

Sociocultural Dynamics in Global Human-Environmental Models: Adding Local Depth to Decision Making Algorithms, An Example from the Paraná Delta, Buenos Aires, Argentina

Stephanie C. Kane¹
Kimberly G. Rogers^{2,3}

¹Department of International Studies, Indiana University; ²Center for the Analysis of Socio-Ecological Landscapes, Indiana University; ³INSTAAR, University of Colorado Boulder

Abstract

Decision making is a cultural process fundamental to slowing environmental destruction in all its guises. Although crucial to understanding environmental decision making, working toward a viable interdisciplinary model that could be used across problems and sites is not without obstacles. In order for coupled models to capture realistic **lag times** and **interactions** between social choices and the environment, algorithms of **cross-scalar decision making** must incorporate the influence of **spatial-temporal local differences**. This is especially true for coupled human-earth system models or agent-based models designed to inform policy. *Here we provide a case study from the Paraná Delta of Argentina where a neighborhood assembly fights against pollution in the delta caused by an engineering failure to demonstrate the multiple scales of local decision making influencing environmental and policy outcomes.* We combine components of a **decision making framework** with concepts from cultural and geographic theory, and then filter the combination through ethnographic description and interpretation to track how **local culture influences decisions, and hence, lag times between actions and outcomes across scales.** Although fundamental to human decision making processes, **cross-scalar sociocultural dynamics** are often left out of formal behavioral modules coupled to environmental models. Through this experiment, we expand the capacity of such a framework for carrying cultural meaning and social interaction.

Case Study: Neighborhood Assemblies Organize to Pressure Municipal, Provincial and Federal Government to Implement and Enforce Environmental Law

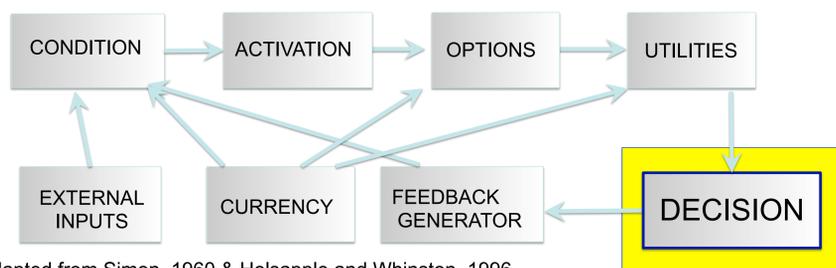


Double action in-situ: decision-making and performance of decision-making (photo by C. Jason Dotson)

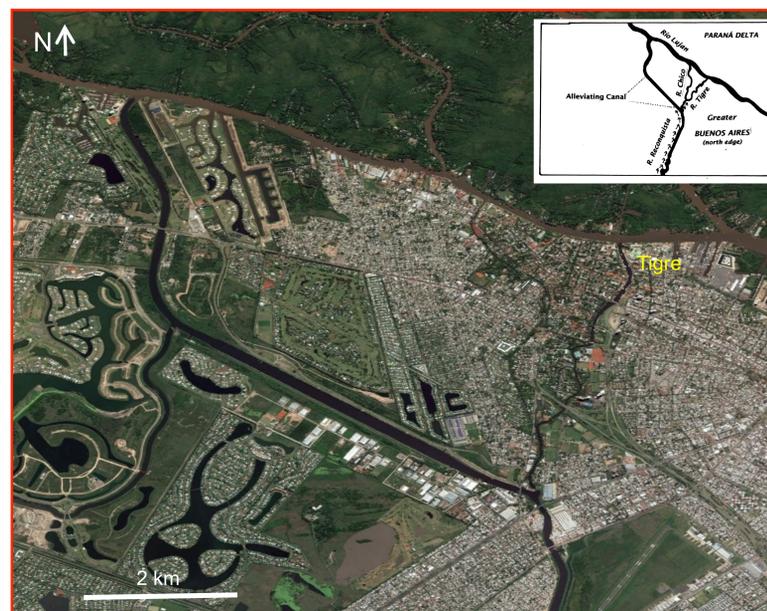
Scene 1: Neighborhood assembly (NA) bimonthly meeting on Tigre Delta quay: Plan next steps toward reversal of faulty engineering causing spread of toxic pollution into Delta

Decision re **Political Identity (Options: NA or NGO):**
Keep place-based, citizen-led egalitarian model of democratic function (NA) OR Acquire legal identity required for River Basin Council (NGO)

The Standard 20th Century Theory and Conceptual Approach: Framework for Decision Making*



* adapted from Simon, 1960 & Holsapple and Whinston, 1996



Cultural Analysis: A Method for Evaluating Parameters of Decision-making and Questions for Modelers

1. Dialogue (as process and performance)

Unfolds in social interactional context; information and values circulate among participants and external interlocutors across spatiotemporal scales

** How might modelers enlist the analytic power of dialogue to increase accuracy of decision-making (their own and those they represent)?*

2. Metaphor (inevitable dependence on language)

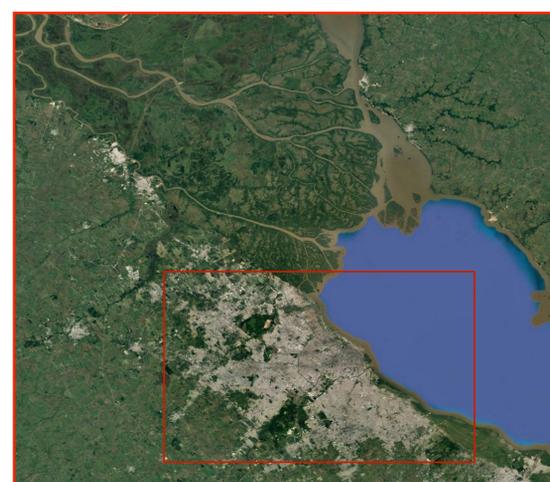
The success or failure of language through which decision-makers establish common purpose within and across scales

** How might modelers consider the import of metaphors underpinning conventional terms?*

3. Fixities and Flows (negotiating scales of action in-process)

At any stage, scales can be manipulated so as to facilitate or obstruct environmental decision-making processes

** Is there a way to build scalar flexibility into models?*



Scene 2. Representatives of NAs from Greater Buenos Aires travel into city center to meet in packed seminar room with Public College of Lawyers for the Federal Capital

Decision re **Affiliation (Options: accept or reject):**
Trust the lawyers' metaphorical claim to unity supporting offer of support OR Distrust lawyers due to differences in class privilege and lack of participation

Supreme Court Decision:

The Tigre NA with Argentine Association of Environmental Lawyers petitioned Federal Supreme Court arguing that pollution mitigation in Delta, which connects Argentina and Uruguay, is responsibility of every government level.

Decision re **Jurisdictional Responsibility (Options: accept or reject):**
Court finds the nation-state free and clear of any legal obligation to act., OR Court accepts some responsibility for mitigating hydrological chaos in Delta



Kane, S.C., 2012. *Where Rivers Meet the Sea: The Political Ecology of Water*. Philadelphia: Temple. [See also 2016 audio edition on Audible by Amazon.]

Kane, S.C., 2013. Environmental Decision-Making in the Argentine Delta. Pp. 77-101. In *Comparative Decision Making*. Crowley and Zentall, Eds. NY: Oxford.