

An underwater scene with a blue tint. In the center, a metal cage is suspended. Numerous sharks are swimming around the cage. In the lower-left foreground, a shark is swimming towards the viewer. The background is filled with many smaller fish and more sharks.

# **Shark 'Cage-Diving' Ecotourism in Hawaii**

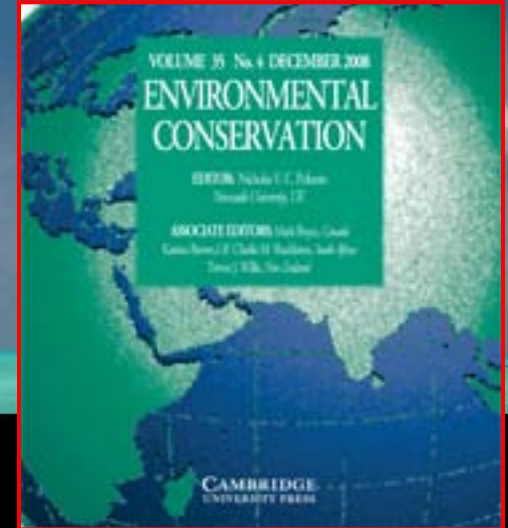
## **Public Safety Implications & Ecological Impacts**

**C. Meyer, K. Holland, Y. Papastamatiou, J. Dale  
Hawaii Institute of Marine Biology**

# Study Components

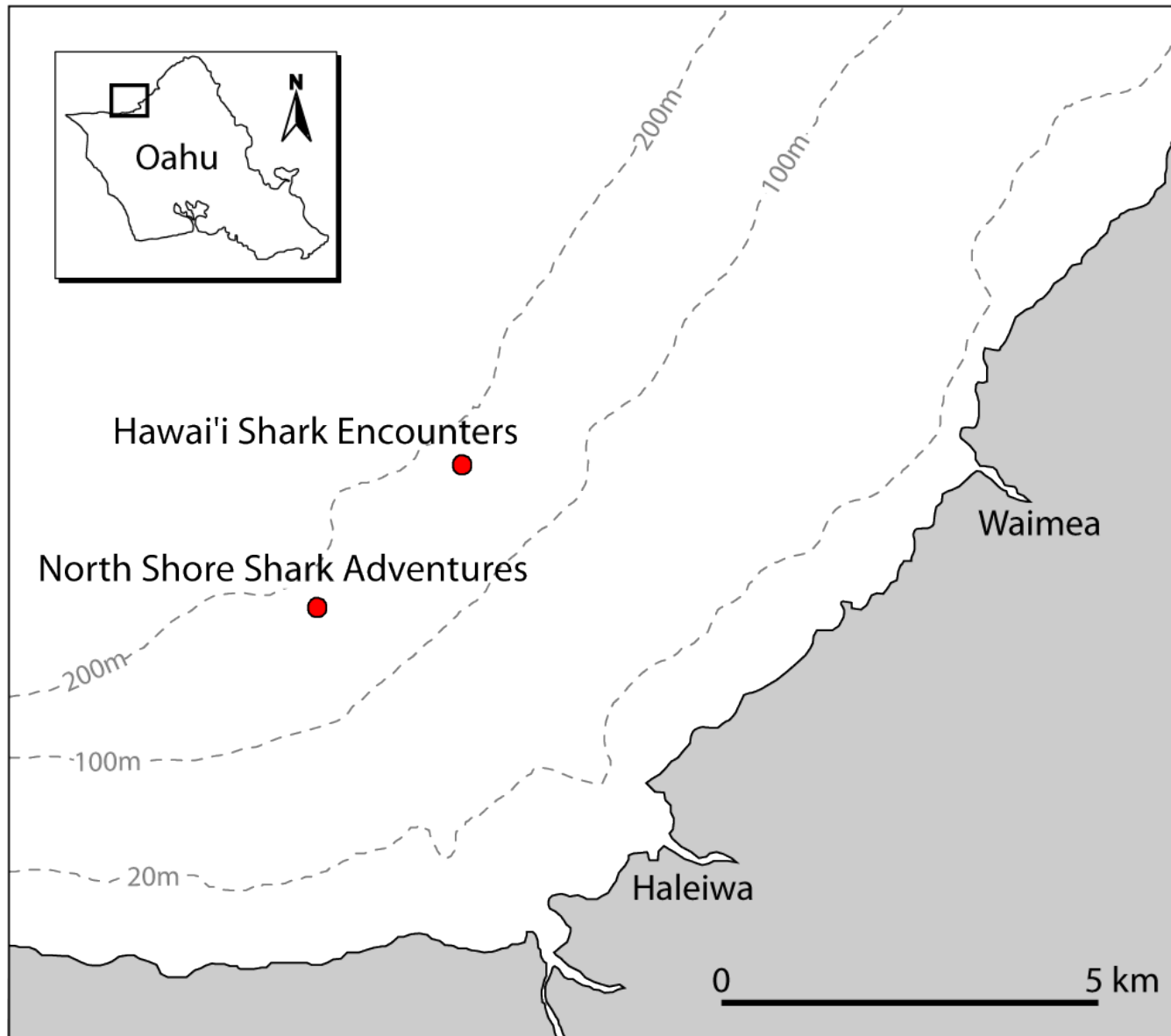
## Phase 1

- Basic characterization
- Preliminary risk assessment



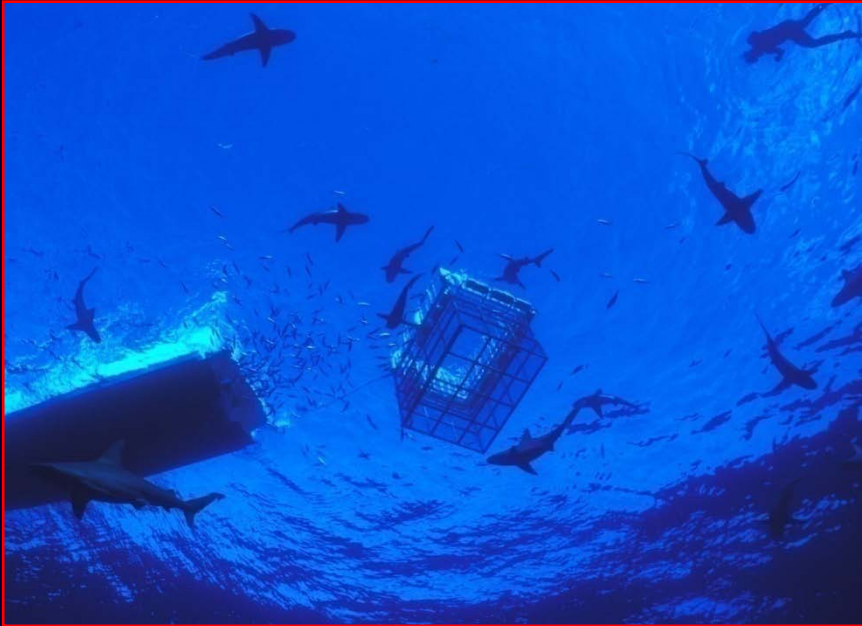
## Phase 2

# Shark Cage Diving: Location of Operations

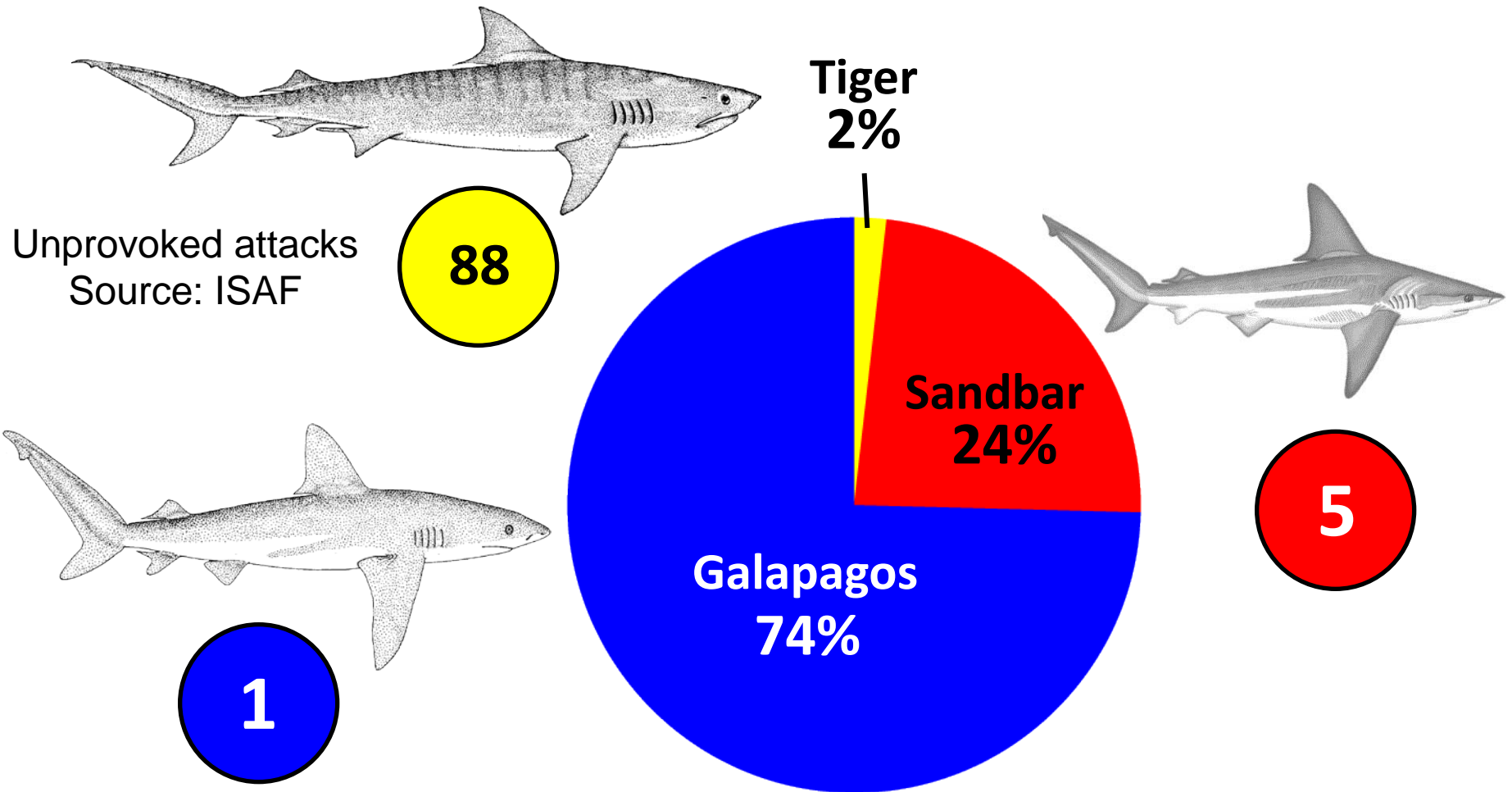




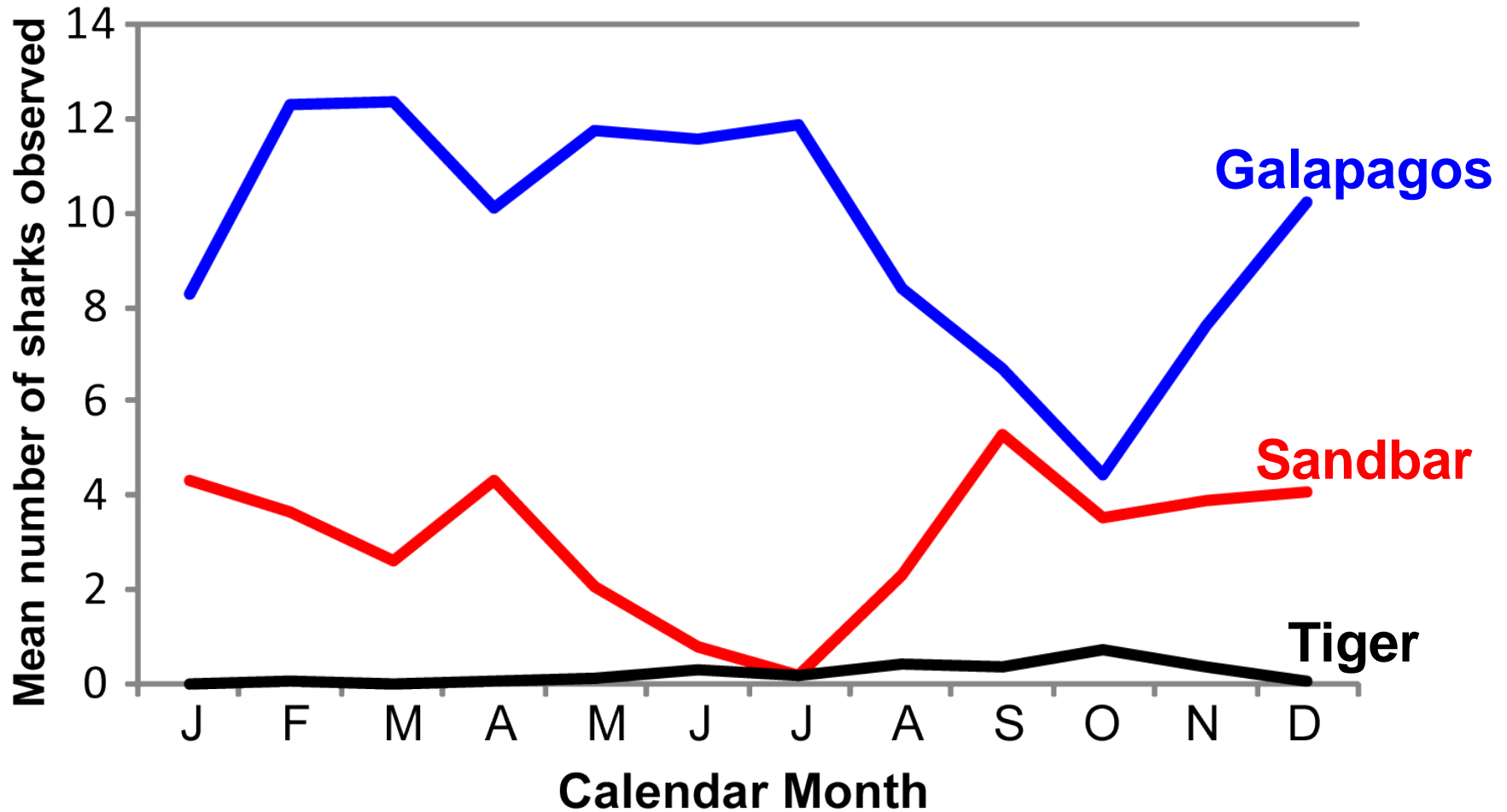
# Shark Cage Diving: *Modus operandi*



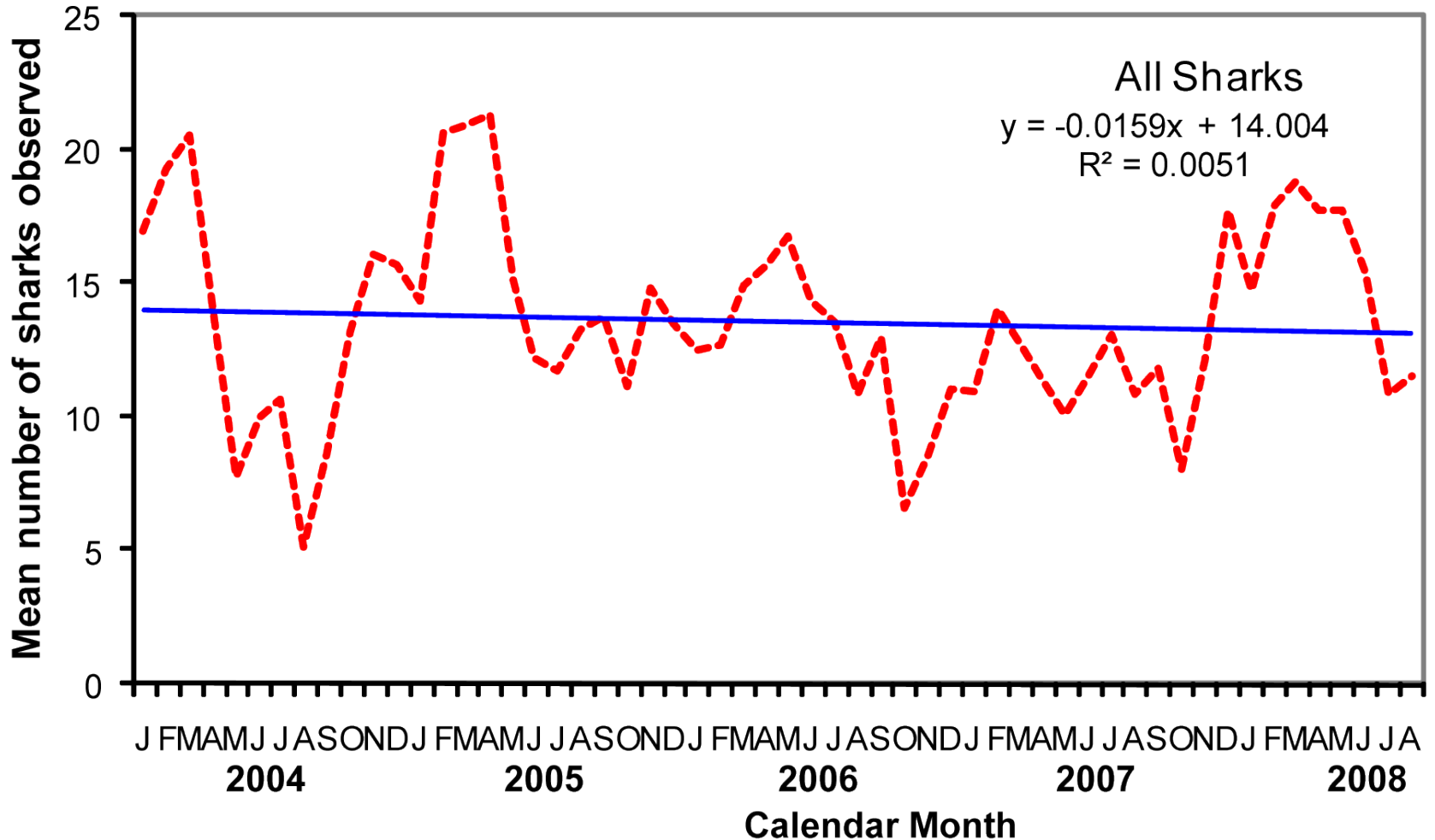
# Percent Occurrence



# Seasonal Patterns

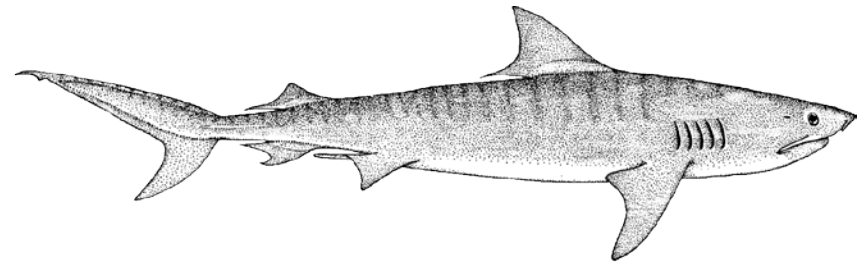
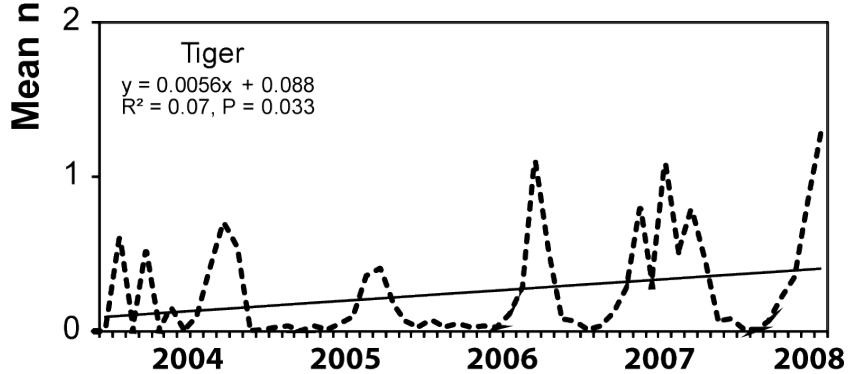
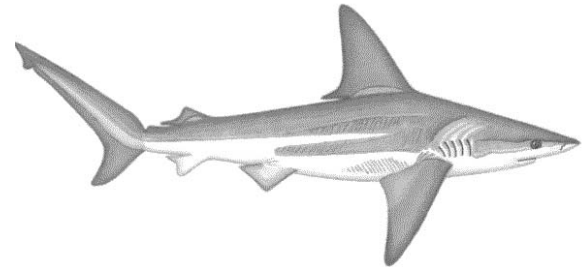
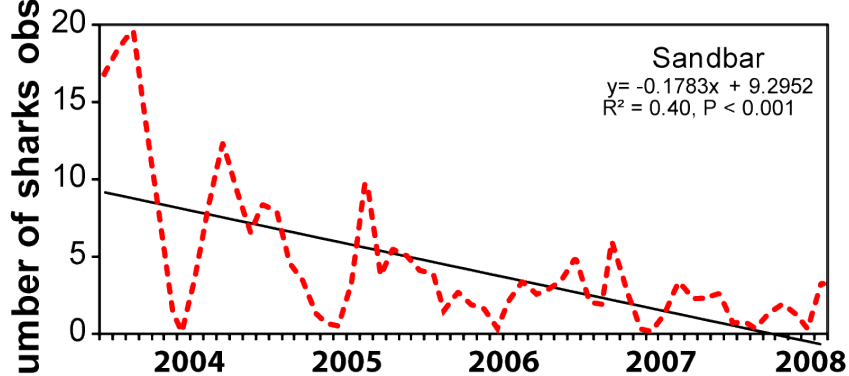
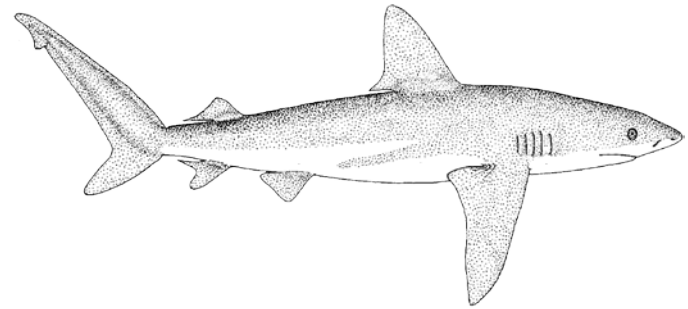
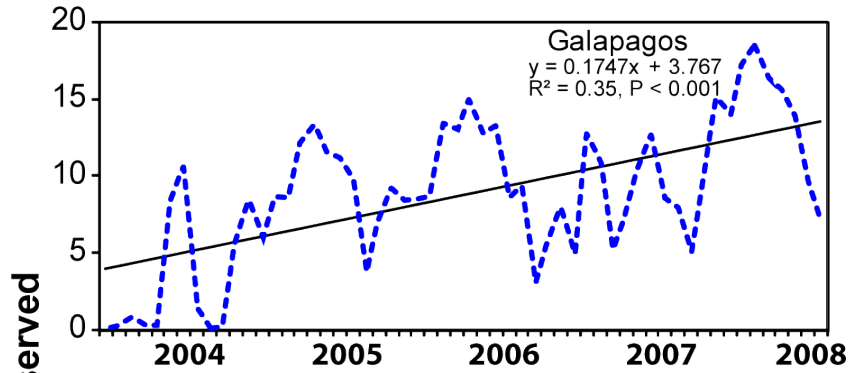


# Long-Term Trends





# Long-Term Trends





# Shark Attack Rate

North Shore (Kaena Pt. to Kahuku Pt.):

2000- To Date = 5 confirmed attacks

1990-1999 = 5 confirmed attacks

**No discernable change in shark attack rate since inception of shark tours (2001)**

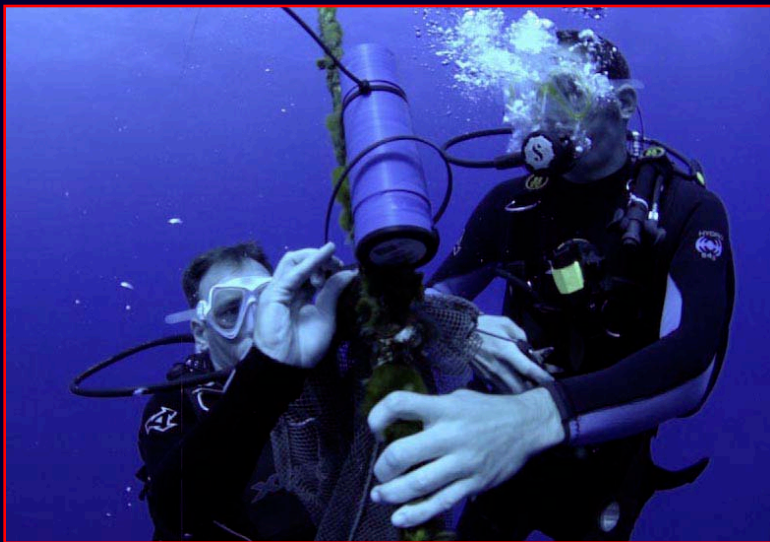
Sources: International Shark Attack Files

Global Shark Attack Files

Hawaii Division of Aquatic Resources

L. Taylor (1993) Sharks of Hawaii: their biology and cultural significance

# Core Tracking Technology: Acoustic Monitoring



# Public Safety Implications of Shark Ecotourism

Carl Meyer & Kim Holland – Hawaii Institute of Marine Biology

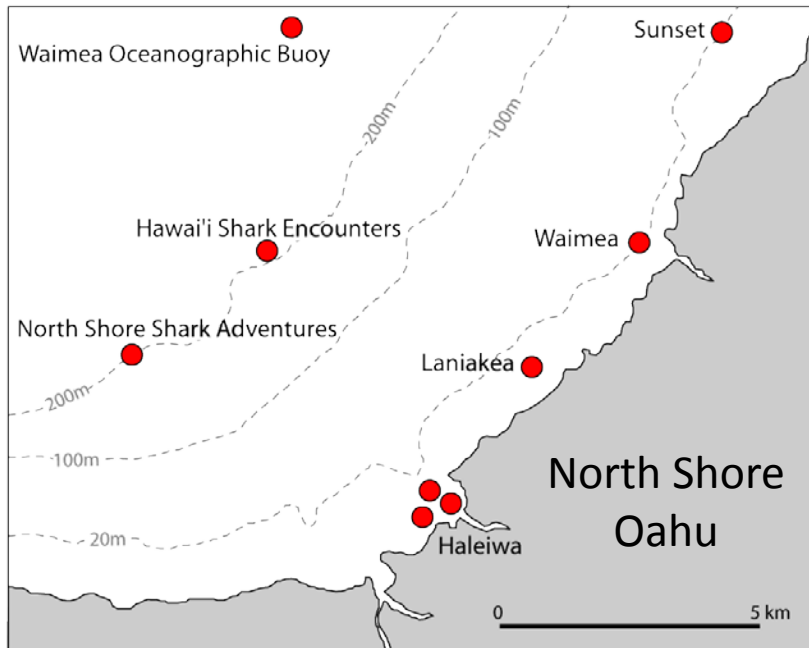


## Questions:

- (1) Do sharks follow boats back to shore?
- (2) Do sharks come into areas used for recreation?

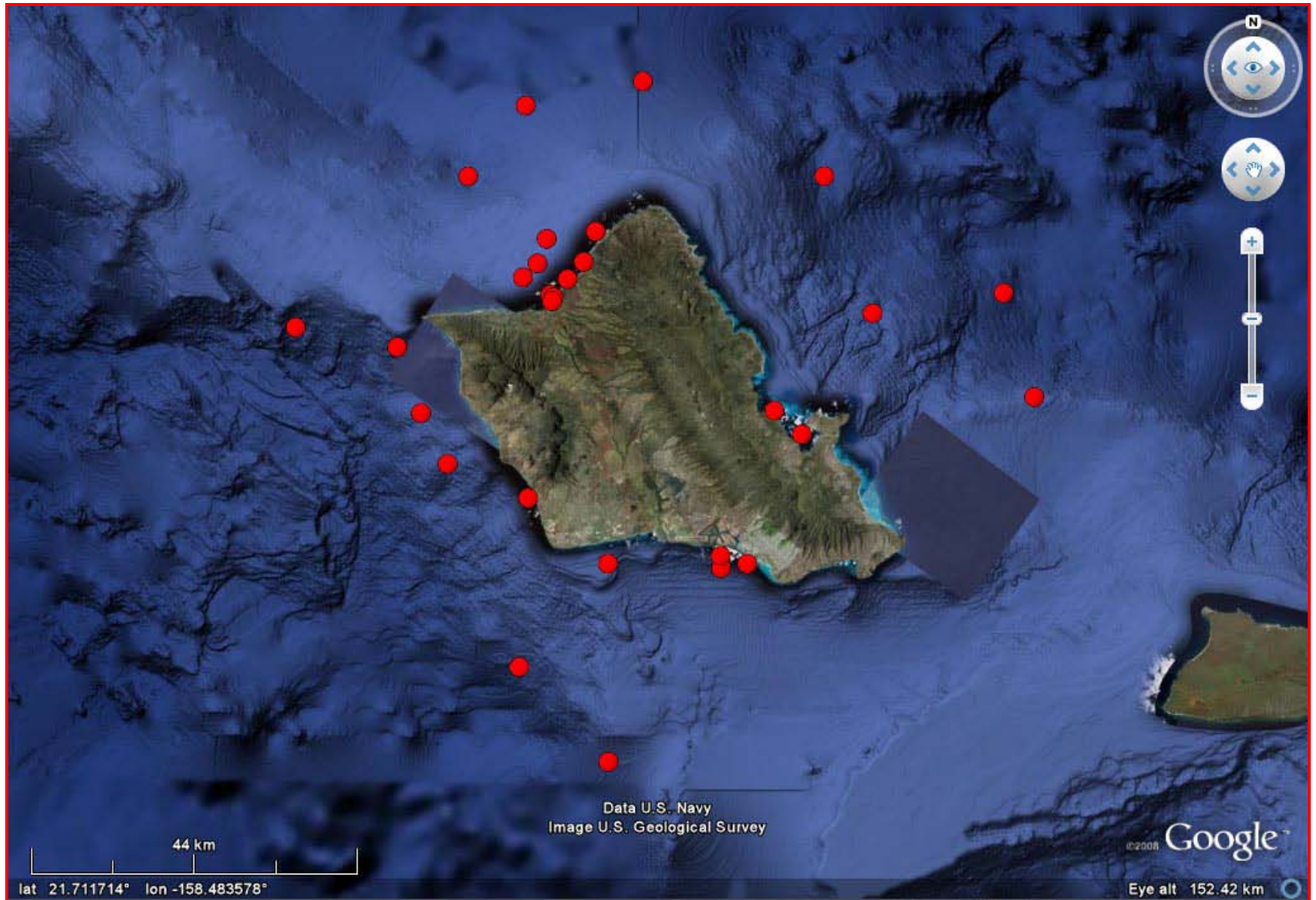
## Methods: Acoustic Monitoring

- (1) Sharks implanted with transmitters
- (2) Movements tracked with remote receivers



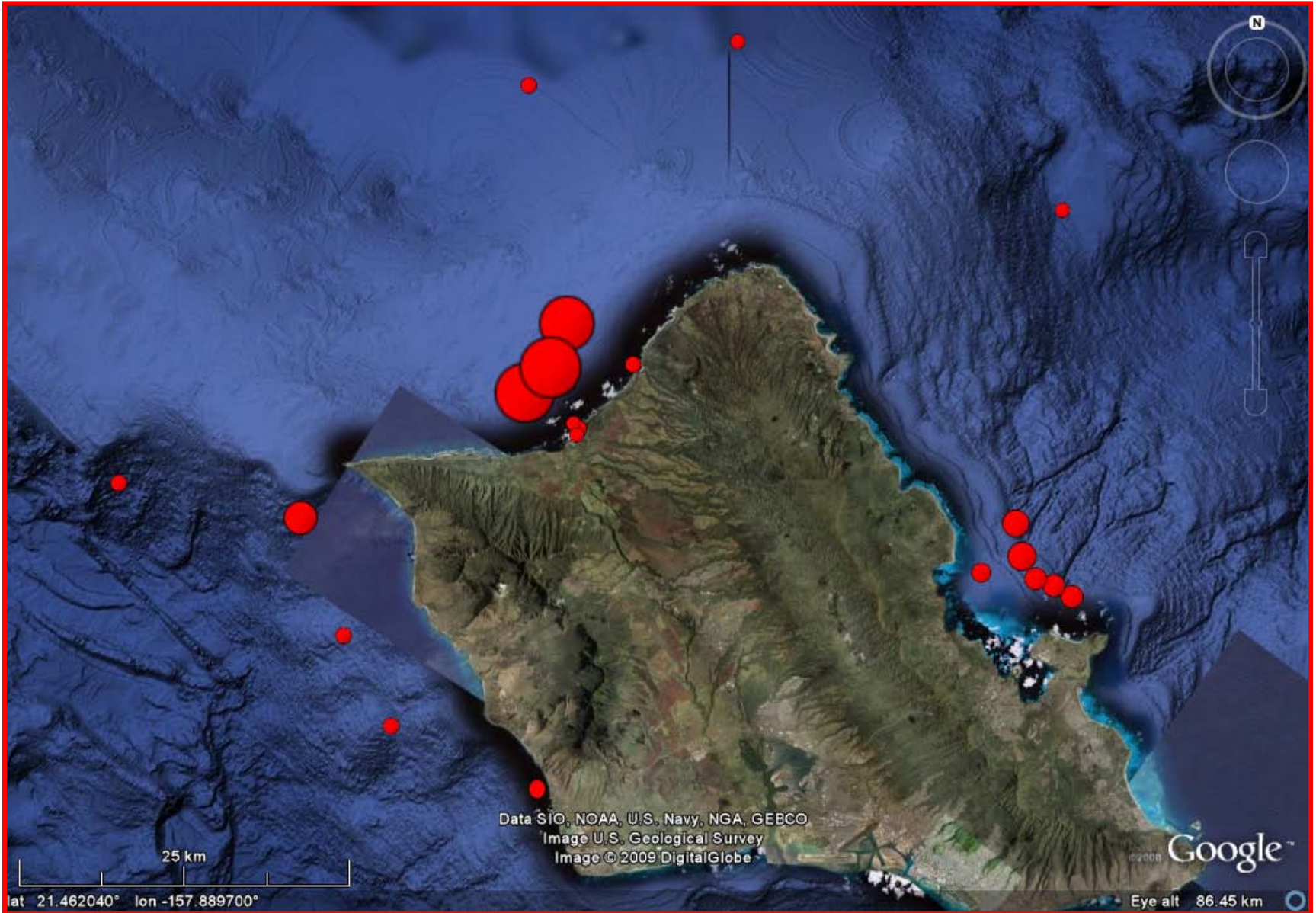


# Oahu Acoustic Array

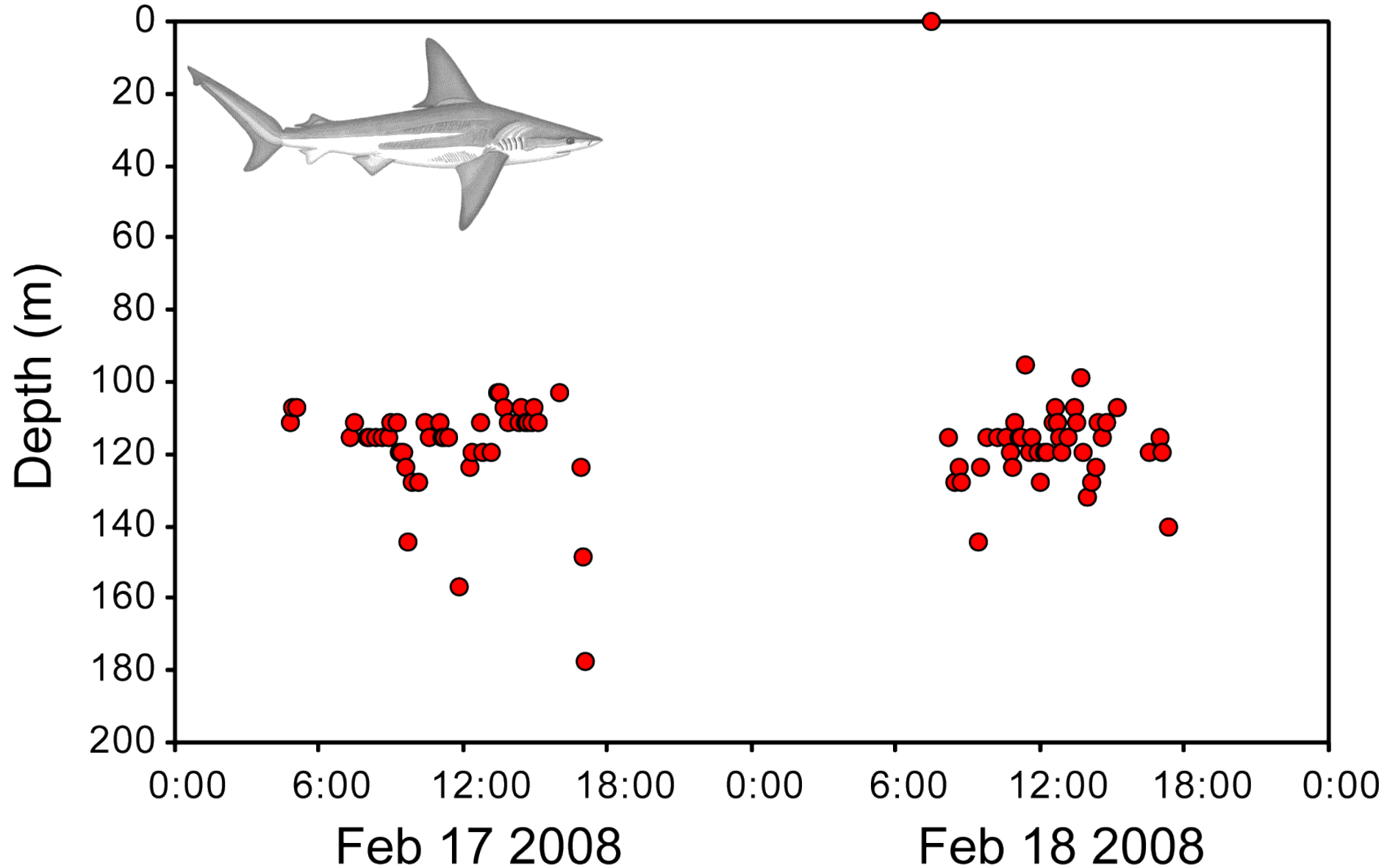




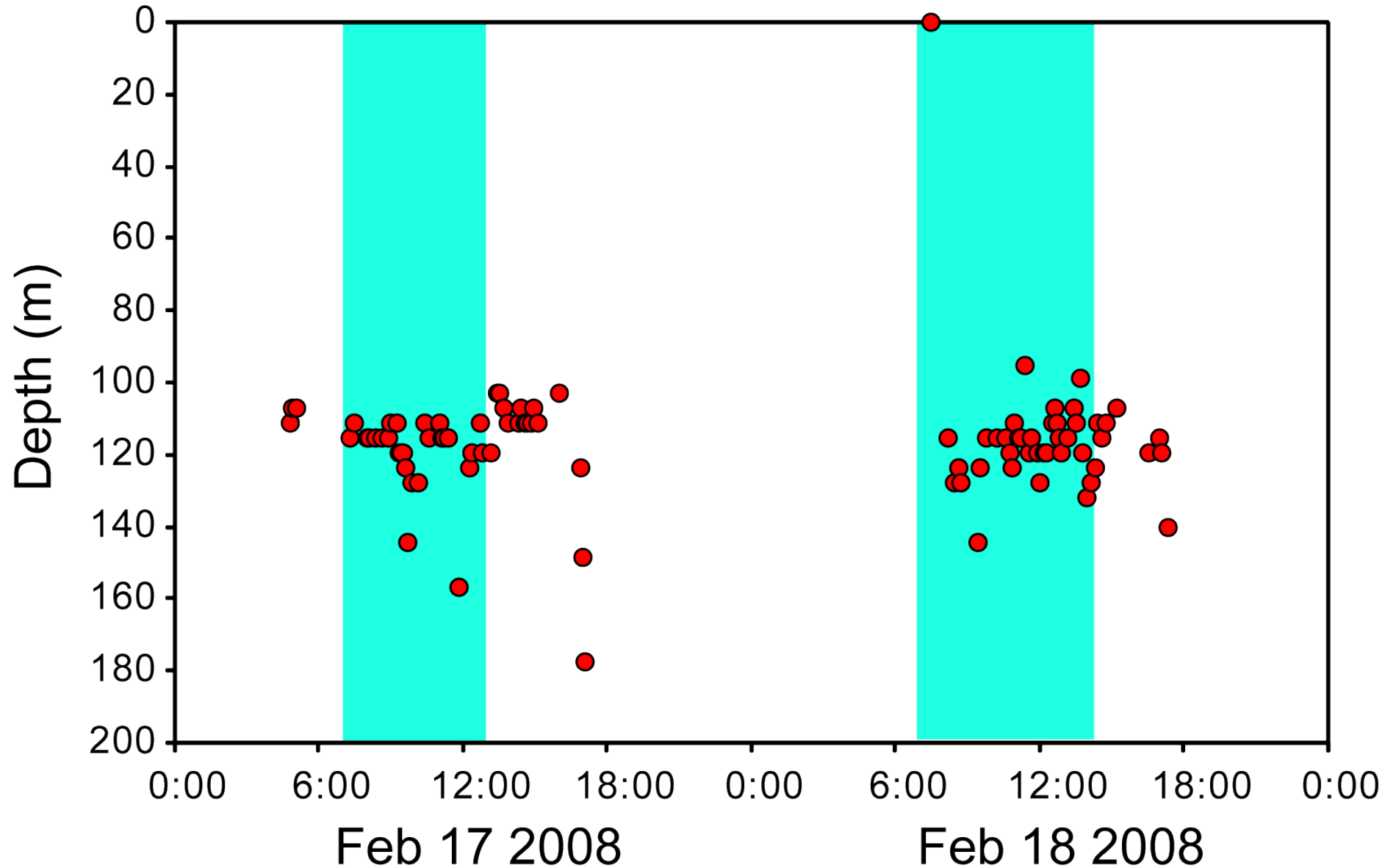
# Where else do 'tour' sharks go?



# Do sharks follow boats back to harbor?



# Do sharks follow boats back to harbor?



# Summary

No detectable increase in shark attacks on North Shore since inception of commercial shark tours

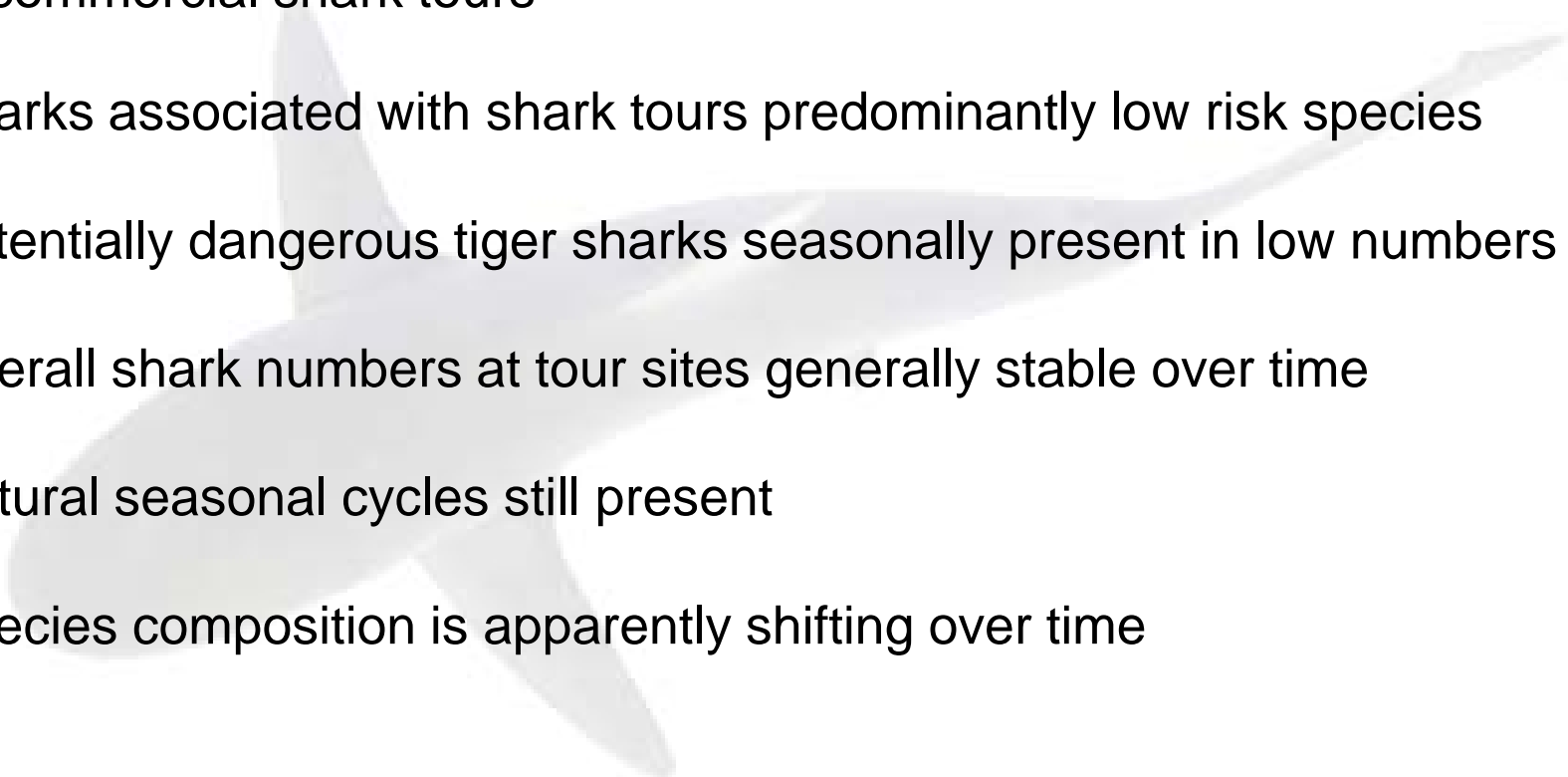
Sharks associated with shark tours predominantly low risk species

Potentially dangerous tiger sharks seasonally present in low numbers

Overall shark numbers at tour sites generally stable over time

Natural seasonal cycles still present

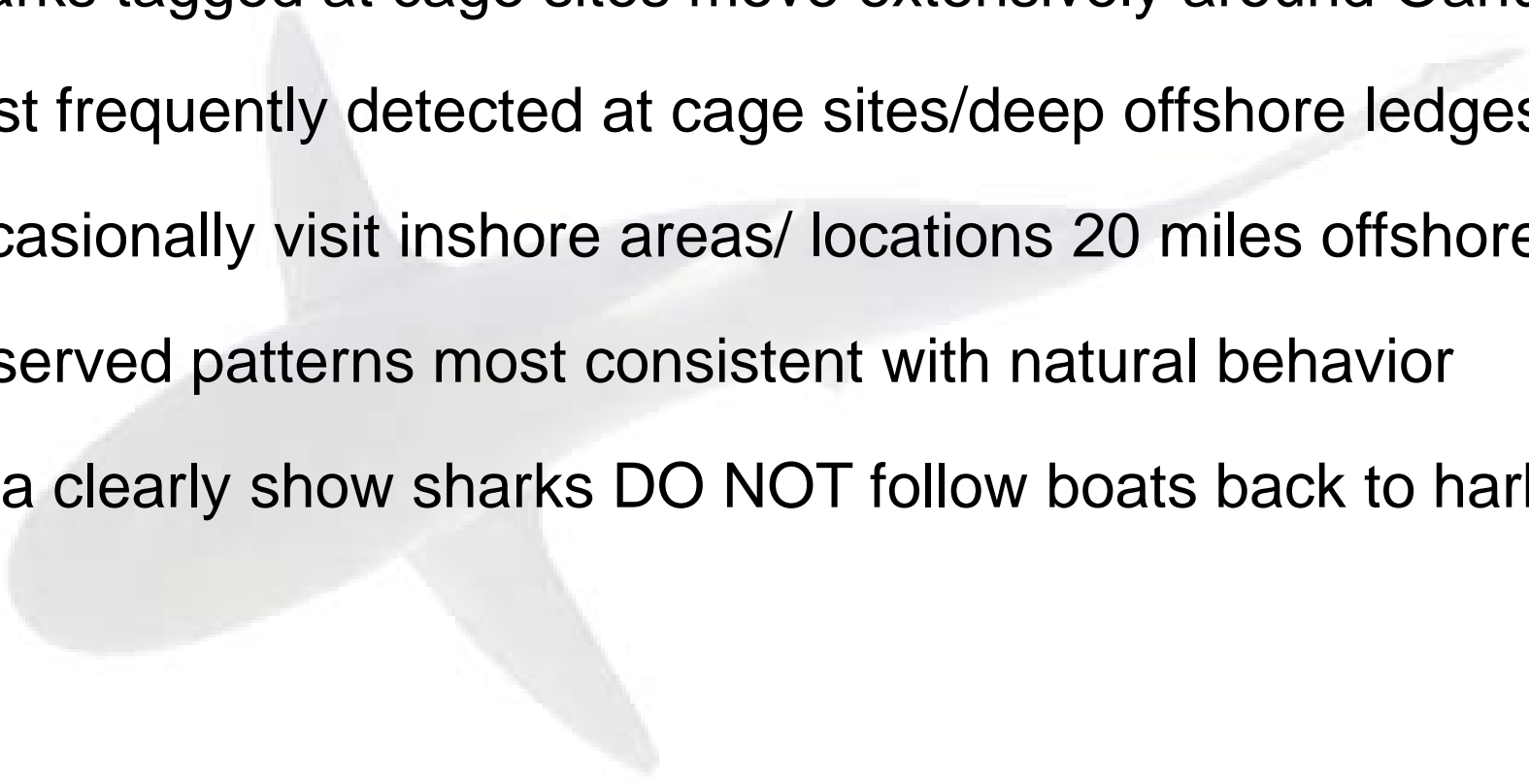
Species composition is apparently shifting over time





# Summary

- Sharks tagged at cage sites move extensively around Oahu
- Most frequently detected at cage sites/deep offshore ledges
- Occasionally visit inshore areas/ locations 20 miles offshore
- Observed patterns most consistent with natural behavior
- Data clearly show sharks DO NOT follow boats back to harbor



# Conclusion

“There is no scientific evidence that existing commercial shark tours increase shark attack risk in near shore waters used for ocean recreation”

