

# Community awareness and influence: A case study of MPAs in Puget Sound



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# Definition of a Marine Protected Area (MPA)

- Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment. (Resolution 17.38 of the IUCN general assembly [1988] reaffirmed in Resolution 19.46 [1994])
- The Washington State Legislature defined an MPA as “a geographic marine or estuarine area designated by a state, federal, tribal, or local government in order to provide longtermprotection for part or all of the resources within that area.” (Substitute Senate Bill 6231 (2008))

# Status of Washington MPAs (Van Cleve et al. 2009:2)

- Washington is home to 127 MPAs managed by eleven federal, state, and local agencies.
- Cover approximately 644,000 acres and over six million feet of shoreline.
- The median size of an MPA in the state is slightly over 23 acres, range from less than one acre to over 300,000 acres.
- Between 1 to 5% of the Puget Sound and coastal region (excluding the greater San-Juan Island area and North Olympic Coast) is covered by an MPA.
- Almost all MPAs restrict harvest or other impacts to marine resources to some degree.

# History of Puget Sound MPA Establishment

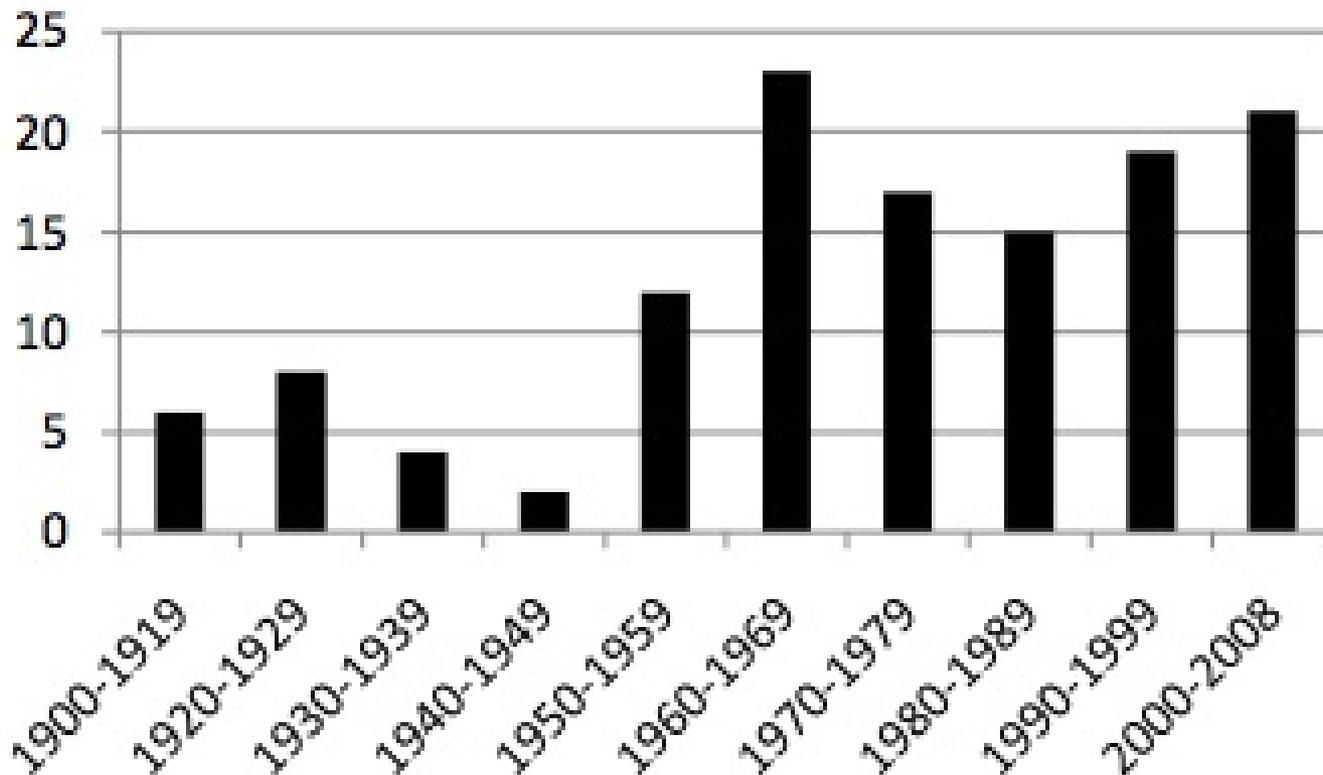


Figure 1. Number of MPAs Established by Year

# Key social contextual considerations in Puget Sound

- Growing awareness of declining Puget Sound conditions
- Much of general public still believes Puget Sound healthy
- Complex social landscape: treaty tribe-government agency co-management, variety of agencies involved in resource management/MPAs
- Strong legal framework and deference to courts for resource management, but institutions stretched thin

# Social Science Research Gaps in Puget Sound

- Few studies examine processes and controversies surrounding MPA establishment in Puget Sound:
  - Whitesell et al. 2007
  - Evans and Klinger 2008
  - Singleton 2009
  - Van Cleve et al. 2009
- Need for identification of social factors that contribute to MPA establishment success.

# Specific Goals of this Research

- Collaborative Governance
  - Fill an empirical research gap related to governance challenges of MPAs in Puget Sound.
  - Determine what factors influence the presence of collaboration in the planning process.
  - Initial examination of the relationship between measures of MPA collaborative planning and social success metrics.

# Research Question

- How does community awareness of MPAs vary around Puget Sound?
- How much influence did the community think that it had during the establishment processes of these MPAs?
- Did the community perceive that collaboration occurred between the government and the public in the establishment processes?

## WA Department of Natural Resources (DNR):

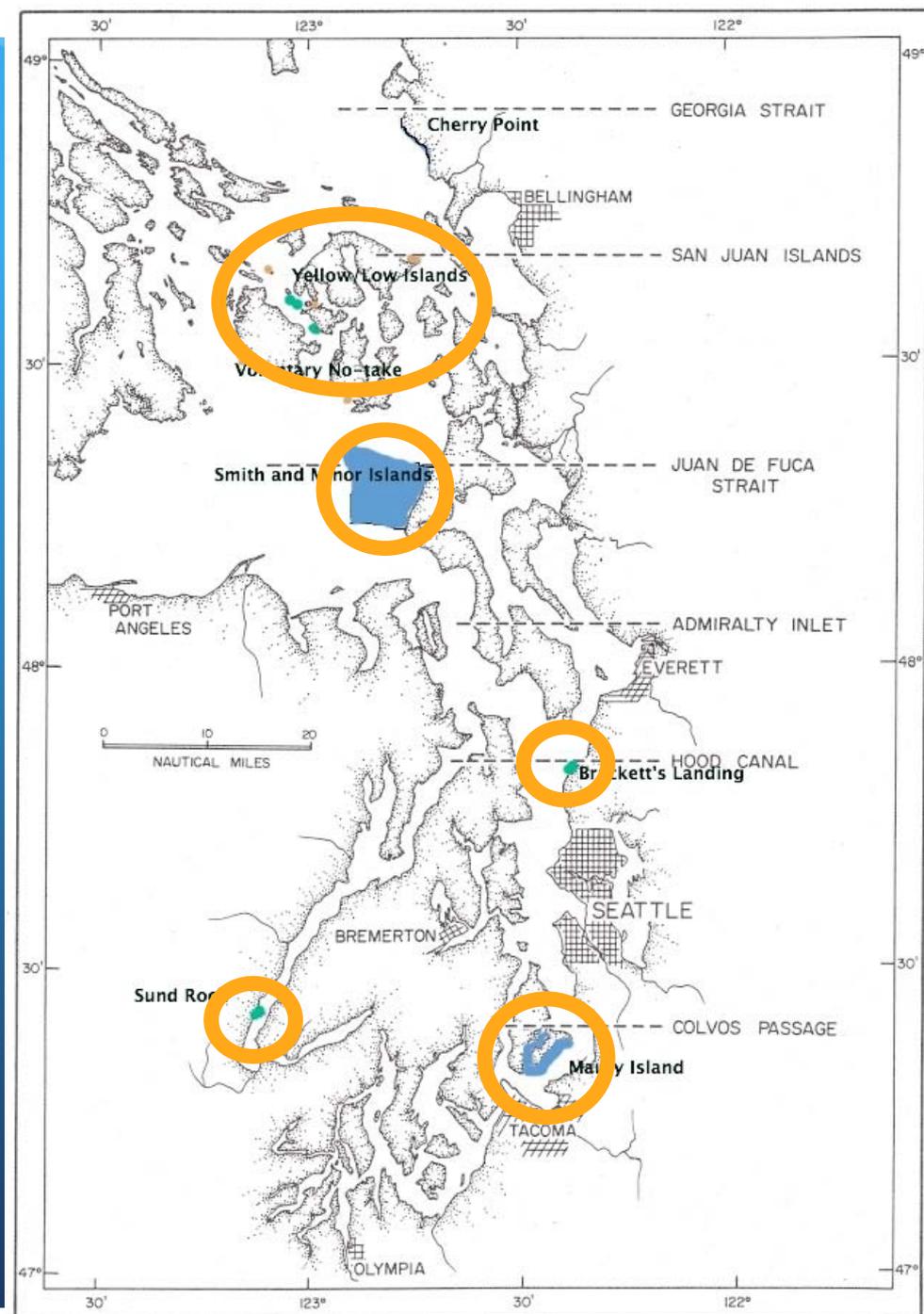
- Maury Island Aquatic Reserve
- Smith and Minor Island Aquatic Reserve

## WA Department of Fish and Wildlife (WDFW):

- Conservation Areas
  - Brackett's Landing (Edmonds Underwater Park)
  - Sund Rock
- Marine Preserves
  - Yellow and Low Island
  - Shaw Island

## San Juan County Marine Resources Committee (MRC):

- Voluntary No-Take Bottomfish Recovery Zones (BRZs)



# Structured Surveys

- 936 Waterfront Users
- 138 Resource Users
- 46 Government Officials
- 30 Key Informants

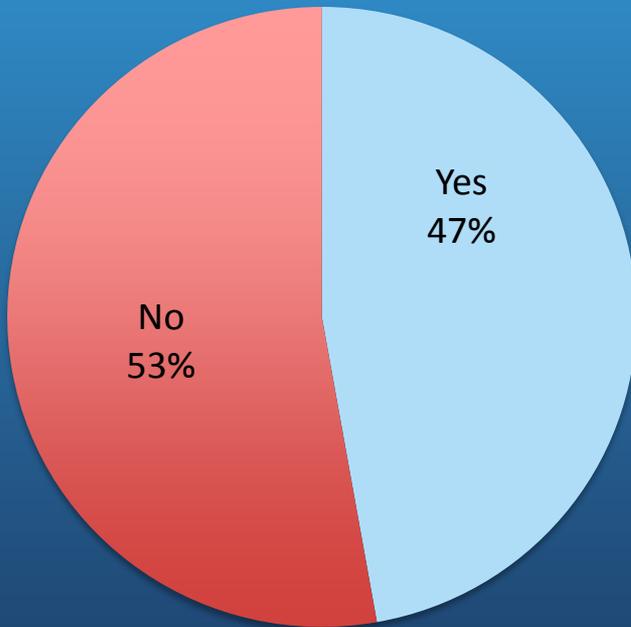


# Profile of waterfront users

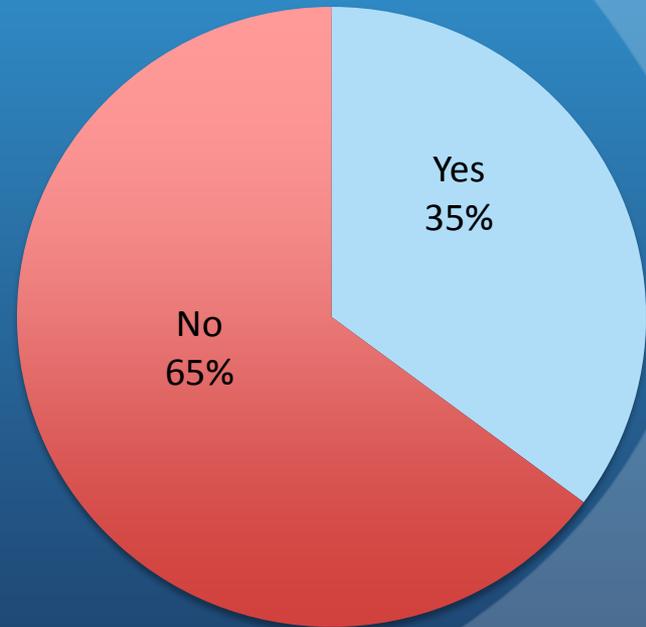
- Average age of respondent: 51.2 years old
- Average length of residence in Puget Sound
  - Females: 22.8 years (N=267)
  - Males: 27.4 years (N=615)  
*\*\*t=2.981, p<0.01, N=927*
- Education levels:
  - Females: 15.7 years (N=281)
  - Males: 15.1 years (N=640)  
*\*\*t=3.776, p<0.01, N=921*

# General awareness of nearby MPA

Males (N=642)



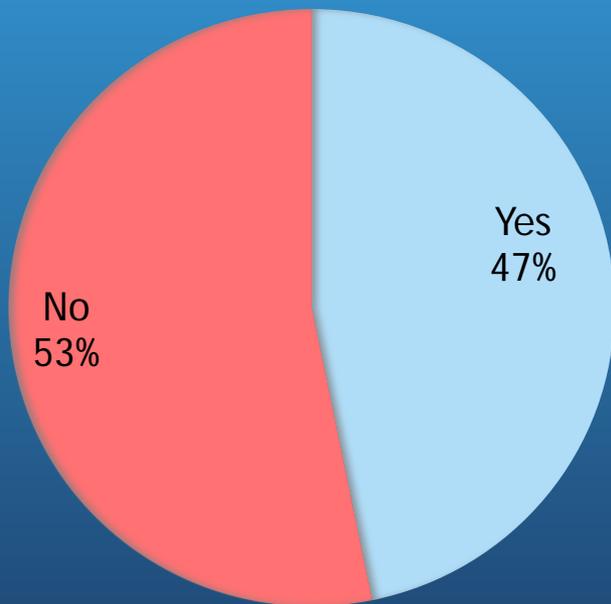
Females (N=234)



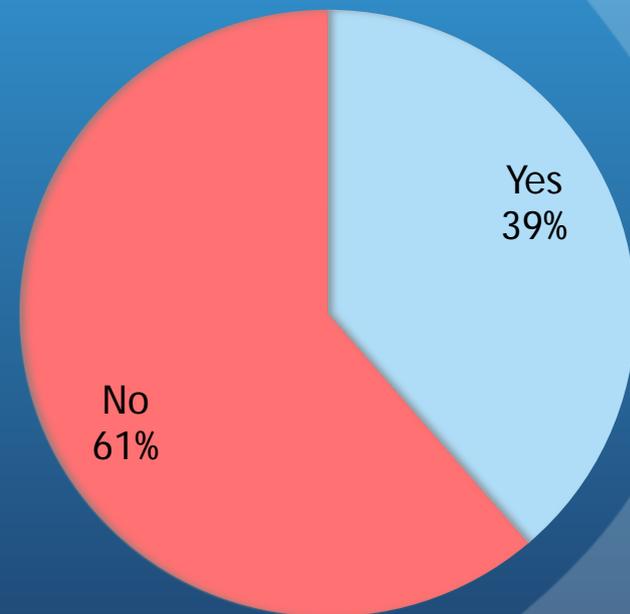
\*\* $\chi^2 = 11.630, p < 0.01$

# General awareness of nearby MPA

Those with at least  
a college degree (N=281)

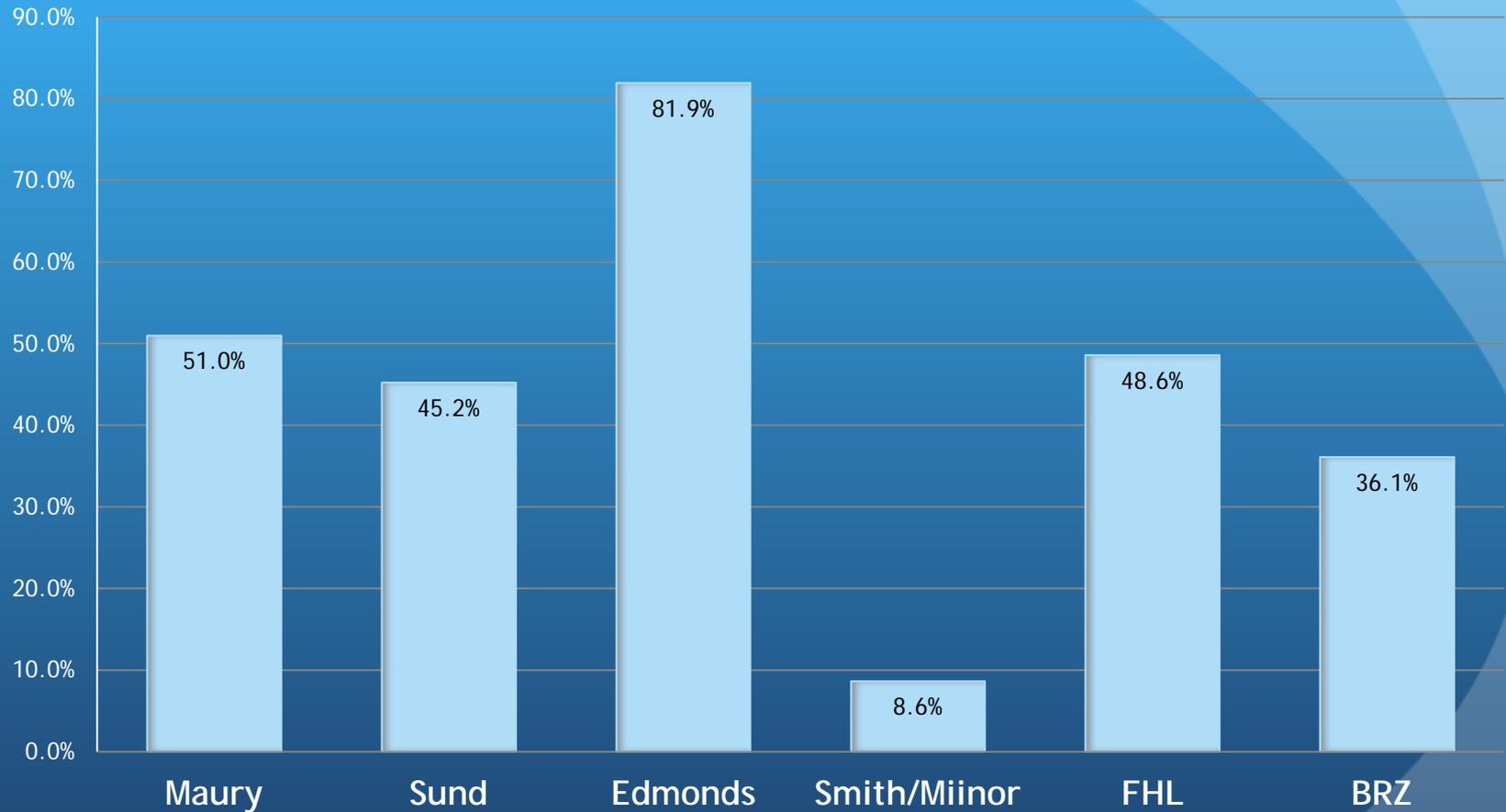


Those without  
a college degree (N=640)



\* $\chi^2 = 5.979, p < 0.05$

# Awareness by site

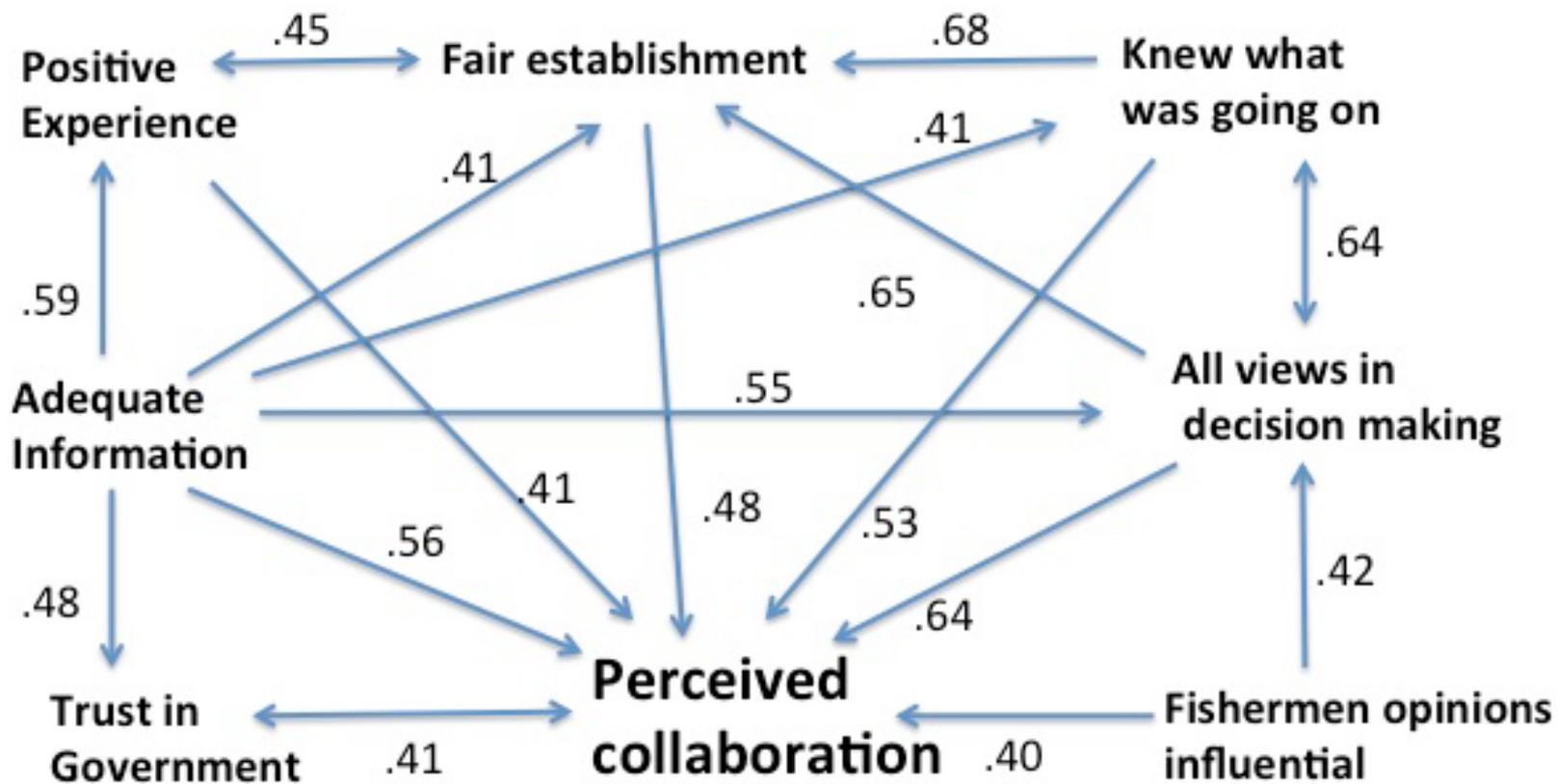


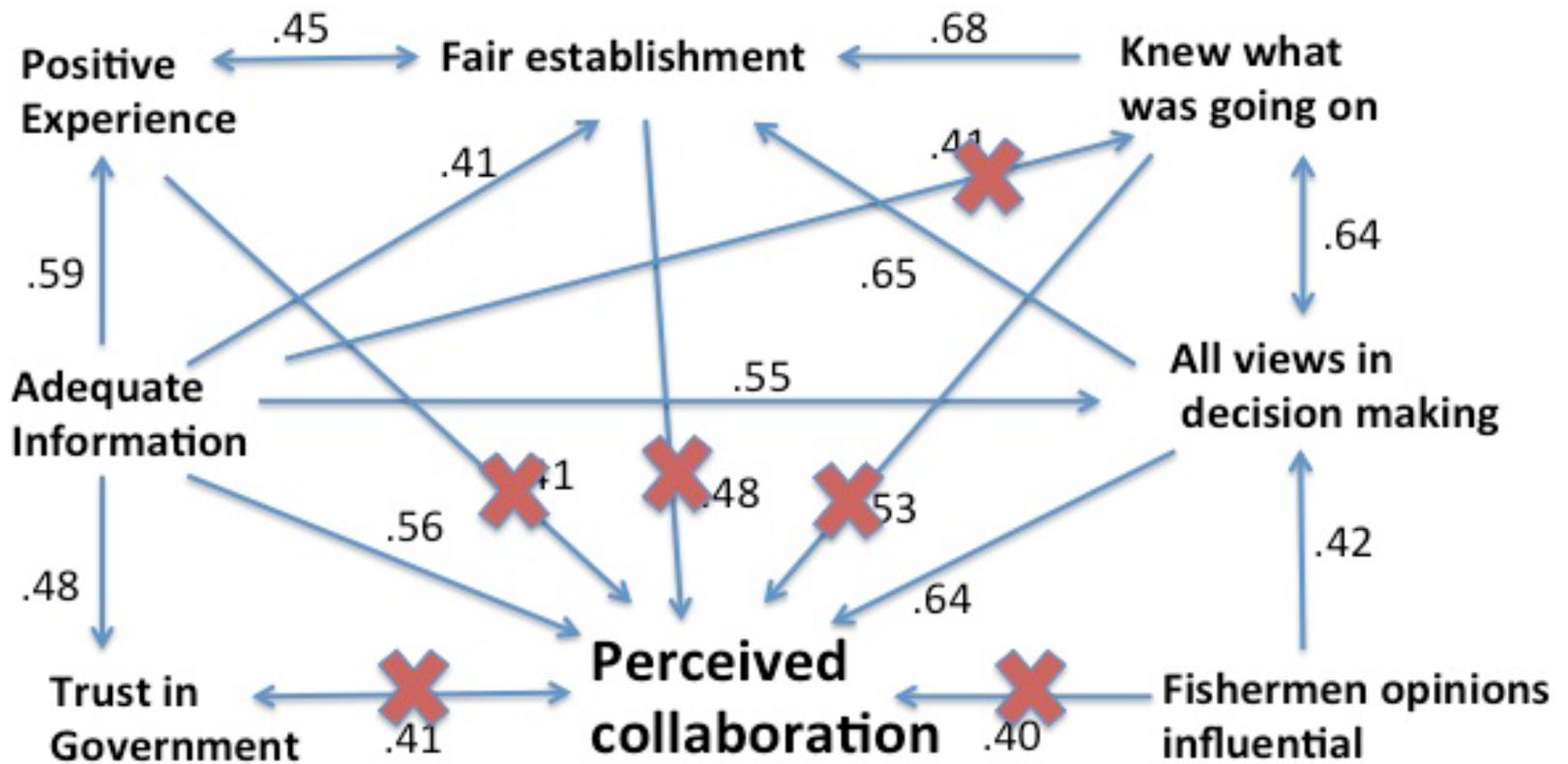
\*\*H=198.228, p<0.01

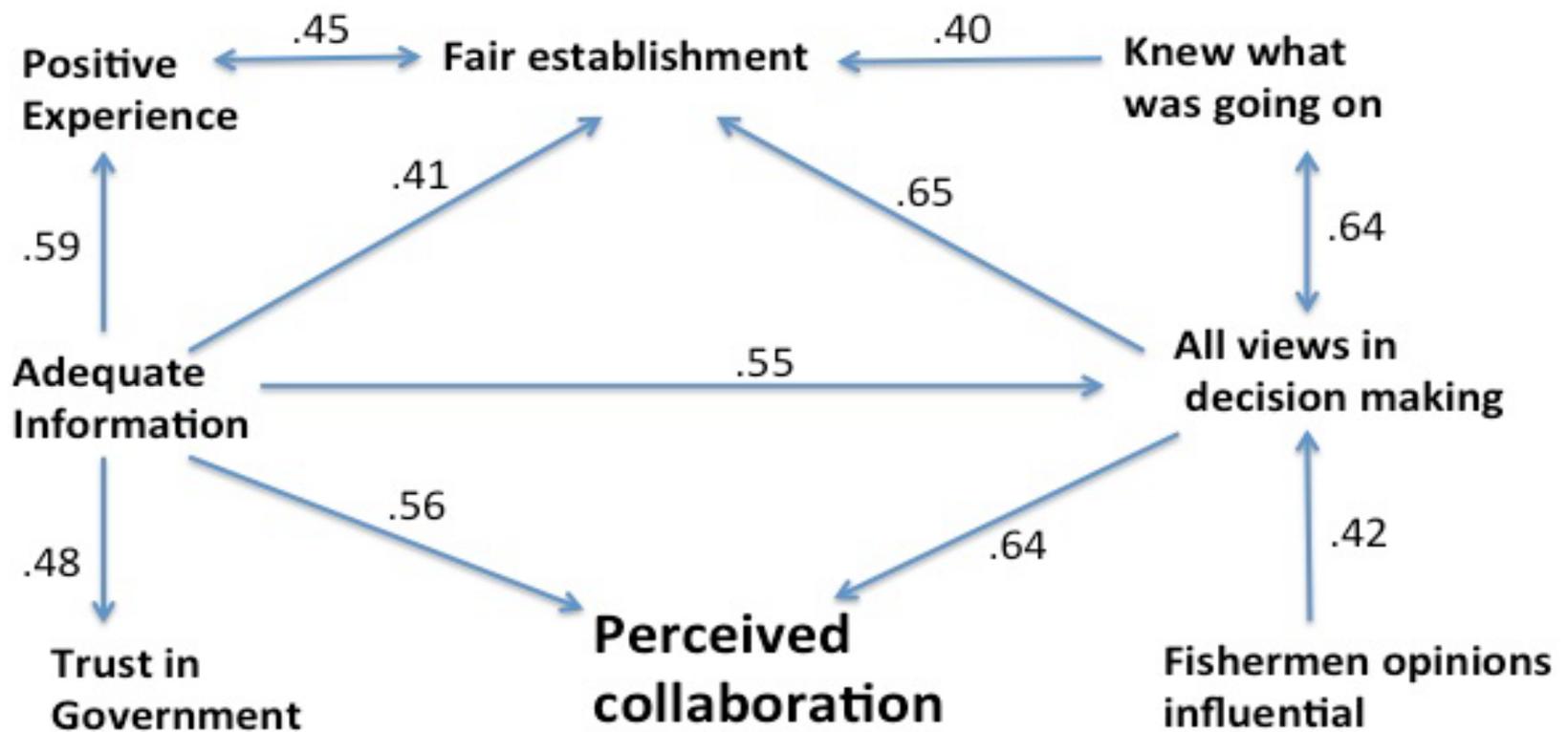
# Perceived Collaboration (people act based on perception)

- Resource user responses
  - How much influence the community had in the overall process
    - Scaled from No influence (1) to Highest influence (5)
  - Was the community involved throughout the process
    - Dichotomous answer: No (0) or Yes (1)
  - How open was the process
    - Scaled from very closed (1) to very open (5)

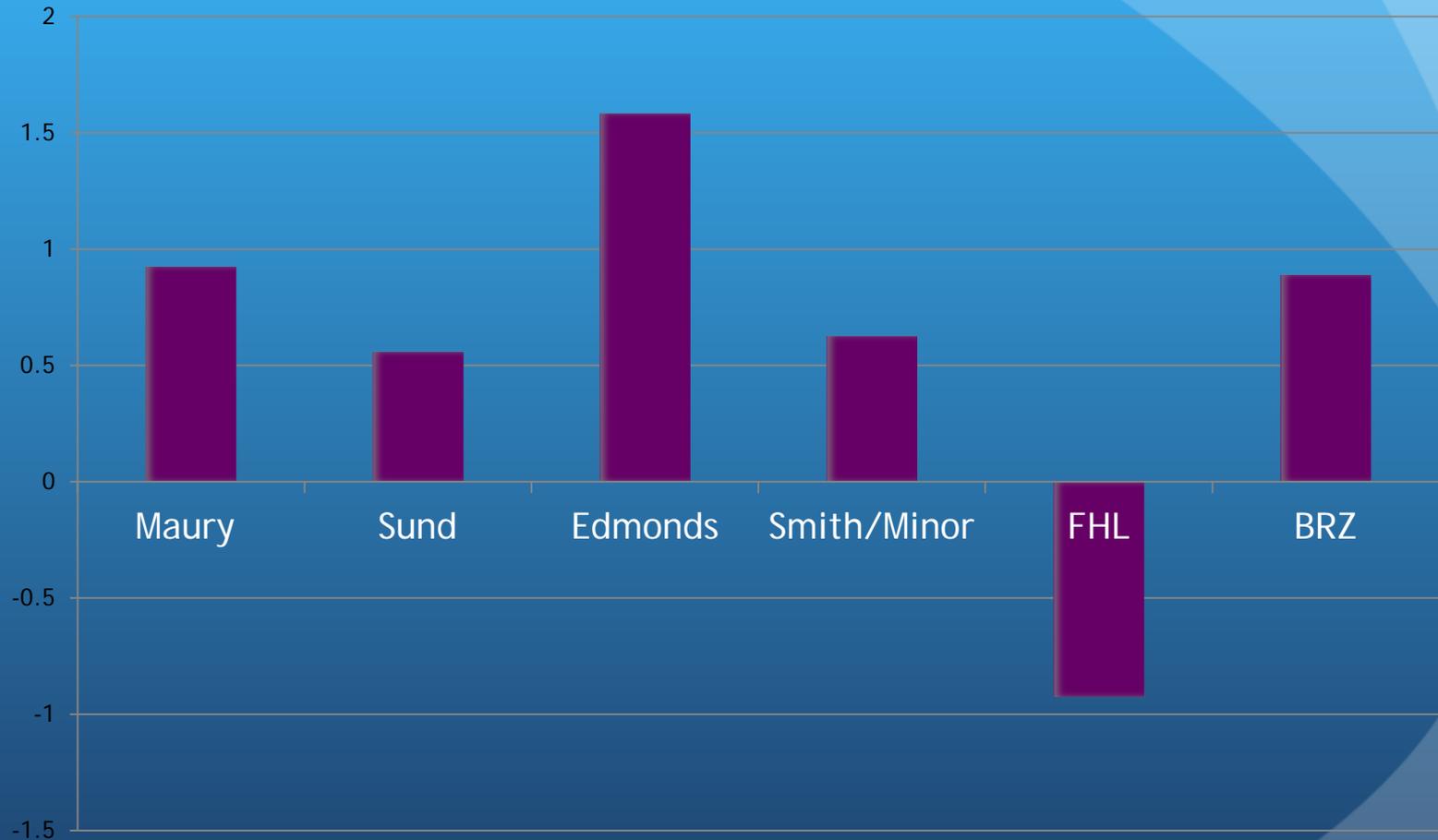
\*Cronbach's alpha reliability score of 0.643





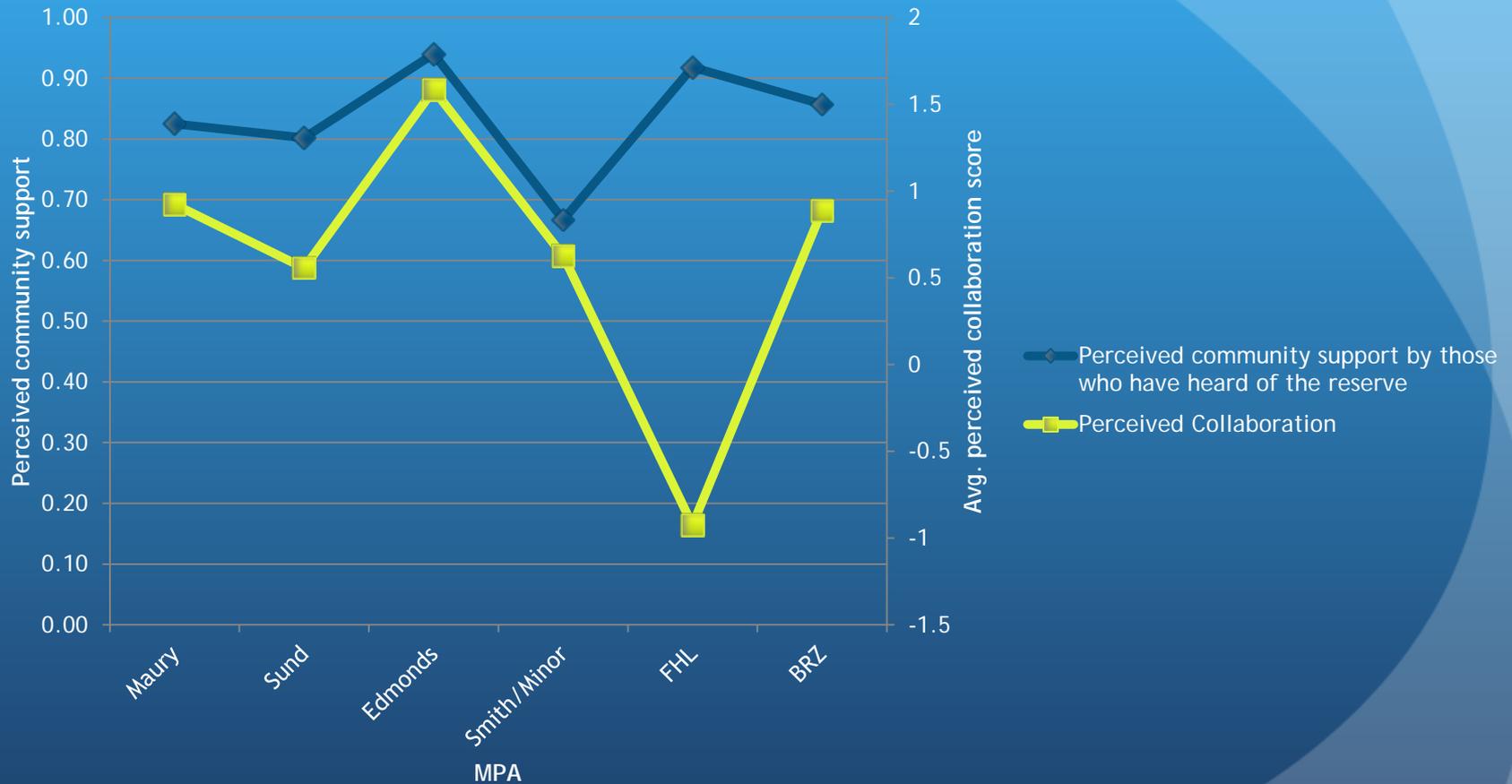


# Perceived collaboration by site



\* $H=16.728$ ,  $p=.005$

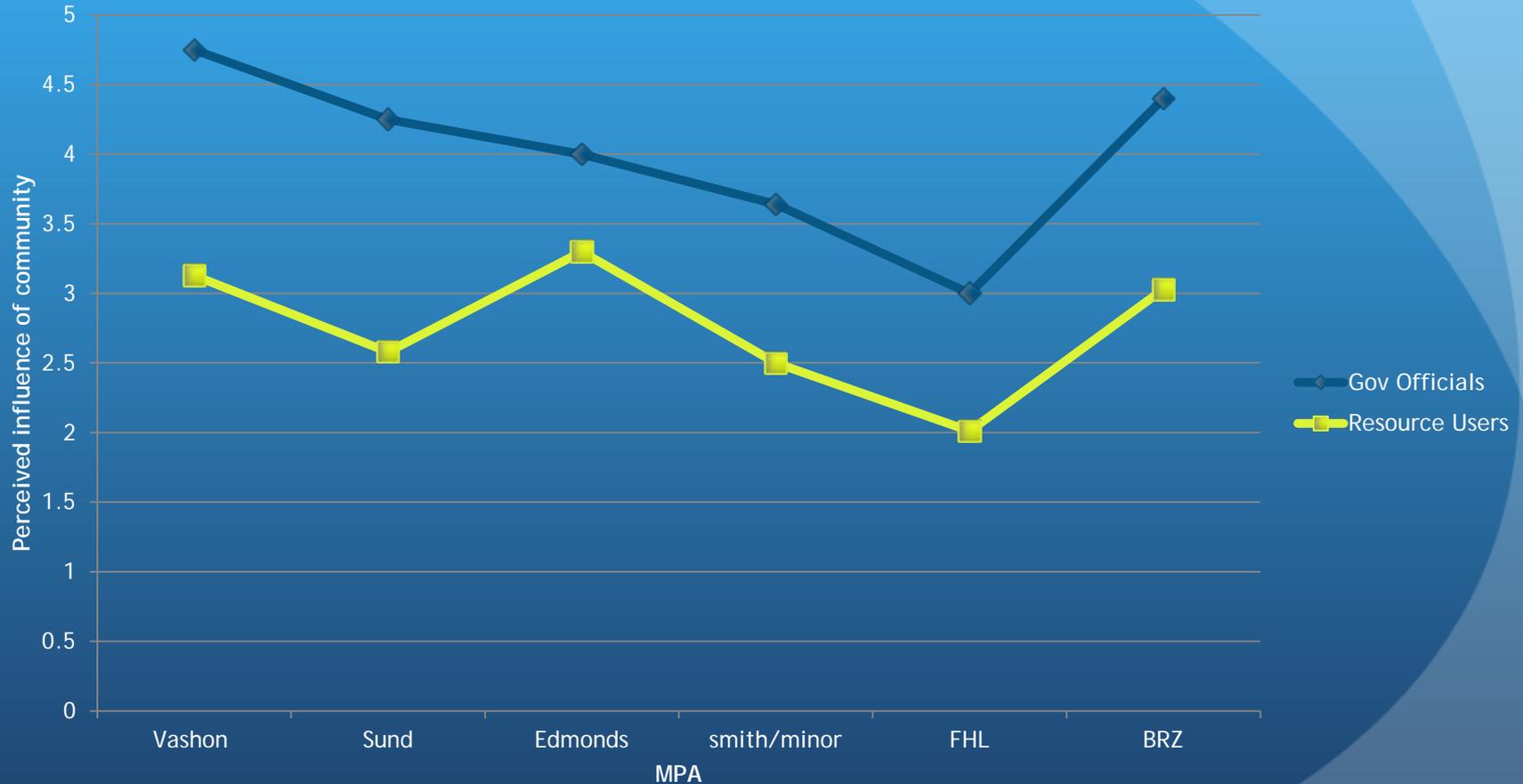
# Perceived collaboration compared to perceived community support



# How open was the process

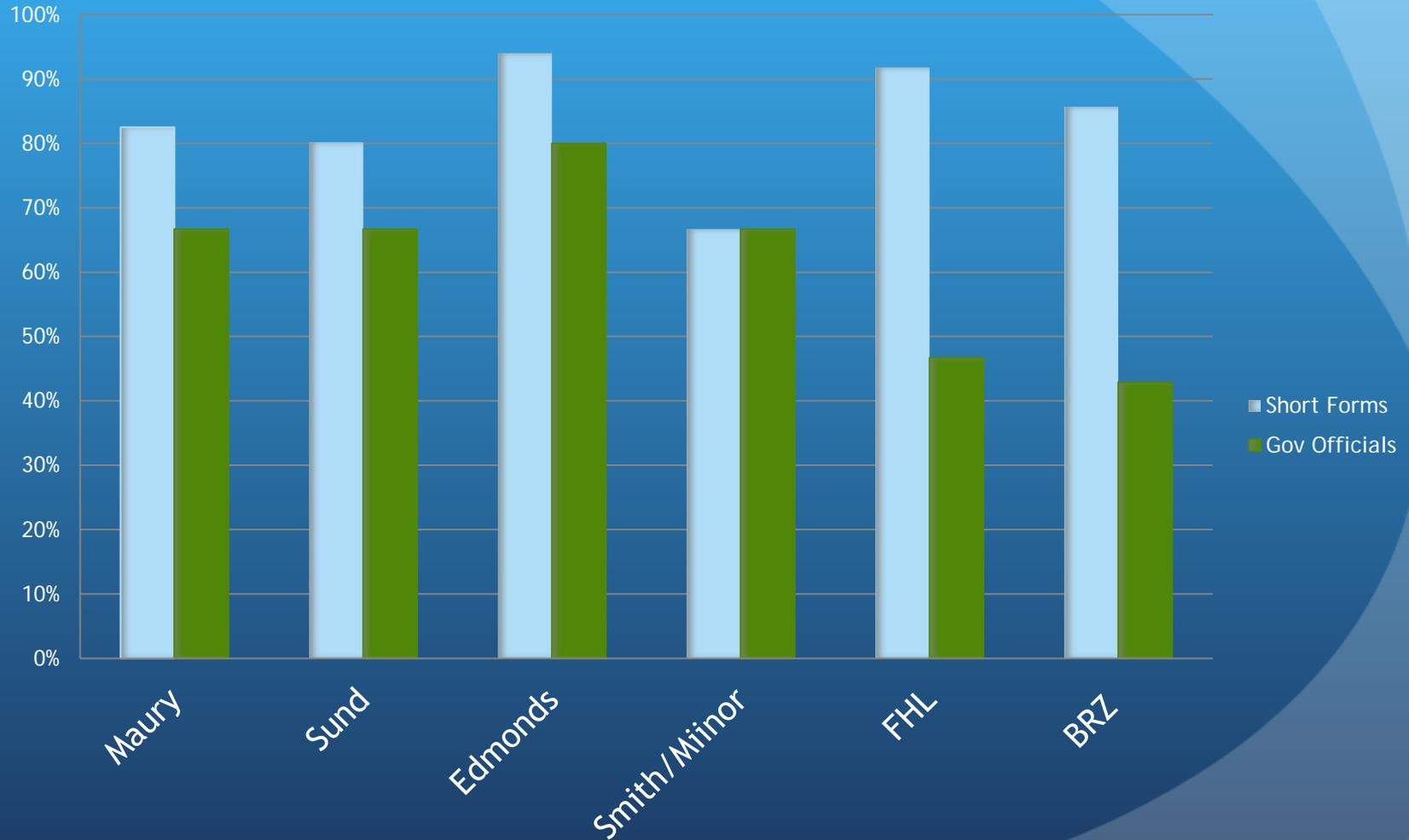


# How much influence the community had

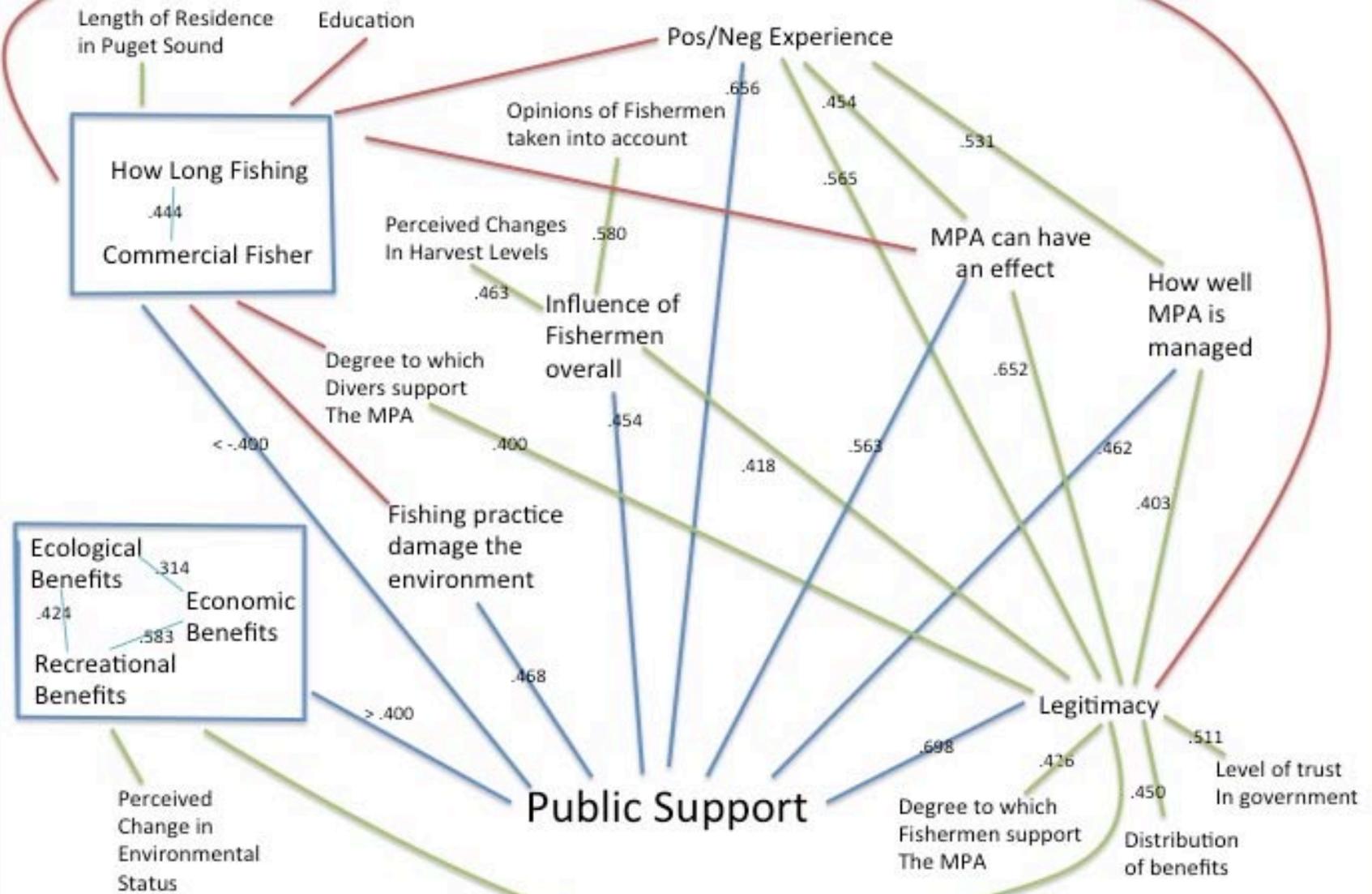


Community support

# Does the majority of the community support the reserve?



# What else may affect Public Support?



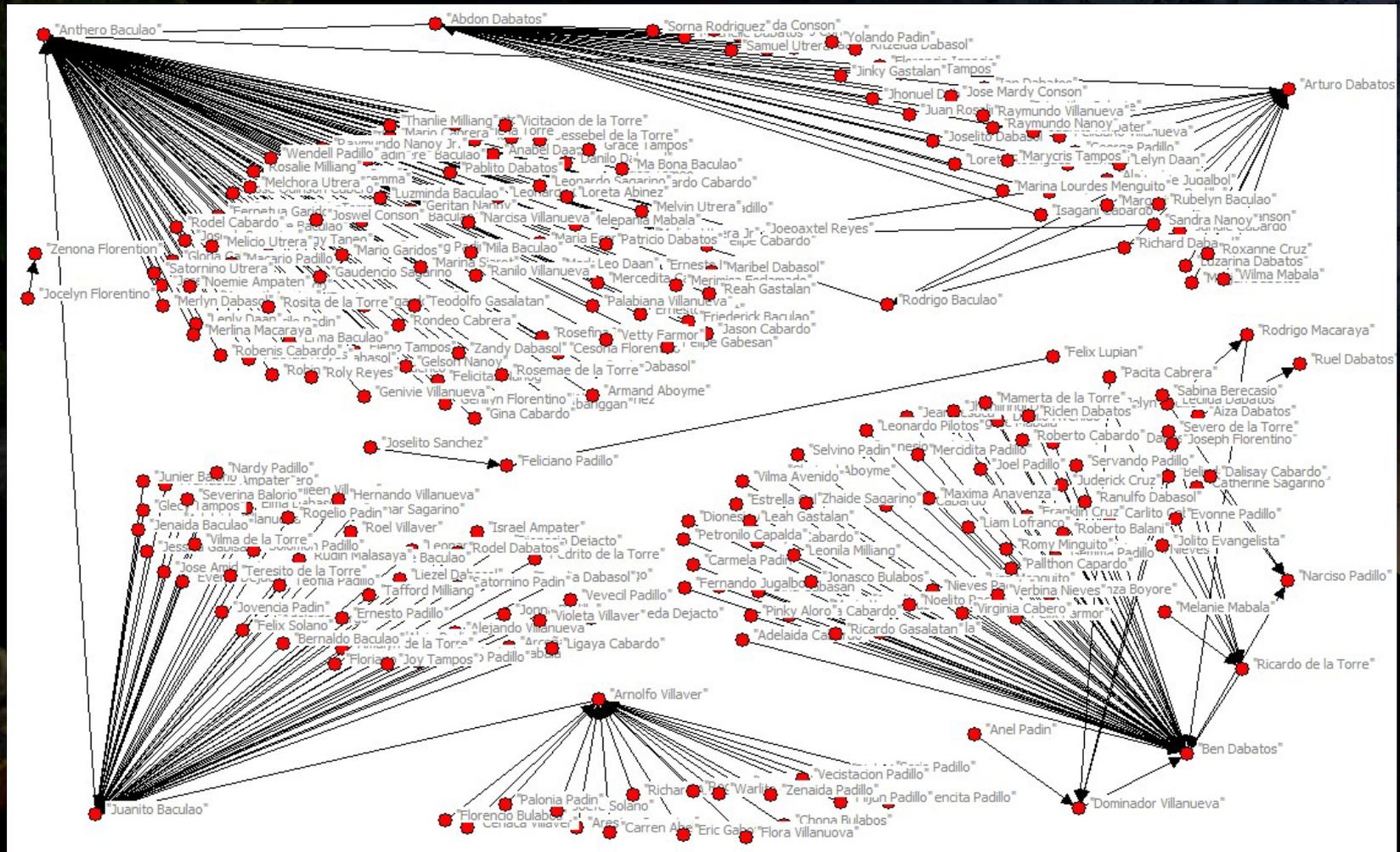
# Dependent Variable: Perceived increase in number of fish near MPA in 36 Philippine MPAs

<u>Significant independent variables</u>	<u>Coeff</u>	<u>t</u>	<u>p 2-tail</u>
Clear leadership for MPA	.30	2.0	.05
Community MPA enforcement group strength	.43	3.0	.01
Threat from commercial fishing	.41	2.6	.01

R=0.66    R<sup>2</sup>= 0.44    Adj R<sup>2</sup>=0.38    F=8.0    p<0.001    n=33

# Clear leadership for MPA

## Social network analysis for a successful MPA



# Summary of these findings

- Waterfront user awareness of sites varies:
  - By Gender and Education level
  - By site
- Perceived collaboration:
  - Dependent on
    - Which site is examined
    - Whether respondents perceived that adequate information and all views were included in decision-making
    - Whether the respondent attended a meeting
  - Is not correlated with:
    - Which interest group the respondent belongs to

# Proposed future research

- Comparative research in 25 sites on context and planning process factors affecting MPA success
- Economic cost benefit of selected areas
- Outreach to disseminate results and research-based strategy to develop more effective MPAs

# For more information, see:

- UW Masters in Marine Affairs theses by Clara Hard and Kristin Hoelting (2011)
- Upcoming publication in *Coastal Management* journal
- Summary of results hand out
- Christie, P., et al. 2003. Toward developing a complete understanding: A social science research agenda for marine protected areas. *Fisheries* 28(12):22-26.

# Acknowledgements

- Washington Sea Grant
- Informants





# Statistics Used

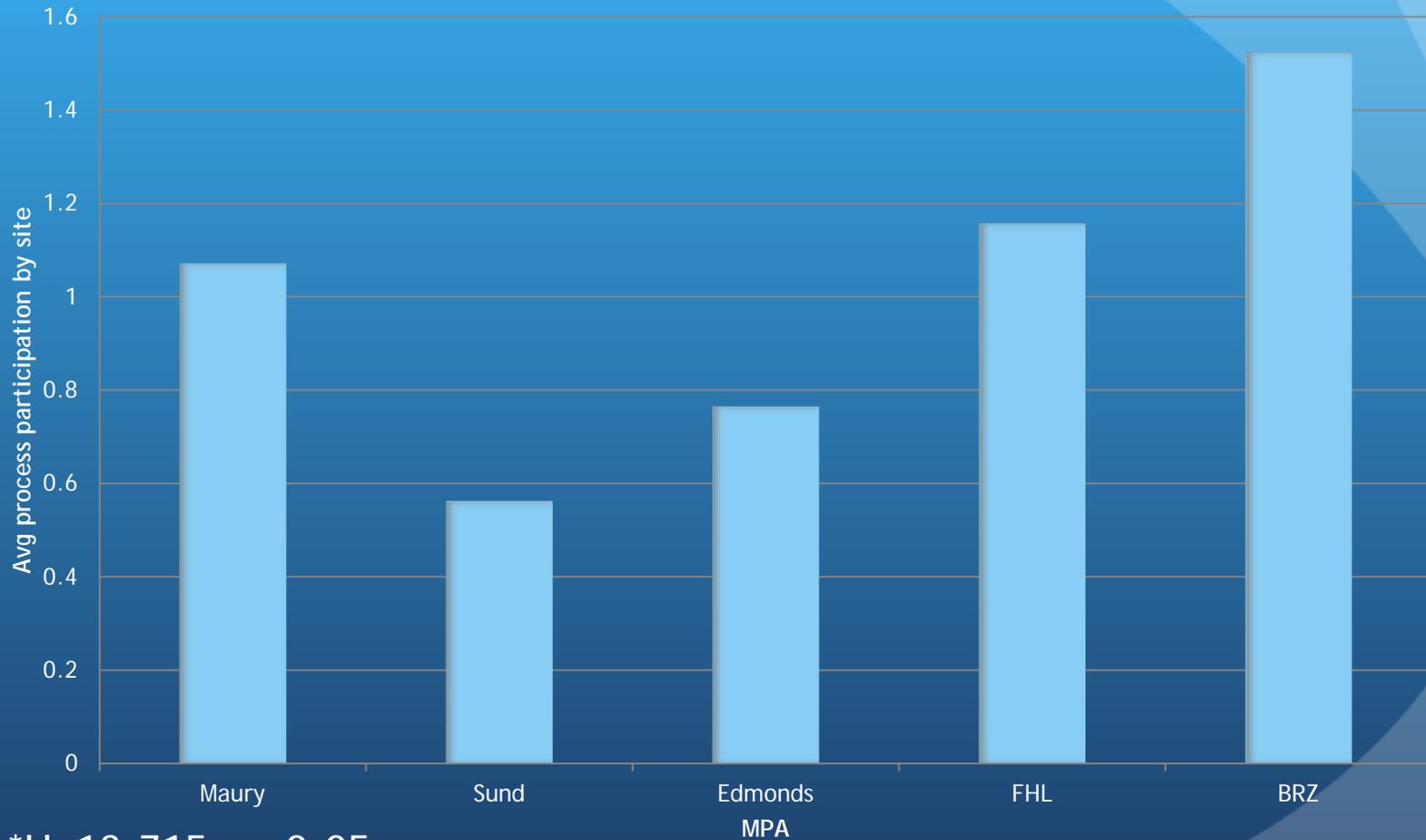
- SPSS
  - Independent t-tests
  - Chi-square goodness of fit
  - Mann Whitney U non-parametric tests
  - Kruskal-Wallis H tests for non-parametric analysis of variance
  - Scale reliability of consistency test- Cronbach's Alpha
  - Non-parametric Spearman's rho correlation analysis and partial correlations

Actual participation

# Process Participation

- Resource user responses
  - Did you attend a meeting?
    - Dichotomous answer: No (0) or Yes (1)
  - Did you receive informational materials about the reserve?
    - Dichotomous answer: No (0) or Yes (1)
  - Was your opinion about the reserve asked?
    - Dichotomous answer: No (0) or Yes (1)

# Process participation by site



\* $H=13.715$ ,  $p<0.05$