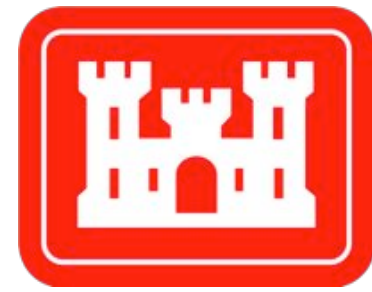


Progress Towards Cultural Change in the Army Corps of Engineers: Good News for Estuarine Ecosystem Restoration?

Eliza Cava, Yale School of Forestry & Environmental Studies

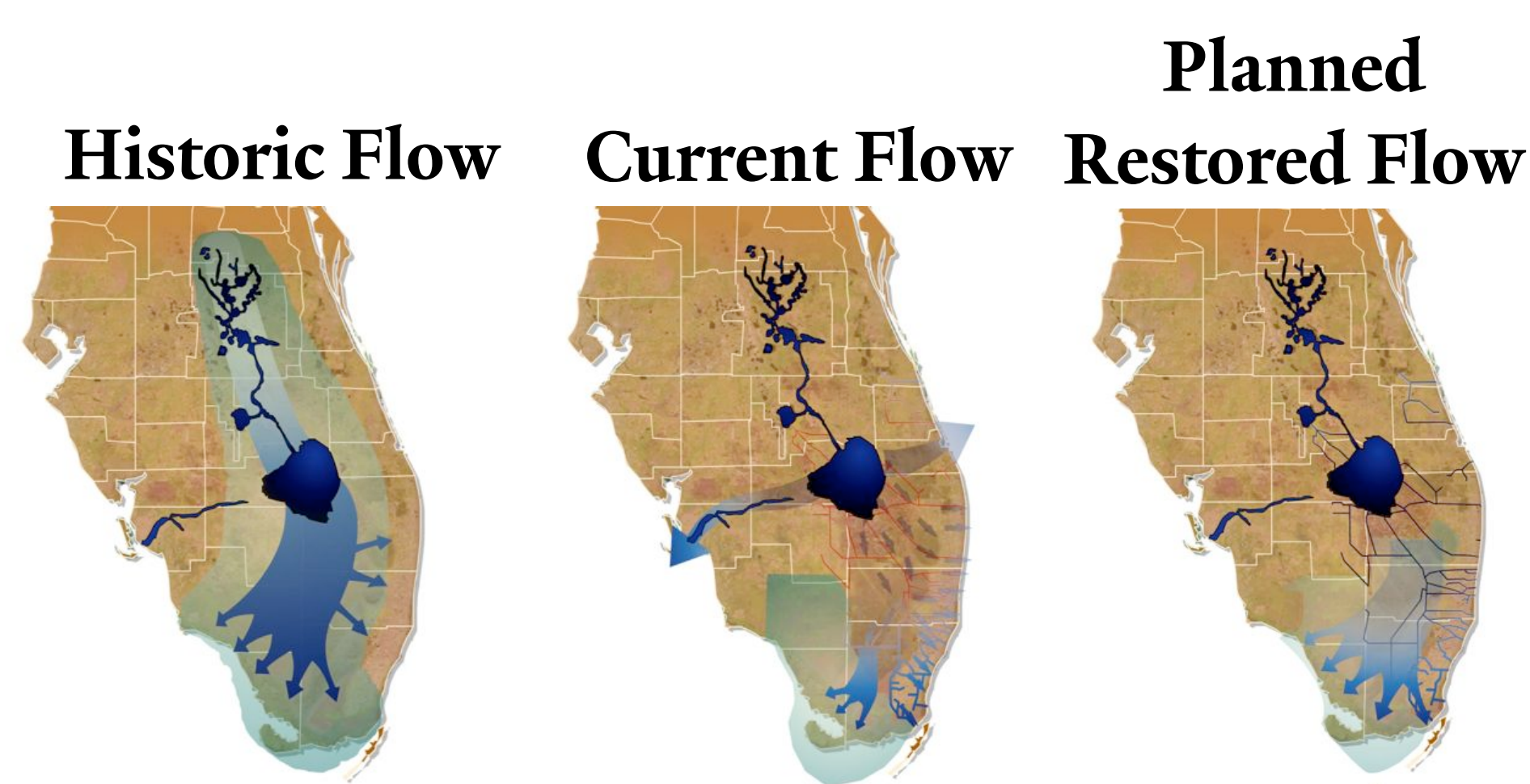
Army Corps' Cultural Adaptation

- Long accused of ignoring environmental issues and being part of the problem in water resource management.
- Now attempting to "green" itself, led by the Jacksonville district and its involvement in Everglades restoration.^{1,2}
- The institutional culture of the Corps and the way it is perceived by outsiders may affect its ability to manage the large-scale, complex process of Everglades restoration.



From Drainage to Restoration

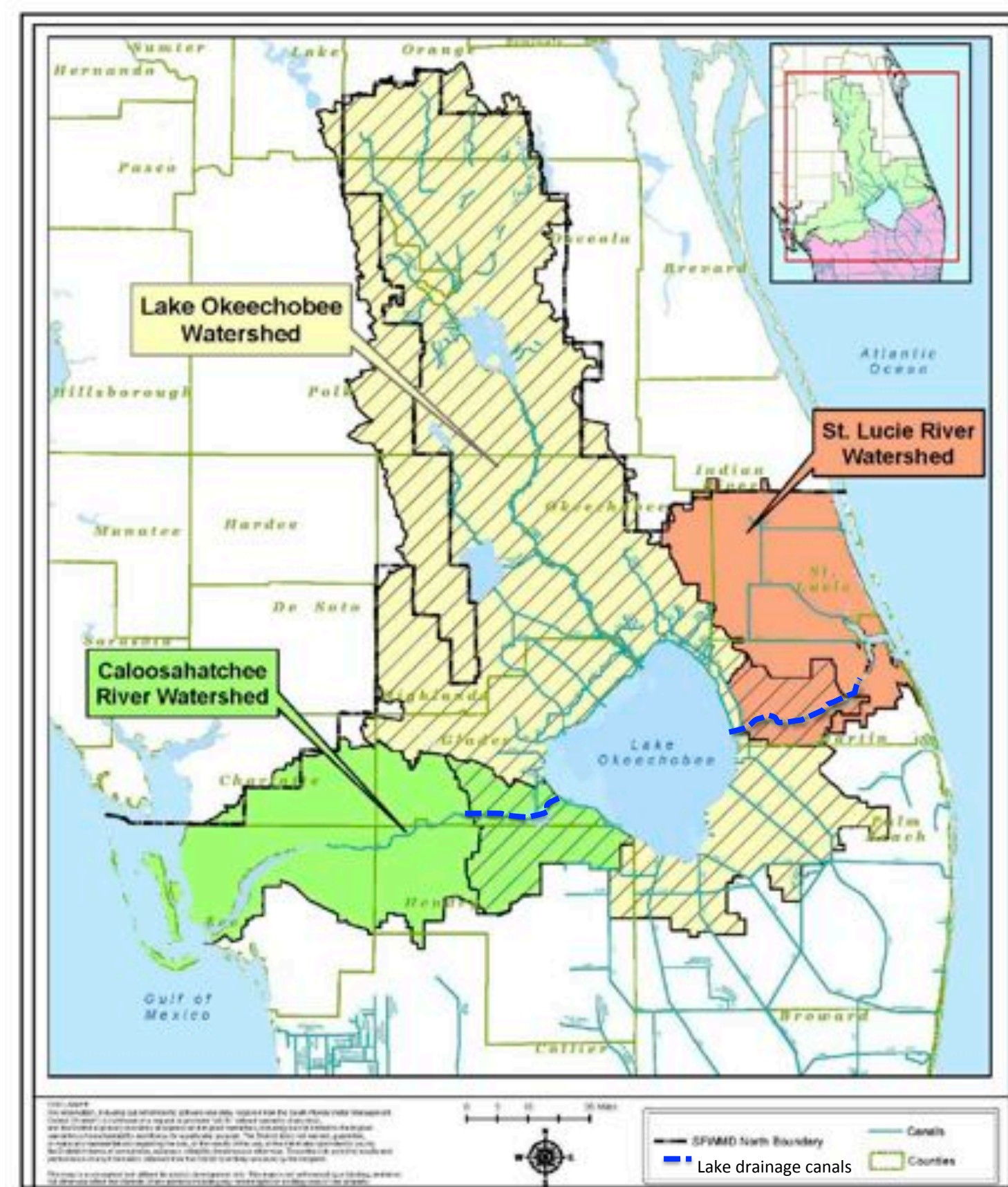
- Historic Everglades drained for agriculture; Army Corps manages flood control system
- Lake Okeechobee drains to the coasts via Caloosahatchee River and St. Lucie canal
- 2000 Comprehensive Everglades Restoration Plan gave Corps responsibility to undo ecological harms of flood control



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St. Lucie and Caloosahatchee Estuaries: A Test Case for Success

- Did not evolve with watershed connections to Lake Okeechobee.
- Altered salinity and hydrology from Lake flood-control pulses harm the estuaries.^{3, 4}
- Both provide habitat for endangered species and nurseries for commercially valuable fish.



Map showing the two major estuaries.⁵

Problem Statement/Hypotheses

- If the Corps is indeed becoming more environmentally-friendly, its institutional culture should be changing to reflect the mission shift.
- A more environmentally-oriented culture will generate a higher likelihood of success in large-scale ecosystem restoration.

Methods

- Conducted semi-structured interviews with 16 employees of the Corps + 34 others
- Transcribed and manually coded interviews
- Analyzed for probability of auto-generated topic occurrence using MALLET toolkit⁶
- Analyzed for co-occurrence with codes using Atlas.TI qualitative analysis software

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Further Information

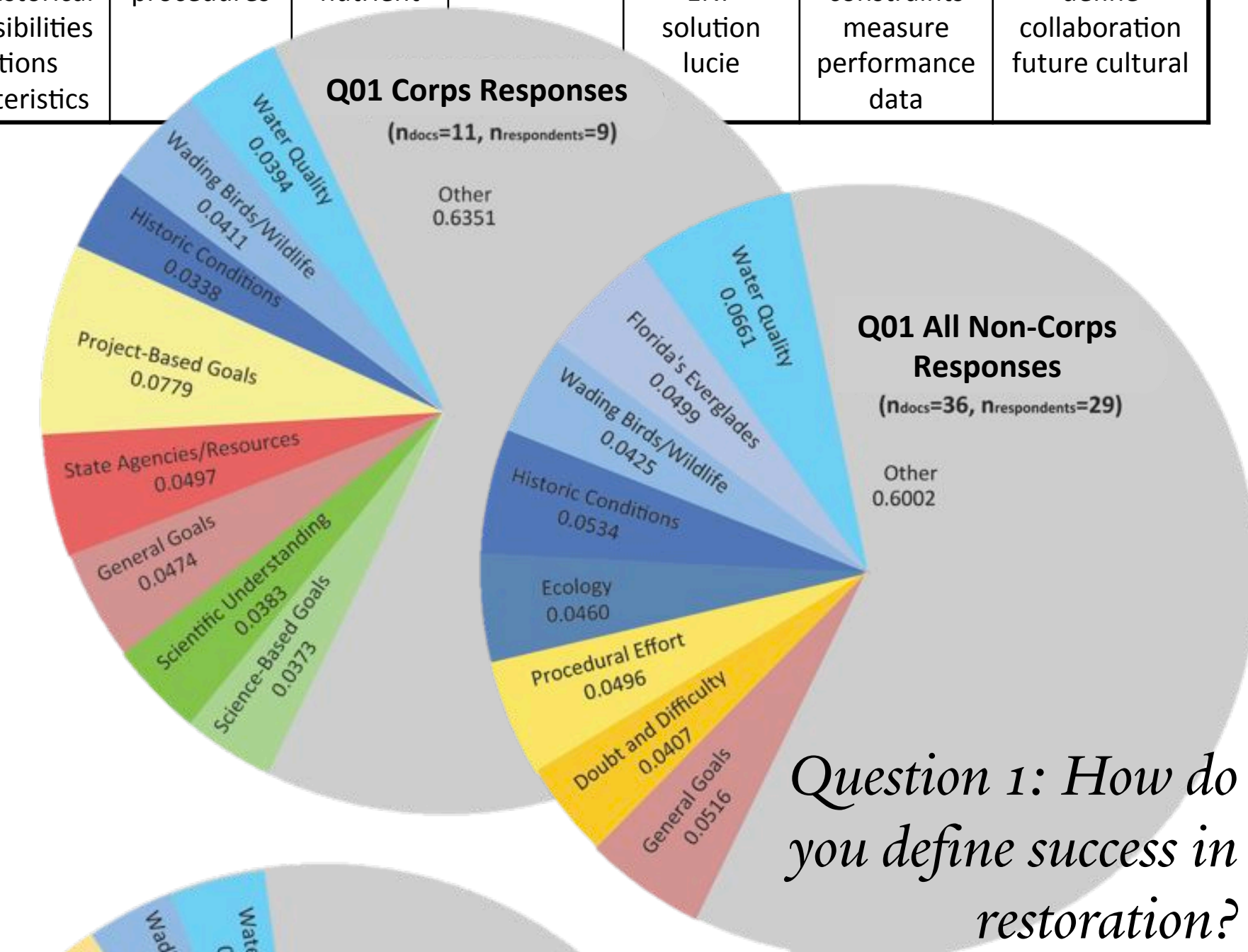
Eliza Cava, eliza.cava@yale.edu for more information or pdf copies of this poster.



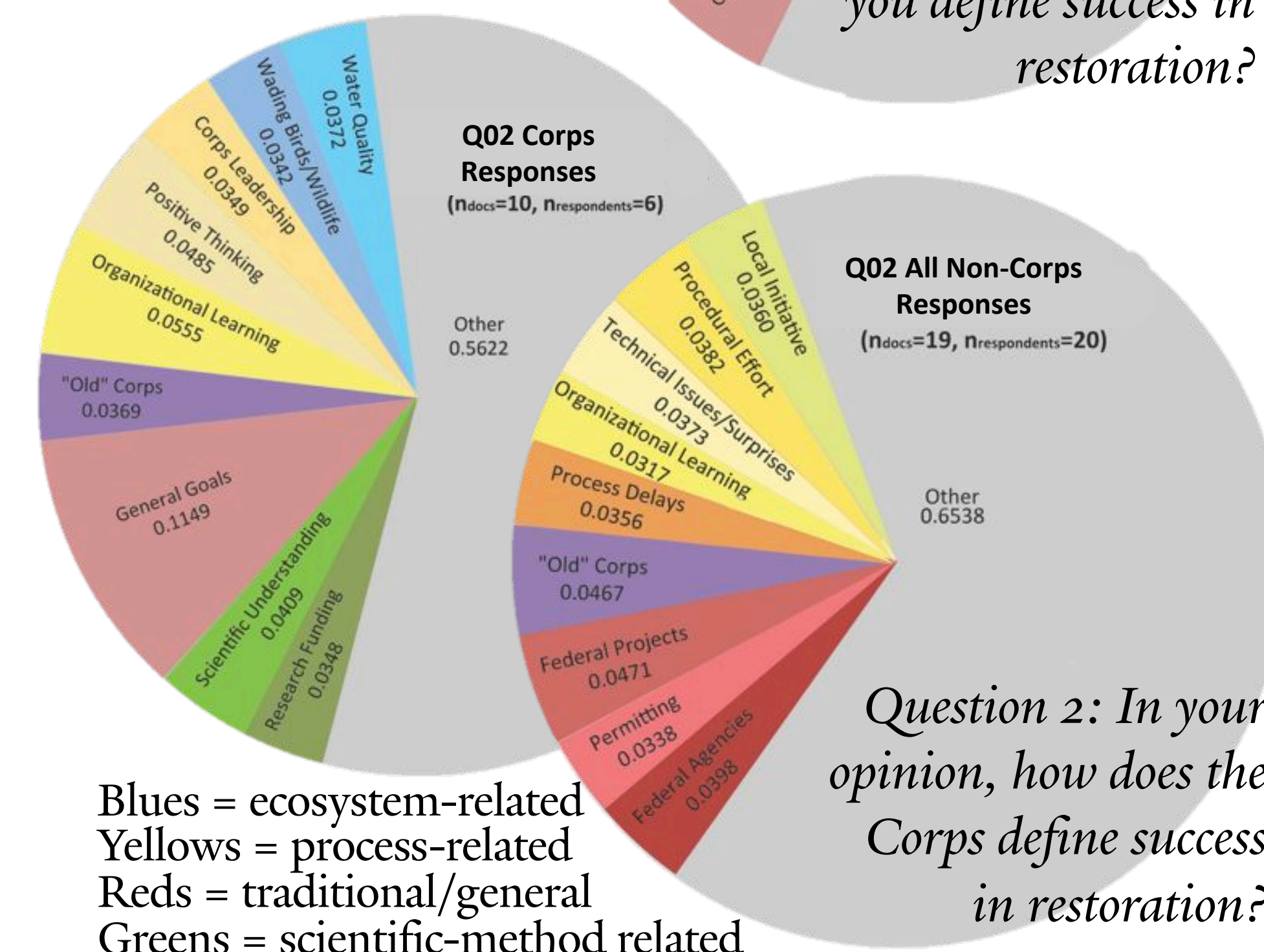
Sample Results: Topics

50 topics auto-generated from interview text. Some examples (labels added for clarity):

General Goals	Procedural Effort	Ecology	"Old" Corps	Water Quality	Science-Based Goals	Organizational Learning
restoration ecosystem goals big supply conditions focus historical responsibilities functions characteristics	effort coming made major partnership speak procedures	system ecological result indicators flow nutrient	restoration engineering flood control mission	water quality natural lake south flow estuaries ENP solution lucie	science targets model program based constraints measure performance data	culture learned wrong necessarily organization define collaboration future cultural



Question 1: How do you define success in restoration?



Question 2: In your opinion, how does the Corps define success in restoration?

Blues = ecosystem-related
 Yellows = process-related
 Reds = traditional/general
 Greens = scientific-method related
 Purple = traditional view of Corps missions

Each pie represents 100% of all topics for a particular question/interviewee category combination. Highlighted in color are those interpretable topics with mean probability of occurrence > 0.3.

Some topics over four questions by category:

	Q1: Define restoration success		Q2: Corps' definition of success		Q3: Corps' successes		Q4: Corps' challenges/failures	
	1st Topic	Prob.	1st Topic	Prob.	1st Topic	Prob.	1st Topic	Prob.
Corps	Project-Based Goals	0.078	State Agencies/Resources	0.050	General Goals	0.115	Project Progress	0.077
Mean All Non-Corps	Water Quality	0.066	Historic Conditions	0.053	Federal Projects	0.047	Project Construction	0.054
(State)	Water Quality	0.069	Florida's Everglades	0.060	* Florida's Everglades	0.106	"Old" Corps	0.059
(Academia)	Wading Birds/Wildlife	0.173	General Goals	0.100	Process + Picaayune	0.086	Federal Projects	0.073
(Agriculture)	*	0.143	Positive Thinking	0.075	Procedural Effort	0.113	Water Quality	0.076
(Environmental Groups)	Water Quality	0.134	Florida's Everglades	0.074	Local Initiative	0.114	*	0.106
(Fed-Other)	Historic Conditions	0.177	Ecology	0.169	National Corps Missions	0.083	"Old" Corps	0.073
(Other)	Procedural Effort	0.178	Technical Issues/Surprises	0.132	Procedural Effort	0.143	"Old" Corps	0.143

Red boxes: note how frequently "Old" Corps arises across categories to describe the Corps, but is not used by Corps members to describe their organization. Purple shading: probability > 0.10 * Uninterpretable

Sample Results: Co-occurrence in water-related codes

- Restoring the estuaries depends upon identifying other ways to store freshwater currently being flushed to the coast.

Question	Codes ->	Water Flow	Water Quality	Water Storage	Water Supply	QQTD*	Flooding/ Flood Control	Getting the Water Right	Agri-culture	Aquifer Storage & Recovery
Success in Restoration		0.04	-0.01	0.06	0.05	-0.04	-0.04	-0.06	0.10	0.02
Corps' Definition of Success		-0.04	0.02	-0.02	-0.04	-0.07	0.07	-0.07	-0.08	
Measure of Progress			-0.03	-0.13		0.14	-0.01	0.04	0.02	
Future of CERP/Restoration		-0.11	-0.12	0.02	-0.03				0.03	0.04
Corps Successes		0.05	0.05		-0.10		-0.05	-0.05	-0.06	0.02
Corps Challenges		-0.04	-0.13	0.06	-0.05	-0.08	-0.04		-0.09	0.06
Relationship of Restoration to Wetland Permitting			0.03	-0.08			-0.02		0.02	
Relationships Among Agencies					-0.03				0.01	
Science		-0.02	-0.01		-0.05	0.02	-0.02	0.02	0.04	
River of Grass**		0.09	0.17	0.14	0.00	0.03	0.01		0.26	0.25
Adaptive Management		0.07	0.02	0.02	0.03		0.05			

Co-occurrence of water-related codes with semi-structured interview questions output by Atlas.TI. Cells show differences in that particular pair between Corps and non-Corps respondents. Positive numbers (blue shading) indicate higher co-occurrence among non-Corps respondents; negative numbers (red shading) indicate higher co-occurrence among Corps respondents.

**River of Grass: Florida's plan to purchase agricultural land south of Lake Okeechobee to create a water storage flowway.



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Discussion / Conclusions

- Elements of the Corps are making real efforts to restore the Everglades, but may be hampered in prioritizing ecosystem outcomes by size and bureaucracy.
- This analysis suggests that there is variation between internal and external perceptions of restoration goals and progress to date.
- Cultural transition is not yet complete. Corps leadership should be aware of progress and consider that as long as institutional culture is still in transition, the agency may not be fully prepared to deal successfully with ecosystem restoration.

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