# Foundations of Environmental Anthropology

Eduardo S. Brondizio

INDIANA UNIVERSITY

Department of Anthropology

Center for the Analysis of Social-Ecological Landscapes (CASEL)

The Ostrom Workshop in Political Theory and Policy Analysis
Indiana University – Bloomington

Science Committee, Future Earth

futureearth
research for global sustainability

SESYNC – University of Maryland
Anthropology Immersion Workshop
Feb 29-March 3, 2016

# The Great Global Acceleration, and its regional shifts

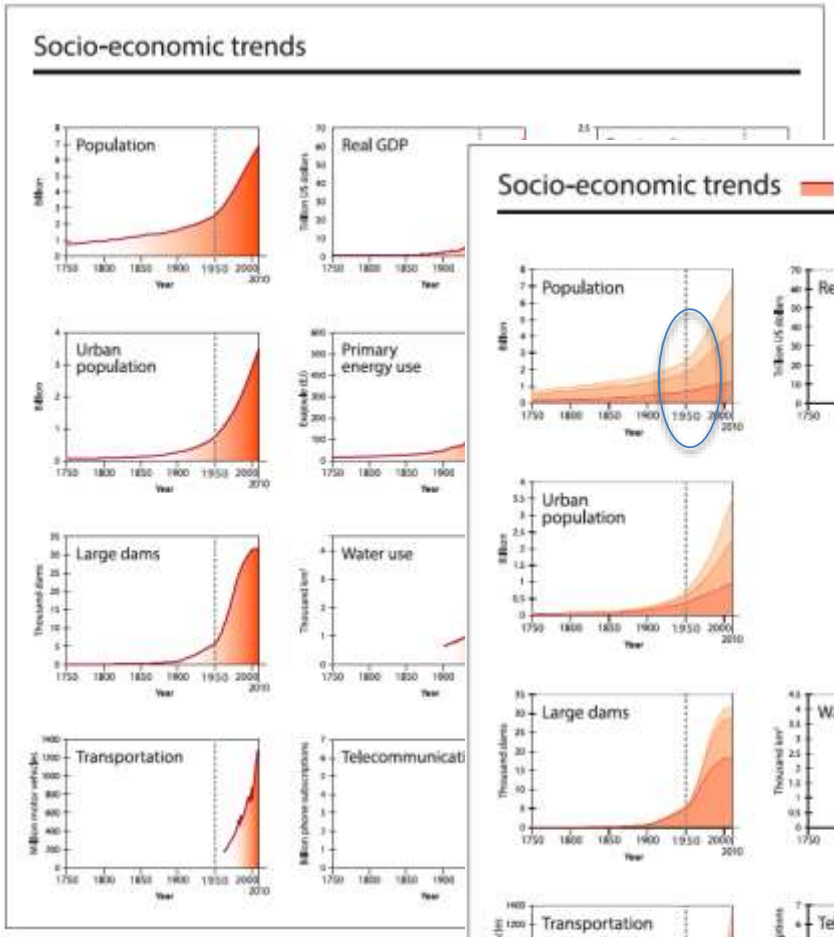



Figure 1. Trends from 1750 to 2010 in globally aggregated
(1) Global population data according to the HYDE (History

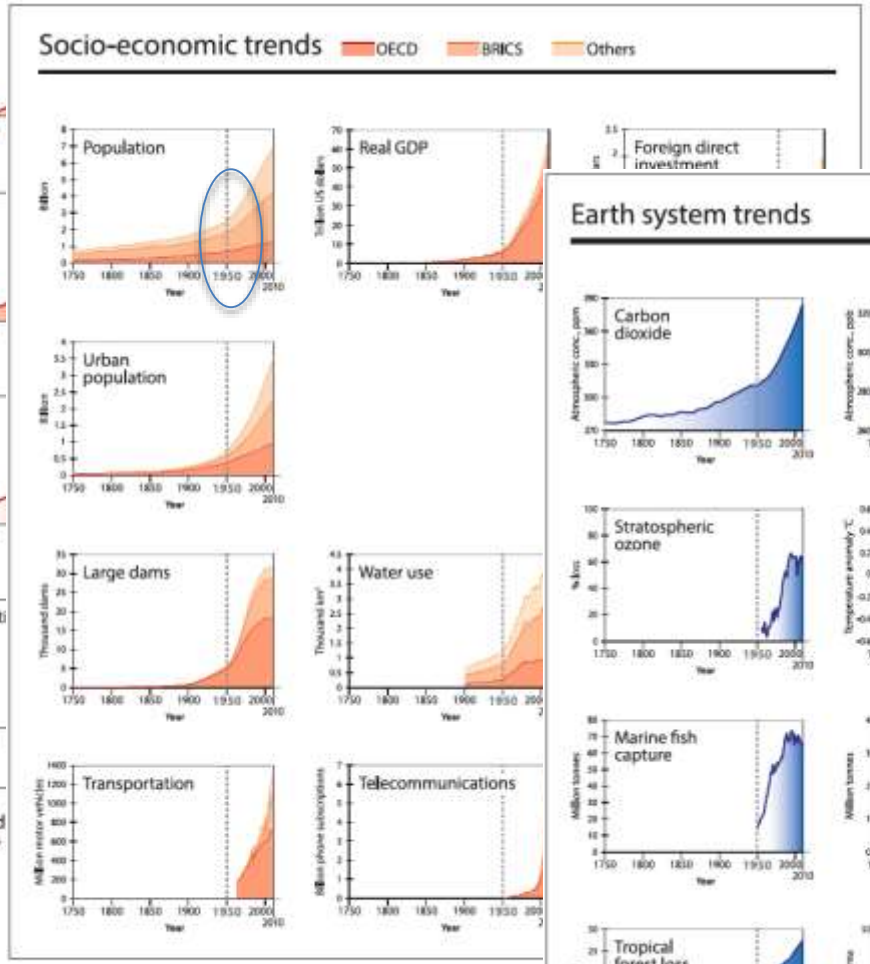



Figure 2. Trends from 1750 to 2010 for ten of the socio-econom
and international tourism) with three splits for: the OECD countri
India, China (including Macau, Hong Kong and Taiwan where applic
the rest of the world.

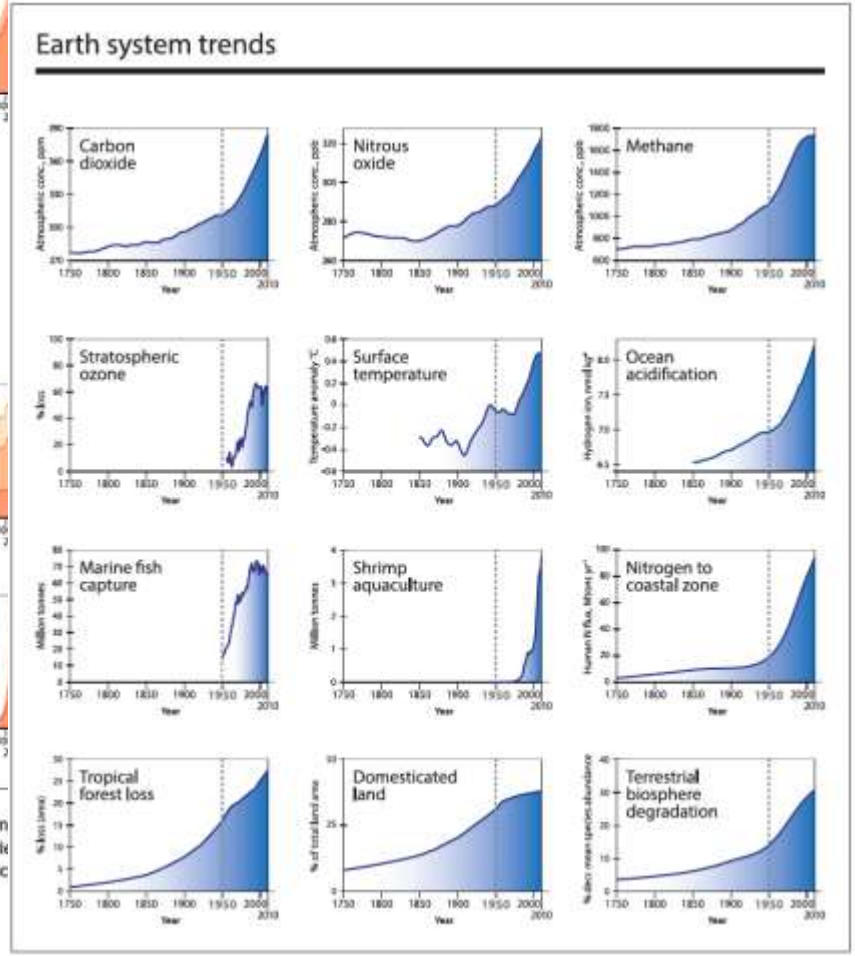
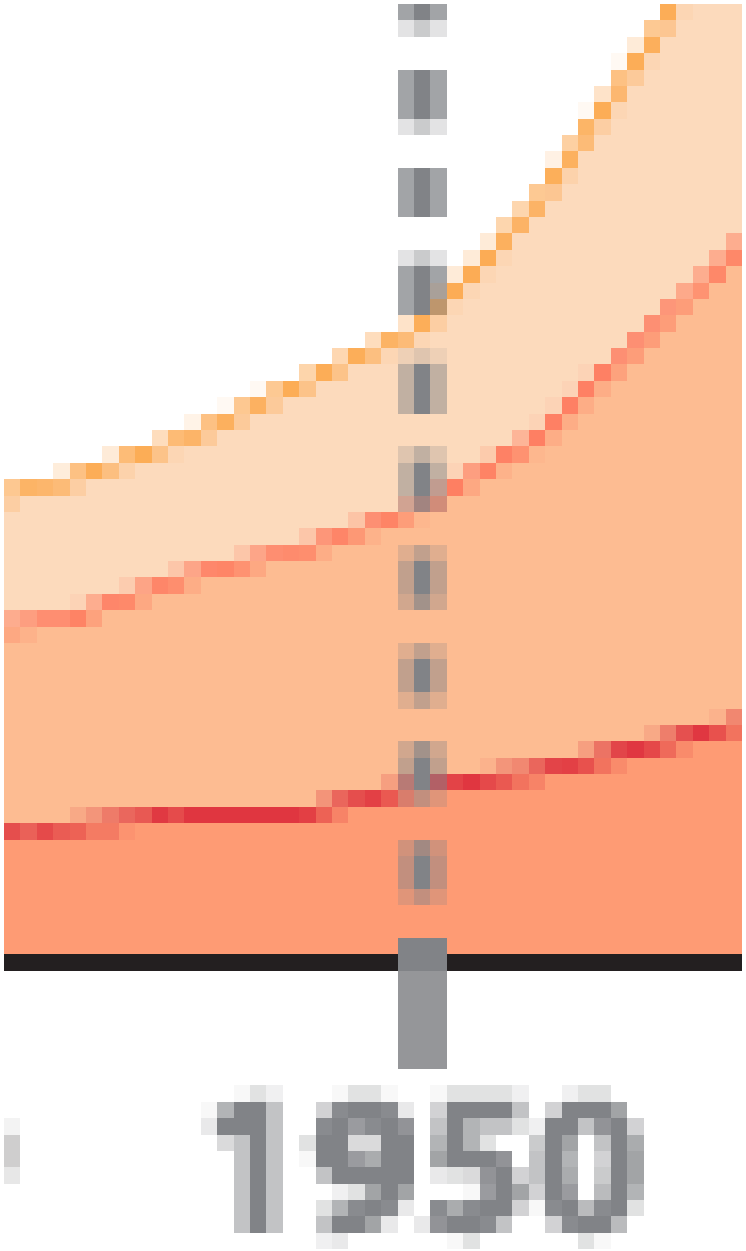
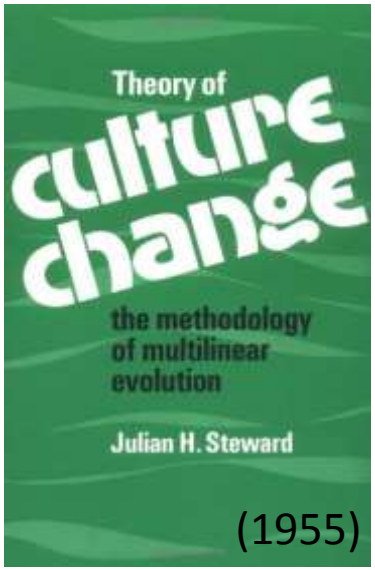



Figure 3. Trends from 1750 to 2010 in indicators for the structure and functioning of the Earth System.

Steffen et al 2015. the Anthropocene Review




Imagine the challenge of understanding Social-Ecological analysis at the ‘onset’ of the ‘Great Acceleration’ (1940-1950)




# The **Cultural Ecology** Approach of Julian Steward (1930s-50s)

**CULTURE CORE**

**Units of Social organization**

**Labor arrangements**

**Marriage patterns**

**Settlement and territorial arrangements**

**…**

**SUBSISTENCE TECHNOLOG**

**Resource use technology**

**Productions techniques**

**Diversification and specialization**

**ENVIRONMENTAL CONSTRAINTS**

**Availability**

**Spatial distribution**

**Seasonality**

**Limiting factors**

**…**

**STEWARD'S APPROACH: MULTI-LINEAR EVOLUTION**:

-certain basic types/features of culture may develop in similar ways under similar conditions, but not necessarily in regular sequence

-cross-cultural regularities may be observed;

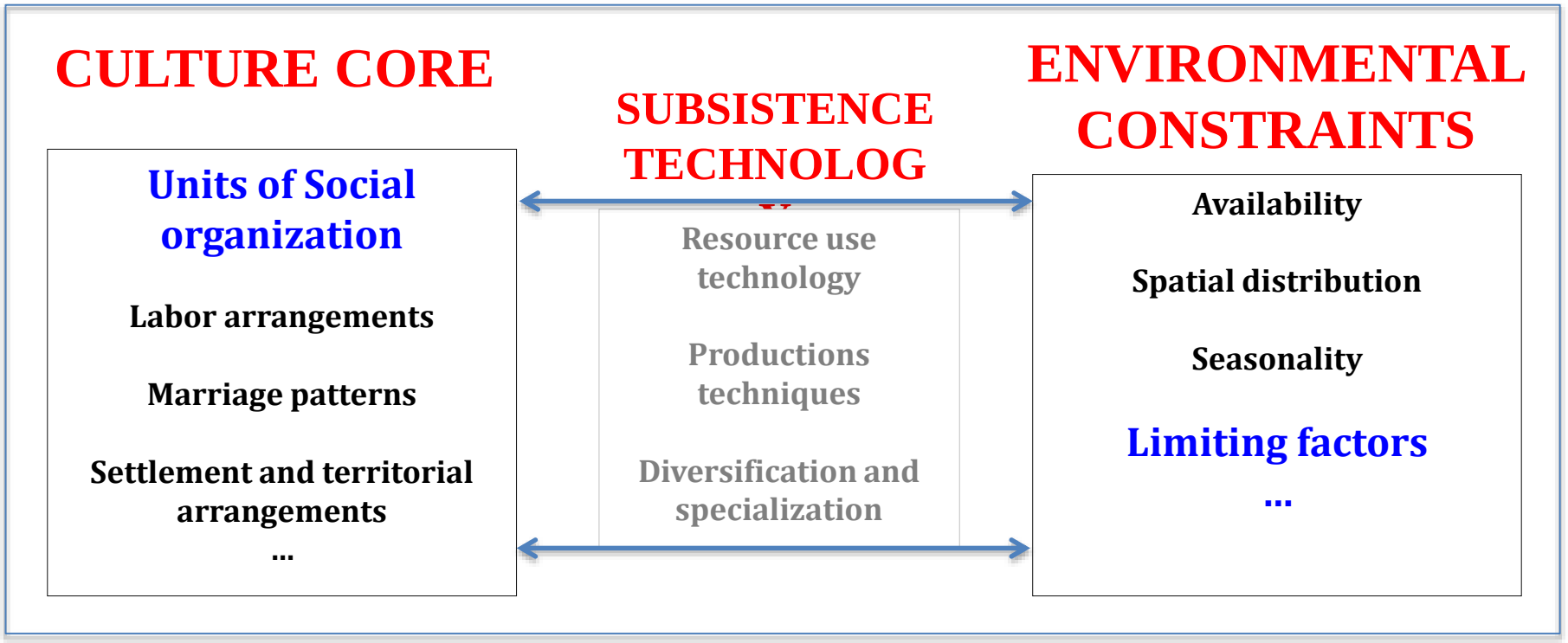
-a perspective that allows questions that are synchronic and diachronic

## GENERAL METHODOLOGY:

**1.** Describe and analyze the **relationship between productive technology and the environment/resources**

**2.** Describe and analyze **behavioral patterns** involved in the exploitation of environment and resources

**3.** Analyze how behavioral patterns important to exploit the environment/resources related and **affect other aspects of culture**



## THE CULTURAL ECOLOGY APPROACH

1-Focus on selected features of culture and the environment [not on totality]

2-Based on the definition of the PROBLEM of study

3-The problem of study will help DEFINE the selection of DIAGNOSTIC FEATURES

4-the diagnostic features are presumed to have some FUNCTIONAL INTER-RELATIONSHIPS

5-Focus on understanding the CAUSALITY of inter-related features

6-Consider the reconstruction of HISTORICAL changes

7-Understand the connections of LEVELS OF SOCIAL integration TECHNOLOGY and TECHNIQUES to be overcome.

# Applying Cultural Ecology to Complex Societies

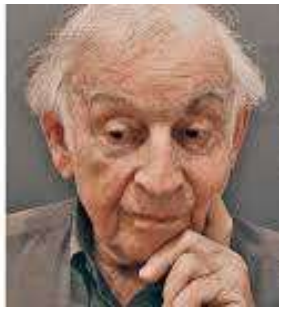
**The Peoples of Puerto Rico Project (~1952-57)**

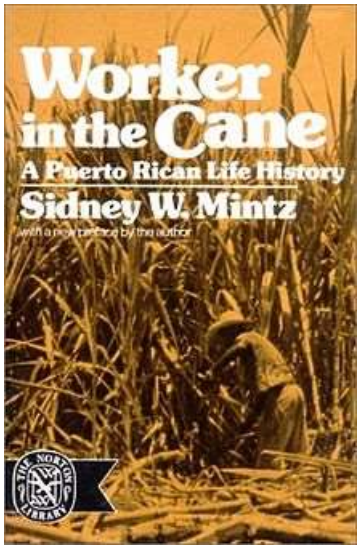

## Levels of Social Integration

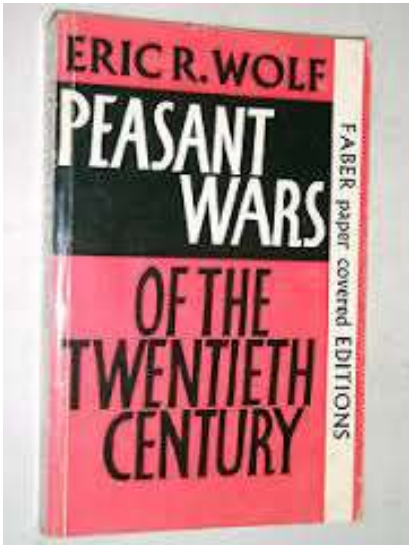
Team work: Case studies w/ comparative framework

Studying farming systems, economic sectors, and the elite

SIDNEY W. MINTZ
1922-2015





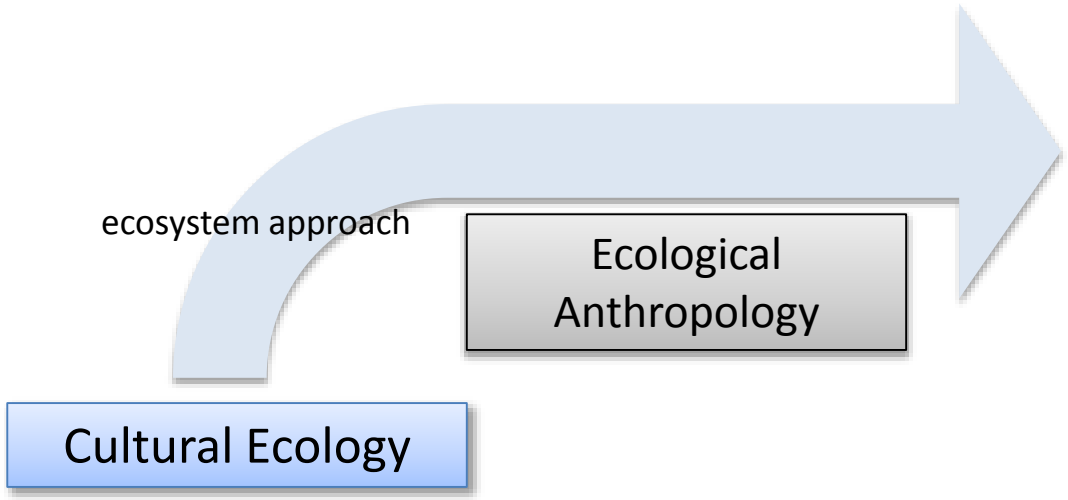



| 19/20th C. | 1930—1950 | 1950-1970 | 1980-1990 | 2000s |
|---|---|---|---|---|

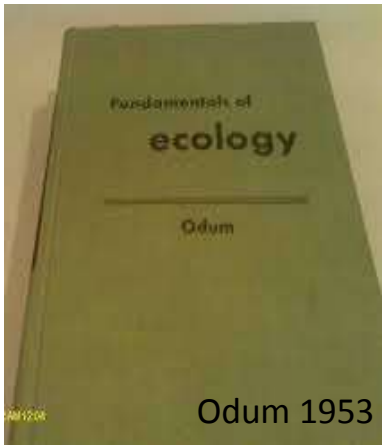
Environmental Determinism

Historical possibilism

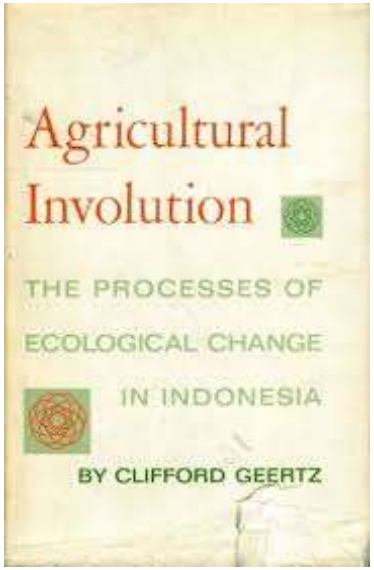
Culture Area

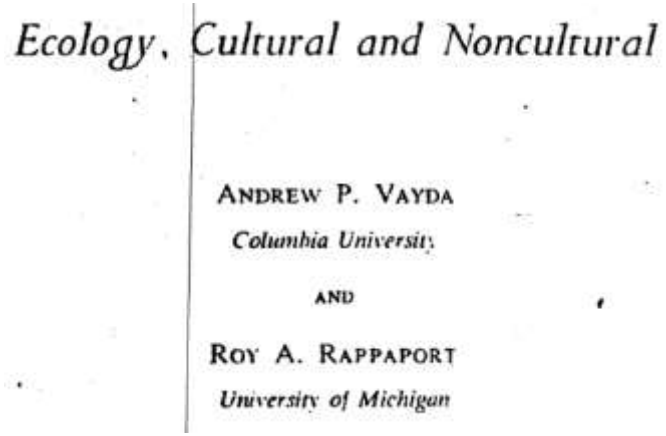


# The Ecosystems turn: Ecological Anthropology emerges



Odum 1953



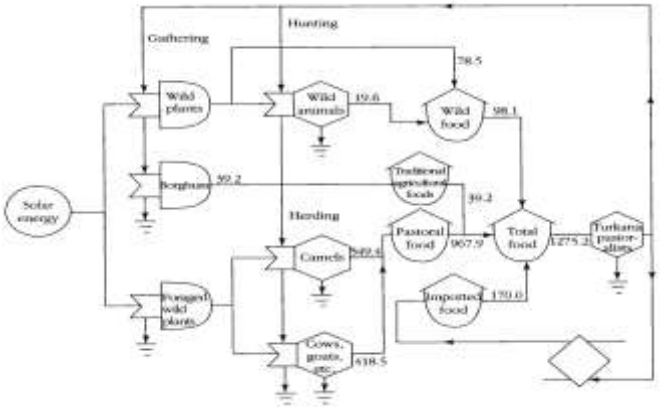

Ecosystem approach

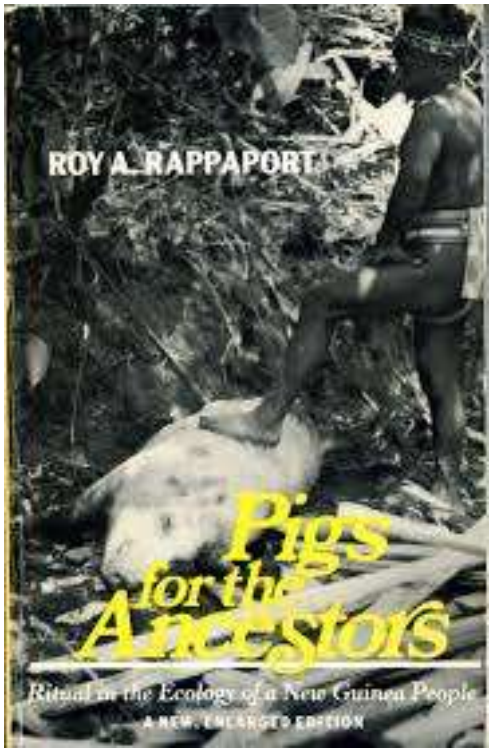
Systems Theory

Feedback mechanisms

Adaptation and adjustment

*Turkana Pastoral System*



- Vayda and Rappaport (1968)
- Ecology rather than cultural Ecology
- Avoid anthropology isolation from general ecology
- Develop a single science of ecology that applies to humans
- Culture as animal behavior – adaptive
- Behavior and genetics interdependent – towards a more unified approach – behavior as selective as biology

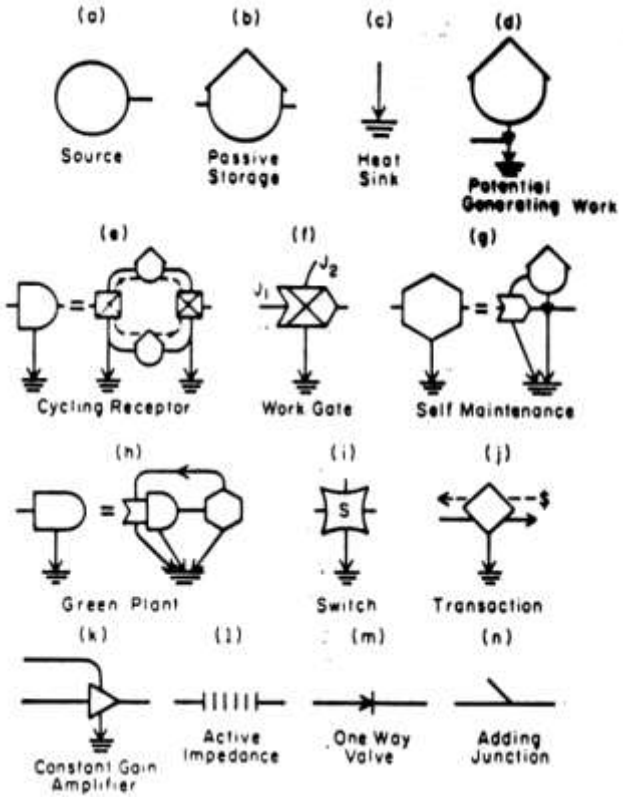
- Need agreements on units of analysis: individual, populations, communities, ecosystems

- Relations should be hypothesized
- More detailed lists of demographic and environmental variables
- Requires interdisciplinary collaborations
- Pay more attention to trade-offs in adaptive and non-adaptive behavior

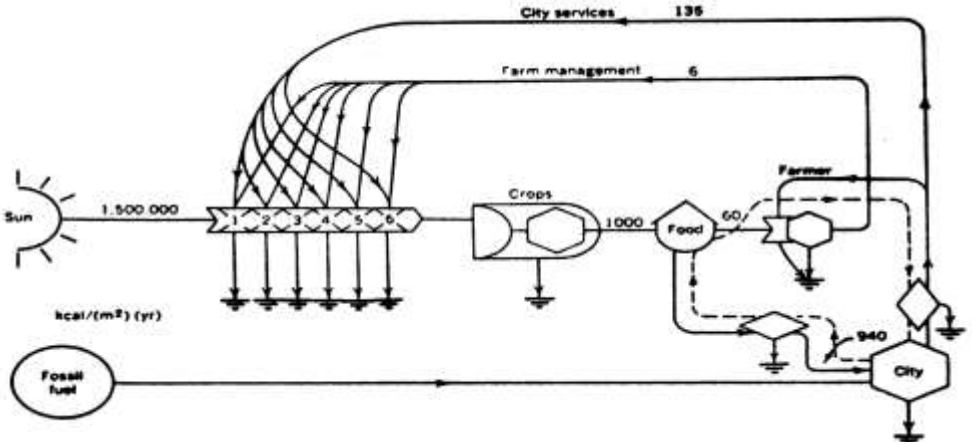
# Ecological Anthropology

1. **Human communities are ecological communities** through which energy flows and by which population/resource relationships are regulated.
2. **Systems:** (Bateson 1972) "any unit containing feedback structure and therefore competent to process information."
3. **Ecosystems:** assemblage of living and non-living organisms and their inter-relations. As units of analysis can be defined according to the problem, broadly or narrowly.
4. **Ecosystem structure:** Energy, matter, information
5. **Homeostasis :** from maintenance of systems state of equilibrium (Odum 1971) to maintenance of systems property (similar to resilience)
6. **Adaptive strategies:** conscious or unconscious, explicit or implicit plans of action carried out by a population in response to either external or internal conditions
7. **Constraints and Stresses; adjusting versus adapting to the source of stress**

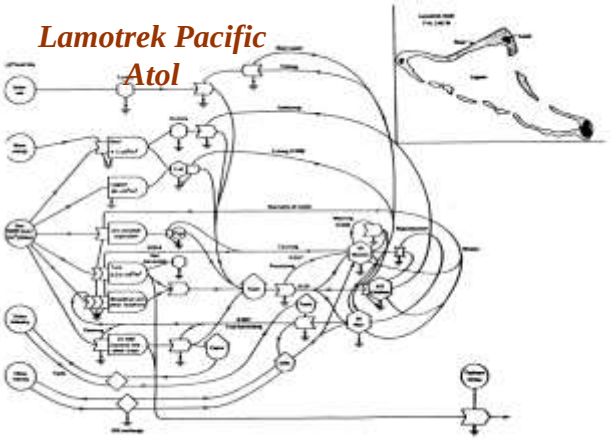
## *Energy Flow Symbols (H.T. Odum)*



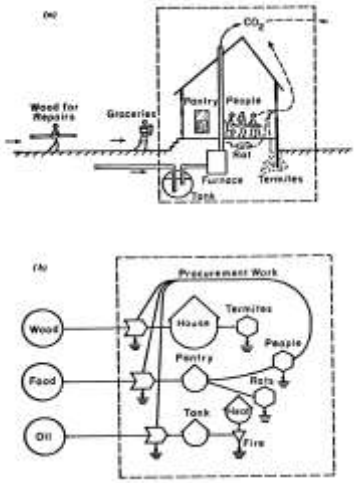

## *Industrialized High-Yield Agriculture*

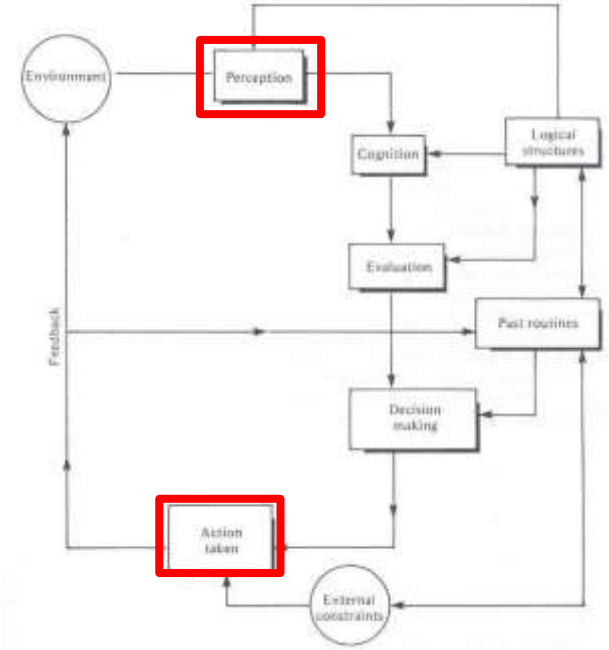



## *Lamotrek Pacific Atol*



## *Household Energy-Flow System*

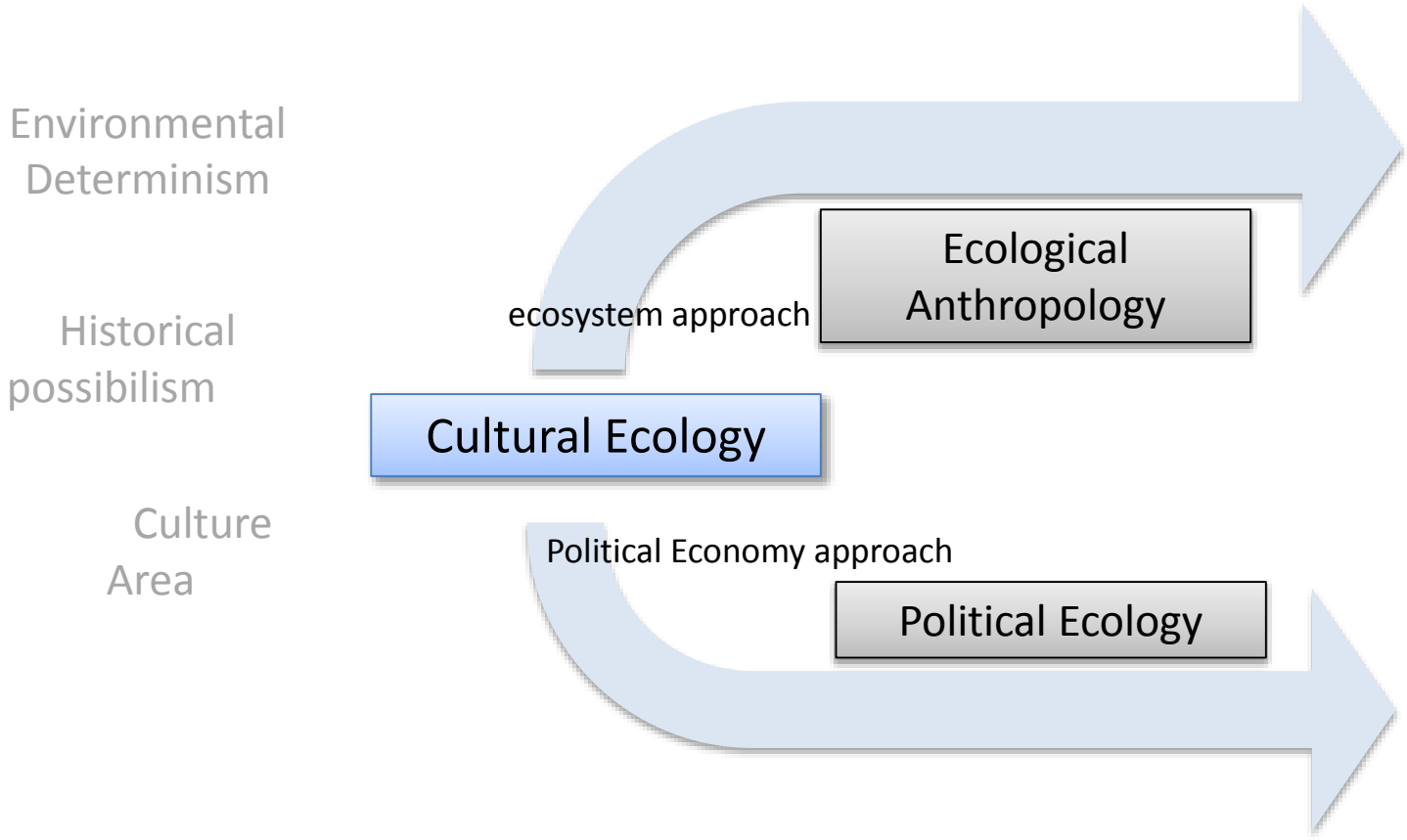


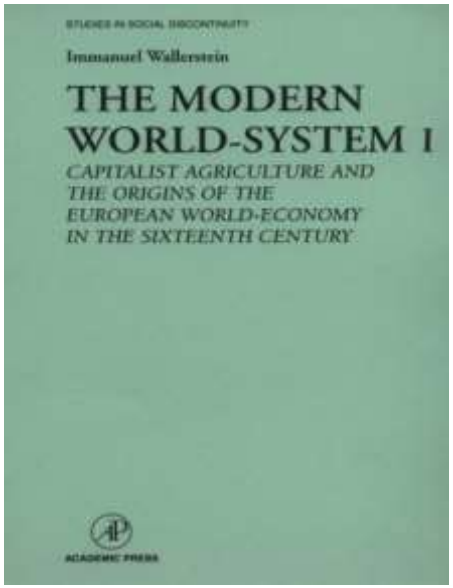
- B. Orlove (1981)

- **Functionalist fallacy**: no sample of population and damage of environment – focus on equilibrium; naïve use of carrying capacity
- **Ecological reductionism** – aspects of social organization as serving one goal, but disconnected from other parts
- **Energetics**: an over emphasis on energy as the limiting factor, no attention to economy and political system
- **Local population as unit of analysis**: neglect supra-local processes and political relations
- **Time Scale**: emphasis on homeostasis disregard for longer time scales

| 19/20th C. | 1930—1950 | 1950-1970 | 1980-1990 | 2000s |
|---|---|---|---|---|



# The Marxian turn: Political Economy takes the stage

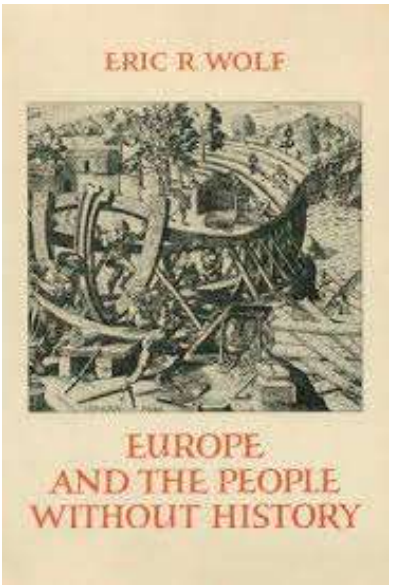



**OWNERSHIP AND POLITICAL ECOLOGY**

ERIC WOLF

City University of New York

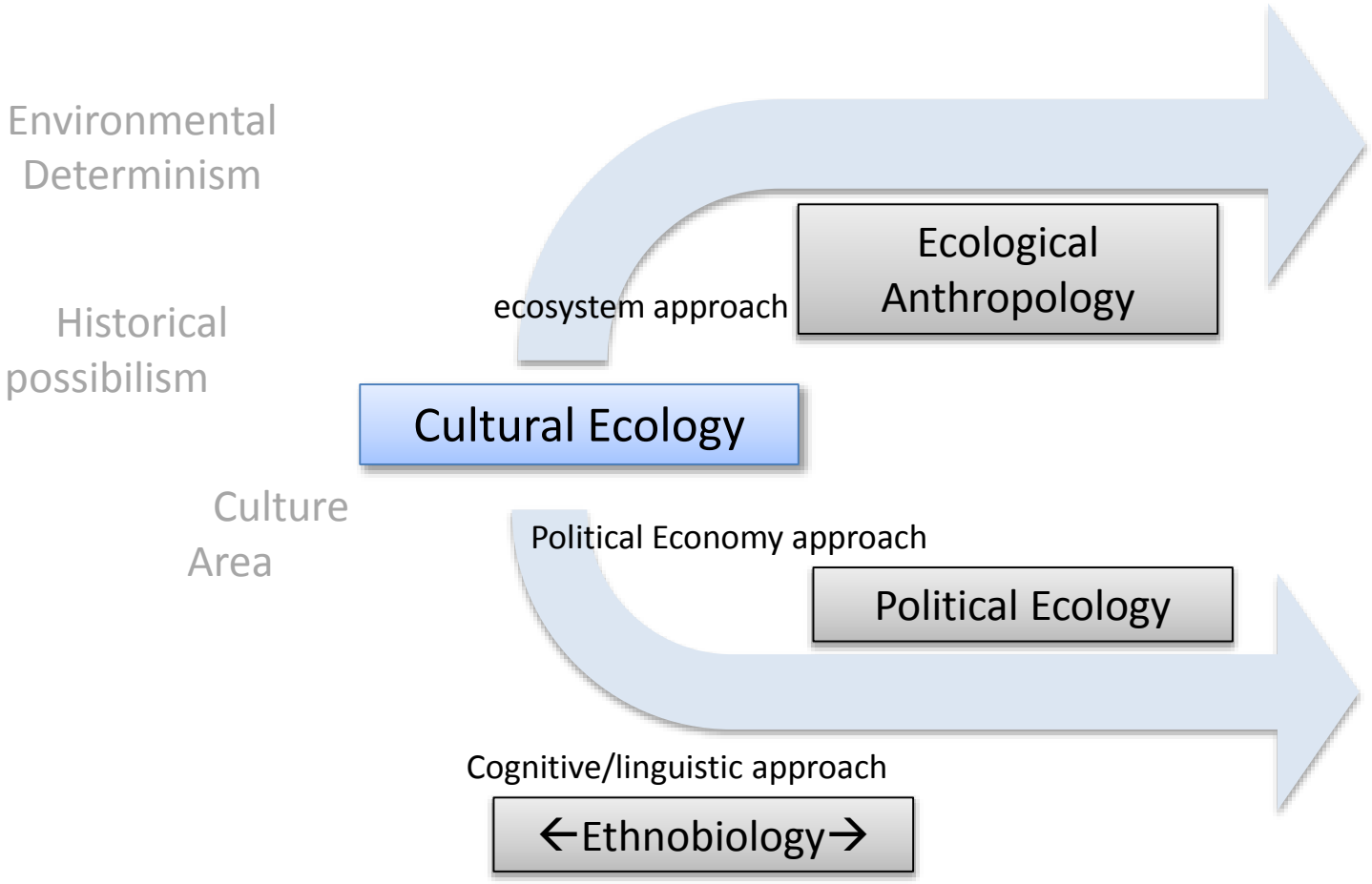
Source: *Anthropological Quarterly*, Vol. 45, No. 3, Dynamics of Ownership in the Circum-Alpine Area (Special Issue) (Jul., 1972), pp. 201-205




Ownership and control
Power relations
Access and tenure
Colonialism and mercantilism
World Systems and Dependency Theory

# ENVIRONMENTAL ANTHROPOLOGY

**19/20th C.** **1930—1950** **1950-1970** **1980-1990** **2000s**



# Cognitive and Linguistic Approach: Ethnosciences, Ethnobiology

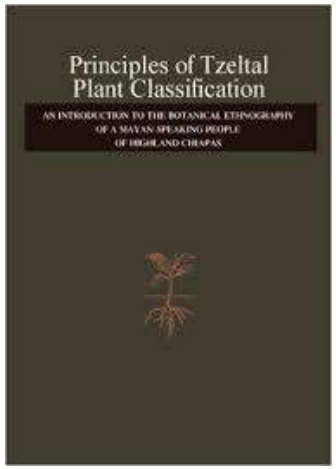
H. Concklin
1926-2016

THE NEW YORK ACADEMY OF SCIENCES 133

*SECTION OF ANTHROPOLOGY*

AN ETHNOECOLOGICAL APPROACH TO SHIFTING AGRICULTURE *

*By* Harold C. Conklin




Cognized environment
Emic perception
The sophistication of local knowledge
Universal forms of classification?

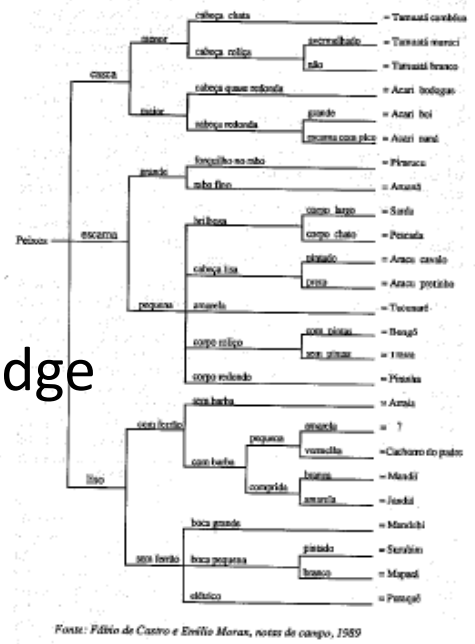
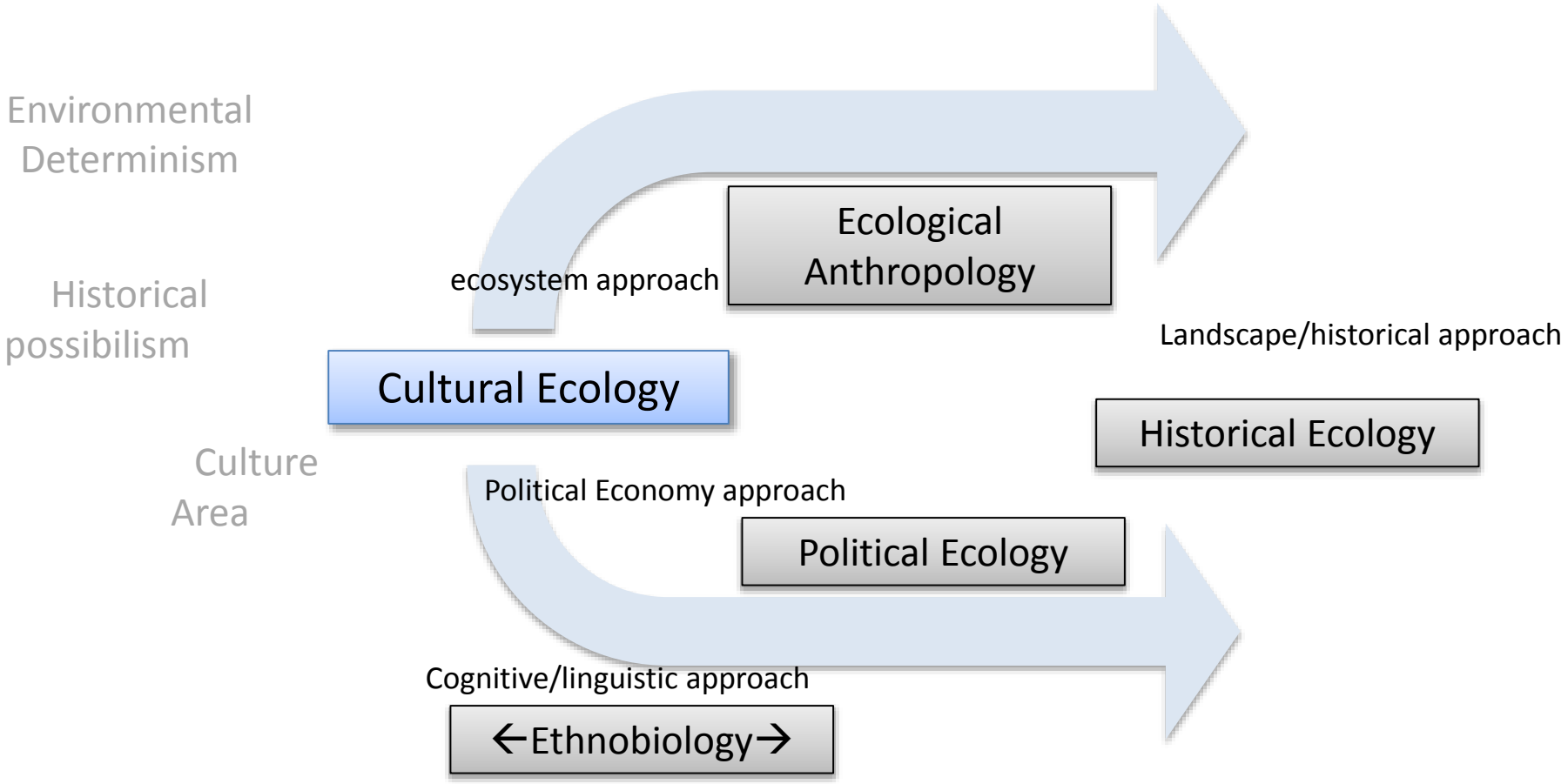


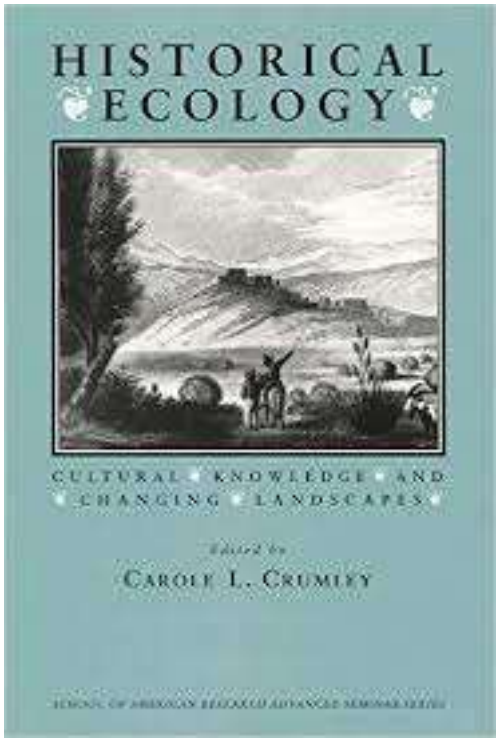

Figura 4,4: Etnoecologia de peixes no lago Arari, ilha de Marajó

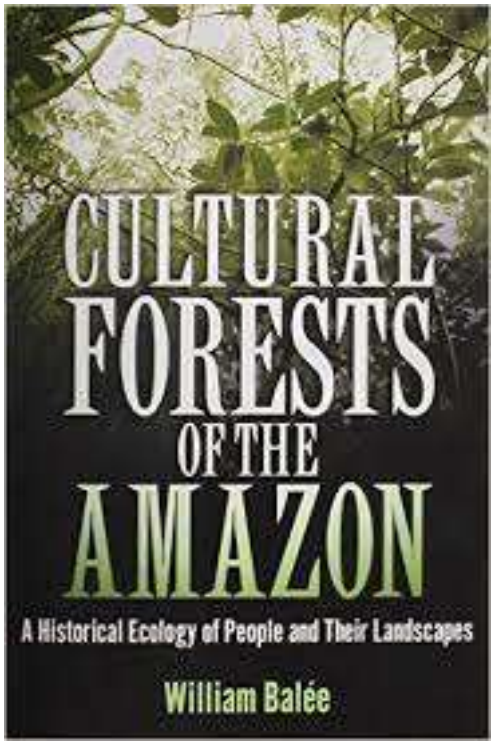
# ENVIRONMENTAL ANTHROPOLOGY

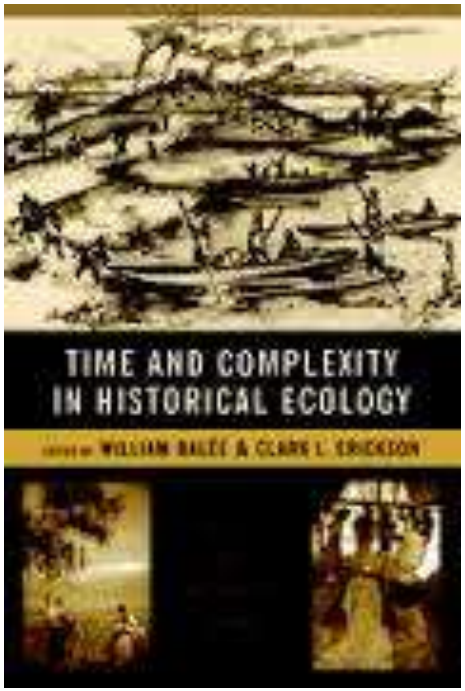
**19/20th C.** **1930—1950** **1950-1970** **1980-1990** **2000s**



# History and Landscape approach: Historical Ecology




Human agency overcomes limiting factors

Long-time frame

Landscape as unit of analysis

Anthropogenic environments

# Symbolic and feminism approach: Symbolic Ecology

## Nature, culture and gender

*Edited by*

**CAROL P. MacCORMACK**
*Ross Institute*
*London School of Hygiene and Tropical Medicine*
*University of London*

*and*

**MARILYN STRATHERN**
*Girton College, Cambridge*

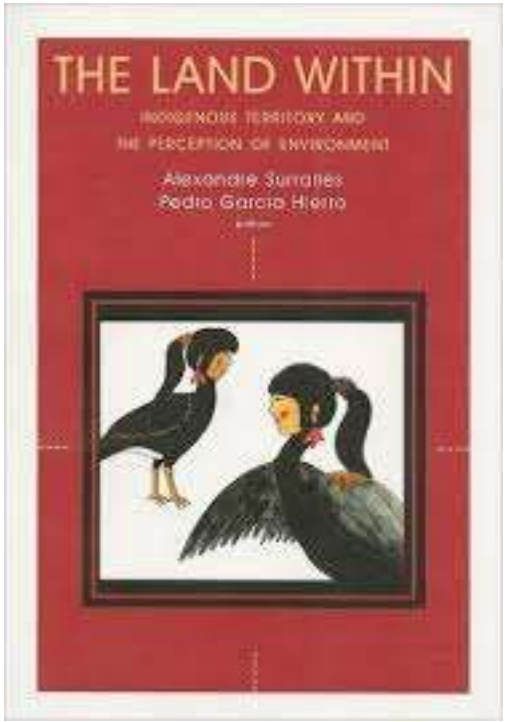


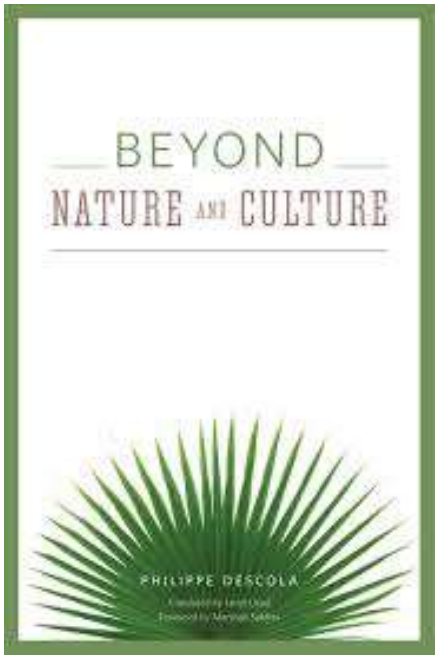
*male–female as symbols for culture–nature*

| | m | | f | |
|---|---|---|---|---|
| | creativity | | instinct | |
| | man-made | | innate | |
| c | society | | individual | n |
| | cultural | | biological | |
| | cultivated | | savage | |
| | savage | | cultivated | |
| n | basic nature | | superficial artifice | c |
| | self-expressive | | other-oriented | |

*culture–nature as symbols for male–female*

| | c | | n | |
|---|---|---|---|---|
| | doing | | being | |
| | public | | domestic | |
| m | cosmopolitan | | confined | f |
| | active | | passive | |
| | subject | | object | |
| | object | | subject | |
| | tame | | powerful | |
| f | subdued, restrained | | violent, energetic | m |
| | cultured | | animal-like | |




Overcome culture/nature dichotomy
Beyond western forms of classifying nature
Ontologies of nature

**19/20th C.** **1930—1950** **1950-1970** **1980-1990** **2000s**

Formative period | Specialization period | Cross-fertilization 'Environmental Anthropology' | New Synthesis?→

.Historical possibilism .Culture Area
→ **Cultural Ecology**

.Neo-functionalist, ecosystem approach
→**Ecological Anthropology**

.Political economy/Marxism approach
→**Political Ecology**

.Historical/landscape approach
→**Historical Ecology**

←**Ethnobiology** →

.Symbolic approach
→**Symbolic Ecology**

→ **Institutional analysis**
& Common Pool Res.

---

→**Changing units of analysis**: Culture area, culture type, niche, ecosystems, individuals/households, landscapes, networks, assemblages

## Intellectual Conciliation and Conflicts

-Specialization, advances, ruptures

-Overlaps, collaborations, synergies

-R. Rappaport: "…rise and demise.."

-E. Wolf: "…a project of intellectual deforestation"

- J. Acheson: "clubs… without theoretical unit"

-Understanding complexity in human environment interaction: An arrested project

-Components without a synthesis?

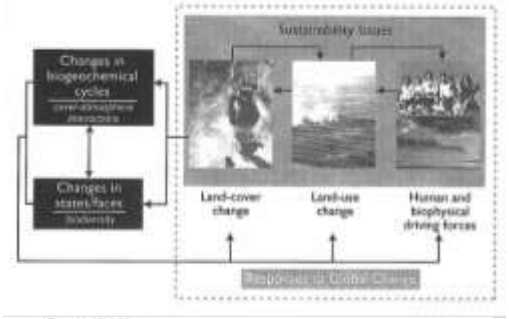
# Confronting Complexity

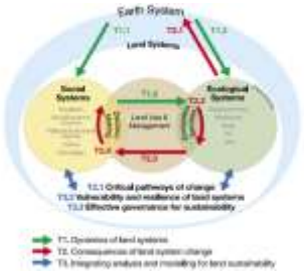
# Understanding Connectivity: A bigger challenge

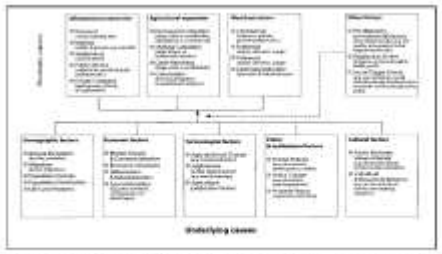
## Narrative Devices and Analytical Tools

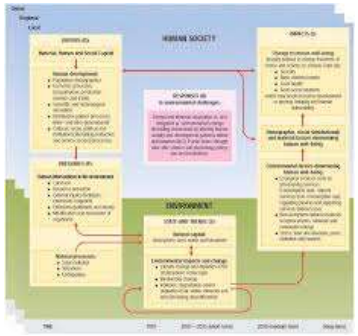
1980s →

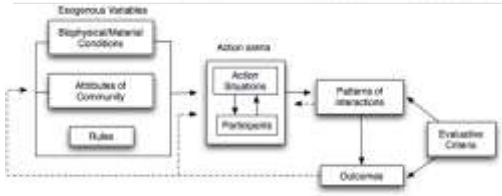
# The Era of Conceptual Frameworks

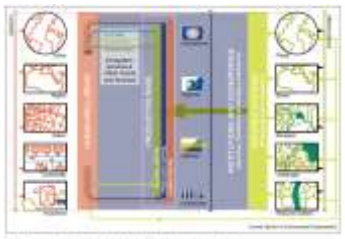


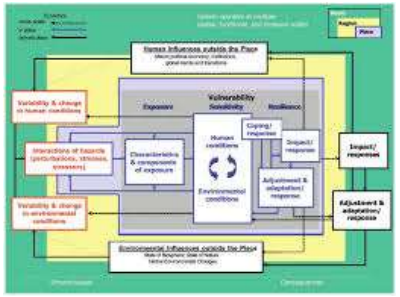



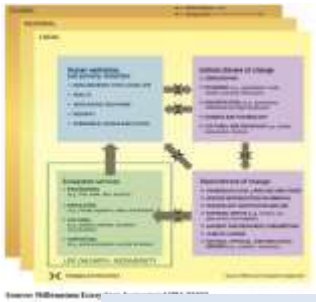



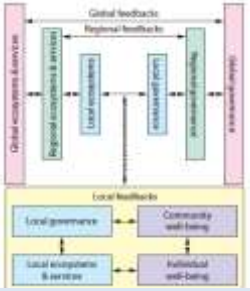


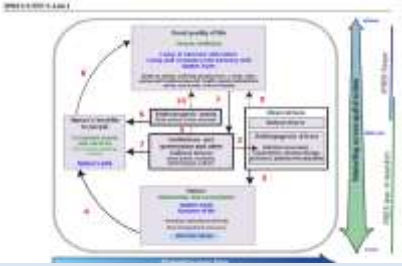


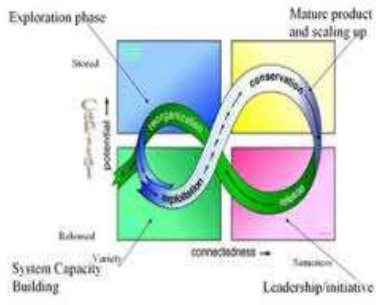














Problem-Oriented
Meta-Theoretical Tools
Breaking dichotomies
Interdisciplinary Collaborations
Progressive understanding of complexity
Hypothesis testing and qualitative explorations

# **The Anthropocene debate**:
# Opportunities, Tensions, and Disciplinary Vices

Human Species -- Social history

Earth System Science – Global Political Economy

Global Responsibility –Regional inequalities

Regional identities – Species Identity

Technological fixes – Behavioral Change

Path dependency -- Desirable Futures

Eco-catastrophe -- Good Anthropocene

# A Cultural Ecology of the Anthropocene?

**“CULTURE CORE”**


SDGs 2015

**COMPLEX SYSTEMS**
**TELECONNECTIONS**
**FUNCTIONAL**
**INTERDEPENDENCY**
**CONNECTIVITY**
**SCENARIOS**
**….**

**NARRATIVES**
**VALUES**
**COSMOLOGIES**
**BEHAVIOR**
**POLITICAL ECONOMY**
**DEPENDENCY**
**NEO-COLONIALISM**
**TELECONNECTIONS**
**….**

**“ENVIRONMENTAL CONSTRAINTS”**

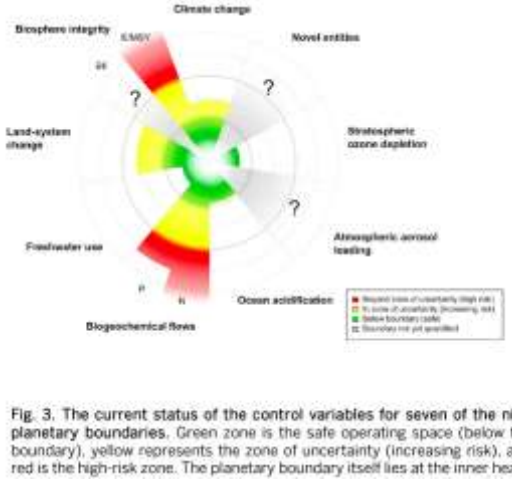
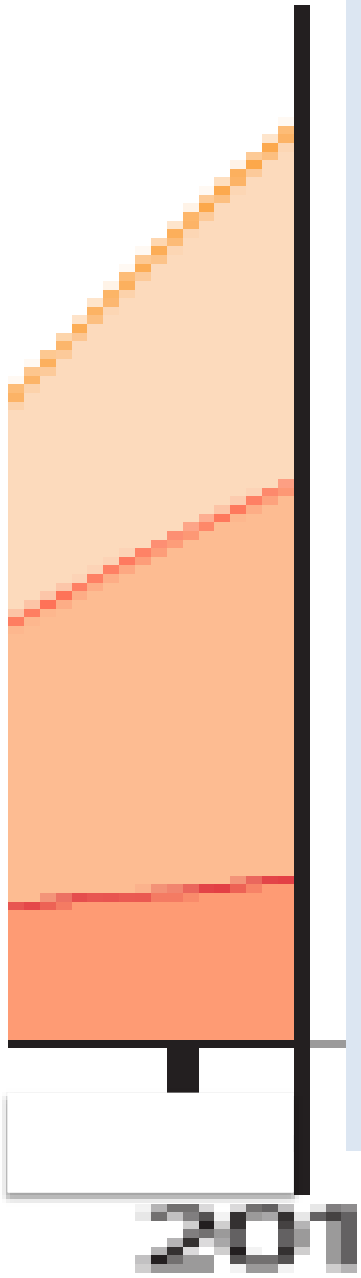



Fig. 3. The current status of the control variables for seven of the nine planetary boundaries. Green zone is the safe operating space (below the boundary), yellow represents the zone of uncertainty (increasing risk), and red is the high-risk zone. The planetary boundary itself lies at the inner heavy

Rockström et al 2009; Sttefen et al 2015




**Towards a joint project?**

**From differences to complementarity: New Synthesis?**

**A place on the table?**

# Thank YOU!

**STEWARD'S GOAL**:
-To understand **EMPIRICALLY** "the conditions determining phenomena of limited occurence… no cultural phenomena is universal" (contrast to previous and concurrent explanations of culture)

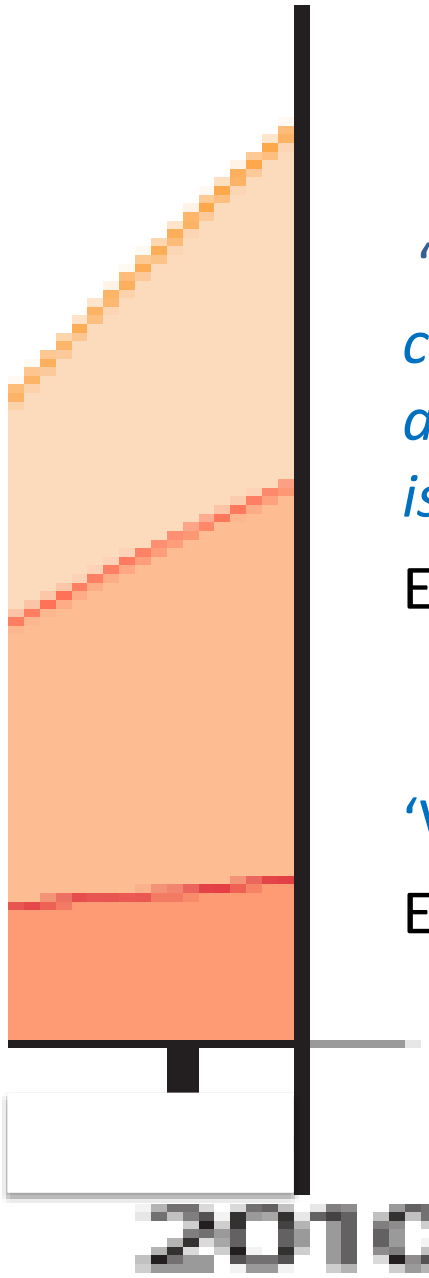
-**Culture change results from adaptation to local environments**

-CULTURE ECOLOGY offers an heuristic device to understand **the EFFECT of environment upon culture**, i.e., how people organize life to acquire local resources

-Focus on LOCAL environment where a society has **LATITUDE** in selection **ADAPTIVE** responses and see adaptation is a **CREATIVE** process

-Understand society in terms of **LEVELS OF SOCIAL INTEGRATION**; cultural development can be understood in terms of increasing complexity in terms of successive levels of integration

# The Challenge is up to us!



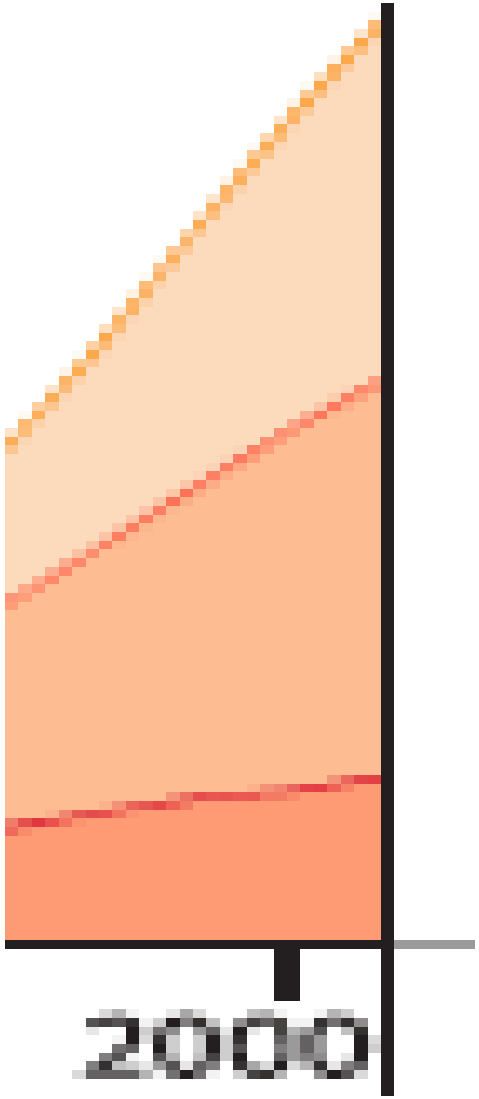

*"…Confront complexity …with thinking that is capable of unifying concepts which repel one another and are otherwise catalogued and isolated in separate compartments."*

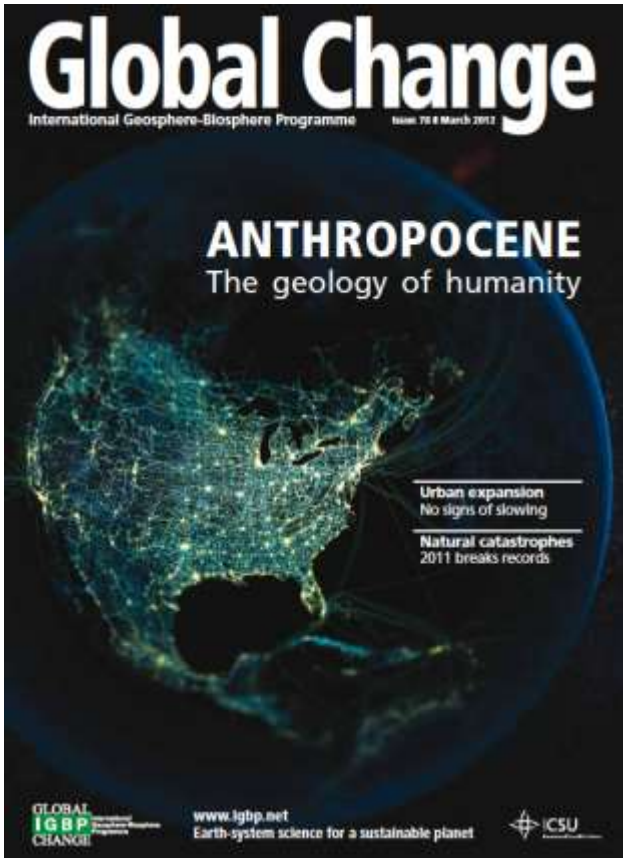
Edgar Morin (2008)

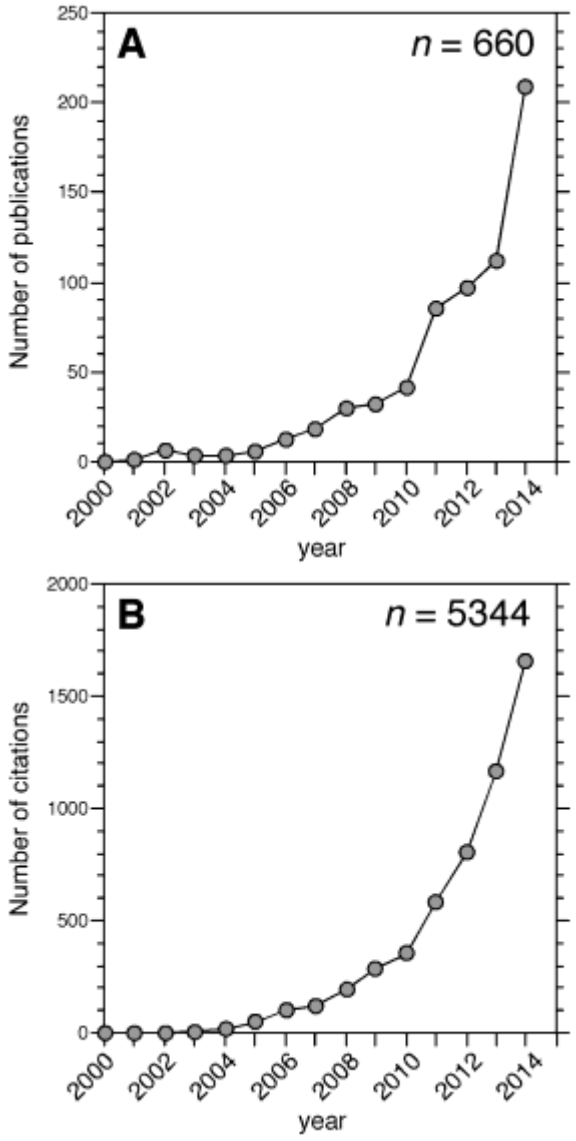
'We solve problems by working together!'

Elinor Ostrom

# Welcome to the Anthropocene!




CITATIONS peer-reviewed: 2000 and 2015
[Brondizio et al. 2016]

## KEY CONCEPTS:

**1-CULTURE CORE:** "Constellation of features which are most closely related to subsistence activities and economic arrangements." = "Empirically defined features closely involved in the utilization of the environment in culturally prescribed ways."

**2-RELEVANT ENVIRONMENTAL FEATURES**: The features of the environment and RESOURCES that a society/culture recognizes as important and central to their lives.

**3-LIMITING FACTORS**: the conditions of the environment and resources that sets a limit of utilization and that requires TECHNOLOGY and TECHNIQUES to be overcome.

- Vayda and Rappaport (1968)
- Ecology rather than cultural Ecology
- Avoid anthropology isolation from general ecology
- Develop a single science of ecology that applies to humans
- Culture as animal behavior – adaptive
- Behavior and genetics interdependent – towards a more unified approach – behavior as selective as biology

- Need agreements on units of analysis: individual, populations, communities, ecosystems

- Relations should be hypothesized
- More detailed lists of demographic and environmental variables
- Requires interdisciplinary collaborations
- Pay more attention to trade-offs in adaptive and non-adaptive behavior

- **CHANGING QUESTIONS:**
- **From why a cultural trait is present to how it works**
- **Relationship between energetics and social stratification [ex. non-food producing elites]**
- **Understanding domestication and intensification**
- **Understanding interdependencies between social behavior, environment, and biological variability**