

# 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. Kane<sup>1</sup>

Kimberly G. Rogers<sup>2,3</sup>

<sup>1</sup>Department of International Studies, Indiana University; <sup>2</sup>Center for the Analysis of Socio-Ecological Landscapes, Indiana University;

<sup>3</sup>INSTAAR, 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)

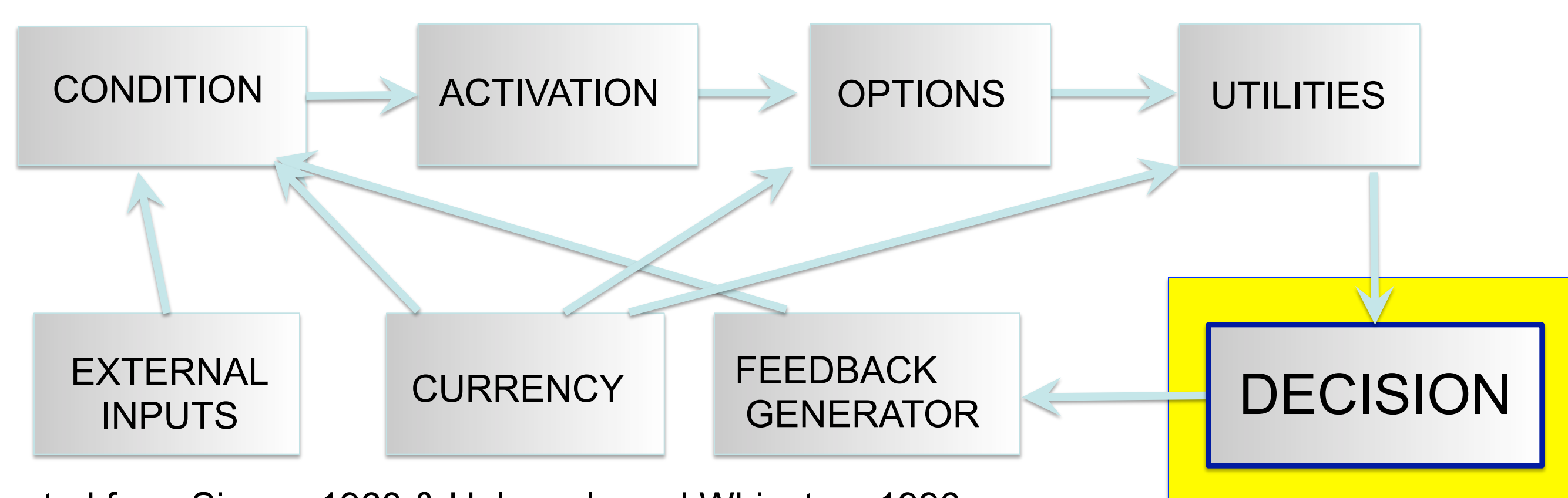
**Scene 1:** Neighborhood assembly (NA) bimonthly meeting on Tigre Delta quay: Plan next steps toward reversal of faulty engineering causing spread of toxic pollution into Delta

Decision re **Political Identity** (Options: NA or NGO):

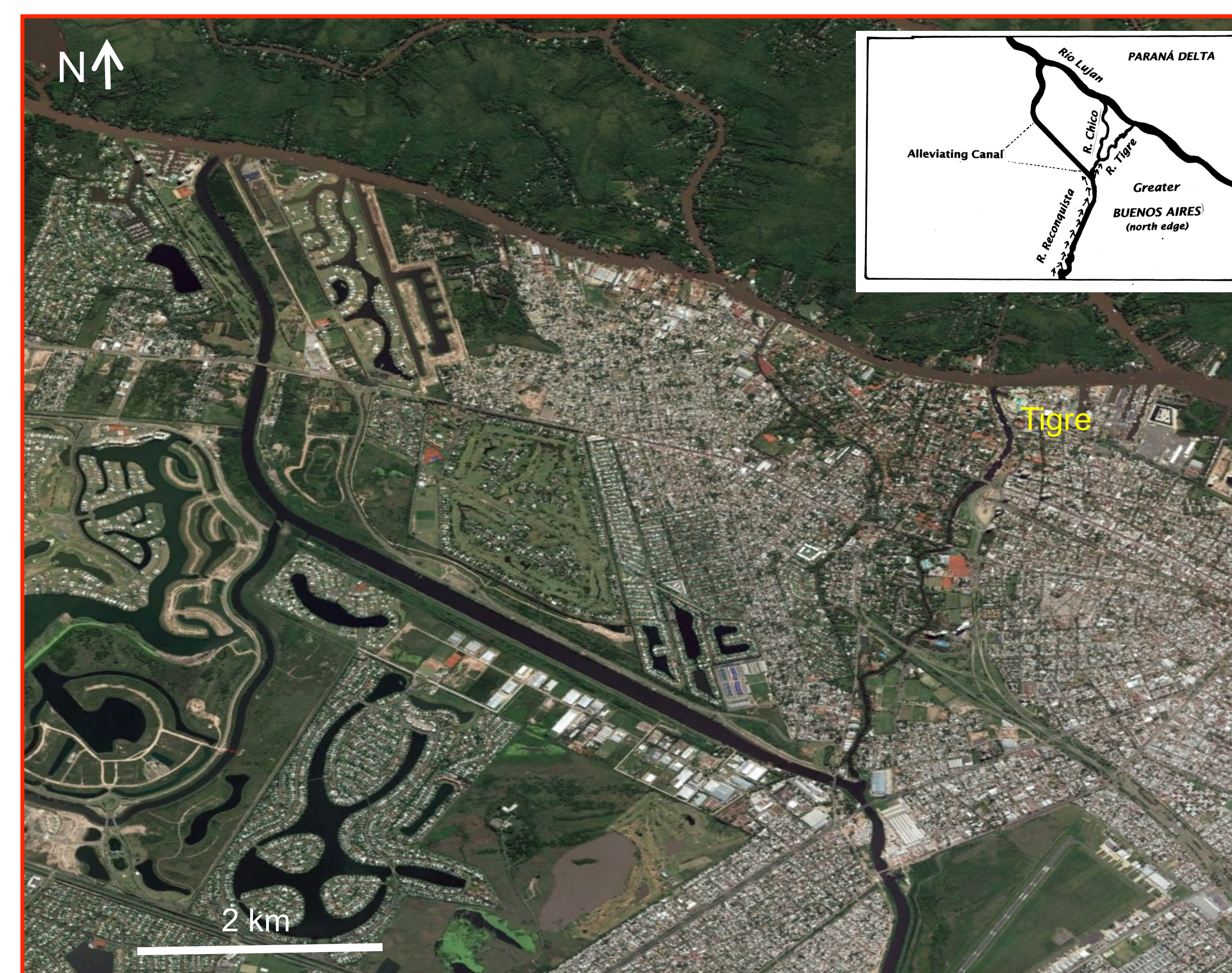
*Keep place-based, citizen-led egalitarian model of democratic function (NA) OR*

*Acquire legal identity required for River Basin Council (NGO)*

## The Standard 20<sup>th</sup> 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)

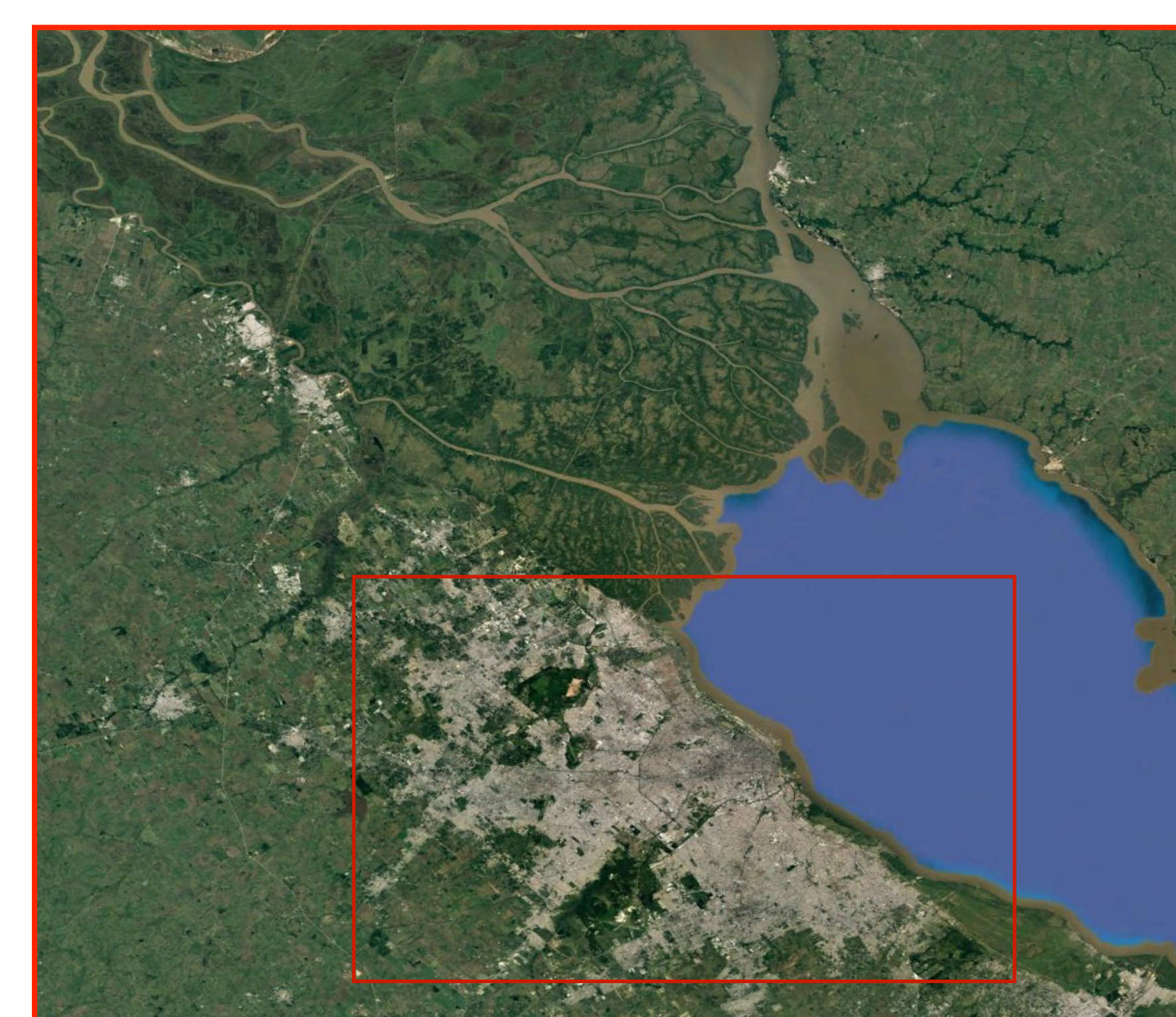
The success or failure of language through which decision-makers establish common purpose within and across scales

*\*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 Meets 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.