

CLIMATE CHANGE IN THE POST-INDUSTRIAL ERA

Human activities that have affected climate

Observations and records of climate change

Temperature (atmospheric and sea surface)

Polar ice extent

Atmospheric chemistry

Greenhouse Gas Emissions

CO₂- good record. Chemically inert. Various sources & sinks

CH₄- chemically reactive. Wetlands major source

CFCs- GHG, stratospheric ozone depletion

SF₆- Electrical switching source, no sinks

H₂O- Strong greenhouse gas, but difficult to measure

Aerosols- Net cooling effect, but work both ways

Land Use

Albedo- forests have lowest albedo

Carbon cycle- NPP altered. Wetland loss changes CH₄ sources

Hydrologic cycle- Dams & irrigation

Nitrogen fixation- fertilizers

Prediction future climate

Models- AGCMs, OGCMs, Coupled models, Earth System Models?

Scenarios- “What if” future emissions were X?

Predictions- based on scenarios as model input

IPCC- Intergovernmental Panel on Climate Change

Consequences of Climate Change

Sea level rise- Ice melting, thermal expansion, anthropogenic

Floods & Droughts- any change in hydrology is “bad”

Coastal Storms- Hurricane frequency related to SST

