

**The 4DEE framework seeks to:**

- Describe a set of concepts and practices central to ecology as requested by the membership
- Inform students of the scope of ecology for future study and career goals
- Describe core ideas (concepts) for practitioners seeking certification as ecologists
- Inform and support instructors and education researchers seeking to incorporate ecology into their STEM education initiatives
- Identify ecology practices and skills necessary for careers in today's and tomorrow's environmental workforce
- Establish ESA as the leader in ecology education

**Integration across dimensions:**

- Is a hallmark of the framework. The ultimate goal is for the four dimensions to be taught as integrated units, courses, and curricula



ECOLOGICAL SOCIETY OF AMERICA

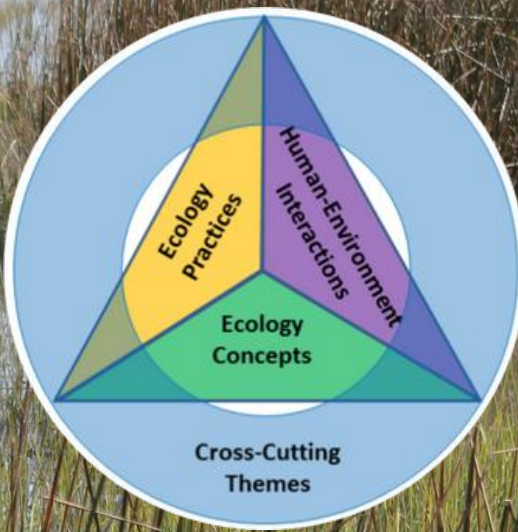
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Contact Us

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**Ecology Education is now 4D**

**Four Dimensional Ecology Education Framework**



For more info on the framework please visit the 4DEE website or scan the QR code

<https://esa.org/4dee/>



## Core Ecology Concepts

Classical Ecological Hierarchy



## Ecology Practices

Approaches and Methods



# Four Dimensional Ecology Education Framework

- **Core Ecological Concepts** follows the widely recognized hierarchy of ecology presented in most ecology textbooks, including organisms, populations, communities, ecosystems, landscapes, biomes and biosphere.
- **Ecology Practices** include the basic components associated with the scientific process, e.g., making observations, collecting data, and generating and testing hypotheses.
- **Human-Environment Interactions** emphasize the bi-directional interrelationship between humans and the Earth's biota and physical environment, with particular attention to the normative values underlying decision-making and policy.
- **Cross-Cutting Themes** represent the concepts that "bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering". Important in ecology are: pathways and transformations of matter and energy, structure and function, systems, evolution, and space and time.

## GET INVOLVED:

- Redesign curriculum and support ecology educators
- Reframe student advising and mentoring
- Develop research agenda on teaching and learning
- Inform professional development programs
- Sign up for updates

## Human-Environment Interactions

Human Dependencies, Impacts, Ethics



## Cross-cutting Themes

Ways of thinking, Unifying Ideas

