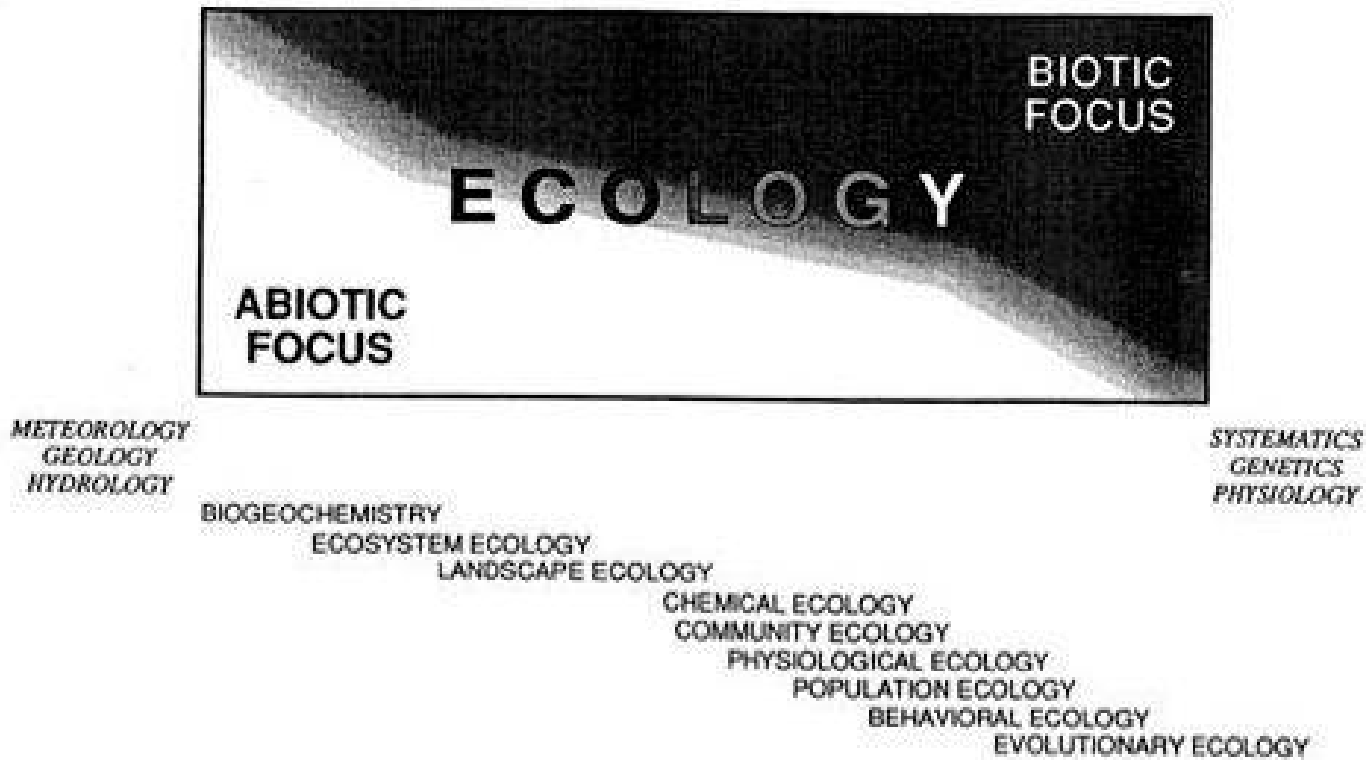


# The Ecosystem Concept

- Objectives
  - Ecological Hierarchy
  - Ecosystem Concept
  - Ecosystem Goods & Services
  
- **First:** take-home points, things you learned, etc. from reading assignment

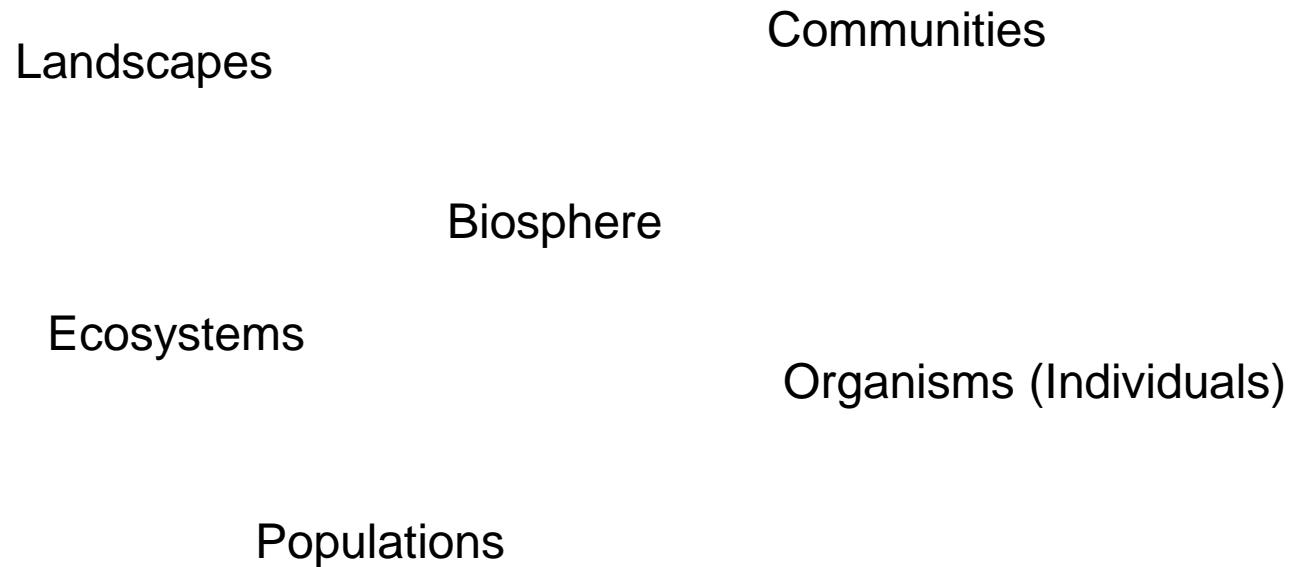
# The Ecosystem Concept

- Ecology



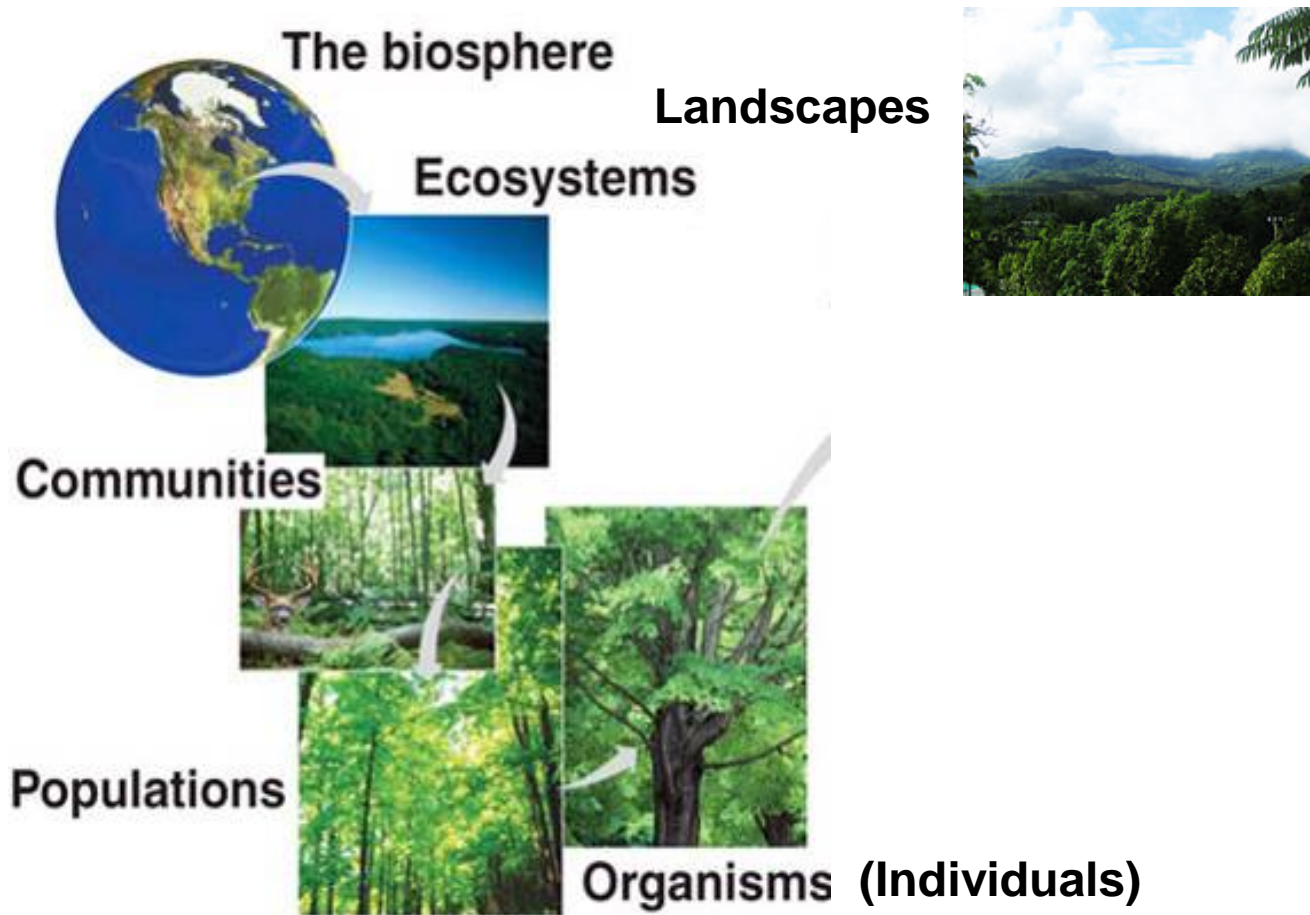
# The Ecosystem Concept

- Ecological Hierarchy



# The Ecosystem Concept

- Ecological Hierarchy



# The Ecosystem Concept

- Individual (Organismal) Ecology

*Acacia koa*  
individual



- **Organismal Ecology:** Study of the life history of an individual (i.e., species) & its response to its environment
  - **Species:** all individuals that can potentially breed with one another and produce viable offspring

# The Ecosystem Concept

- Population Ecology

*Acacia koa*  
population



- **Population ecology:** Study of the abundance, distribution, & dynamics of a group of individuals of the same species
  - **Population:** group of potentially interbreeding & interacting individuals of the same species living in the same place & time

# The Ecosystem Concept

- Community Ecology

*Acacia koa*-  
"dominated"  
community



- **Community ecology:** Description & quantification of natural assemblages of different species/populations
  - **Community:** Collection of organisms/populations interacting directly and indirectly in the same place & time

# The Ecosystem Concept

- Ecosystem Ecology

**Tropical  
Rainforest  
Ecosystem**



- **Ecosystem ecology:** Study of interactions among organisms and their physical environment as an integrated system
  - **Ecosystem:** Bounded ecological system consisting of all organisms in a given area & the physical environment



# The Ecosystem Concept

- Landscape Ecology

Windward  
Mauna Kea  
Landscape



- **Landscape ecology:** Study of the spatial arrangement of ecosystems & how this affects biotic & abiotic components
  - **Landscape:** heterogeneous region consisting of  $\geq 2$  interacting ecosystems exchanging organisms, energy, water, nutrients, etc.<sup>9</sup>

# The Ecosystem Concept

- Biosphere (Global Ecosystem)

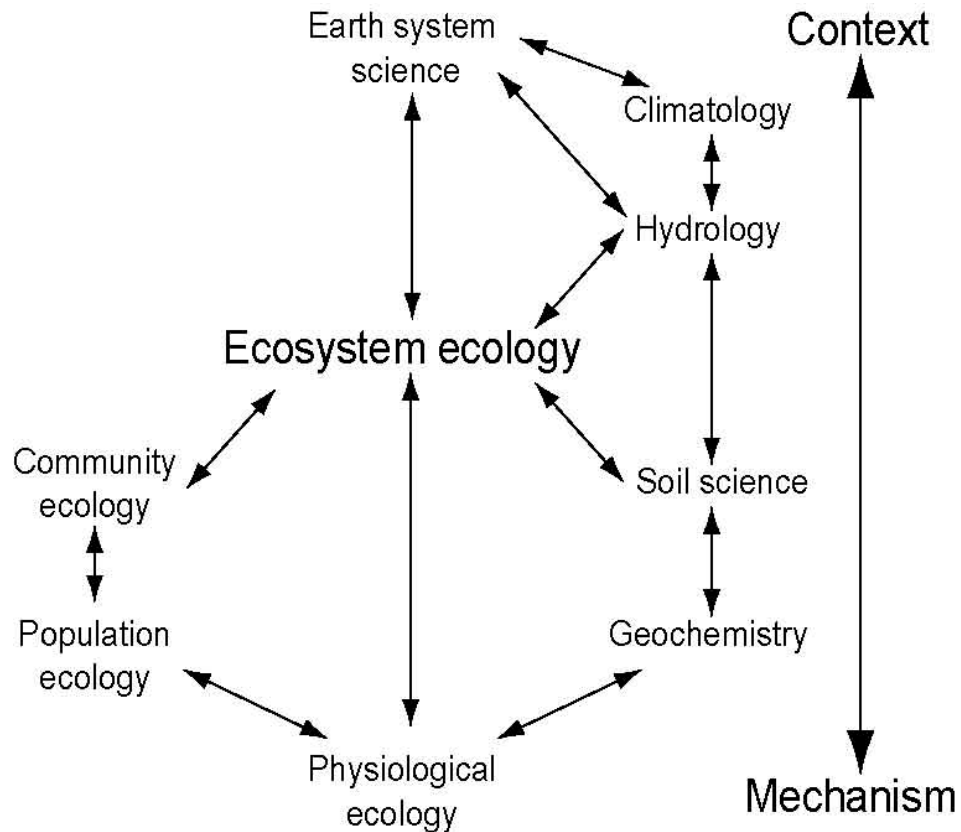
The Earth  
Biosphere



- **Biosphere:** Global sum of all ecosystems (biotic and abiotic) as an integrated system
  - Earth as an ecological entity or system

# The Ecosystem Concept

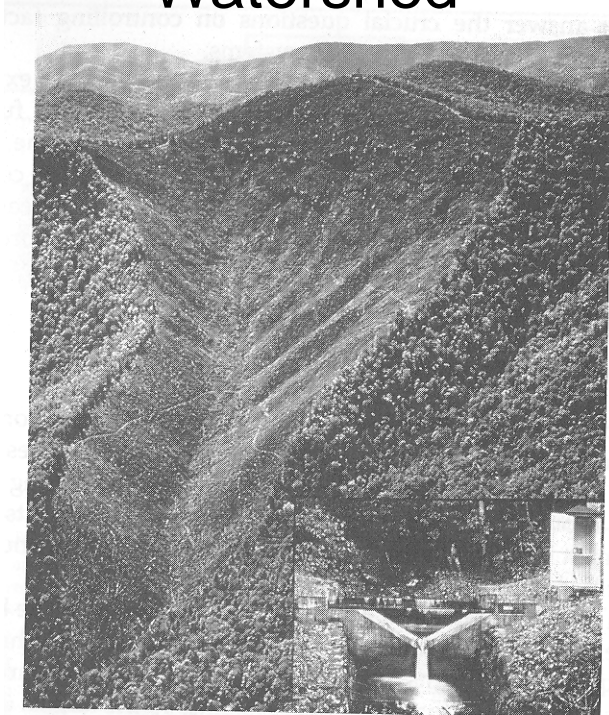
- Ecosystem Ecology



# The Ecosystem Concept

- Ecosystems – Spatial Scale

Watershed

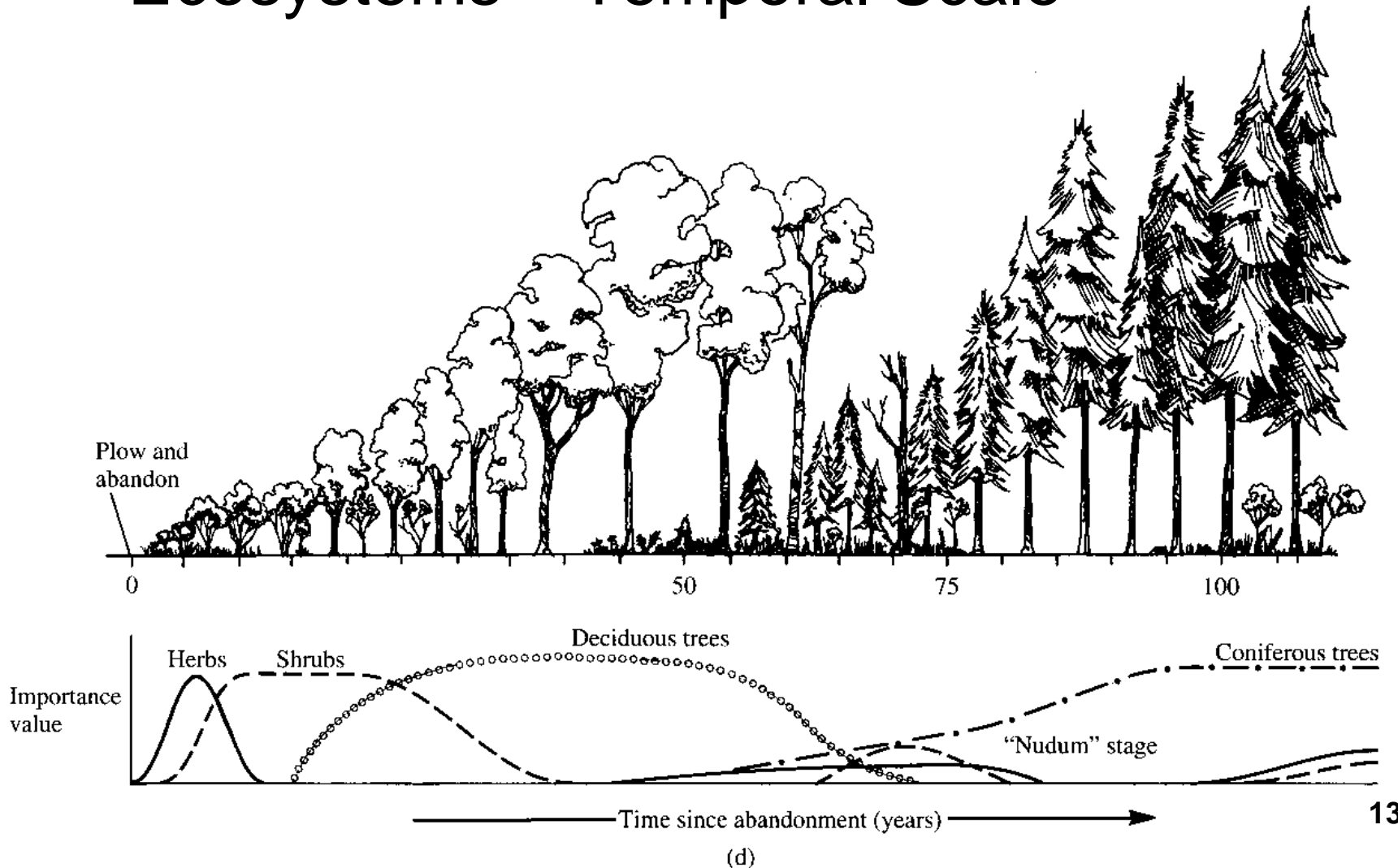


Forest Stand



# The Ecosystem Concept

- Ecosystems – Temporal Scale



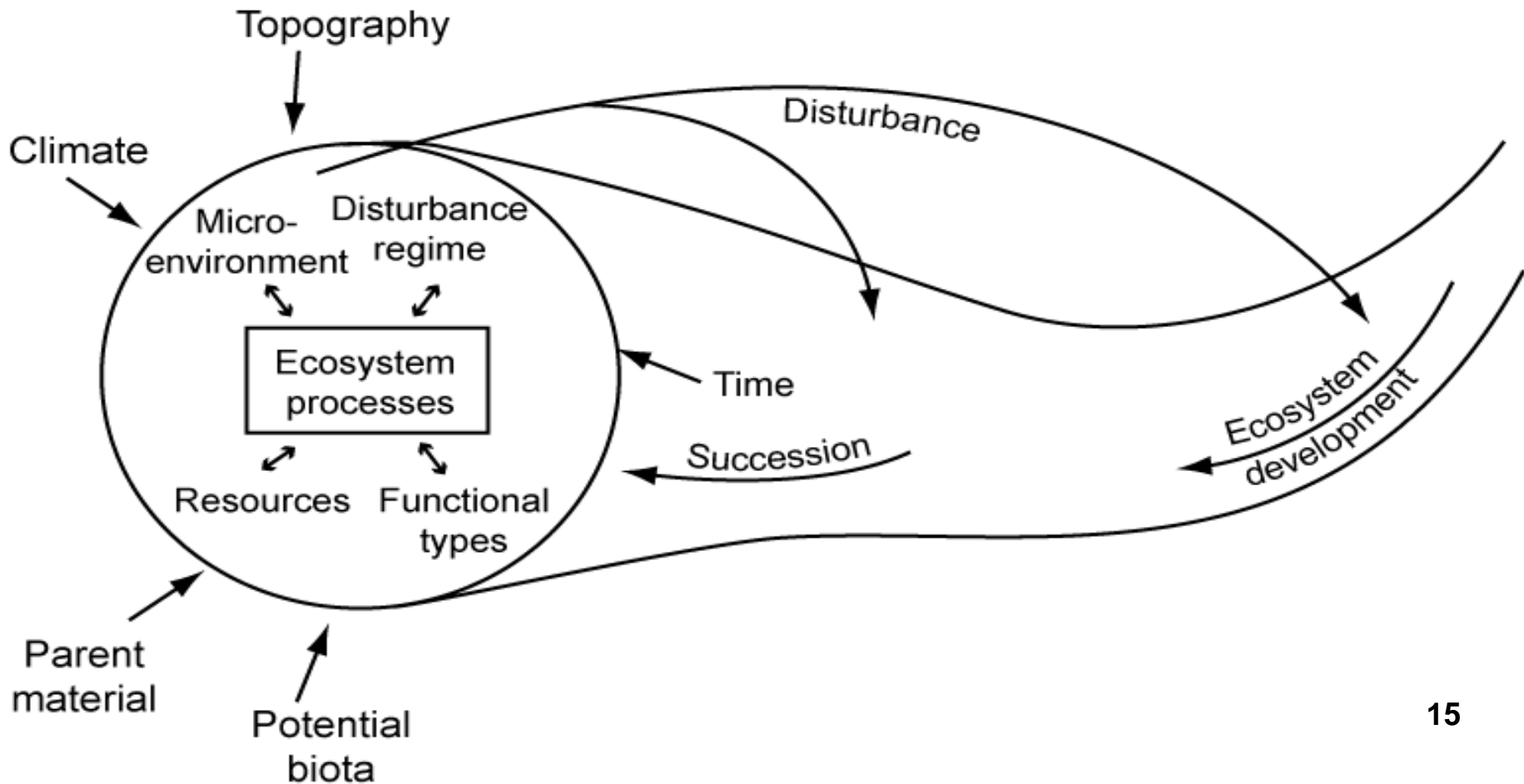
# The Ecosystem Concept

- Ecosystem Attributes



# The Ecosystem Concept

- Controls on ecosystem structure & function



# The Ecosystem Concept

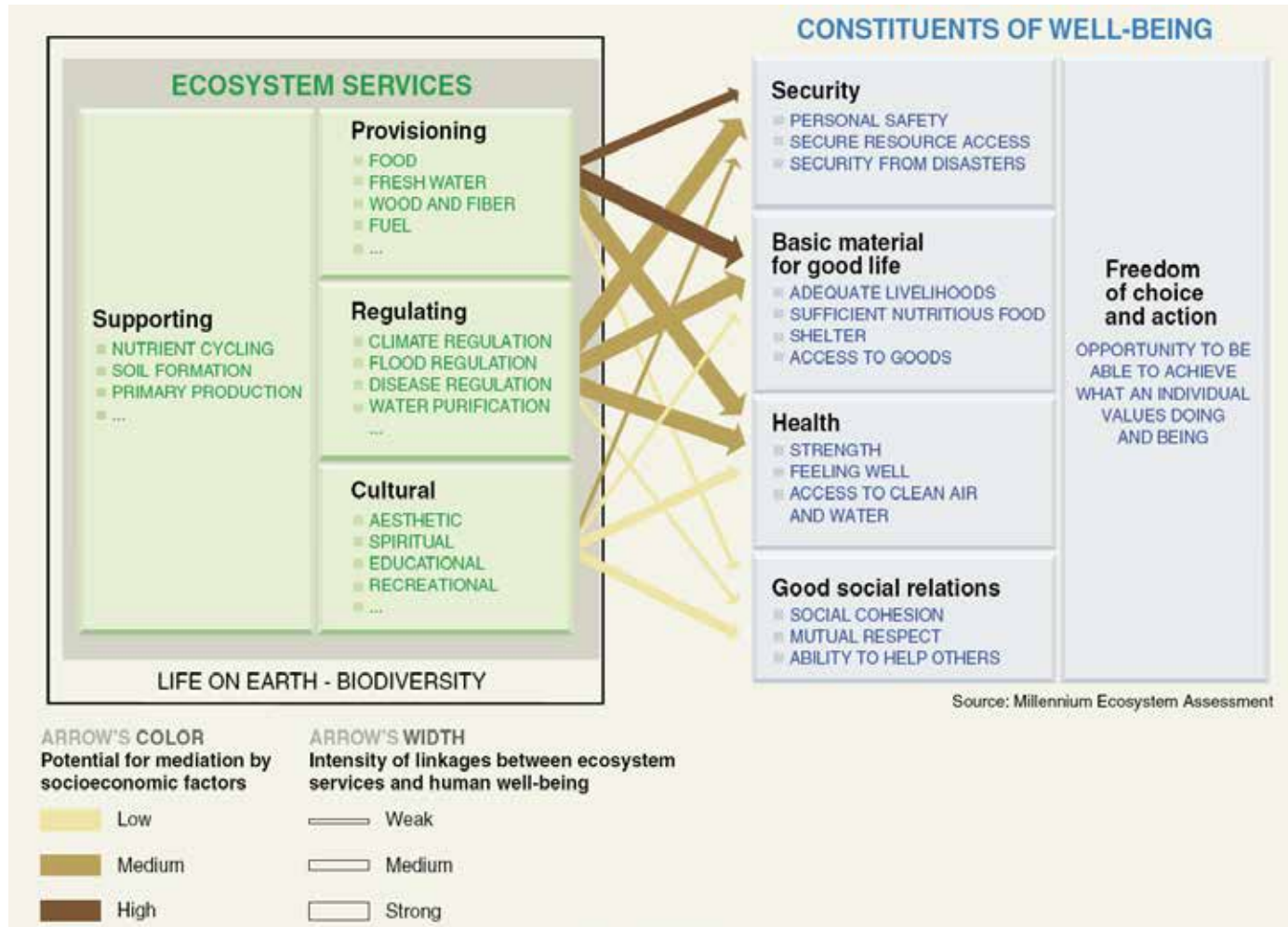
- Ecosystem Goods & Services
  - Fundamental life-support services provided naturally by ecological systems without which human civilizations would cease to thrive





# The Ecosystem Concept

- Ecosystem Goods & Services



# The Ecosystem Concept

- Ecosystem Goods & Services - The Anthropocene

