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Cultural Models - A Tool For Enhancing Communication And Collaboration In Coastal Resources Management: A Primer For Coastal Training Program Coordinators In National Estuarine Research Reserves

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A Primer for Coastal Training Program Coordinators In National Estuarine Research Reserves

A Report Submitted to

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A Primer for Coastal Training Program Coordinators

Introduction

Imagine this scenario. A group of stakeholders have gathered for a Coastal Training Program (CTP) workshop to discuss an environmental issue. The issue is of mutual concern but complicated by conflict due to differences of opinion among stakeholders about the just and proper use of a natural resource. Goals of the workshop include, presenting the latest science, justifying proposed tightening of resource use regulations and securing consensus from all stakeholders. Scientists and representatives from natural resource management agencies responsible for regulating the use of this resource sit across the table from resource users, citizen activists and members of regional environmental groups.

The day is long. The facilitator is effective. Everyone listens to presentations of recent research results indicating the critical condition of the resource. Stakeholders discuss the issue and have a chance to ask questions. Resource users challenge the need for stricter regulations. Environmental groups charge that the rules aren't strict enough. The feeling, as people leave the meeting room and head for their cars, is one of frustration.

As she makes her way to the parking area, the CTP Coordinator passes clusters of stakeholders gathered to react to the workshop. She overhears exclamations of, "What were they thinking?" "How could they say the things they did?" "What did they mean by making those demands?" "There's no way I can live with these rules!"

Scientists, confident that their data is reliable, and regulators who feel the laws are clear and fair are often the stakeholders most baffled by the failure of resource users to *understand* and accept what to them is obvious. Practitioners of a new brand of environmental anthropology would see the situation differently. Cultural understanding of the values, beliefs and attitudes people bring to the table can help stakeholders in participatory and collaborative process make sense of conflict. Understanding the cultural roots of conflict can be the first step to overcoming barriers to progress on environmental issues. Coastal Training Program Coordinators can benefit from lessons learned in this new approach to anthropology.

During the past decade, anthropological research strategies have been employed to better understand environmental situations similar to the scenario described above. Researchers are learning that understanding the *cultural models* at the root of conflicts can contribute to the design of effective of communication strategies for coastal resources management.

Cultural models researchers are studying the complex interaction of attitudes, values, and knowledge systems and discourses surrounding an array of environmental issues including global climate change, toxic phytoplankton impacts, protected areas management and landscape conservation and planning. Cultural models research as applied to coastal management has the broad goal of understanding how humans make sense of and understand environmental issues and how this understanding is translated into decision-making and action. Understanding conflicting cultural models can improve dialogue among stakeholders and create policies and environmental solutions that benefit from a combination of lay and expert knowledge.

This primer introduces principles and theories of cultural models research. Examples of environmental research benefiting from this approach are presented, along with relevant web links and a bibliography. The goal of this primer is to highlight lessons learned relevant to the design and implementation of Coastal Training Programs (CTP) in the National Estuarine Research Reserve System (NERRS).

What does Anthropology have to do with Coastal Resources Management?

The Society for Applied Anthropology (2003) defines anthropology this way,

> *Anthropology is concerned with the production and use of knowledge regarding human social and cultural behavior in specific historical and environmental contexts and cross-culturally.*

Modern anthropology has evolved to include two sub-disciplines increasingly applied to enhancing the effectiveness of environmental communication – *Cognitive Anthropology* and *Environmental Anthropology*. Some definitions important to the understanding of anthropology and its application to environmental communication appear in the table below.

Culture	The shared collection of learned and socially transmitted behaviors, beliefs, and institutions that act like a template shaping behavior and consciousness from generation to generation. Culture includes what people think, what they do and the materials they produce. (Bodley, 1994)
Cultural Model	"Presupposed, taken-for–granted models of the world that are widely shared (although not necessarily to the exclusion of other, alternative models) by the members of a society and that play an enormous role in their understanding of that world and their behavior in it." (Holland and Quinn, 1987, p.4) Complex taken for granted mental patterns that govern behavior. (Shore, 2001)
Cultural Knowledge	The shared presuppositions about the world organized as cultural models. (Holland and Quinn, 1987)

Cognition	The mental process by which knowledge is acquired. That which comes to be known through perception, reasoning, or intuition. (American Heritage Dictionary, 1975)
Cognitive Anthropology	Cognitive Anthropology studies the relationship between human thought and society. It focuses on the mechanisms and strategies people use to understand and reason about the experiences, events and objects in their world. (D'Andrade, 1995)
Environmental Anthropology	Environment anthropology studies the way communities and social groups identify and solve environmental problems by examining culturally diverse perceptions, values and behaviors. Environmental anthropology contributes to policy formulation and planning by improving and facilitating the communication process among diverse stakeholder groups. Environmental anthropology helps bridge the gaps between scientists, resource managers and resource users and the public. (Society for Applied Anthropology, 2002)
Folk Models	This was the term traditionally used to characterize the radically different belief systems of non-western people or naïve models of concepts viewed with greater complexity by experts. The term *cultural models* was solidified in the 1987 work of Holland and Quinn to replace the term folk models.
Schemas	The building blocks of cultural models schema exist for tangible things like blue crabs and for ideas, processes and concepts like "ordering a drink" or "marriage." Schemas are the abstract representations that our mind uses as a form of short hand for processing information about the world. Schemas allow us to process and organize incoming information automatically and unconsciously. In prepositional schema something is said about something. With image schemas pictures come into our minds and represent things. (D'Andrade, 1995)

Environmental anthropology is anthropology practiced in the context of environmental issues. Understanding cultural diversity and intercultural conflict as it is played out in the way people talk about environmental events, ideas and issues is one focus of environmental anthropology. The conflict so commonly experienced when diverse stakeholders convene to collaborate on environmental issues is an example of the kind of relationships analyzed by anthropologists. Scientists, environmental regulators and farmers relate to environmental issues in culturally distinct ways (Crumley, 2001).

The tools and methods used to pursue environmental anthropology draw heavily from the philosophies and theories of cognitive anthropology. Cognitive anthropologists are interested in learning about the knowledge people need to acquire in order to behave and speak in culturally acceptable ways. Cognitive anthropologists rely on observational and participatory research techniques, ethnographic interviews, surveys, and other systematic

data collection strategies. They are interested in how cultural knowledge is acquired, how it is transmitted, and the relationship between cultural knowledge, motivation and behavior.

Cultural models are templates for cultural knowledge. People who live, work and learn in similar environments develop similar cultural models. We use these models as cognitive tools to filter and categorize new information, determine relevance and priorities and guide decision-making. People use their cultural models unconsciously. Our cultural model of dogs allows us to recognize a borzoi as a dog the first time we see one. A scientist, regulator and farmer walking a plowed landscape adjacent to a tidal wetland see different features as they look through the lenses of their cultural models. One anthropologist describes cultural models as the lenses through which we view the world. Cultural models are what we *see with* (Paolisso, 2003).

Michael Paolisso and Katherine Bunting-Howarth conducted research on the cultural models used by stakeholders involved with coastal resources management. Paolisso studied the watermen, scientists and resource managers involved with the blue crab fishery in the Chesapeake Bay. Bunting-Howarth analyzed the cultural models used by the public and members of a citizen advisory group regarding the toxic dinoflagellate *Pfstieria* and non-point source pollution in Delaware Estuaries. Both researchers describe the role that cultural models play in the translation of scientific information, and the capture of important local or lay knowledge. The understanding gained by this type of environmental anthropology can improve communication among diverse stakeholder groups (Paolisso, 2002; Bunting-Howarth, 2001).

Communication characterized by conflict, bio-complexity and scientific uncertainty is familiar to any coastal resource manager who has attempted to explain the rationale for a retreat policy for sea level rise to a coastal property owner; the connection between planning board decisions and coastal water quality to a municipal official, or solicit funding from the state legislature for a habitat restoration program. Inherent is all of these situations are multiple interrelated sets of cultural models being used by people to understand, process and act on information. To the extent that workshops and outreach activities associated with CTP focus on resource conflicts or the communication of novel/complex information they can benefit from understanding the cultural models that workshop participants use to reason about the topic at hand.

What are Cultural Models?

Cultural models are a cognitive tool used by people to process and organize information, make decisions and guide behavior (D'Andrade, 1995). Cultural models are shared perceptions and attitudes about how the world works. These models are implicit, taken for granted, and operate below the level of consciousness. People construct simple models of how the world works and use these models to guide decision-making, behavior and as a device for understanding novel, unfamiliar ideas (Holland and Quinn, 1987).

Cultural models exist in nested hierarchies in the mind. The models are composed of building blocks called schemas. Schemas may consist of images – *car*, or propositions -

the family breadwinner. Cultural models may consist of story-like chains of schema that connect to provide a short hand understanding of complex events. Examples of lower level schemas are grabbing coffee, starting a car, paying a toll. These are the building blocks of a simple cultural model of *getting to work in the morning*. This simple model is nested within a more complex model of *doing my job*, which is nested within a higher order cultural model of *pursuing my career* or *caring for my family*. Language provides a window to cultural models (Quinn, 2005). What is left *unsaid* in a conversation can be an important clue for recognizing cultural models. Using the above example, a person who arrives at work and says, "I got a ticket on my way to work today" will receive sympathetic or derisive reactions from co-workers without any further explanation of meaning.

Recent interdisciplinary research has documented the role of cultural models in social learning and environmental communication. Cultural models research has been used to determine: stakeholder perceptions of toxic dinoflagellate blooms; farmer's understanding of nutrient enrichment in the Chesapeake Bay, and perceptions of watermen about the role of science in management of the blue crab fishery. In each of these studies, an understanding of the cultural models used by the lay public has helped scientists and resource managers communicate with important stakeholder groups, and has facilitated collaborative learning and public participation in decision-making (Morgan, et. al., 2002;Paolisso, 2002; Bunting-Howarth, 2001; Paolisso & Chambers, 2001; Falk, Darby & Kempton, 2000; Paolisso & Maloney, 2000; Kempton, Boster & Hartley, 1995).

A Survey of Selected Cultural Models Research

Environmental anthropologists bring to environmental issues a perspective that recognizes the integration of cultural knowledge and scientific information (Crowley, 2001).[1] Environmental issues involving complex natural processes, characterized by scientific uncertainly, and complicated by conflicting human values and beliefs have attracted the attention of anthropologists using variations of cultural models research. Toxic phytoplankton blooms, global climate change, sustainable resource use and non-point source pollution serve are examples of environmental issues where the traditional reductionist approach of positivist science has not been 100% effective in determining causes, evaluating consequences, and proposing solutions. Five cultural models studies are summarized in Appendix I.

Kempton et al. (1995) used cultural models research strategies to analyze the environmental values shared across American culture. This study demonstrated the diversity of methods that can be incorporated into a cultural models study. Results from ethnographic interviews, focus group techniques, and a standard Lickert scale-based survey were integrated to develop a comprehensive understanding of how people use

[1] See Appendix II for internet resources including the Society for Applied Anthropology's Environmental Anthropology website providing examples of research being conducted into broad themes of citizen participation, environmental justice, risk communication and stakeholder perceptions.

cultural models to understand issues and make decisions about environmental choices. In the case of global climate change, Kempton et al. found that the groups they studied were applying cultural models developed to understand air pollution to interpret global climate change. Using the cultural model of air pollution focused attention on contaminants in the air and failed to make a connection between energy use, carbon dioxide and global warming. This faulty cultural model produced reasoning about solutions that were ineffective in addressing the problem of global warming.

In her research, Bunting-Howarth (2001) looked at the cultural models of citizens involved in coastal planning. The stakeholder group was involved in designing and implementing management actions called TMDLs (total maximum daily load) to reduce non-point source pollution reduction in response to threats associated with the toxic dinoflagellate, *Psfiesteria.* Using ethnographic interviews, discourse analysis techniques and participant observation Bunting-Howarth determined the cultural models used by a public stakeholder group working in the Delaware NERR. Bunting-Howarth evaluated the role that cultural models played in the evaluation of scientific information, and the development of solutions to coastal management problems.

Working with farmers, watermen, resource managers and scientists on Maryland's Eastern Shore, Michael Paolisso and others have used cultural models research to examine the interplay of values, beliefs and experiences in the ways these groups frame and take responsibility for their role in managing fishery resources and coastal pollution. Using ethnographic interviews, computer analysis of text, triadic comparisons of descriptive lists, and participant observation, these studies have produced descriptions of: cultural models of farmer environmentalism; watermen's cultural models of God's stewardship of blue crabs, and the watermen's model of the role of science in blue crab management. The results from these studies are currently being used as the foundation for interactive dialogues among stakeholders working to manage the blue crab fishery and mitigate impacts of non-point source pollution in the Chesapeake Bay (Paolisso & Maloney, 2000; Paolisso & Chambers, 2001; Paolisso, 2002).

Cultural Models as a Tool for the NERRs' Coastal Training Programs

Cultural models research with implications for CTP is summarized in Appendix I. This research suggests that understanding cultural models has multiple benefits for environmental communication and coastal resource management. The potential for CTP to educate and enlighten audiences may depend upon cultural understanding of the groups participating in trainings. Education and outreach that is keyed to cultural models can enhance the effectiveness of decision-making and lead to policies that contribute to problem resolution (Pfeffer, et al., 2001; Kempton, et al., 1995).

An understanding of the ways that cultural models differ among a group of training participants and be used to the design training. Collaborative Learning (Daniels & Walker, 2001), community based social marketing (McKenzie-Mohr, 1999) and techniques presented in NOAA's Project Design and Evaluation process (NOAA, 2003)

emphasize the role of formative evaluations in training design. Cultural models research provides a rich understanding for such formative evaluations.

Cultural models research can improve the design of education and outreach materials and speed the process of understanding novel and complex environmental issues (Kempton, Hartley, Boster, 1995; Bunting-Howarth, 2001.) Translation of scientific research findings and monitoring data using cultural models can result in products that are more easily assimilated by target audiences. Cultural models can serve as cognitive stepping-stones, building bridges from what is known to what is unknown.

Communicating scientific information about sea level rise, remote sensing of marine resources, marine invasives and ecosystem services can benefit from an understanding of the knowledge and perceptions that audiences bring to the table. Designing training activities that connects new information to existing cultural models of familiar concepts can bridge cultural barriers and smooth the science to policy transition.

An understanding of conflicting cultural models can be used to improve dialogue among stakeholders. The implicit nature of cultural models can be made explicit through dialogue. Assumptions and values can then be examined to find common ground for policy formulation and the development of environmental solutions that benefit from diverse perspectives. Science represents only one way of knowing. Scientists are the first to admit that they don't have all the answers. Paolisso and others found that the cultural models of nature held by farmers and watermen working close to the resource showed an understanding of the resilient and chaotic attributes of nature in line with modern complexity theory. Perspectives of these people are unique and valuable for collaborative learning applied in the context of co-management of natural resources (Paolisso and Maloney, 2000; Paolisso and Chambers, 2001; Paolisso, 2002; Power & Paolisso, 2005).

Research currently underway at the Wells National Estuarine Research Reserve aims to learn about the cultural models used by municipal officials making decisions that affect coastal water quality (Feurt, 2003, 2005 & 2006). The information from this research will be incorporated into the design and evaluation of education and outreach strategies for the Wells CTP. The results of this research are providing insights about innovative and effective ways to use knowledge of cultural models to advance the goals of Coastal Training Programs across the NERR system. For an update on this research visit the Cooperative Institute for Coastal and Environmental Estuarine Technology (CICEET) website at http://ciceet.unh.edu/. Use the project explorer to search for projects listed for Christine Feurt.

Appendix I. Descriptions of Selected Cultural Models Research with Potential Applications to Coastal Training Programs in National Estuarine Research Reserves.

Study and Subject	Context	What is the Model?	Potential Application to CTP
Bunting-Howarth, 2001 **Cultural models of *Pfiesteria*, science and environmental policy**	Outbreak of *Pfiesteria* prompted multi-stakeholder responses to a novel environmental threat, taxing existing institutions, regulatory regimes, and contributing to inappropriate public responses to perceived risks.	<u>Cultural Model of *Pfiesteria*</u> Seven distinct model of Pfiesteria emerged ranging from a microorganism or parasite of fish to an unproven hypothesis about a microorganism. There was no single dominant model. <u>Cultural Model of Science</u> Science produces truth or facts and science is an evolving phenomenon. The identity of the scientist, length of the study and inclusion of data from folk experts affects the credibility of science <u>Cultural models of government in environmental policy</u> Governments should involve members of the community, be flexible in management practices and should use expertise to provide fact sheets and presentations to communities on issues of concern rather than writing rules and regulations.	Three areas of practical application came from this study: improvements in communication between experts and the lay public; recommendations for improving public participation processes; and recommendations for environmental managers responding to novel environmental threats. The Pfiesteria event had an impact by focusing attention on nutrient pollution in the region as well as increased funding. Government's role can be more effective if they view themselves as partners in a process, not just providers of technical information. Technical and scientific information from the government is frequently distrusted despite interaction with the responsible agency. Incorporation of folk expert knowledge into documents can enhance acceptability.

Study and Subject	Context	What is the Model?	Potential Application to CTP
Kempton, Boster & Hartley, 1995 **Part I Cultural Models of Weather and the Atmosphere**	A thorough examination of popular environmentalism in America. Employing interviews and surveys of a cross section of people with varying allegiance to environmentalism, this study describes the beliefs and values that form a shared core of mainstream environmental thinking.	<u>Pollution (atmospheric)</u> Pollution consists of artificial (not natural) substances. Chemical pollutants are toxic to life, but health effects may not be observed until later. Industry and automobiles are the sources. Installing additional filtering equipment fixes pollution <u>Photosynthesis and Respiration</u> Trees absorb CO2 and produce O2. O2 comes from today's living plants. Cutting trees means less O2 production and we could run out of O2. <u>Global Warming</u> People are using existing cultural models of pollution. They are confusing ozone depletion which 'came first' with global warming. (Aerosol sprays thin the ozone layer and warm the earth). People believe they have already experienced global warming effects. They fear we will run out of O2 from deforestation. The don't connect burning of fossil fuels and energy consumption with global warming.	Cultural models of new processes are developed from what is known. Understanding of global warming is arrived at using existing models of pollution. Inappropriate models can lead to ineffective decision-making and policy formulation. Believing that cutting the rainforests will cause the earth to "run out of oxygen" is an example of inappropriate understanding of photosynthesis and respiration that does not recognize the accumulation of oxygen in the atmosphere from millions of years of photosynthetic activity. Education and communication designed with an understanding of existing models can be more effective by using what people already believe as a bridge to new information.
Kempton, Boster & Hartley, 1995 **Part II Cultural Models of Nature and Environmental Concern**	(Same as above)	<u>Nature as a limited resource</u> "The Earth is like a spaceship with only limited room and resources". Humans are part of and dependent upon the environment. The planet is finite and our wastes enter cycles that come back to haunt us. <u>Nature as balanced, interdependent and unpredictable</u> Parts of nature are so interdependent that changing one can cause a chain reaction on others. Interdependencies are so complex that is impossible for human to predict the interactions. Because of the above, humans should not interfere with nature. <u>Environmental Concern</u> Modern economic and social systems devalue nature. People are increasingly alienated from nature and don't care. "Primitive" peoples lived closer to the earth and valued it more.	See above.

Study and Subject	Context	What is the Model?	Potential Application to CTP
Paolisso & Maloney, 2000 **Part I. Farmer Environmentalism (pgs 215-217)**	Farmers received the brunt of the blame for causing nutrient enrichment that caused blooms of toxic *Pfiesteria.* Were the farmers the bad guys? What did the farmers think?	"We're stewards of the land…We take care of it to the best of our ability. We don't go out there… and do anything detrimental that would hurt us or our neighbors." Farmers have a personal and economic stake in maintaining the quality of the environment, value protecting the environment and see themselves as environmentalists. Acceptable risks must be taken to maintain current agricultural capacity. Nature is dynamic and unpredictable requiring flexible solutions.	Farmer environmentalism is locally derived, based on local values and beliefs and livelihood strategies. As stakeholders farmers became disenfranchised in the conflict that arose around *Pfiesteria*. Sense of urgency and massing of scientific evidence superceded opportunities to dialogue.
Part II. Farmer and Environmental Professional Views on Pfiesteria (From correspondence analysis of triadic comparisons) pgs 217-218	(same as above)	Farmers strongly believe they are environmentalists and their environmentalism is linked to beliefs and values. How do their views about *Pfiesteria* compare to environmental professionals? Both view causes and consequences and inside and outside in a similar way. They view each other as dissimilar.	Local and regional environmentalism can become a focal point for cooperation between environmental professionals and farmers working together to construct a new and sustainable environmental model. Keep building on understanding of existing model and recognize that is has elements applicable to other environmental domains. Farmer environmentalism needs to be integrated into policy and program discussions.

Study and Subject	Context	What is the Model?	Potential Application to CTP
Paolisso, 2002 **Watermen, scientists and regulator perceptions of blue crab management**	In response to declining populations, increasingly strict regulation of Blue Crab fishery was implemented in Maryland. Watermen affected by these regulations were resistant and challenged the efficacy of the regulations to solve the problem	God is nature's steward. Only God and nature can determine the abundance of crabs. There are natural cycles of abundance and scarcity. The unpredictability of nature protects the crabs. Watermen must respect God's stewardship of crabs. There is a role for scientists because God gives scientists knowledge. This kind of knowledge cannot predict everything. Scientists are smart but they still need to talk to people who work on the water. Scientists cannot understand nature because there is too much variability, which is part of God's plan. Watermen feel a role for science is in addressing the role of declining water quality and protecting the bay from the enemies of the bay (polluting corporations). While greed plays a role in harvesting crabs, regulations are not the only answer.	Cultural models help explain statements made by watermen that otherwise seem to portray them as self-interested, greedy and irrationally opposed to efforts to save the blue crab. Cultural models gives clues to the areas where scientific monitoring and models are not understood by watermen, even though they arise from the shared goals of protecting the crabs that God provides. Next step is to organize dialogue workshops involving scientists, resource managers and watermen to facilitate collaborative learning and design of co-management strategies.
Pfeffer, Schelhas & Day, 2001 **Protected area management**	A case study of natural resource management implementation with in a Honduran National Park and the effects of the cultural models of park residents on acceptance of those policies.	Local park residents in remote Honduran villages express environmental concerns similar to those expressed world-wide. While acknowledging the value of forested park land for wildlife and watershed protection, the residents question the benefits they personally receive from the protection. The land they live on is protecting the water supply and hydropower for the city, yet they are without electricity.	Park protection following a predominantly western cultural model of environmentalism is being applied in localities and to people that have no direct control over or input into policy formulation or associated regulations. There is a disjunct between the model used to design park management and the effects that model has on the lives of people in the park. Local park residents are beginning to recognize inequities and injustice and challenge park management practices. Recognizing and responding to park resident's concerns is one way of increasing support for park management policies.

Appendix II. Internet Resources for Environmental Anthropology and Cultural Models Research

Internet Resources Link Viable as of March 20, 2006

- Society for Applied Anthropology Environmental Section: http://www.sfaa.net/eap/abouteap.html

This site contains copies of the final reports for recent research projects including the following studies of potential interest to Coastal Training Program Coordinators:

SANDRA CRISMON, EAP INTERN -- THE WATERSHED PROTECTION APPROACH ON THE GROUND: EXAMINING PARTICIPATION AND ENVIRONMENTAL JUSTICE ISSUES IN EPA REGION 4 WATERSHED PROJECTS

SARA JO BRESLOW -- FARMERS' PERCEPTIONS OF SALMON HABITAT RESTORATION MEASURES: LOSS AND CONTESTATION

R. SHAWN MALONEY, SFAA/EPA ENVIRONMENTAL FELLOW -- USING ANTHROPOLOGY TO ADDRESS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT ISSUES IN RURAL AREAS: THE CASE OF PFIESTERIA PISCICIDA ON MARYLAND'S LOWER EASTERN SHORE

MARK WAMSLEY -- RESPONDING TO PFIESTERIA: INCREASING STAKEHOLDER UNDERSTANDING AND COLLABORATION THROUGH ANTHROPOLOGICAL RESEARCH

- **American Anthropological Association, Environment Section: http://www.eanth.org/**

- **Anthropological Theories: A Guide Prepared by Students for Students,**
  "The Theories of Cognitive Anthropology"
  http://www.as.ua.edu/ant/Faculty/murphy/436/coganth.htm

- **Anthrobase**
  http://www.anthrobase.com/default.html

A multilingual searchable database of articles, theses, reports, etc. written by cultural anthropologists.

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