Comparing Environmental Professional and Watermen Knowledge and Values about Environment and Pollution

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Cultural Anthropological Research on Chesapeake Bay

- Department of Anthropology, UMCP began with cultural analysis of *Pfiesteria piscicida* (1997-1998);
- Cultural Models of Pollution and Environment (Farmers, Watermen, and Environmental Professionals); (1999-2003);
- Using Collaborative Learning, Cultural Models and Dialogue to Advance Co-Management Planning of the Chesapeake Bay Blue Crab Fishery (2001-2003)

Anthropological Research (cont'd)

- Gender and Soft Crab Fishery (2002-2003);
- Heritage and Tourism (Center for Heritage Resource Studies) www.heritage.umd.edu;
- Introduction of *Crassostrea ariakensis* into Chesapeake Bay (2002-2003);
- Chesapeake Bay Environmentalism;
- Website: www.bsos.umd.edu/anth/chesapeake

Culture, Cognition, and Cultural Models

- Culture: "whatever it is one has to know or believe to operate in a manner acceptable to its members." (e.g., workplace exchange; resource managers' culture)
- Cognitive anthropology: focus on the way knowledge is used in ordinary life and how that knowledge is organized in thought
- Culture is partially "in the mind"

- Mental schemas: abstract mental objects with default values or open slots that can be filled in with particulars
  - Birds, commercial transaction, leisure...or "good workboat," "good research," or "good management" or "anthropologist," "watermen," "scientists," and "resource manager"

- Cultural models: a number of connected schemas, implicit, and shared. Cultural models help you reason about complex situations. (e.g. good workshop)

- Stated beliefs and values are good evidence of underlying schemas and cultural models.

Data Collection Techniques for Cultural Models

- Free Listing: Defining a Cultural Domain (e.g., *Pfiesteria*)
- Triadic Comparison (e.g., *Pfiesteria*)
- Text Analysis (interview, natural discourse, published (e.g, blue crab management model)
- Agreement Questionnaires (e.g. Consensus Analysis)

Cultural Consensus Analysis

- Formally states: agreement reflects shared knowledge;
- Allows for estimation of individual knowledge levels (cultural competence)
- Uses factor analysis
- If consensus, strong loading on first factor (3:1 ratio with second factor)

Chesapeake Environmental Agreement Data

- Sample: 74 environmental professionals, 102 watermen, and 45 farmers;
- Methods: intensive qualitative interviews to develop agreement survey.
- Asked same 66 agreement questions to each group;
- Respondents rated their degree of agree or disagree with the statement;
- Themes: nature, pollution, science, regs., collaborations; responsibility; religion;

Agreement Survey

The water and land resources of the Chesapeake Bay region have steadily declined in abundance over time.

6	5	4	3	2	1
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

Changes in natural cycles of productivity alone could lead to more plentiful harvests of natural resources.

6	5	4	3	2	1
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

Watermen and Environmental Professionals Combined

- EIGENVALUES

FACTOR	VALUE	PERCENT	CUM %	RATIO
1:	27.252	61.1	61.1	2.536
2:	10.747	24.1	85.2	1.627
3:	6.606	14.8	100.0	
	44.605	1	00.0	

- Note: Variables correlated with underlying factors is their “factor loading. “Factor loadings” squared = individual variance; sum of squared factor loadings = eigenvalue.

- Analysis: No consensus: It would be better if the first factor accounted for more than 3 times the variance of the second.

Environmental Professionals

- EIGENVALUES

FACTOR	VALUE	PERCENT	CUM %	RATIO
1:	15.577	75.7	75.7	5.186
2:	3.004	14.6	90.3	1.501
3:	2.001	9.7	100.0	
	20.582	100.0		

- Analysis: Consensus: first factor more than 3 times the second factor.

Environmental Professional Cultural Competence

- Estimated Knowledge of each EP Respondent

	1
	KNOWLEDGE

1	0.64
2	0.38
3	0.34
4	0.40
5	0.39
6	0.52
7	0.49
8	0.61
9	0.43
10	0.40
11	0.43
12	0.52

Watermen

- EIGENVALUES
- FACTOR VALUE PERCENT CUM % RATIO
- ------- ------- ------- ------- -------
- 1: 19.903 68.7 68.7 3.157
- 2: 6.304 21.8 90.5 2.295
- 3: 2.747 9.5 100.0
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- 28.954 100.0
- Note: Consensus: first factor more than 3 times the second factor. Estimated knowledge values valid.

Watermen and Environmental Professional Comparisons of Agreement and Disagreement

Inter-Group Agreement

- The water and land resources of Chesapeake Bay region have steadily declined in abundance over time. (w = 76%; ep = 87%)
- Much of the decline in the Bay's marine resources is due to the effects of declining water quality. (w = 79%; ep = 81%)
- Environmentalists, natural resource managers and scientists are needed to protect against polluting the land and water. (w = 87%; ep = 100%)
- Farmer and watermen experienced-based knowledge of nature needs to integrate scientific environmental knowledge. (w =93%; ep =96%)
- The knowledge of people whose livelihood directly depends on working the land and water is essential to scientific knowledge of the environment. (w = 96%; ep =93%)

Inter-group Agreement (cont'd)

- In studying the changes in natural resources we must integrate farmer and watermen knowledge with that of scientists. (w= 92%; ep =95%)
- In the absence of scientific findings, we need to be cautious and take action to protect natural resources. (w =77%; ep =99%)
- Regulations are needed to control the temptation of some to overharvest. (w =79%; ep =99%)
- Most watermen and farmers are sincerely concerned about protecting natural resources and not polluting. (w =93%; ep =88%)
- Collaborative research among scientists, farmers and watermen creates new environmental knowledge, and promotes sharing of environmental values and attitudes. (w =91%; ep =100%)
- Watermen and farm communities are an important part of the Chesapeake Bay region's heritage. (w =100%; ep=100%)

Inter-group Disagreement

- Unpredictability is nature's own way of ensuring that natural resources are not overharvested. (w =86%; ep = 15%)
- Changes in natural cycles of productivity alone could lead to more plentiful harvests of natural resources. (w = 85%; ep = 45%)
- Periods of reduced harvests (crop, fish, crab and oysters) are due primarily to natural cycles. (w = 88%; ep = 16%)
- Large industries pollute the Bay more than farmers and watermen. (w =96%; ep = 30%)
- Farmers and watermen are targeted more for regulations than development because farmers and watermen are easier to control. (w =94%; ep = 34%)
- Scientists should study the effects of pollution rather than try to predict changes in the availability of natural resources. (w =94%; ep = 26%)

Inter-Group Disagreement (cont'd)

- Most government regulations are unnecessary because the economics of the market already accomplish much of what regulations aim to achieve. (w =81%; ep =3%)
- Regulations are used too often protect the environment. (w =88%; ep =15%)
- Watermen are stewards of the water. (w =94%; ep =58%)
- The purpose of natural resources is to support humans. (w =74%; ep =20%)
- Belief in God and religion promotes stewardship of nature. (w =92%; ep =40%))
- God and Nature are the best resource managers of natural resources. (w =95%; ep =23%)

Concluding Remarks

- Culture as consensus = systematic study of environmental knowledge
- Environmental knowledge = beliefs and values
- Consensus data help construct cultural models
- Reinforce qualitative data
- Important tool for environmental education and partnership building
- Helps make culture an environmental variable comparable to biological/ecological/health factors