

Earth System Approach

Physical state variables

(e.g. temperature, moisture, salinity, ozone, phytoplankton, trees, soil carbon, mammals)

Physically-based mechanisms

(e.g. conservation of momentum, conservation of mass, gravity, thermodynamics, trophic transfer)

Transformative parameterizations

(e.g. cloud formation, ocean mixing, photosynthetic carbon fixation)

Earth System Economics

Human biological state variables

(e.g. demography, human stoichiometry, predictive neural networks)

Human-created state variables

(e.g. tools, buildings, machinery, vehicles, roads, books, computer code)

Time allocation

(conservation of time among activities)

Human subjective experience

(affect, life evaluation)

Fields of human study

Economics

(preferences, capital, goods/services)

Anthropology and Sociology

(behaviour, culture, values)

Law

(societal rules)

History

(long-term cultural dynamics)

Psychology

(emotions, neuroscience, cognition)

Medicine

(physiology, pathogens, disorders)

Industrial Ecology

(material fluxes, social metabolism)