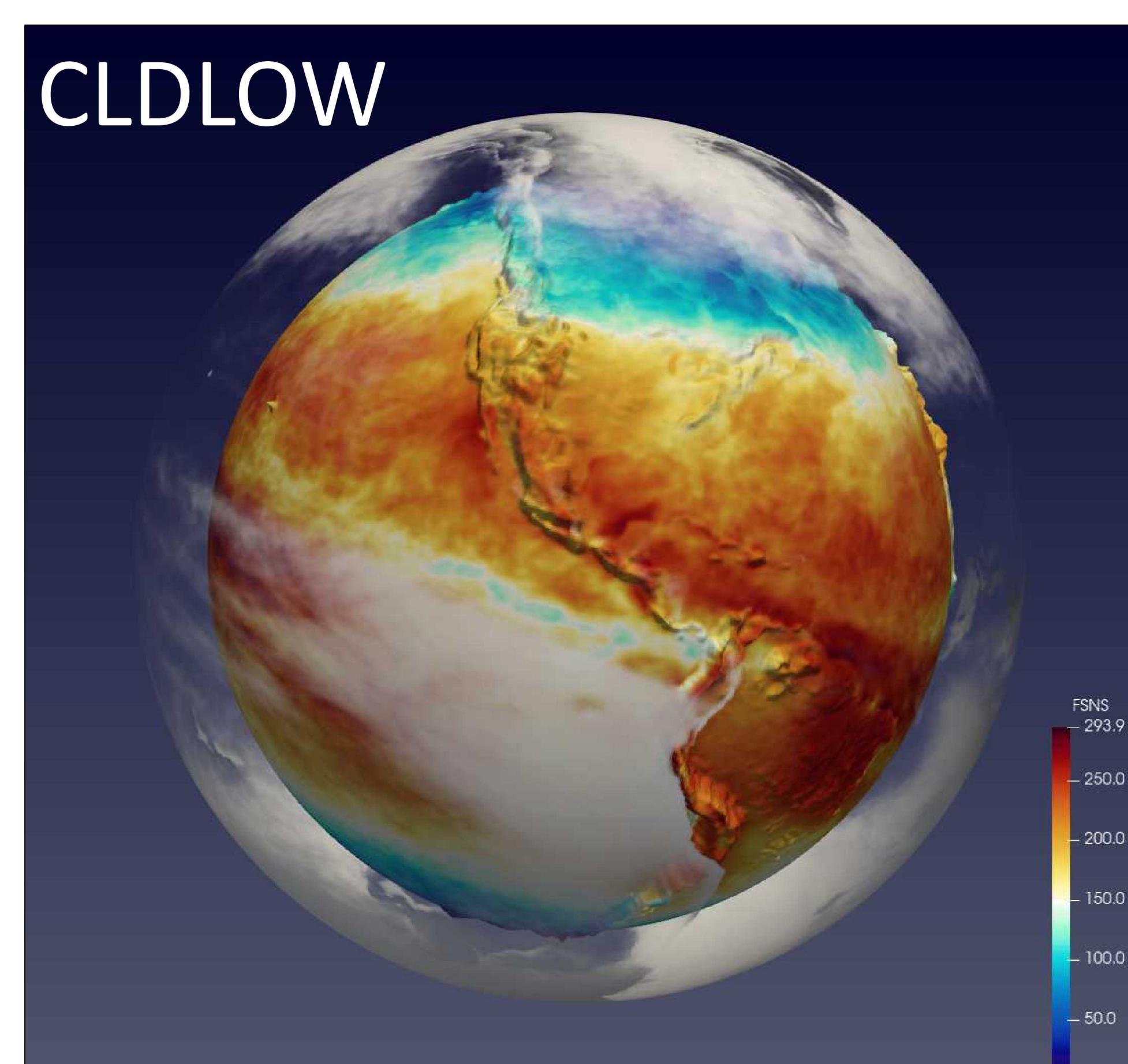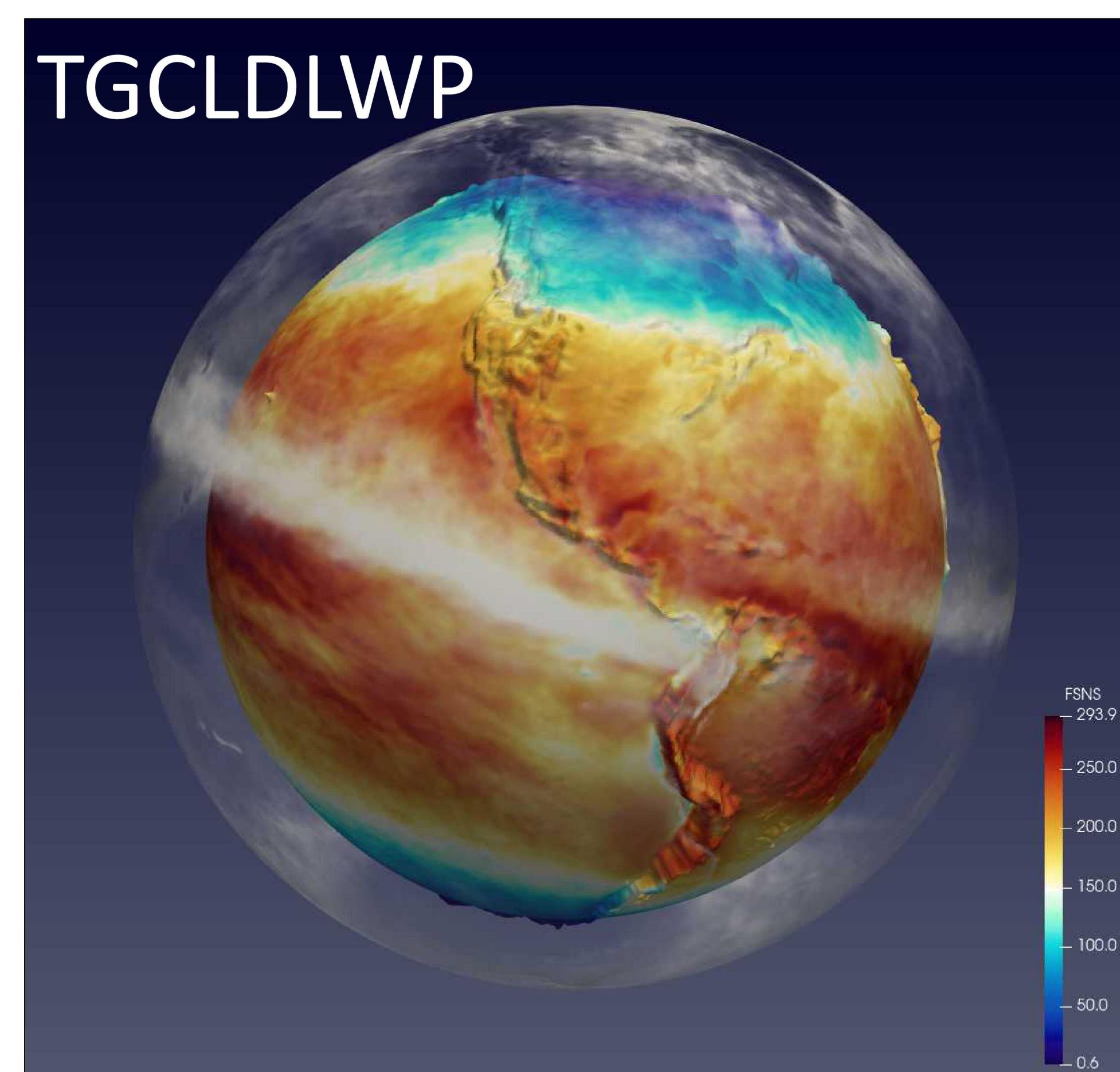
Will these figures **enable your scientific discoveries**? Will they communicate your findings at first impression to your peers?

TGCLDLWP

Each figure depicts one of four atmospheric variables (PRECC, PRECL, CLDLOW, TGCLDLWP) plotted over the net solar flux at the surface (FSNS).

PRECC

PRECL

CLDLOW