

# Understanding Ecological Interactions in the SE USA

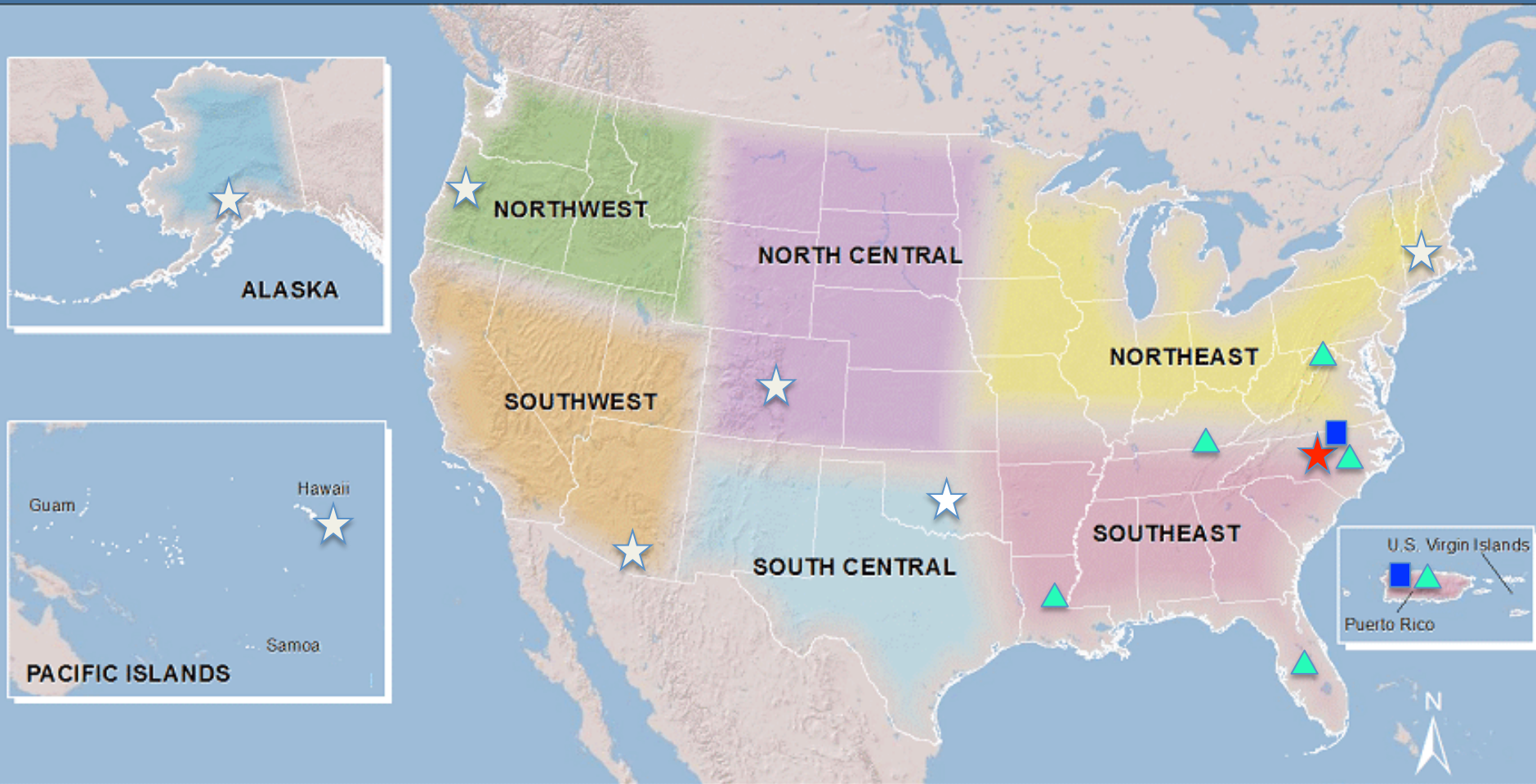
Gerard McMahon, SE Climate Science Center  
SECOORA Stakeholder Meeting May 2016 \* Raleigh, NC



DEPARTMENT *of the* INTERIOR  
SE CLIMATE SCIENCE CENTER

**NC STATE UNIVERSITY**

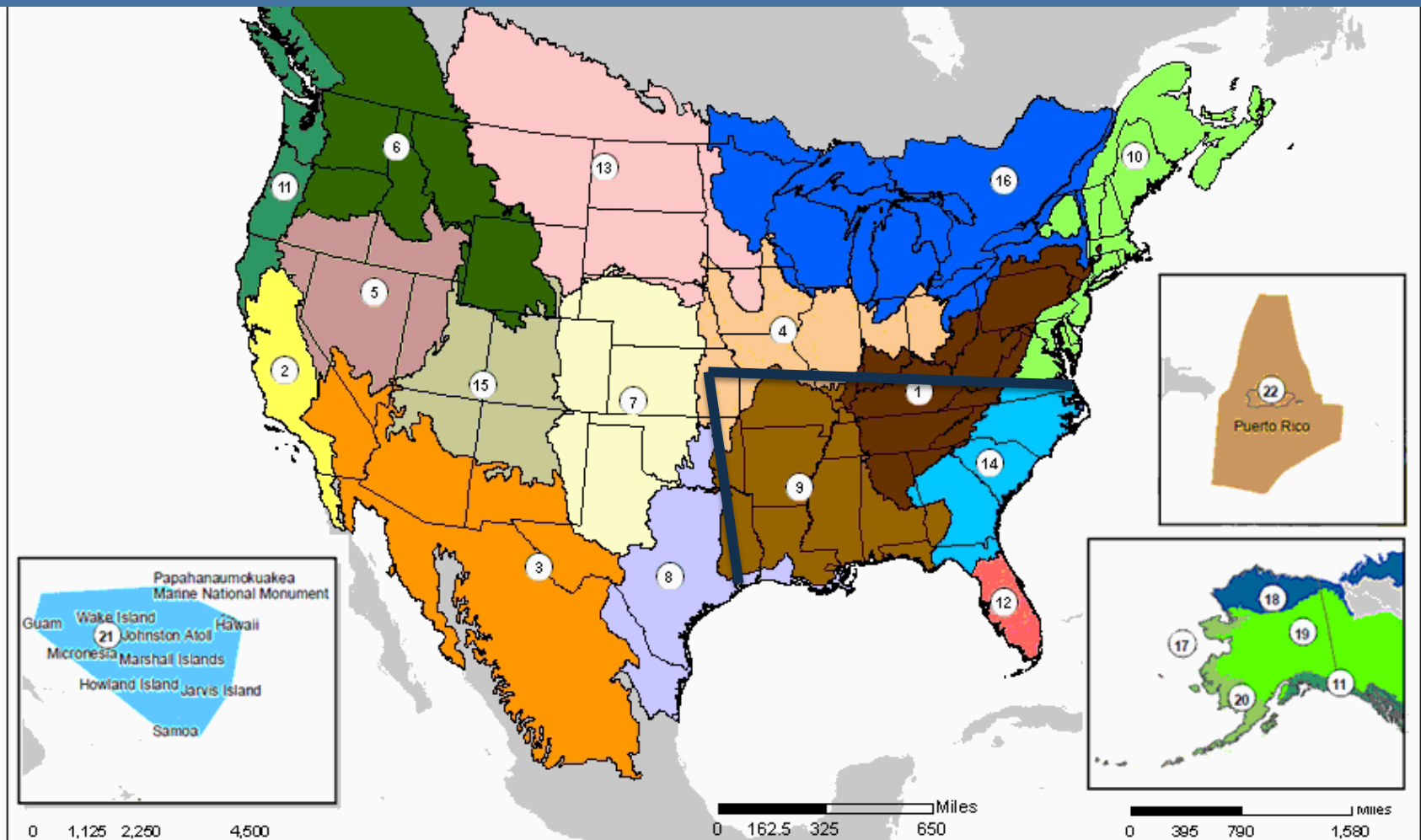
# Department of Interior Climate Science Center Network



DOI Secretarial Order 3289: Producing **actionable science** that helps individuals and organizations **understand and adapt** to global change.

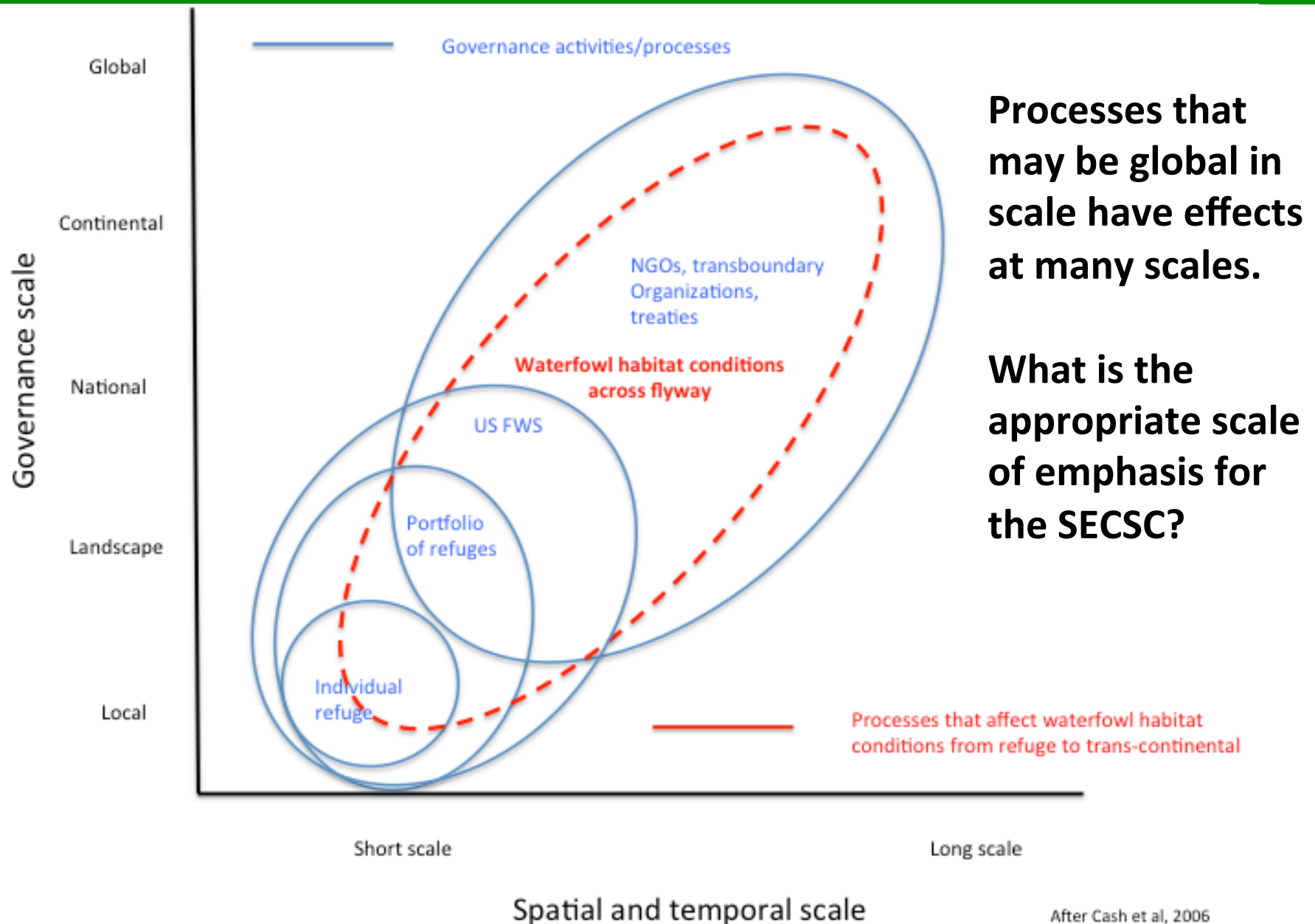


# Landscape Conservation Cooperatives



- |   |                                   |                                     |                      |
|---|-----------------------------------|-------------------------------------|----------------------|
| 1. Appalachian                              | 7. Great Plains                   | 13. Plains and Prairie Potholes     | 19. Northwest Boreal |
| 2. California                               | 8. Gulf Coast Prairie             | 14. South Atlantic                  | 20. Western Alaska   |
| 3. Desert                                   | 9. Gulf Coastal Plains and Ozarks | 15. Southern Rockies                | 21. Pacific Islands  |
| 4. Eastern Tallgrass Prairie and Big Rivers | 10. North Atlantic                | 16. Upper Midwest and Great Lakes   | 22. Caribbean        |
| 5. Great Basin                              | 11. North Pacific                 | 17. Aleutian and Bering Sea Islands | Unclassified         |
| 6. Great Northern                           | 12. Peninsular Florida            | 18. Arctic                          |                      |

# What is the right scale to be working at?





# SECSC: Emerging Three-part Identity

- **Convene conversations** among decisionmakers, scientists, and managers to identify: key ecosystem adaptation **decisions** driven by climate and land use change, the **values** and objectives that will be used to make decisions, and the **adaptation policy/action options**.
- **Build the capacity** of natural resource professionals, university faculty, and students to **understand and frame natural resource adaptations decisions** and develop and use research-based information to **make wise adaptation decisions** in the face of climate change
- **Provide decision-focused, researched based information** that supports wise global change adaptation decisions.

# Provide decision-focused, researched based information to support GC adaptation decisions

## SECSC 2012-2017 science plan: 6 strategic science themes

2: processes that drive change 4: processes that respond to drivers

- Science Theme 1: Develop climate projections and determine appropriate projections to use for resource management
- Science Theme 2: Land use and land cover change projections
- Science Theme 3: Impacts of climate change on water resources
- Science Theme 4: Ecological research and modeling
- Science Theme 5: Impacts of climate change on coastal and near-shore marine environments, and
- Science Theme 6: Impacts of climate change on cultural-heritage resources.



# Theme 5: Coastal and near shore impacts of CC



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Johnson, F. A., M. J. Eaton, G. McMahon, R. Nilius, M. R. Bryant, D. J. Case, J. Martin, N. J. Wood, and L. Taylor. 2015. Global change and conservation triage on National Wildlife Refuges. *Ecology and Society* 20(4):14. <http://dx.doi.org/10.5751/ES-07986-200414>

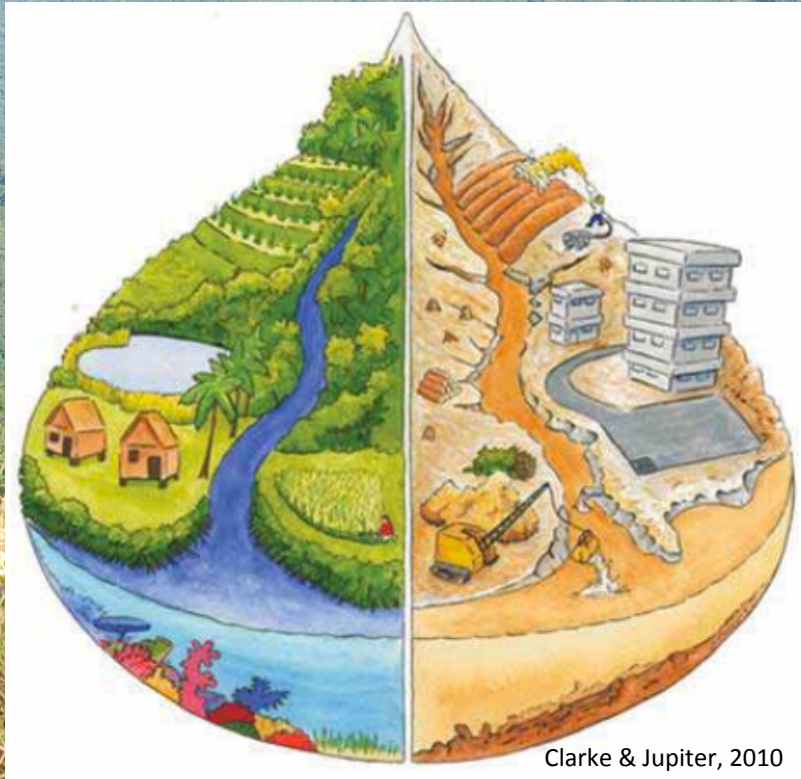


## Global change and conservation triage on National Wildlife Refuges

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# Ridge to reef: a familiar construct for linking land and sea in Pacific and Caribbean island ecosystems



Clarke & Jupiter, 2010





**R2R: a coupled human-natural systems  
conceptual framework...**

**...to frame GC adaptation  
decision problems**

# R2R decision framework: How to meet R2R objectives in face of local to global threats?

## Adaptation policy options

(what are options for addressing the things that matter?)

	Expand land use planning and fee simple acquisition	Expand land use planning and use easements	change mandated objectives
Business as usual			

## Objectives

(what matters about this decision?)

Meet mandated objectives

T&E species

Sediment water quality standards

Meet regional conservation objectives

Minimize dispersal of invasive species

Maintain biodiversity, esp endemism

Viable local economy

ecotourism

commercial fishing

Protect cultural landscape and resources

Connecting people and nature

**"Scientific" predictive models**  
(how does action affect objective?)

*Science on the ridge*

*Science along the transport path*

*Science on the reef*

*Science that connects islands*

*Science that connects people  
and places*



# Ridge to reef: challenges for linking land and sea in Pacific and Caribbean island ecosystems

- **Endpoints that matter to diverse stakeholders**
  - Movement from general understanding of framework and footprint of change to framing adaptation decision problems
  - Will require time consuming and culturally astute and sensitive discussion among diverse stakeholders about what matters in 3 or more settings
- **Science that can predict the state of these endpoints**
  - Doing science (ridge, transport, reef, coupled human-natural systems) in settings that may be data poor.
  - Complex systems will result in uncertain predictions of endpoint condition...stakeholders will need to increase their skills for decisionmaking in face of uncertainty.
- **Integrated PI/Carib R2R studies? LCC and CSC roles?**



Thanks...



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