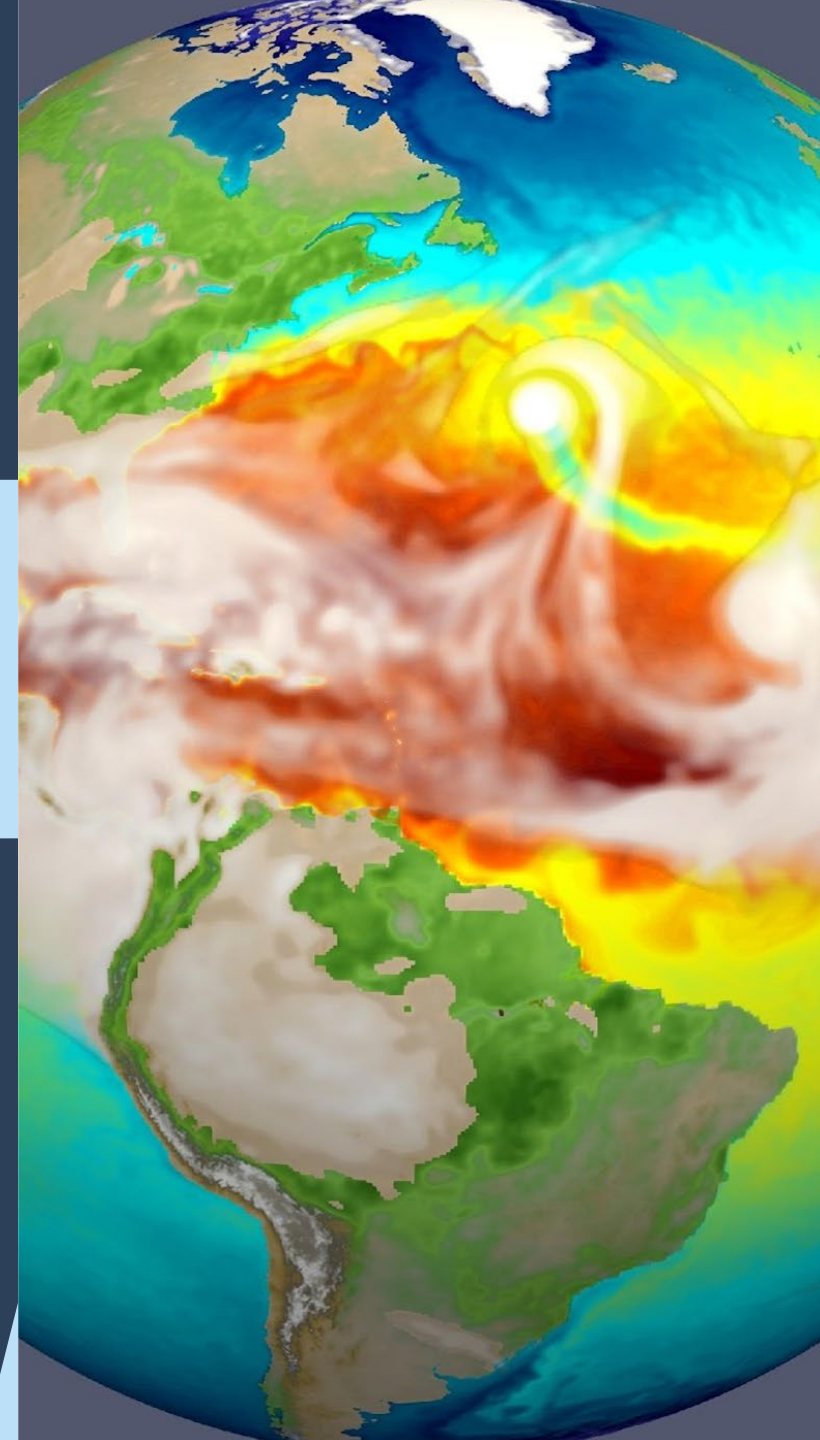


USGCRP and DOE climate activities

Dr. Renu Joseph

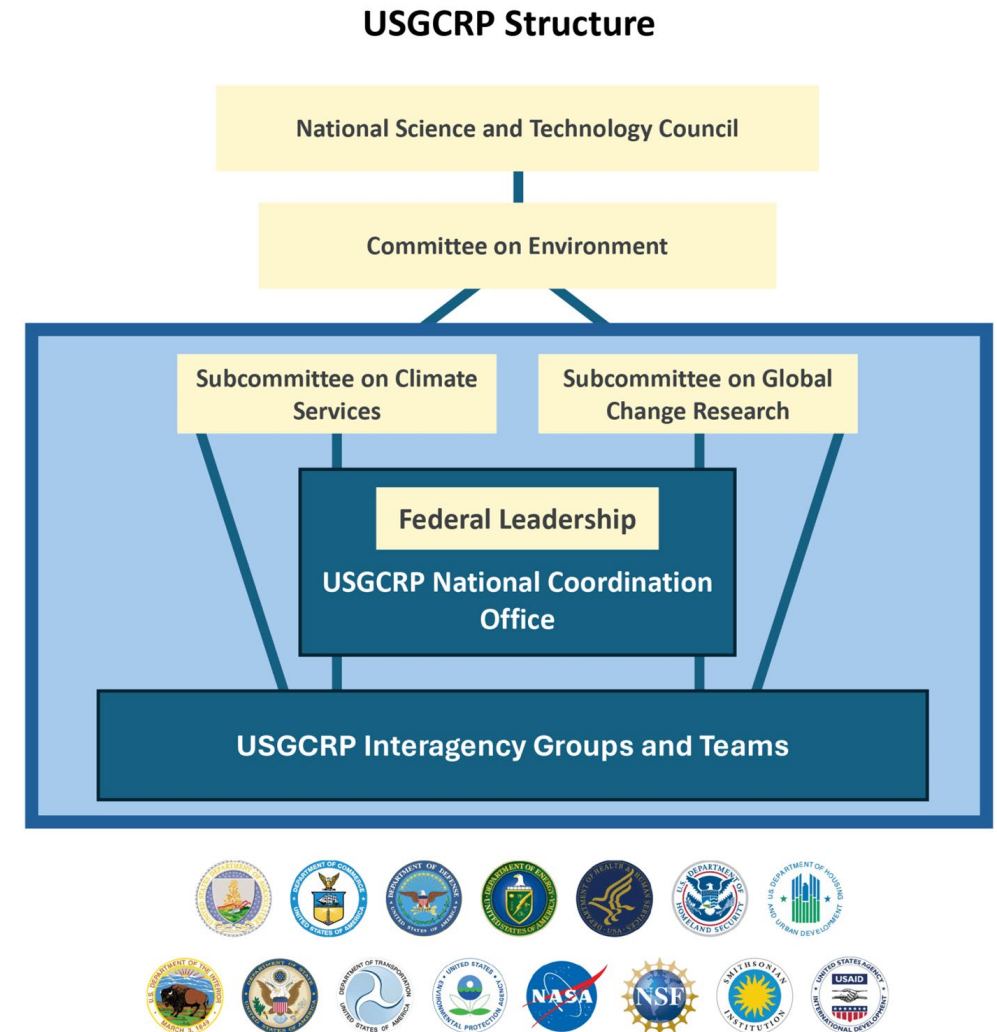
Earth and Environmental Systems Modeling (EESM) Program Manager
Earth and Environmental Systems Sciences Division (EESSD)
Office of Biological and Environmental Research
Department of Energy, Office of Science

Pathway to regular and sustained delivery of climate forcing datasets
28-31 October 2024
ECMWF, Shinfield Park, Reading, UK (and online)



U.S. Global Change Research Program (USGCRP)

- **Established in 1989 by Presidential Initiative** to develop and coordinate “a comprehensive and integrated US research program.. ..assist the Nation and the world to understand, assess, predict, and respond to human-induced.. ..global change”
- **Coordinates climate research across 15 agencies** that conduct or use research on global change
- **Observational networks and observational campaigns** NOAA (Dept. Commerce), DOE, USGS (Dept. Interior), EPA, NASA, NSF, and others
- **Global and regional climate modeling** NOAA-GFDL (Dept. Commerce), E3SM-Project (DOE), NCAR (NSF/DOE), NASA-GISS, NASA-GSFC, and supporting projects

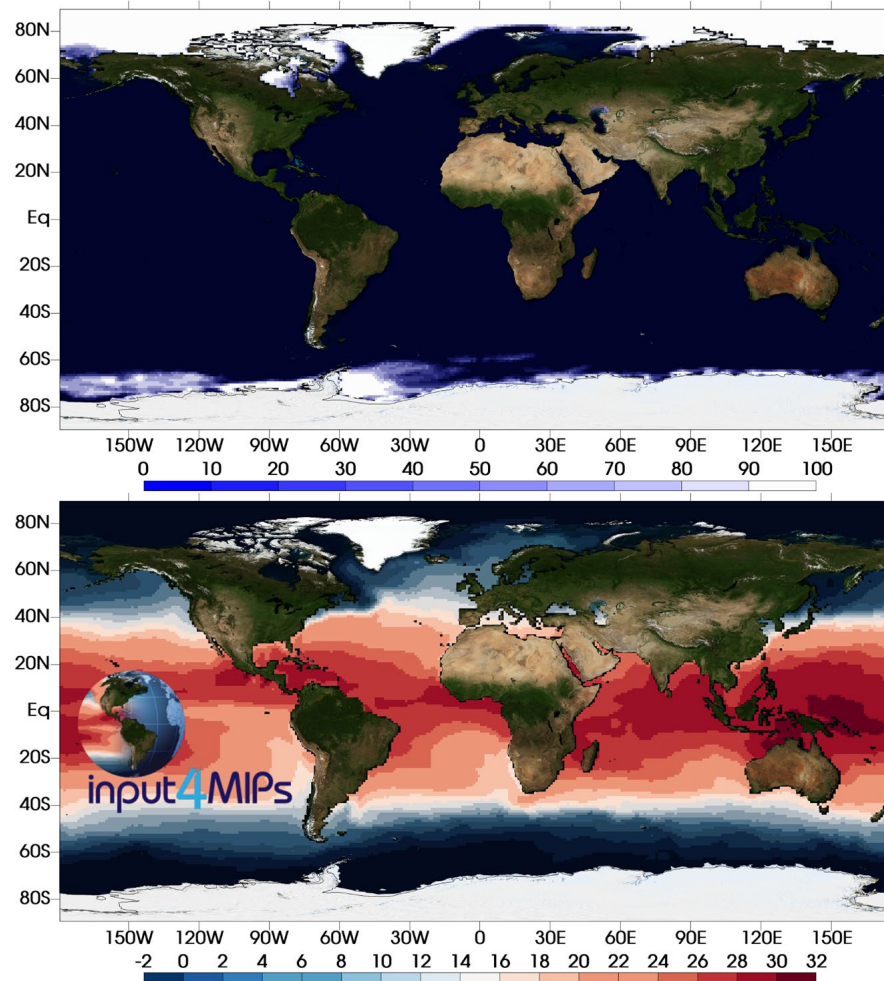


U.S. Global Change Research Program (USGCRP)



- **Responsible for coordinating international interactions** including Intergovernmental Panel on Climate Change (IPCC) Assessment Report (ARs) authorship, and World Climate Research Program (WCRP) engagements across agencies and institutions
- **Responsible for coordinating National Climate Assessments (NCAs)** connecting the latest climate science with impacts, mitigation and regional solutions
- **USGCRP mandate temporal coverage of 25-100 years beyond present:** Prepare and submit to the President and the Congress an assessment which...
...projects major trends for the subsequent 25 to 100 years.
<https://globalchange.gov/about-us/legal-mandate>

DOE supported CMIP forcing data

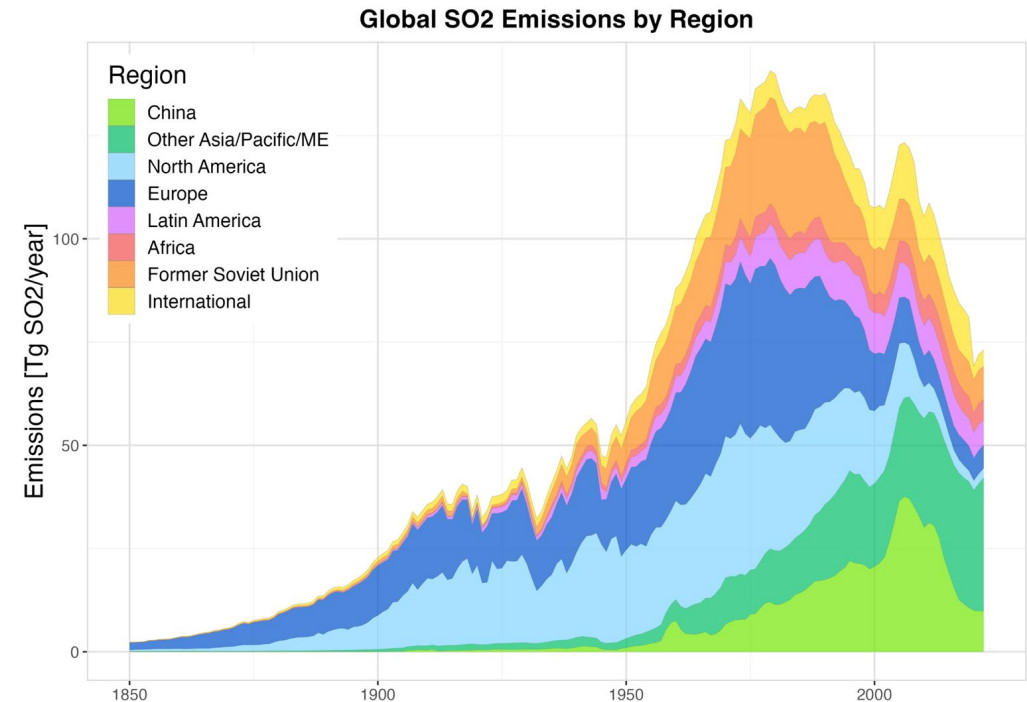


- PCMDI AMIP Sea Surface Temperature and sea ice boundary conditions (PCMDI-AMIP)
- 1870 to 2022
- Used by CMIP AMIP (atmosphere-only) experiment that anchored the Model Intercomparison Project phases since 1989
- Used in the AMIP1, AMIP2, CMIP3, CMIP5, CMIP6 and plans for CMIP7 phases
- Depends on UK MetOffice HadISST v1 data pre-satellite, NOAA OISST v2.0 data afterward
- New v2 version in preparation, using completely revised inputs - allowing extension to near real-time
- Program Manager Renu Joseph



DOE supported CMIP forcing data

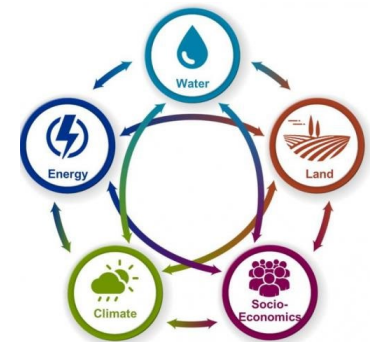
- Community Emissions Data System (CEDS)
- Anthropogenic emissions and short-lived climate forcers (SLCFs, e.g., CO, CH₄, NH₃, VOCs, ...)
- 1750 to 2021 (provisional extensions to 2023)
- Used by CMIP piControl, historical experiments
- Used in the CMIP6 and CMIP7 phases
- Depends on International Energy Agency (IEA) and other fuel combustion data and incorporates global emission inventories (US, EU, Canada, etc.), with specific contributions from databases
 - EU/IIASA Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS)
 - EU Emissions Database for Global Atmospheric Research (EDGAR)
- Program Manager Xujing Davis



DOE supported CMIP forcing data

- Additional DOE funded activities
 - ScenarioMIP
 - Brian O’Neill, Claudia Tebaldi as part of Global Change Intersectoral Modeling System (GCIMS)
 - Global Change Analysis Model (GCAM)
 - Program Manager Bob Vallario
 - Community MIP forcing data - CFORCE
 - OMIP Gokhan Danabasoglu (NCAR) and LMIP Dave Lawrence (NCAR) dataset updates
 - DOE Program Managers Xujing Davis, Renu Joseph, co-supported with NOAA and NSF

GCIMS



Pacific Northwest
NATIONAL LABORATORY

NCAR
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

DOE supported CMIP projects



- **Earth System Grid Federation (ESGF)** an international consortium of infrastructure providers hosting Model Intercomparison Project (MIP) data - ESGF2-US US DOE contribution - Program Manager Justin Hnilo
- **input datasets for Model Intercomparison Projects (input4MIPs)** ESGF project to collate and manage forcing datasets for CMIP and broader MIP use
- **Climate Model Output Rewriter (CMOR)** DOE-supported software facilitating modeling groups and data providers to meet MIP data requirements required by ESGF
- **CMIP Rapid Evaluation Framework (REF)** supported through the DOE Coordinated Model Evaluation Capabilities (CMEC), International Land Model Benchmarking (ILAMB) and PCMDI Metrics Package (PMP) projects
- **observations for Model Intercomparison Projects (obs4MIPs)** ESGF project to collate and manage observations enabling REF routine evaluation



Office of Science

Biological and Environmental Research Program

Thank You!

Dr. Renu Joseph

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Department of Energy, Office of Science

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