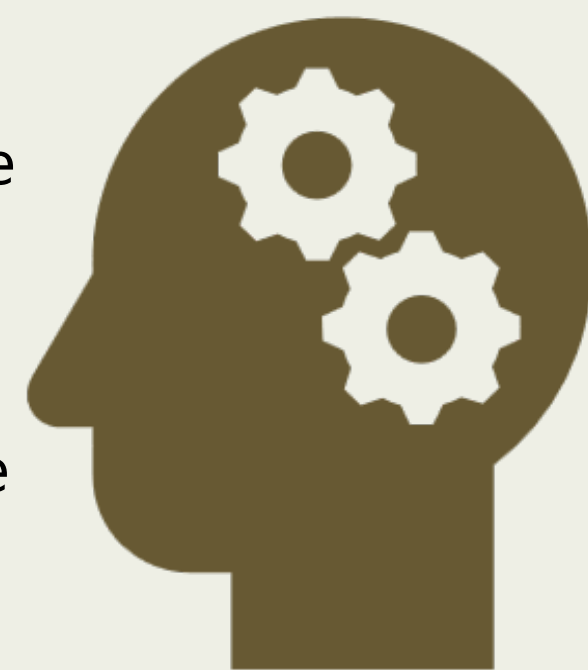


STAKEHOLDER PERCEPTIONS OF WATER ISSUES IMPACTING THE FLORIDAN AQUIFER

Sadie Hundemer and Martha Monroe

INTRODUCTION

Developing effective communication and outreach to explore the potential tradeoffs of water sustainability measures requires first understanding how water issues are perceived by stakeholders. Stakeholders interact with water in a variety of ways and those differences shape how they perceive the system. By exploring stakeholders' mental models – their thoughts about how the system works – the FACETS communication team will be better able to “meet stakeholders where they're at” by framing information in a manner that is familiar to a given audience.

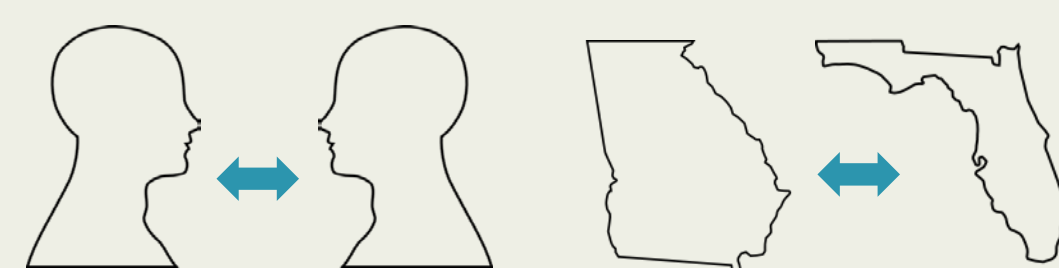


The study presented here uses conceptual content cognitive maps (3CM), in conjunction with a perception survey, to identify and compare the mental models of stakeholder groups.

OBJECTIVES

Determine how stakeholders perceive the relationships between regional water resources (surface and ground), water issues (quality and quantity), and the regional economy.

Record and compare the mental models of stakeholders of different types (e.g. producers and environmentalist) and of different locations.



This information will better enable us to answer several key questions

How to frame communication?

What is behind a survey response?

How do different groups perceive the same issue?



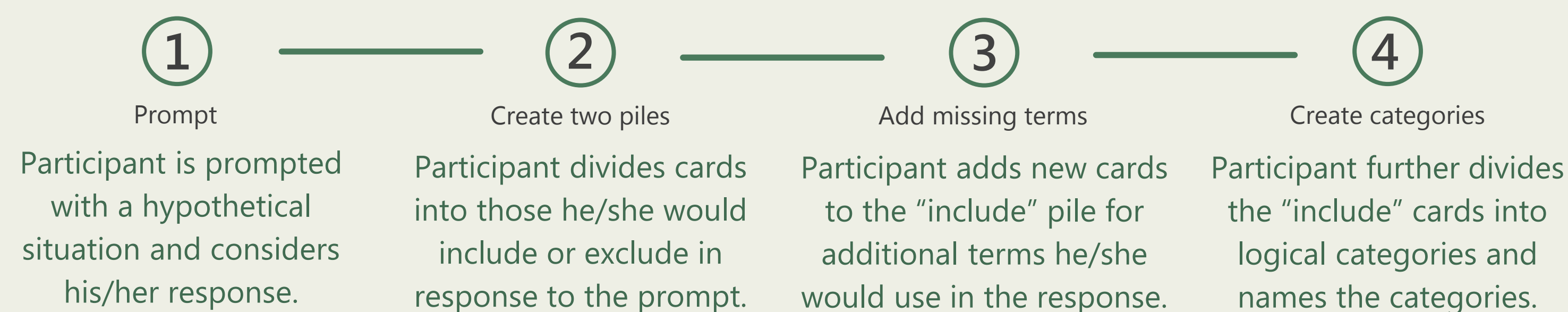
Sample of 3CM cards

METHODS

Developed by Kearney and Kaplan (1997), 3CM is a card-sorting technique designed to capture a person's mental model about a topic of interest. The 3CM process consists of participants individually responding to a prompt using cards displaying relevant terms.

The prompt used for this study was, *Imagine someone you know recognizes your knowledge of local water issues (water quality and quantity) and has asked for your honest perspective on the relationships between water and the regional economy.* Participants were provided with a deck of 57 cards, such as those shown in the upper-right, and asked to complete a four-step process (adapted from Kearney, 2015).

CARD SORTING PROCESS



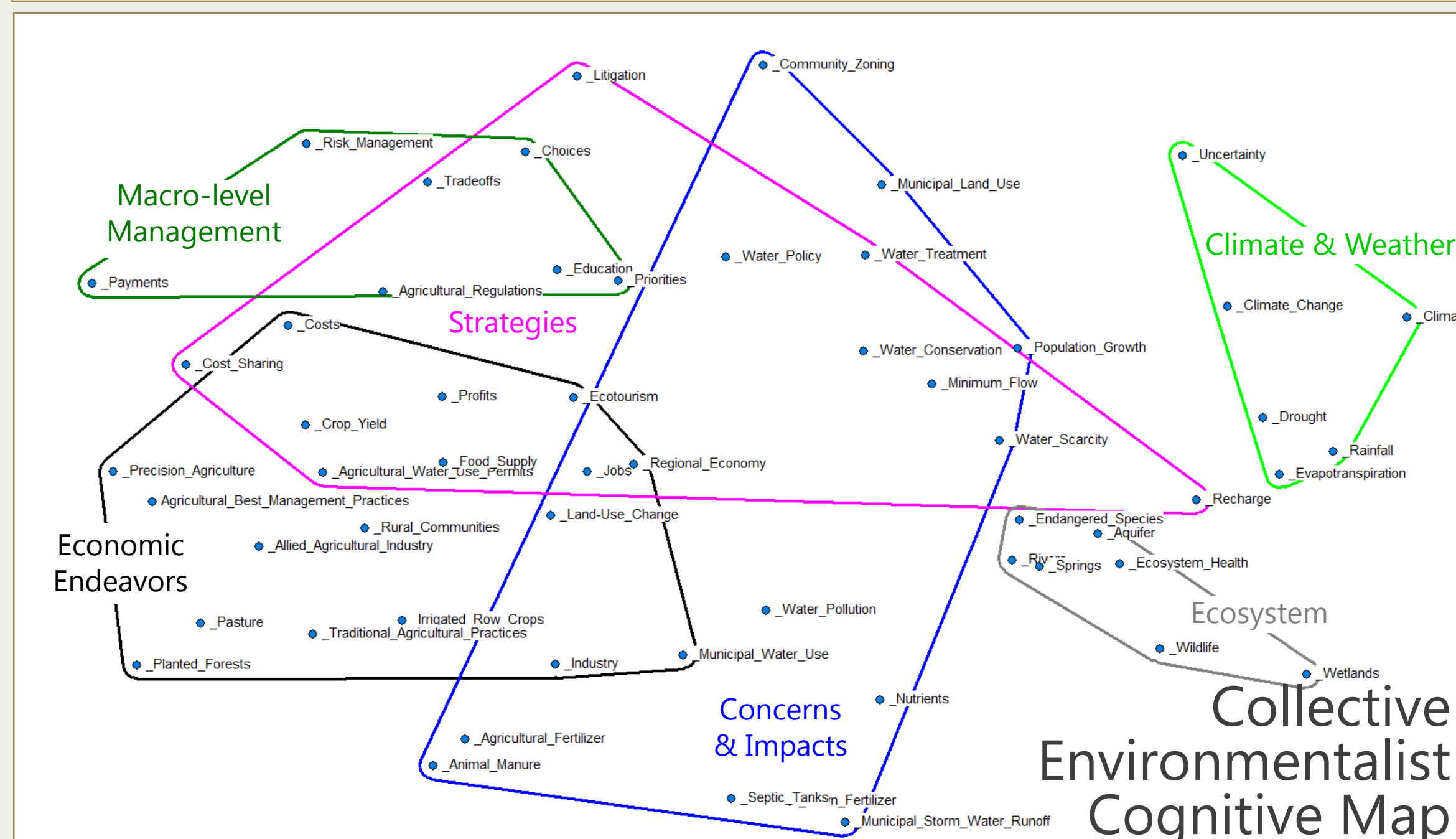
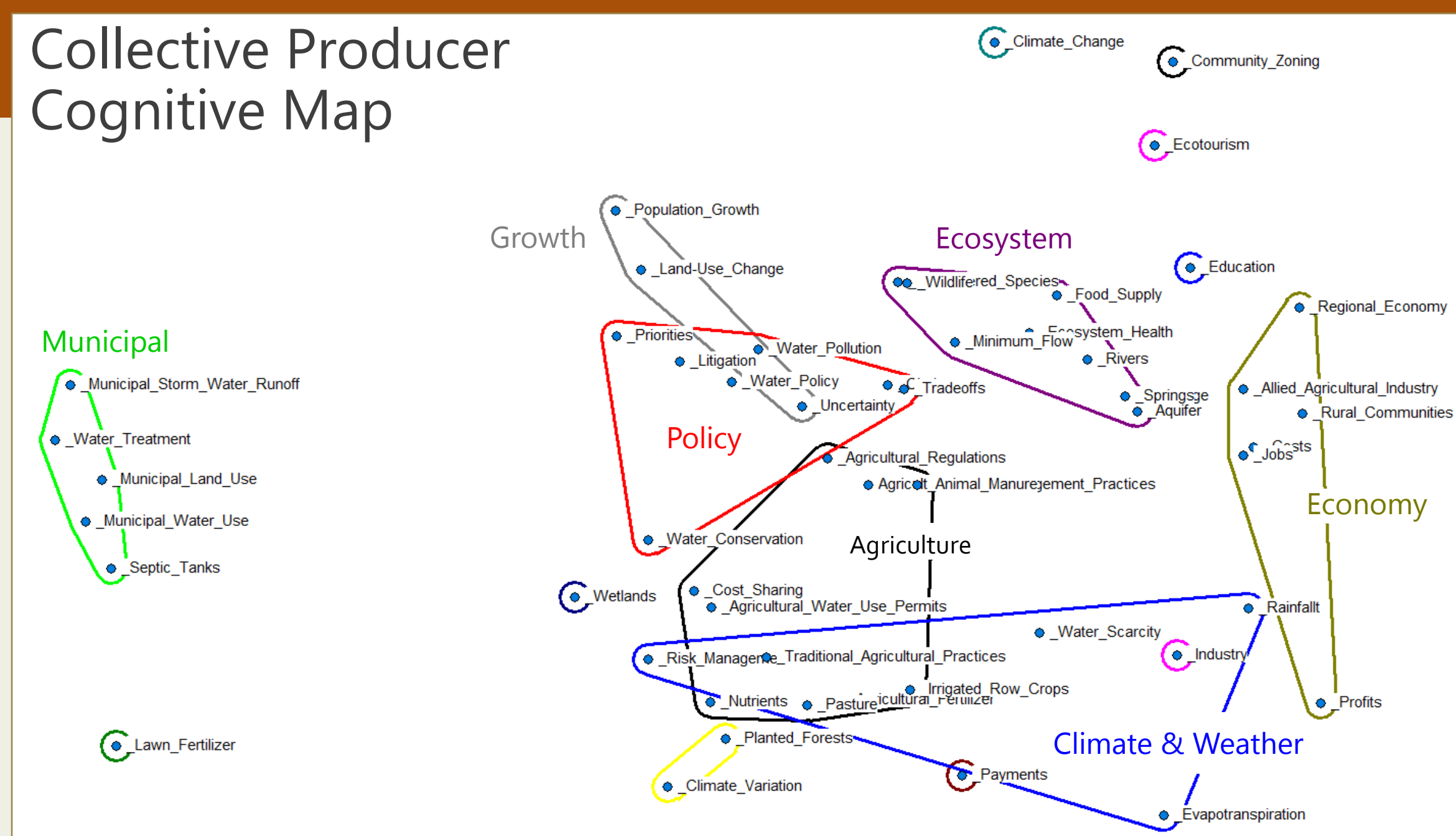
This process captures the mental model for a single participant has been captured. Stakeholder analysis, however, explores the commonalities in the perceptions held by members of stakeholder groups. The commonalities were visualized using composite maps of stakeholders' mental models developed with the statistical package Anthropic (Borgatti 1992).

Anthropic uses multi-dimensional scaling to create a two-dimensional composite map reflecting the relationships between term pairs, and generates clusters of related terms using Johnson's (1967) hierarchical clustering and the average linkage method (Sokal and Michener 1958).

ANALYSIS & RESULTS

CLUSTERS AND THEIR RELATIVE POSITIONS

Clustered terms and the relative positions of the clusters illustrate how participants perceive relationships between elements of the water-economic system. Clusters, that are close to one another suggest a more direct relationship between the concepts in the minds of members of participants. The cognitive maps shown to the right suggest the different ways in which producers and environmentalists may consider system.



CONCLUSIONS

- High levels of concern regarding water and quality exist among all stakeholder categories in the sample. Florida participants are more likely to view water quality as the foremost concern and Georgia participants are more likely to view water quantity as their top priority.
- Of the stakeholder categories evaluated, producers and environmentalists believe their perceptions are most different from one another. Producers in the sample tend to frame the relationship between water and the economy in terms of distinct functional components of the system that interact in agricultural production. In contrast, environmentalists in the sample tend to frame the relationship between water and the regional economy in terms of broad overarching problems and solutions.
- Follow-up studies will allow us to test several key questions, including: Are these participant's mental models generalizable to a broader population? Do the high levels of concern for water pollution and water availability extend beyond immediate stakeholders to the public?

Borgatti, S. 1992. Anthropic (version 4.0). Lexington, KY: Analytic Technologies.
 Kearney, A. R. 2015. 3CM: A Tool for Knowing "Where They're At." In *Fostering Reasonableness: Supportive Environments for Bringing Out Our Best*, ed. R. Kaplan and A. Basu. Ann Arbor, MI: Michigan Publishing.
 Kearney, A. R., and S. Kaplan. 1997. Toward a Methodology for the Measurement of Knowledge Structures of Ordinary People. *Environment and Behavior* 29 (5): 579-617.
 Sokal, R. and C. D. Michener. 1958. A statistical method for evaluating systematic relationships. *University of Kansas Scientific Bulletin* 38: 1409-1438.

TERM INCLUSION PERCENTAGES

	Florida	Georgia
Agricultural BMPs	90%	63%
Education	74%	50%
Endangered Species	58%	88%
Irrigated Row Crops	74%	100%
Litigation	48%	88%
Water Pollution	90%	63%

Cards retained more or less frequently by participants suggest those terms that are more and less relevant in the relationship between water and the regional economy.

TERM ASSOCIATIONS

The clusters to which each term belongs were compared across groups to identify differences in the cognitive domains likely to be triggered with the term's usage.

