

# **Non-Resident SCUBA Divers and Anglers: Social Considerations for Resilience Management in the Florida Keys**

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# Today's Talk

- Introduce the recent FRRP-University of Massachusetts Amherst Human Dimensions project
- Discuss the theoretical and descriptive focus of the project
- Present selected management-relevant research findings (non-residents)
- Discuss how these findings may benefit future management activities

# Introduction to the Project

- A social science research project to address the FRRP question: *what do people want and need from coral reefs?*
- A broad first effort to understand Florida Keys reef users in a representative way
- Designed to complement ongoing biophysical resilience research

# The Relevance of the Project

- There are many data gaps with respect to Florida Keys reef users
- The biology and ecology of reef resilience cannot tell us what should be done
- Implementing any management actions suggested by FRRP research will require a stakeholder approach
- We need to understand stakeholders' behaviors, perceptions, motivations, norms, and conflicts (among others)

# Project Methods

- Dillman-based survey methods
  - Focused on anglers, divers, and snorkelers
- A representative sample – intercept methodology
  - 13 sampling trips
  - Weekdays/weekends/holidays
  - Lower, Middle, Upper Keys – shore to reef
  - Collected names, addresses, and telephone numbers
- Sample sizes (n):      D = 1,595      A = 703
- Response rates:        D = 57.9%      A = 49.9%

# Research Foci

To better understand divers', snorkelers', and anglers':

- Levels of specialization
- Motivations to engage in reef activities
- Beliefs about appropriate behavior at coral reefs
- Thoughts about ecological conditions and trends
- Expectations and satisfaction regarding the reef
- Potential conflict via attributions
- Use of activity-specific information

# Specialization Theory

- A way to segment the population of interest into meaningful subgroups
- Distribution is based on a specialization index

	<u>Low</u>		<u>Mod.</u>		<u>High</u>		<u>V. High</u>	
	n	%	n	%	n	%	n	%
Anglers	97	16.3	154	25.8	235	39.4	110	18.5
Divers	30	3.1	217	24.8	378	43.2	250	28.6

# Participation Rates and Side Bets

<u>Divers</u>	<u>L</u>	<u>M</u>	<u>H</u>	<u>VH</u>	<u>F</u>	<u>p</u>
No. of years diving	1.5	4.6	7.7	13.6	57.669	0.000
Days past 12 months	2.4	3.2	6.8	18.0	44.766	0.000
Equipment value(\$)	775	1,156	1,822	2,920	47.153	0.000
<u>Anglers</u>	<u>L</u>	<u>M</u>	<u>H</u>	<u>VH</u>	<u>F</u>	<u>p</u>
No. of years fishing	6.6	20.1	29.7	33.2	70.833	0.000
Days past 12 months	3.2	12.7	30.3	55.0	79.195	0.000
Equipment value(\$)	512	1,399	2,499	6,107	16.792	0.000

# Importance of Coral Reefs as Places to Fish or Dive On

## Mean Importance

Anglers	2.48
Divers	3.40

1=Not at all important, 5=Extremely important

# Angler Motivations

	<u>L</u>	<u>M</u>	<u>H</u>	<u>VH</u>	p
To relax	<u>3.45</u>	<u>4.06</u>	<u>4.23</u>	<u>4.27</u>	0.000
To be outdoors	<u>3.82</u>	<u>4.00</u>	<u>4.21</u>	<u>4.22</u>	0.001
Fun of catching fish	<u>3.80</u>	<u>4.13</u>	<u>4.12</u>	<u>4.22</u>	0.000
Natural surroundings	<u>3.94</u>	<u>4.21</u>	<u>4.16</u>	<u>4.21</u>	0.080
Exp. of the catch	<u>3.80</u>	<u>4.14</u>	<u>4.01</u>	<u>4.19</u>	0.012
Away from demands	<u>2.90</u>	<u>3.18</u>	<u>3.10</u>	<u>3.31</u>	0.238
Solitude	<u>2.81</u>	<u>3.14</u>	<u>3.13</u>	<u>3.29</u>	0.073
Catch trophy fish	<u>2.17</u>	<u>2.14</u>	<u>2.33</u>	<u>2.94</u>	0.000
Get fish to eat	<u>2.23</u>	<u>2.70</u>	<u>2.74</u>	<u>2.73</u>	0.052

1=Not at all important, 5=Extremely important

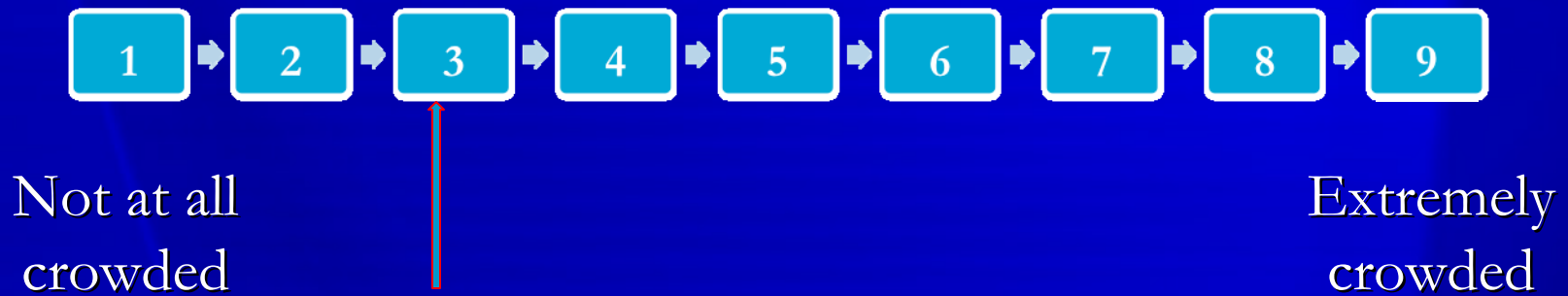
# Normative Approach

- A norm is a rule or standard about how things ought to be, socially agreed upon
  - We won't throw things at the speaker
  - Chris Bergh buys drinks for the speakers tonight
- Normative theory has been applied to:
  - Crowding and conflict
  - Resource condition – divers only

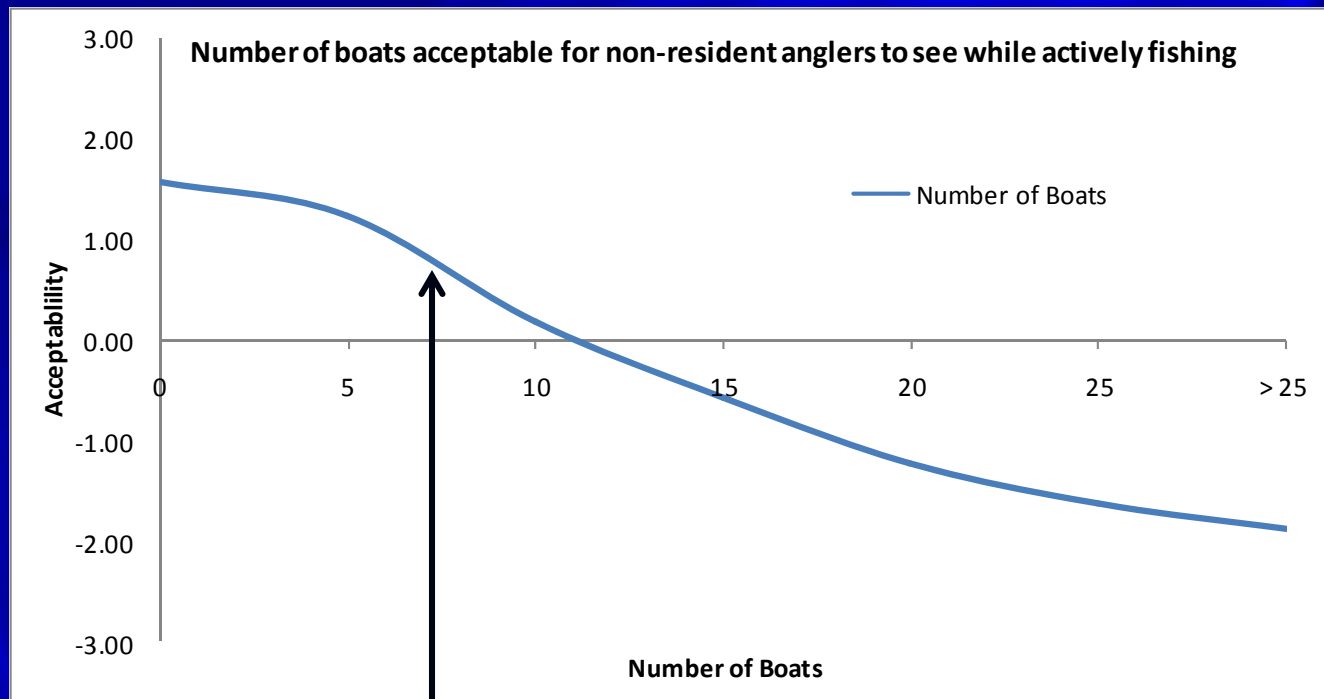
# Crowding Norms

Anglers      Mean  
                 3.29

Divers      3.17



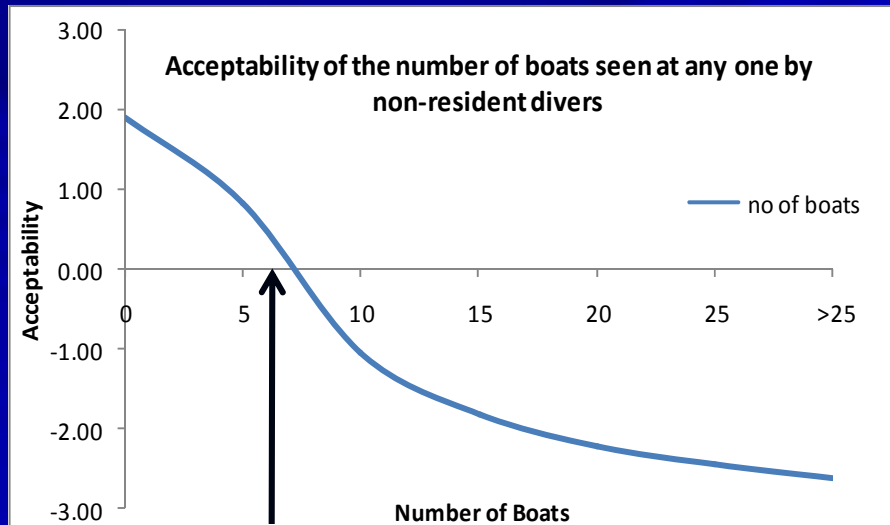
# Norms for Anglers



Actual number of boats seen = 7

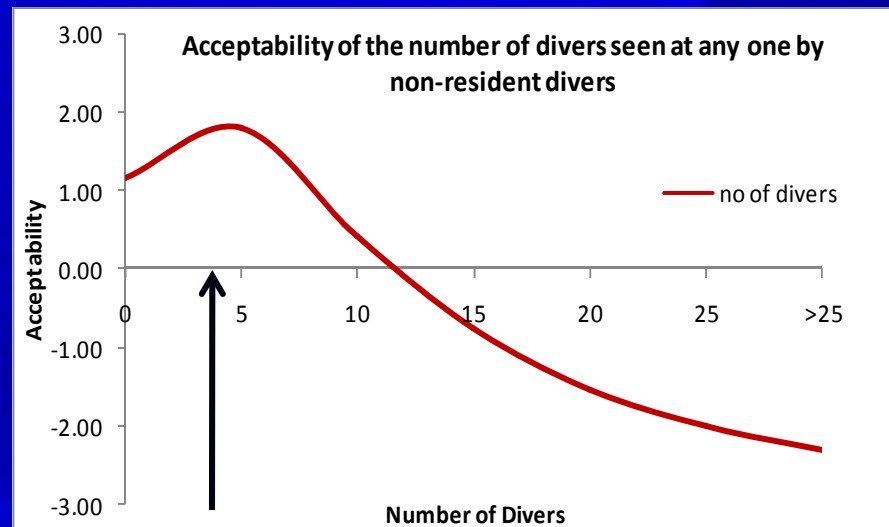
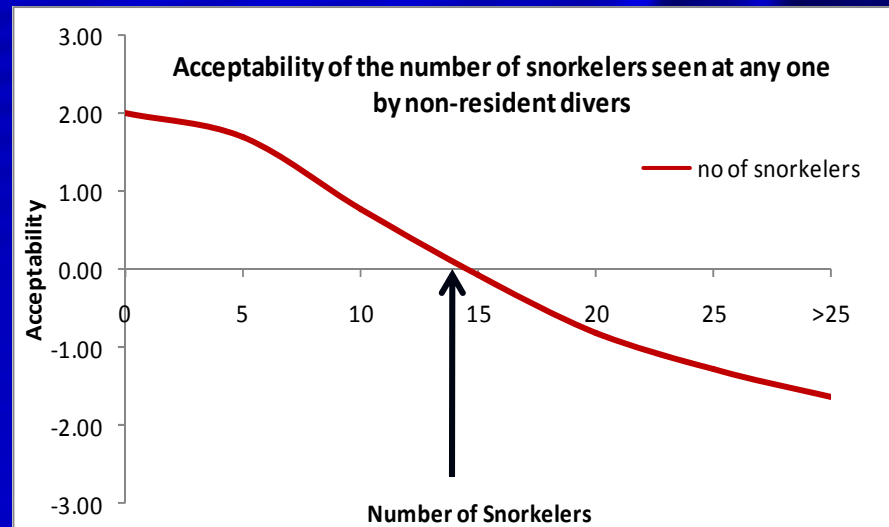
# Norms for Divers

Actual no. of snorkelers = 14



Actual number of boats seen = 6

Actual number of divers = 4.4

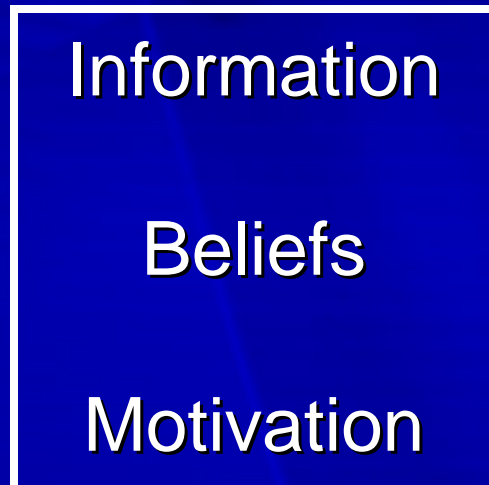


# Potential Conflict: Attributions

- People attempt to determine the causes for outcomes or things in the world around them
- Attributions are these “perceived causes”
- Several types of attributions:
  - internal and external;
  - blaming and non-blaming

# How Attributions Relate to Conflict

Antecedents



Attributions



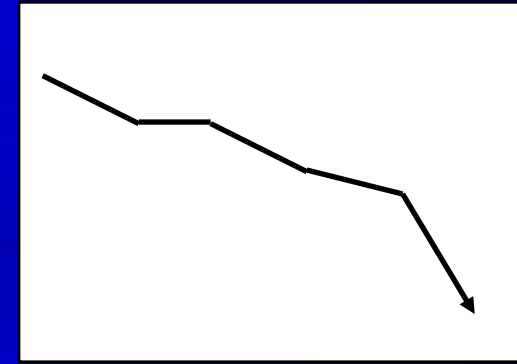
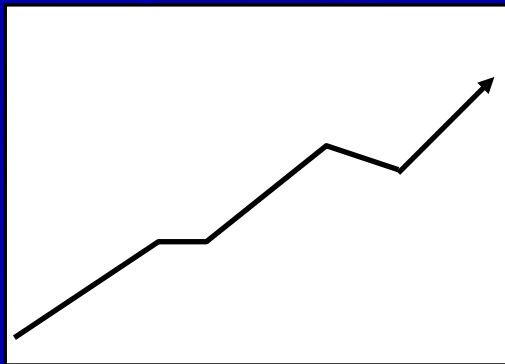
Consequences



# Attributing Causes for Reef Conditions

Do users view the condition and trends of reefs in the Florida Keys as suboptimal?

If so, to what extent are users blaming themselves and others?



# Attribution Results

Angler and divers views of the ecological condition of reefs in the Florida Keys:

## Current condition

- 1 = Poor
- 2 = Fair
- 3 = Good
- 4 = Very Good
- 5 = Excellent

## Divers

2.89

## Anglers

2.46

## Trends

- 1 = Declining substantially
- 2 = Declining somewhat
- 3 = Staying the same
- 4 = Improving somewhat
- 5 = Improving substantially

## Divers

2.53

## Anglers

2.29

# Attribution Results

A positive or negative impact on the ecological health of coral reefs in the Florida Keys?

	<u>Diving</u>	<u>Comm. Fish.</u>	<u>Snorkeling</u>	<u>Rec. Fishing</u>
Divers	4.09	2.77	4.00	3.37
Anglers	3.54	2.54	3.56	3.64
	<u>Water Quality</u>	<u>Hurricanes</u>		
Divers	4.21	2.51		
Anglers	4.12	2.63		

(1 = ext. negative; 7 = ext. positive)

# Attribution Results

Are the following activities resulting in long lasting damage to reefs?

	<u>Snorkeling/Diving</u>	<u>Recreational Fishing</u>
Divers	3.33	3.43
Anglers	3.36	3.32

(1 = strongly disagree; 5 = strongly agree)

# Satisfaction with Experience

<u>Anglers</u>	<u>Expectation</u>	<u>Actual</u>	<u>Satisfaction</u>
See large fish	3.76	3.09	3.06
Catch large fish	3.27	2.75	2.80
Easy Conditions	3.34	3.33	3.30

<u>Divers</u>	<u>Expectation</u>	<u>Actual</u>	<u>Satisfaction</u>
See healthy reef	4.05	3.89	3.50
Visibility	3.90	3.72	3.50
See large fish	3.76	3.60	3.36
See live coral	4.28	4.13	3.62

# Mediated Interaction - Anglers

	<u>L</u>	<u>M</u>	<u>H</u>	<u>VH</u>
Talking with other anglers	2.85	3.72	4.11	4.27
Bait and tackle shops	2.86	3.63	3.84	3.94
Rec. fishing magazines	2.02	2.89	3.46	3.54
Newspapers	2.01	2.84	2.93	2.77
Govt. agency publications	1.90	2.40	2.64	2.49
Conservation org. pubs.	1.83	2.43	2.54	2.49
Television	1.85	2.37	2.66	2.86
Radio	1.61	2.01	2.25	2.80
Club meetings	1.34	1.57	1.87	1.93

1=No use, 5=A lot of use

# Mediated Interaction - Divers

	<u>L</u>	<u>M</u>	<u>H</u>	<u>V H</u>
Talking with other divers	3.57	4.00	3.93	4.15
Dive shops/companies	3.73	3.91	3.90	3.99
Diving/snorkeling magazines	2.23	2.92	3.35	3.44
Conservation org. pubs.	1.57	1.91	2.05	2.47
Govt. agency publications	1.37	1.71	2.02	2.18
Club meetings	1.30	1.52	1.69	2.03
Newspapers	1.50	1.56	1.73	1.70
Television	1.23	1.65	1.82	1.76
Radio	1.10	1.32	1.37	1.43

1=No use, 5=A lot of use

# Recommend Returning?

If asked by a friend whether he/she should fish on or around the coral reef you visited on your most recent trip to the Florida Keys, what advice would you give?

Mean = 4.09 (Recommend)

If asked by a friend whether he/she should snorkel or dive at coral reef you visited on your most recent trip to the Florida Keys, what advice would you give?

Mean = 3.75 (Unsure to Recommend)

# Selected Conclusions

- Both divers and anglers think the reefs are in fair to good condition, but are declining somewhat
- It isn't too crowded
- There may be some blaming going on amongst user groups
  - It isn't my fault
  - It's their fault

# Selected Conclusions

- Placement of information messages may need to be adjusted:
  - Conservation and government publication not being used much
  - Radio and TV not being used much
  - Dive shops, bait/tackle shops, and speaking with each other is
- There appears to be some latitude for management actions

# Thank you

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