

Drowning and Aquatic Injury Trends in Hawaii

Dan Galanis

***Injury Prevention and Control Section,
EMS & Injury Prevention Systems Branch,
Hawaii Department of Health***

ph: 733-9236

E-mail: daniel.galanis@doh.Hawaii.gov

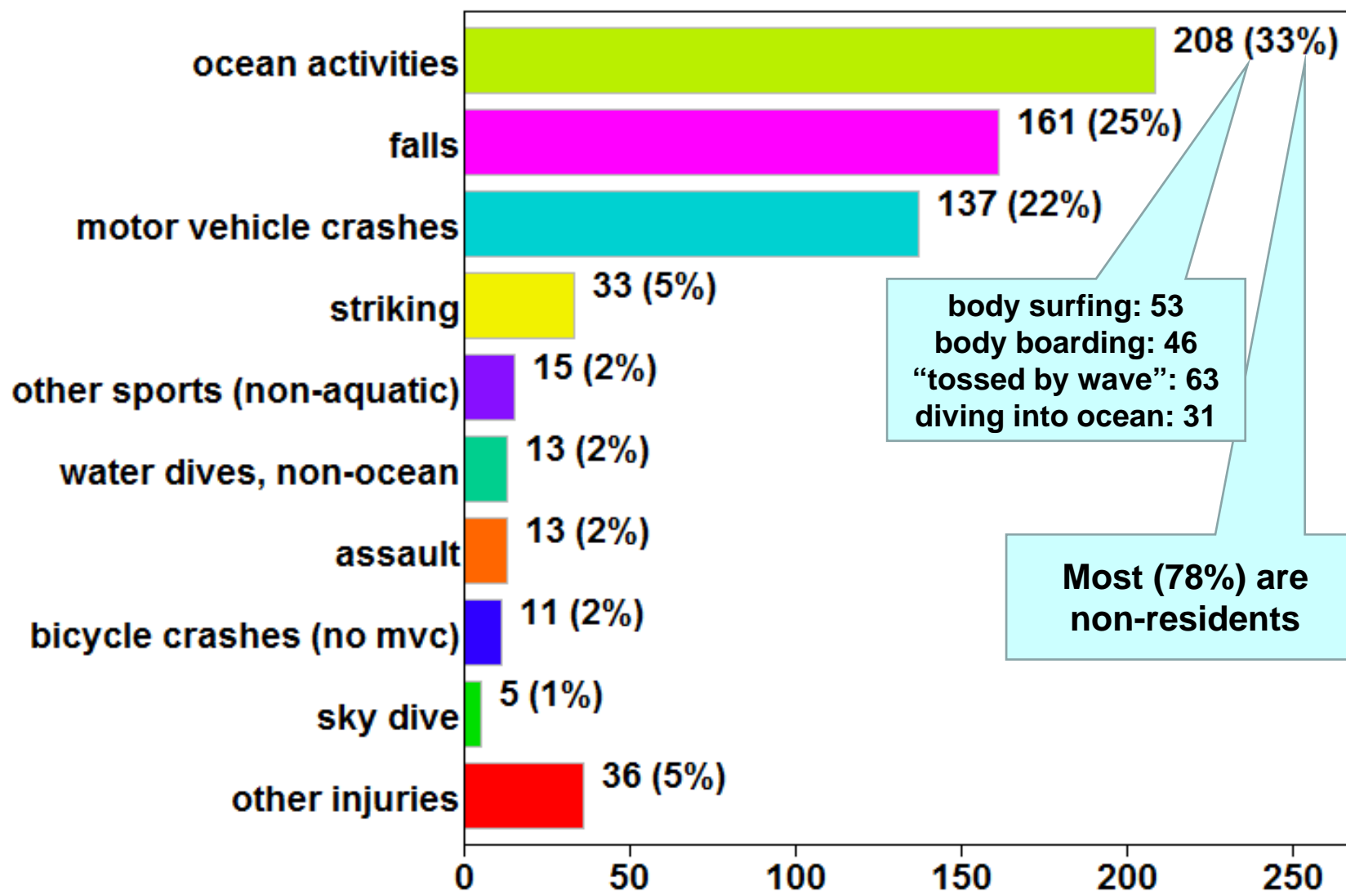
Overview of presentation

- **Part 1: Spinal cord injuries**
 - *Injuries related to ocean activities*
- **Part 2: Ocean drownings**
 - *Rate comparisons*
 - *County specific trends, data, and maps*
 - *Locations, victim residence, and seasonality (October-March vs. April-September)*
- **Part 3: Near-drownings in ocean**
 - *Survival, related to EMS response times*

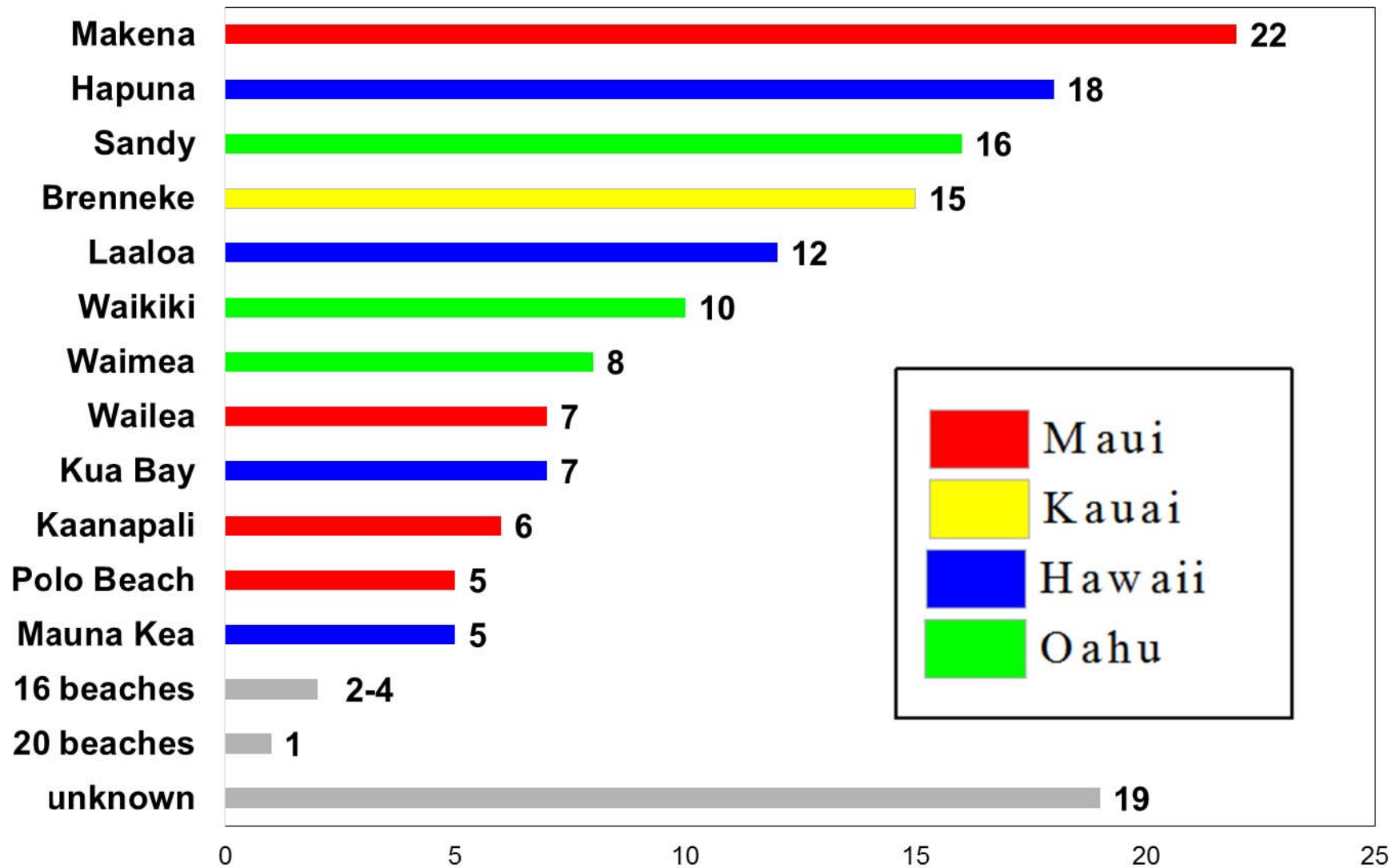


Spinal cord injuries, 2009-2013

Leading causes of spinal cord injuries in Hawaii, 2009-2013



Location (beach) of spinal cord injuries from ocean activities in Hawaii, 2009-2013



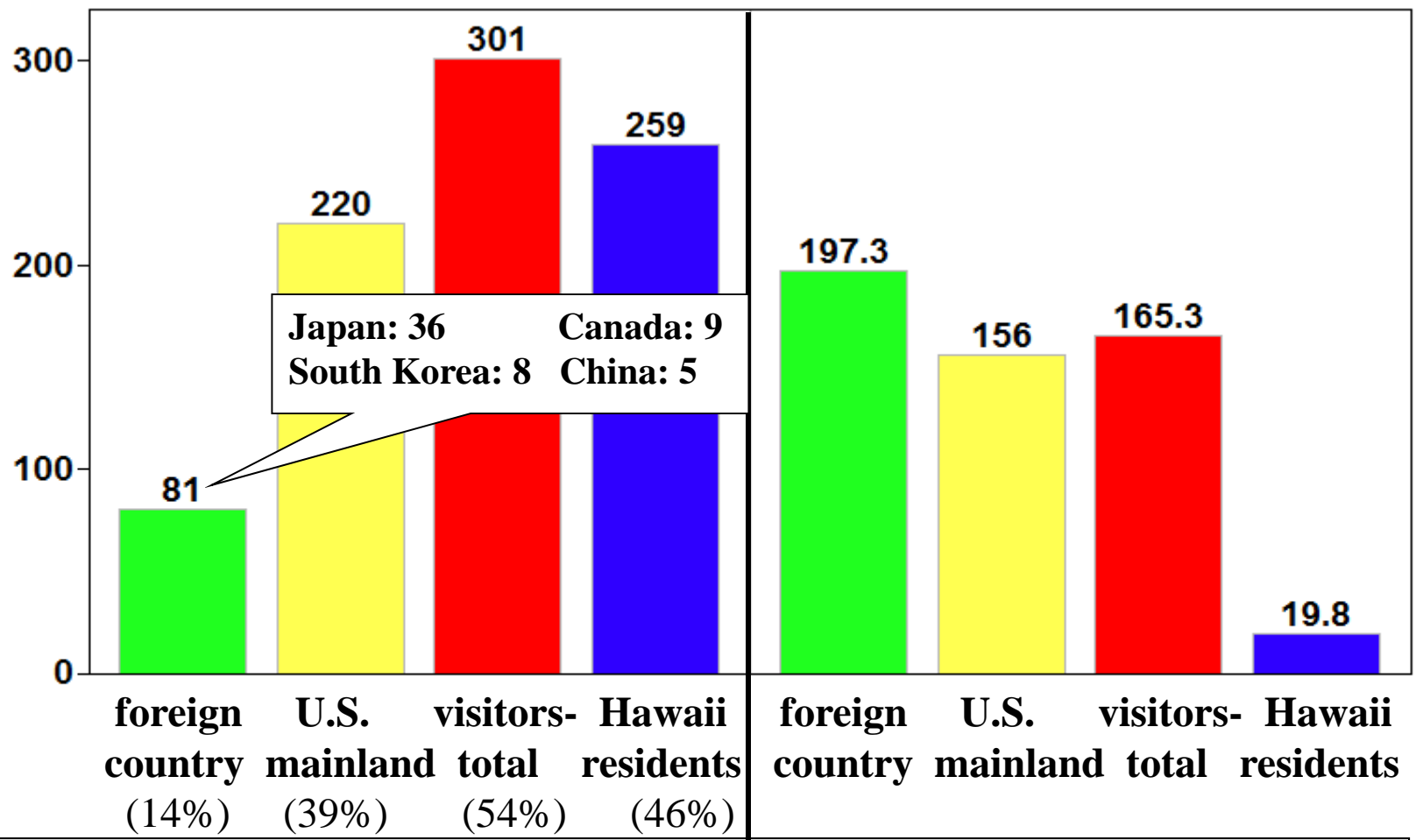
Summary of patients with ocean-related spinal cord injuries in Hawaii 2009-2013

- **Demographics:**
 - **Mostly (84%) male**
 - **Wide age distribution**
 - About two-thirds (64%) were 45 to 70 years old
 - **Mostly (78%) non-residents**
 - 57% from US mainland, 22% from foreign countries
- **Clinical**
 - **Average length of stay: 6 days**
 - 28% 1 week or longer
 - 52% admitted to ICU
 - **About two-thirds (63%) discharged home**
 - 18% transferred, 13% to rehab, 6% skilled nursing, 1% died
 - 20% discharged with “moderate disability”, 10% “severe”
 - 12% with complete severing of spinal cord

The background of the slide is a dark blue monochromatic image. It features several palm trees of varying heights and lean angles, silhouetted against a lighter blue background that suggests a beach and ocean. The overall mood is somber and tropical.

Ocean drownings, 2004-2013

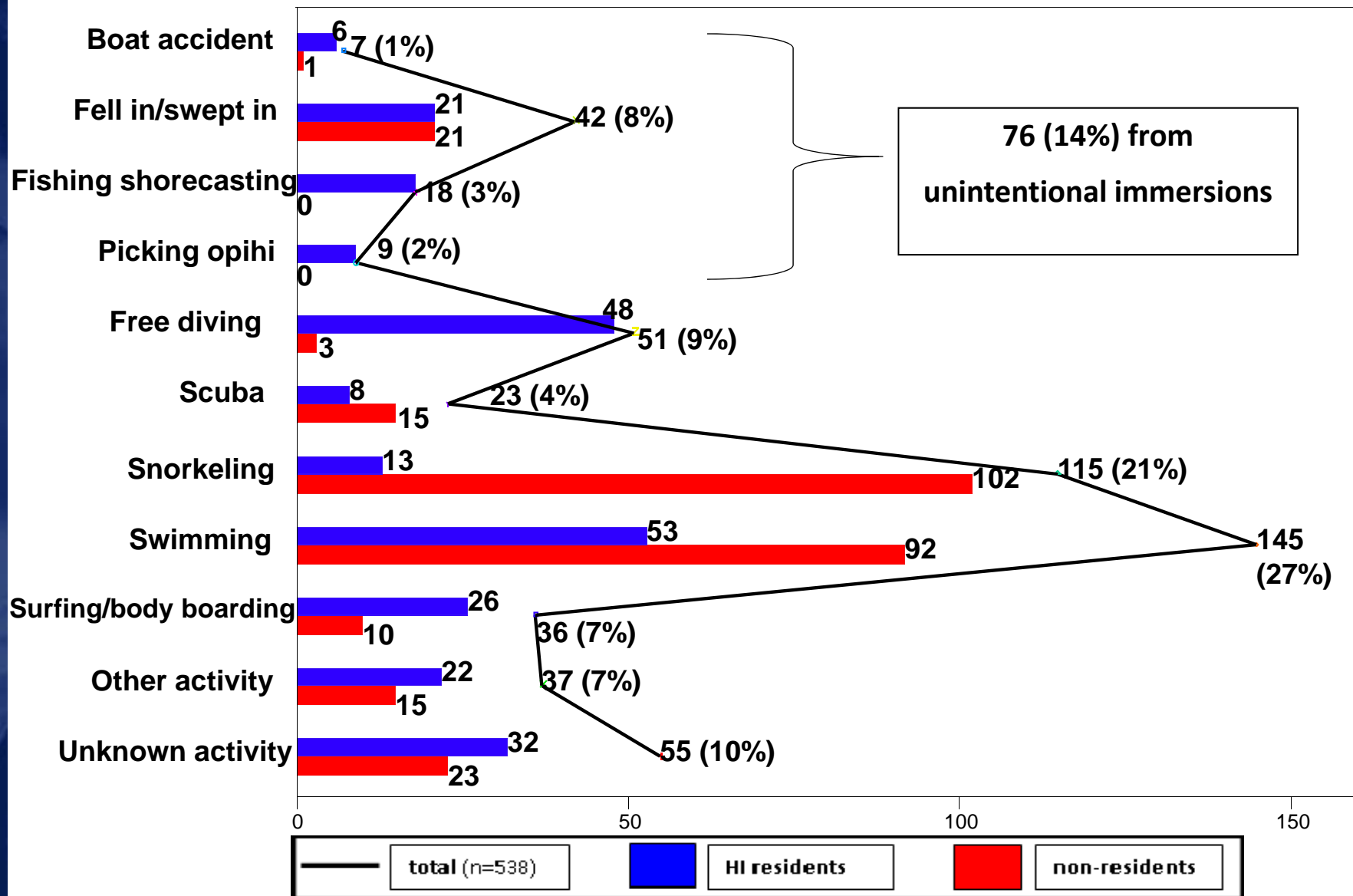
Number and ten-year rate of ocean drownings in Hawaii, by residence of victim, 2004-2013



Number of drownings

Rate (/100,000) of drownings

Ocean drownings in Hawaii, by residence and activity of victim, 2003-2012



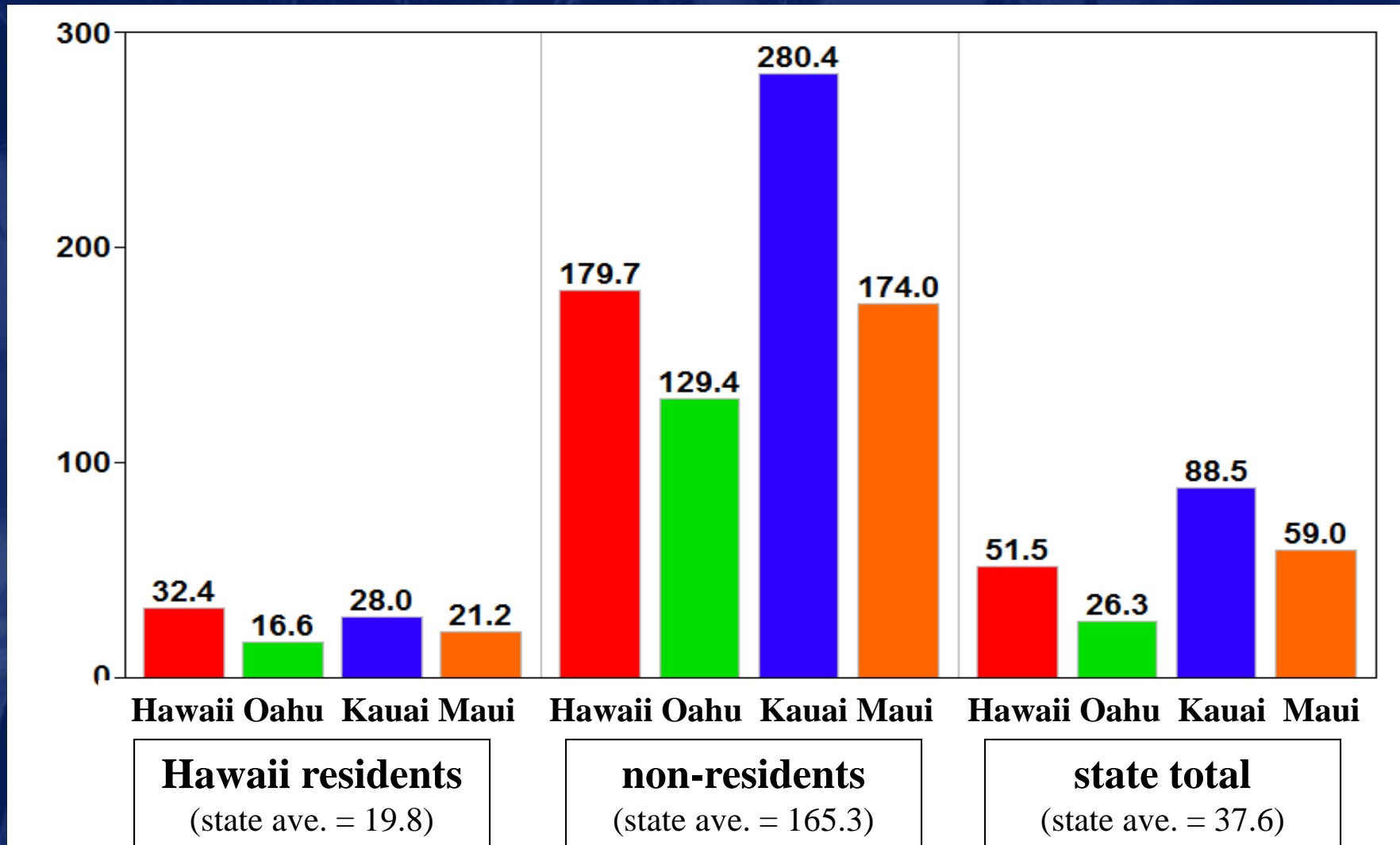
Summary of autopsy records for drowning victims, Honolulu, Maui and Kauai counties, 2004-2011

- **Intrinsic factors were prevalent among 67% of the victims of ocean drownings**
 - ***Circulatory diseases (mostly heart disease): 45%***
 - ***Most (65%) of victims over 50 years of age***
 - ***Alcohol use among 14%***
 - ***Positive illicit drug screens for 11%***
 - ***Other factors: traumatic injuries (10%), and seizure disorders (3%)***



County-specific data

Ten-year rate (/100,000) of ocean drownings in Hawaii, by residence status and county, 2004-2013

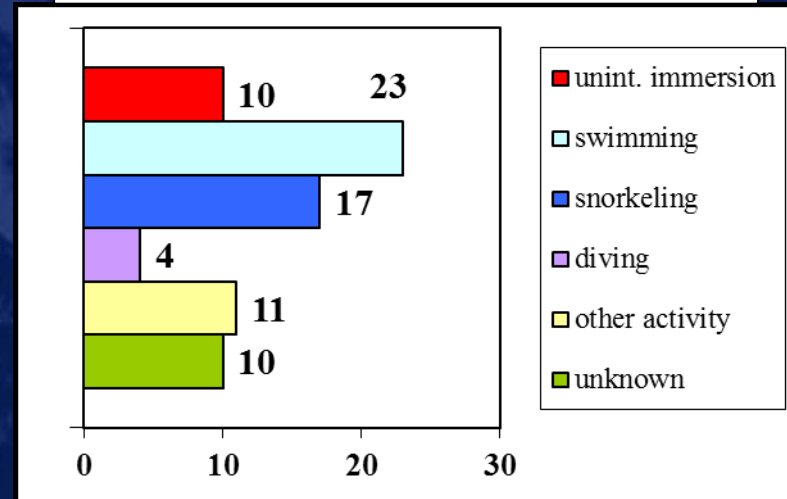


Ocean drownings on Kauai, 2004-2013

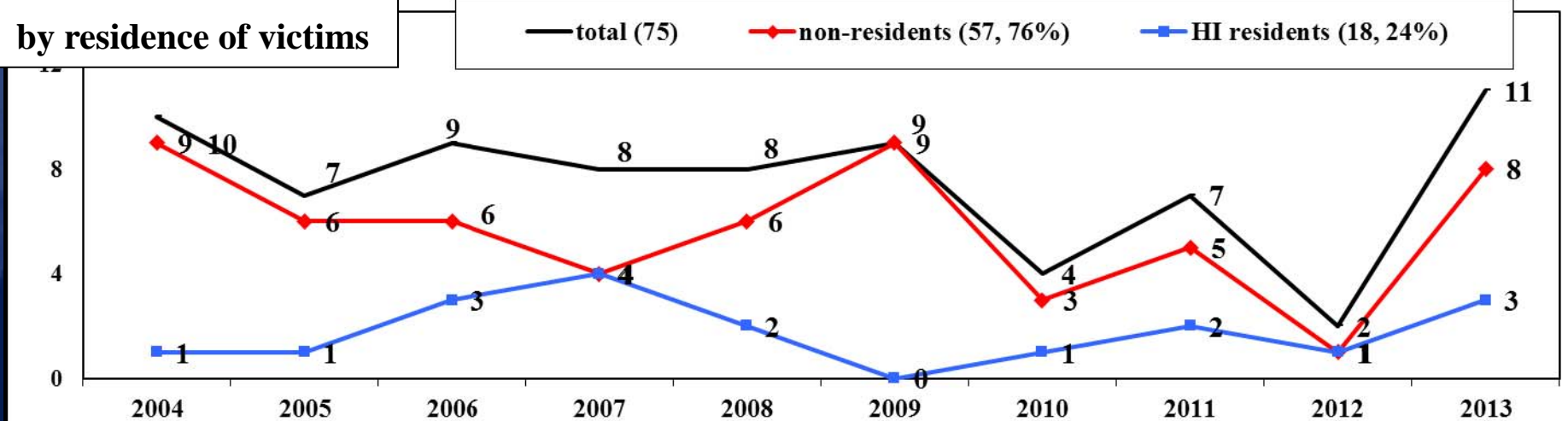
- Summary

- 75 total, 2 to 11 per year
- Somewhat decreasing trend
- Mostly (76%) non-residents
- Activity: Swimming (31%) and snorkeling (23%)

Number of drownings, by activity



Annual trends,
by residence of victims



Napali Coast: 5 drownings:

- 4 non-residents
- 4 during Oct-March

Kee-Princeville: 19 drownings:

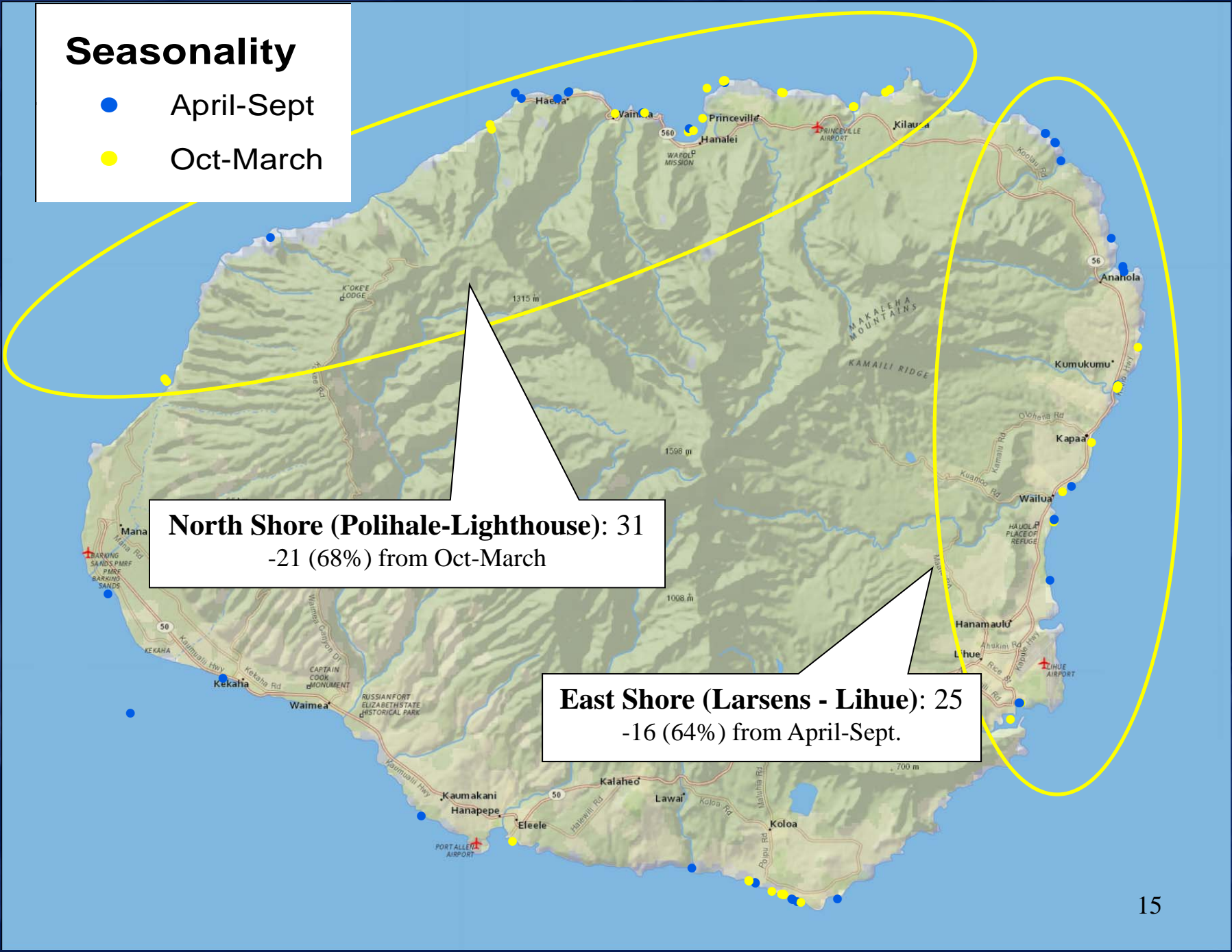
- 15 non-residents (all US)
- no seasonality
- 4 at Queen's Bath, none since 2008

Poipu area: 10 drownings:

- all non-residents (all US)
- no seasonality
- only 1 since 2011

Seasonality

- April-Sept
- Oct-March



North Shore (Polihale-Lighthouse): 31
-21 (68%) from Oct-March

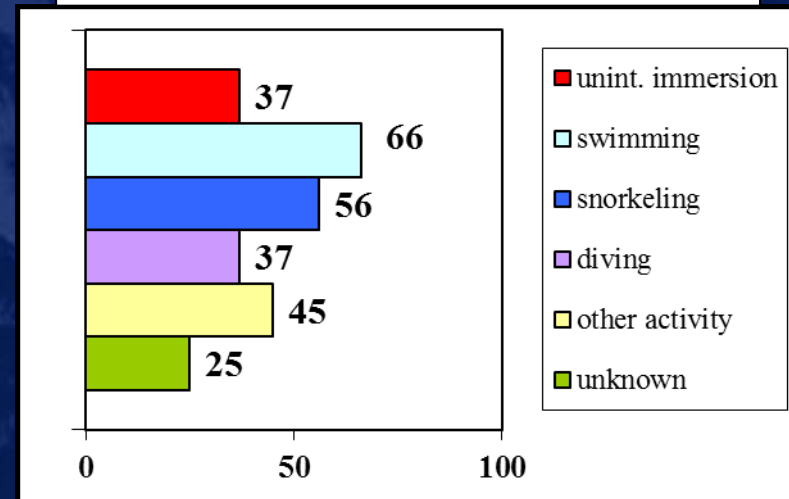
East Shore (Larsens - Lihue): 25
-16 (64%) from April-Sept.

Ocean drownings on Oahu, 2004-2013

- **Summary**

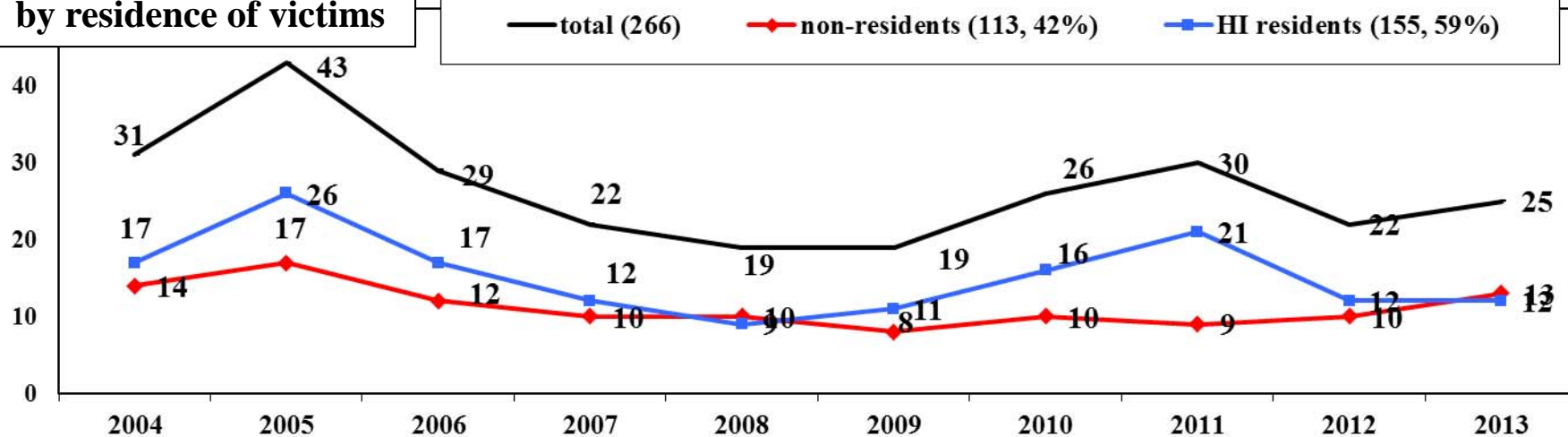
- **266 total, 19 to 43 per year**
- **No consistent trend**
- **Slightly more residents (58%)**
- **Activity: wide distribution**

Number of drownings, by activity

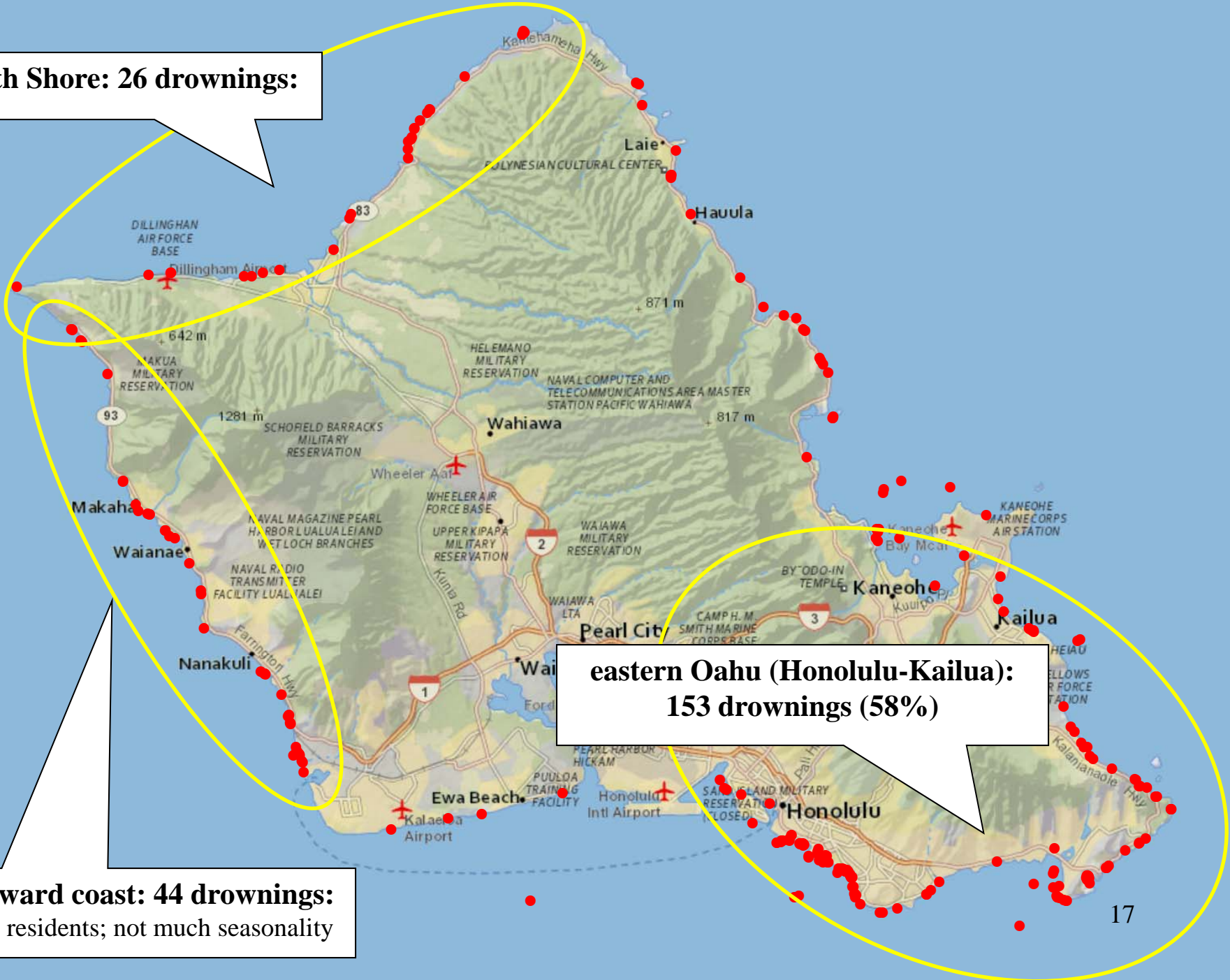


Annual trends,

by residence of victims



North Shore: 26 drownings:



**eastern Oahu (Honolulu-Kailua):
153 drownings (58%)**

**Leeward coast: 44 drownings:
50% residents; not much seasonality**

Residence

Residence status

- non-resident
- resident

Point Panic-Ala Wai marina: 23:
-19 residents

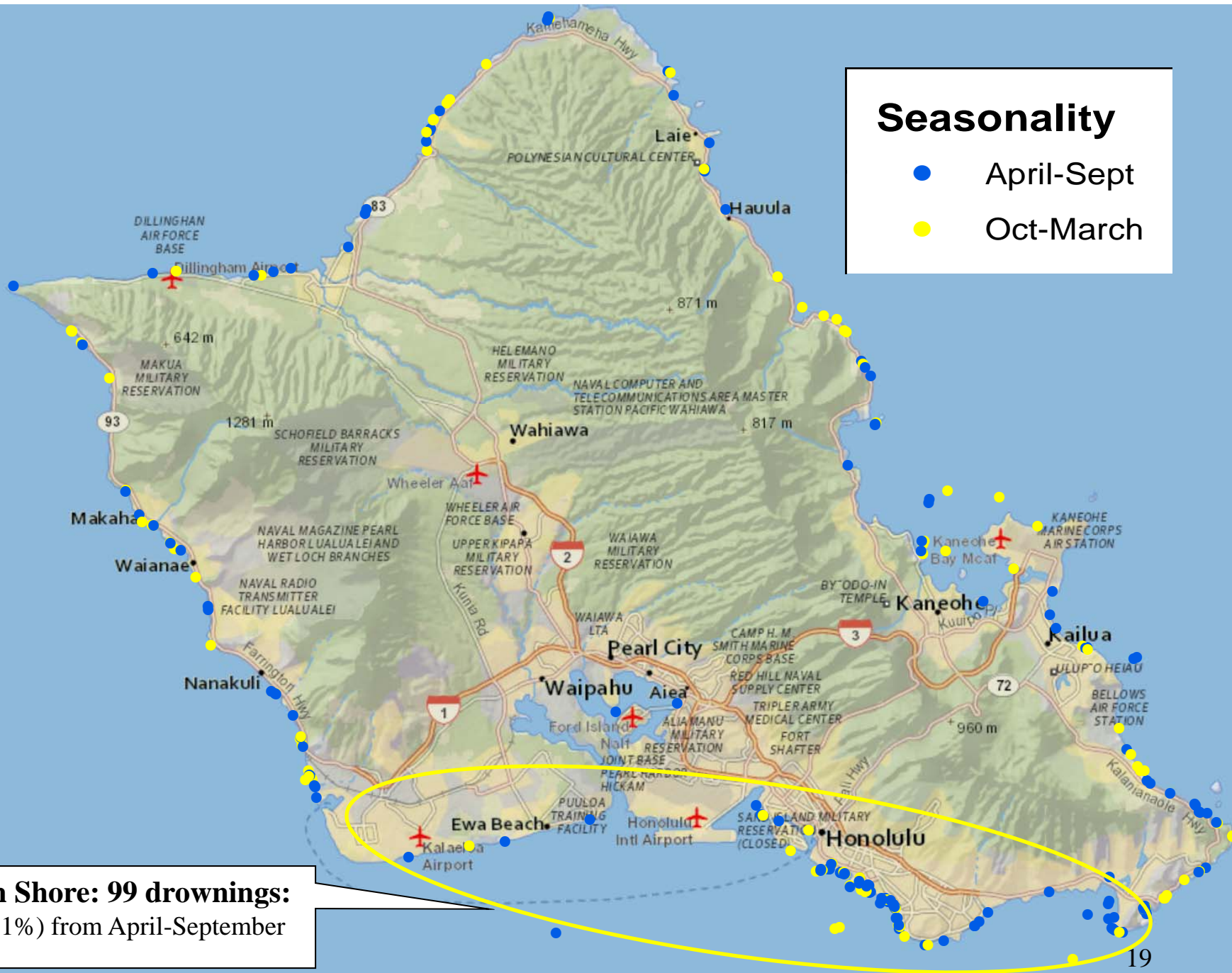
Hilton Hawaiian-Kapahulu: 34:
-26 non-residents (9 US, 17 foreigners)

Hanauma: 23:
-22 non-residents
-6 US, 16 foreigners

Kapahulu-Portlock: 27:
-21 residents

Seasonality

- April-Sept
- Oct-March



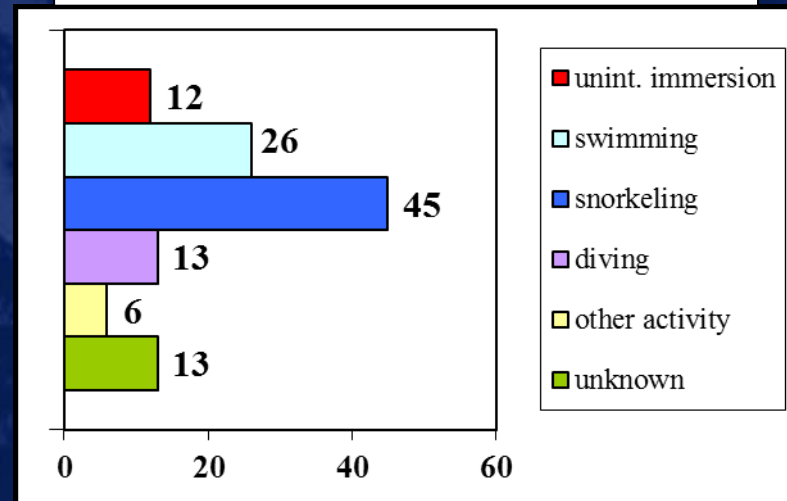
South Shore: 99 drownings:
-70 (71%) from April-September

Ocean drownings on Maui County, 2004-2013

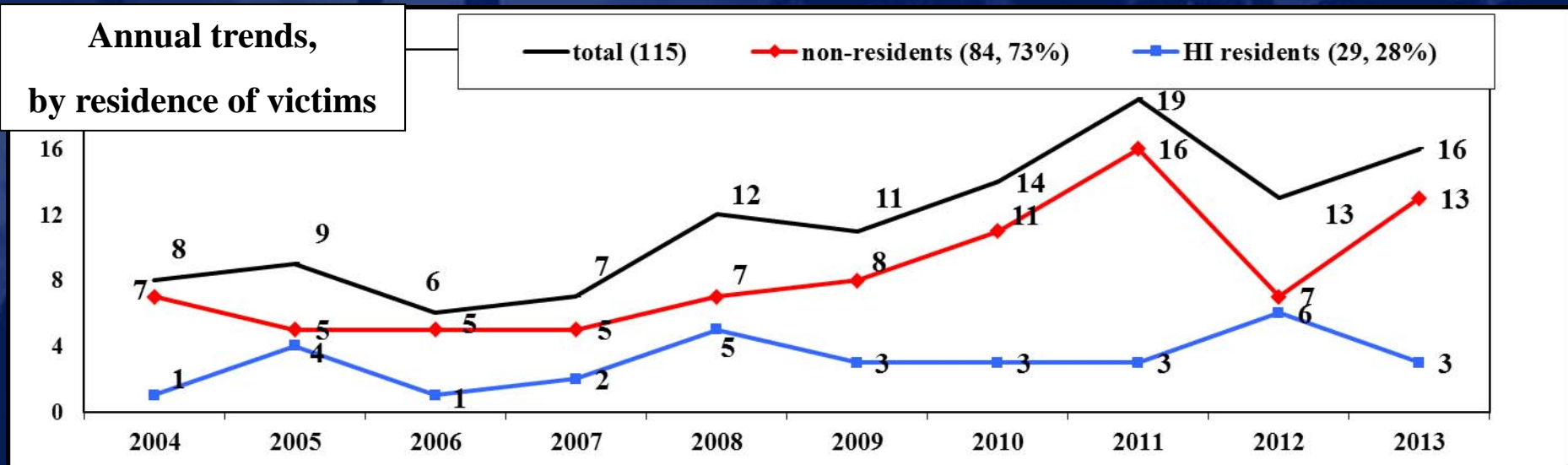
- **Summary**

- **115 total, 6 to 19 per year**
 - (105 on Maui, 8 Molokai, 2 on Lanai)
- **Increasing trend**
- **Mostly (73%) non-residents**
- **Activity: Snorkeling (39%) and swimming (23%)**

Number of drownings, by activity



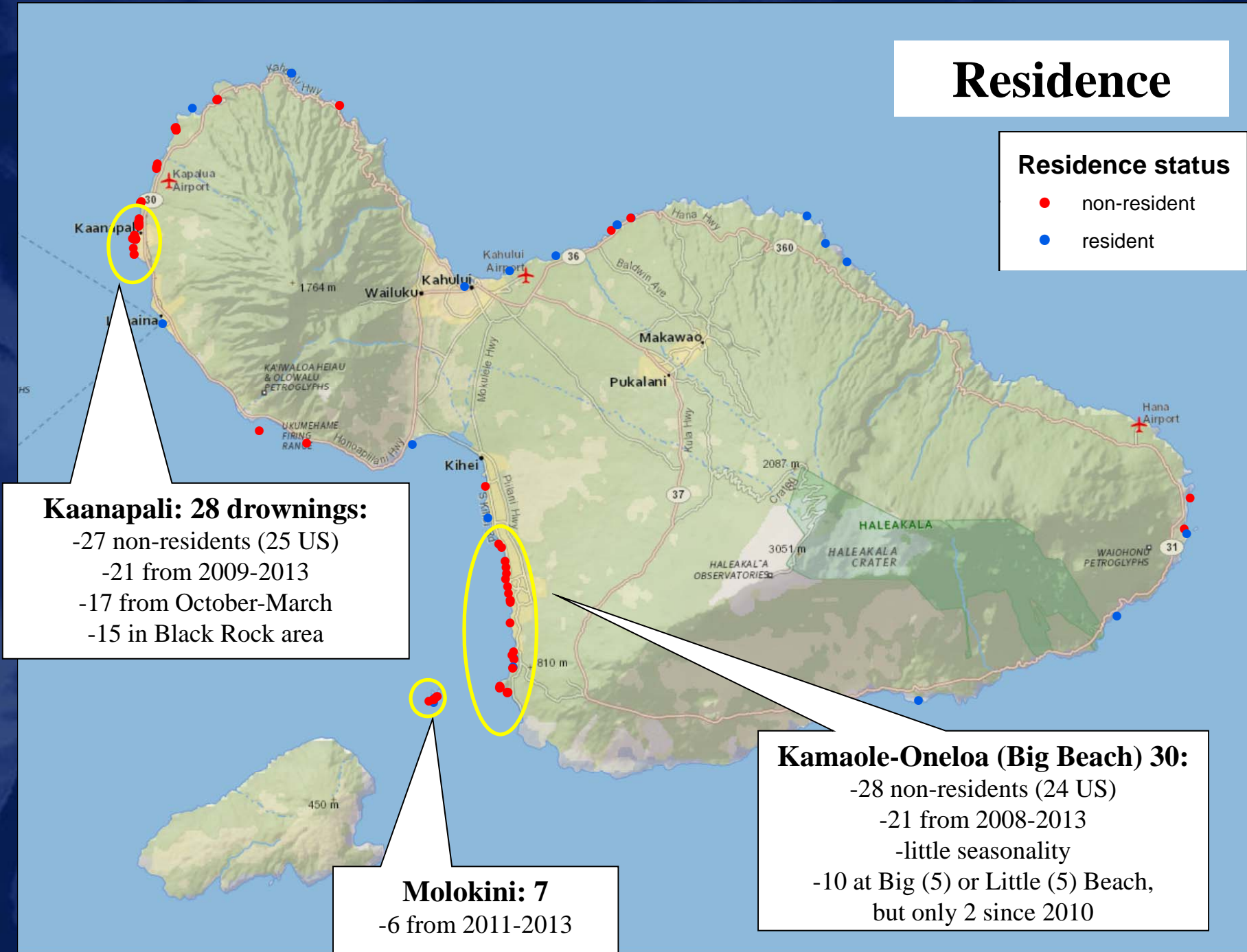
Annual trends, by residence of victims



Residence

Residence status

- non-resident
- resident

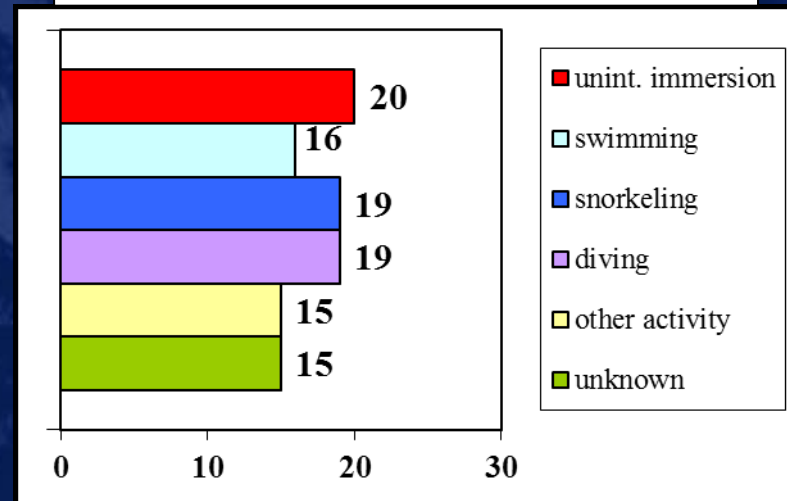


Ocean drownings on Hawaii County, 2004-2013

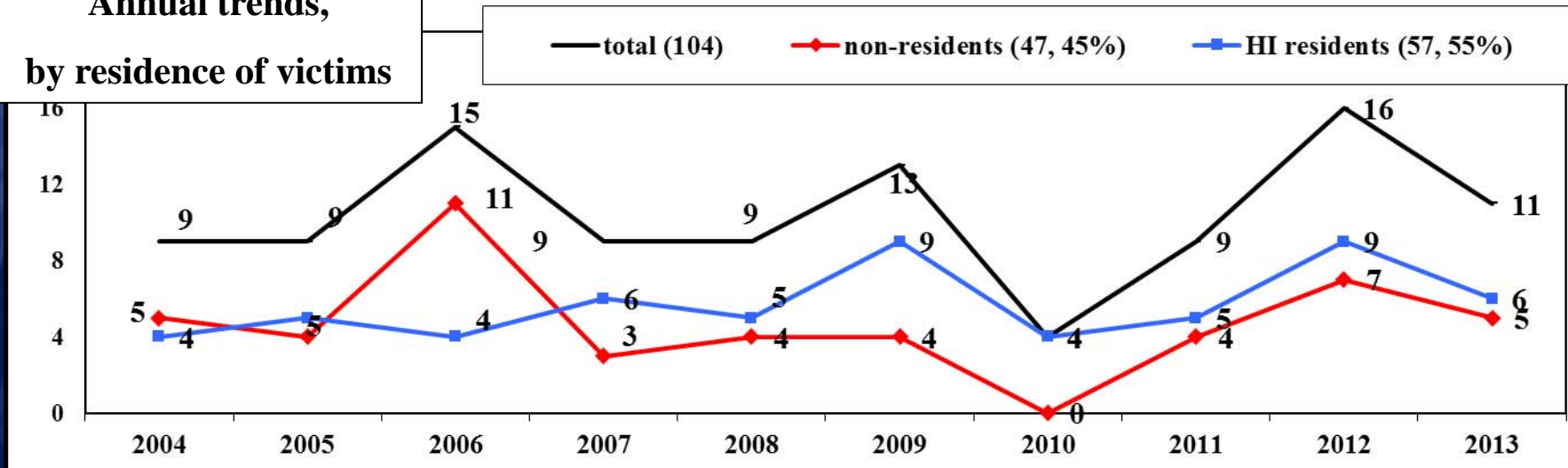
- Summary

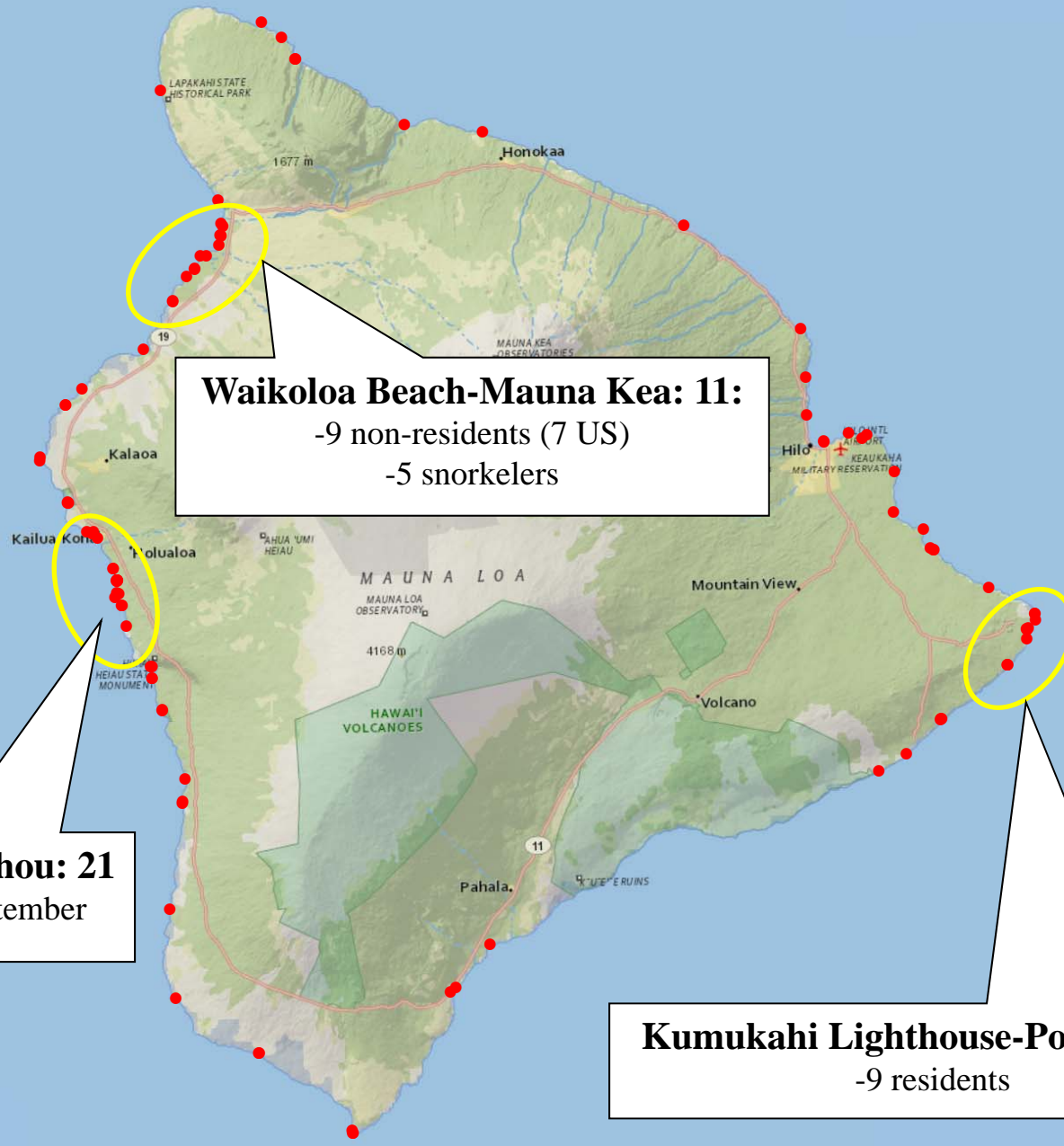
- *104 total, 4 to 15 per year*
- *No consistent trend*
- *Slightly more residents (55%)*
- *Activity: wide distribution*

Number of drownings, by activity



Annual trends,
by residence of victims





Residence

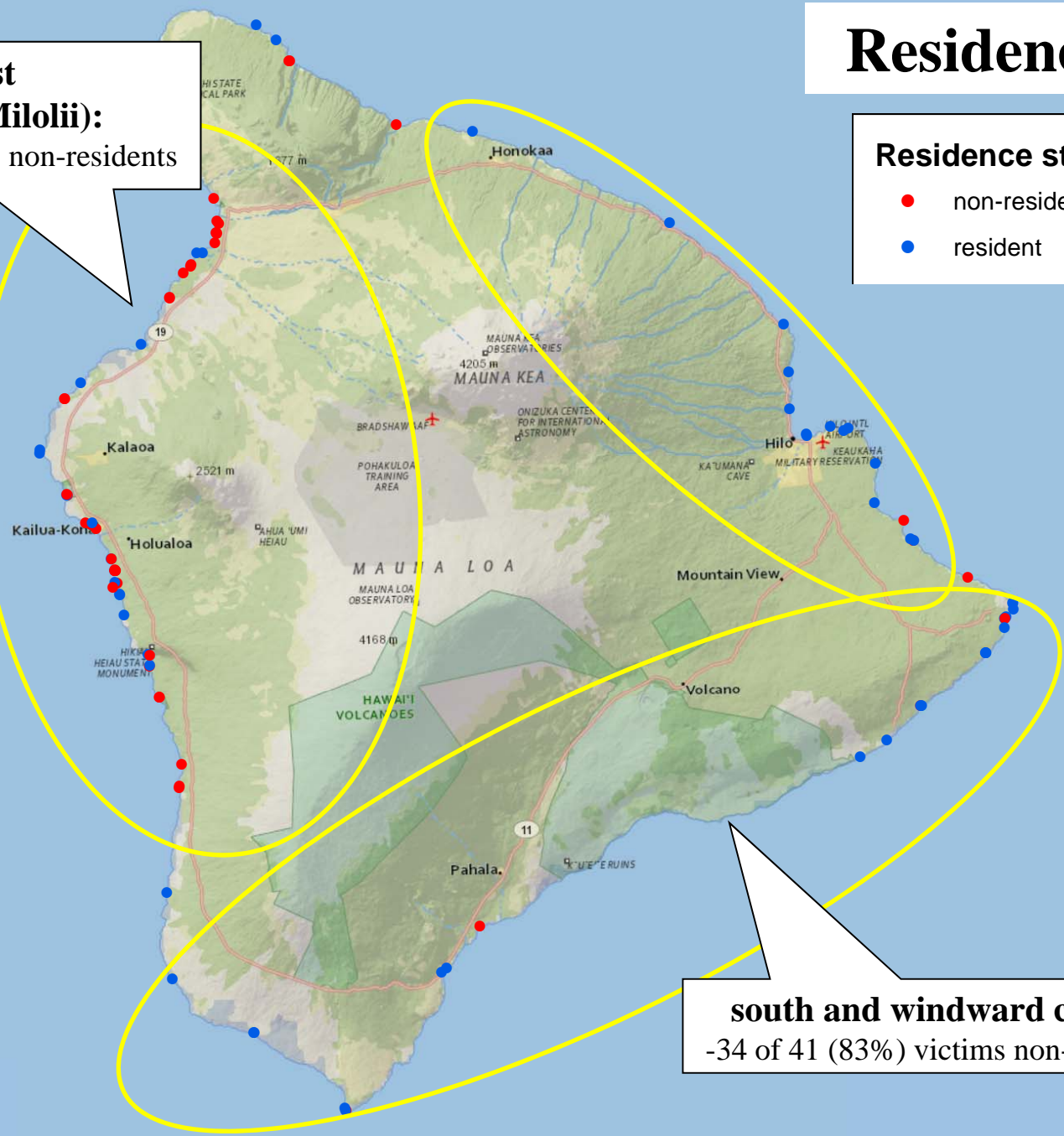
Residence status

- non-resident
- resident

west coast (Mauna Kea-Milolii):

-35 of 53 (66%) victims non-residents

south and windward coasts:
-34 of 41 (83%) victims non-residents



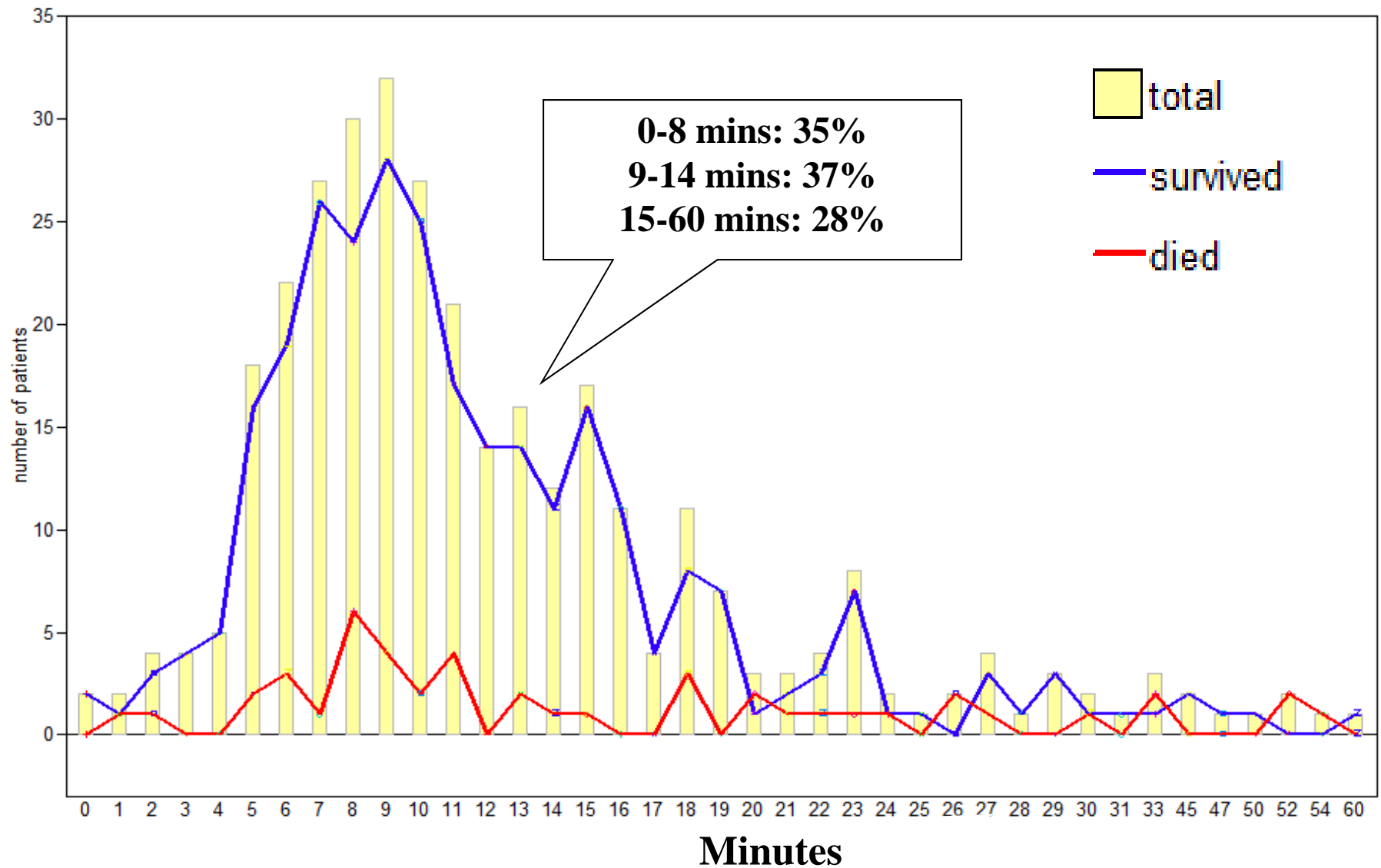


***Near-drownings in the ocean:
survival related to EMS response times***

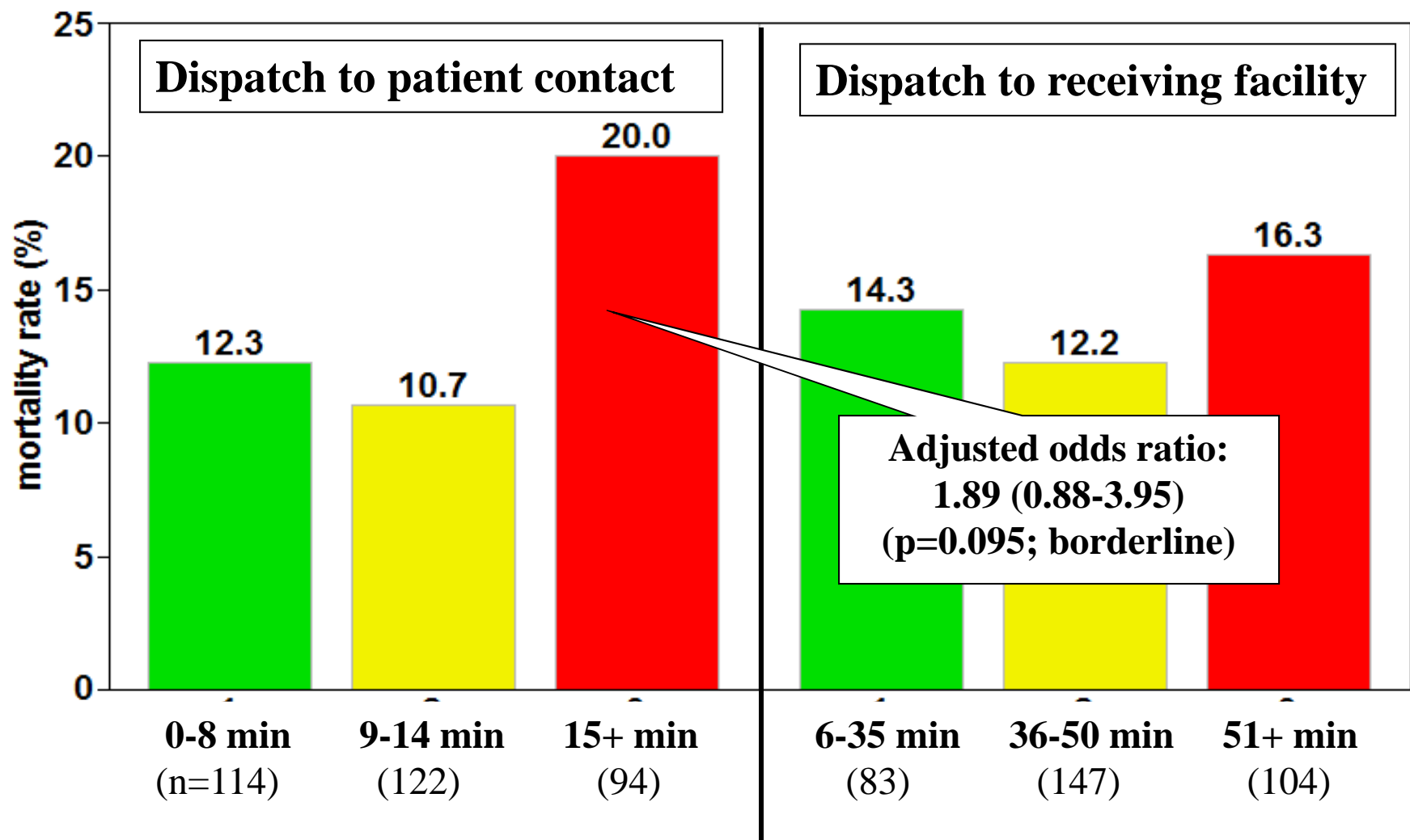
Linkage summary, 2008-2009

- **335 near drownings in ocean/saltwater**
 - **About half (48%, or 160) on Oahu**
 - 70 in Hawaii County, 57 Maui, 48 Kauai
 - **Most patients (86%, or 288) survived**
 - 140 discharged from ED, 148 admitted
 - 14% (47) died
 - No difference in mortality across counties
 - **Transport time predictors:**
 - 1. Minutes from dispatch to patient contact
 - 2. Minutes from dispatch to receiving facility

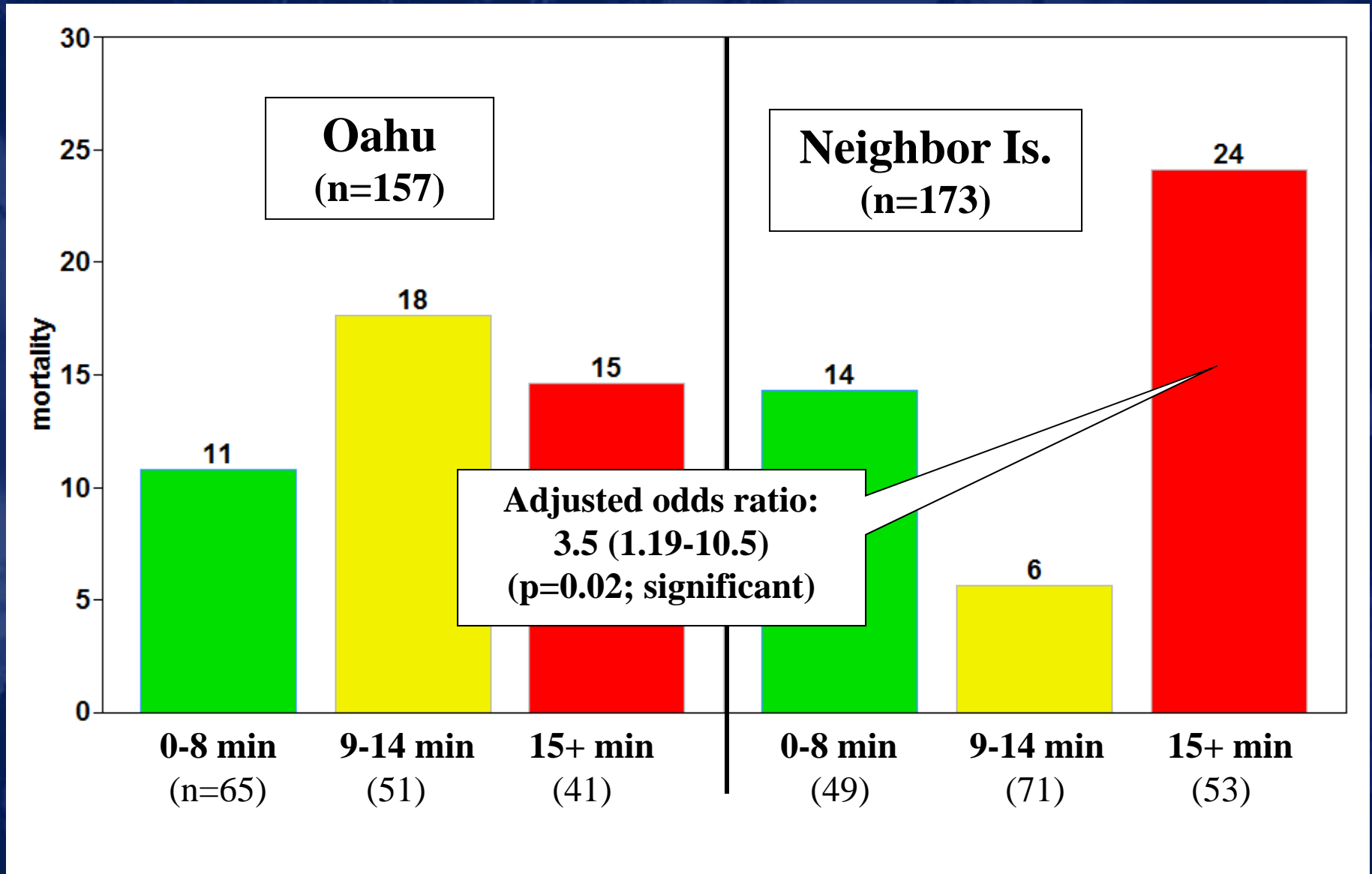
Outcomes of patients transported for saltwater near-drownings, by time from dispatch to patient contact

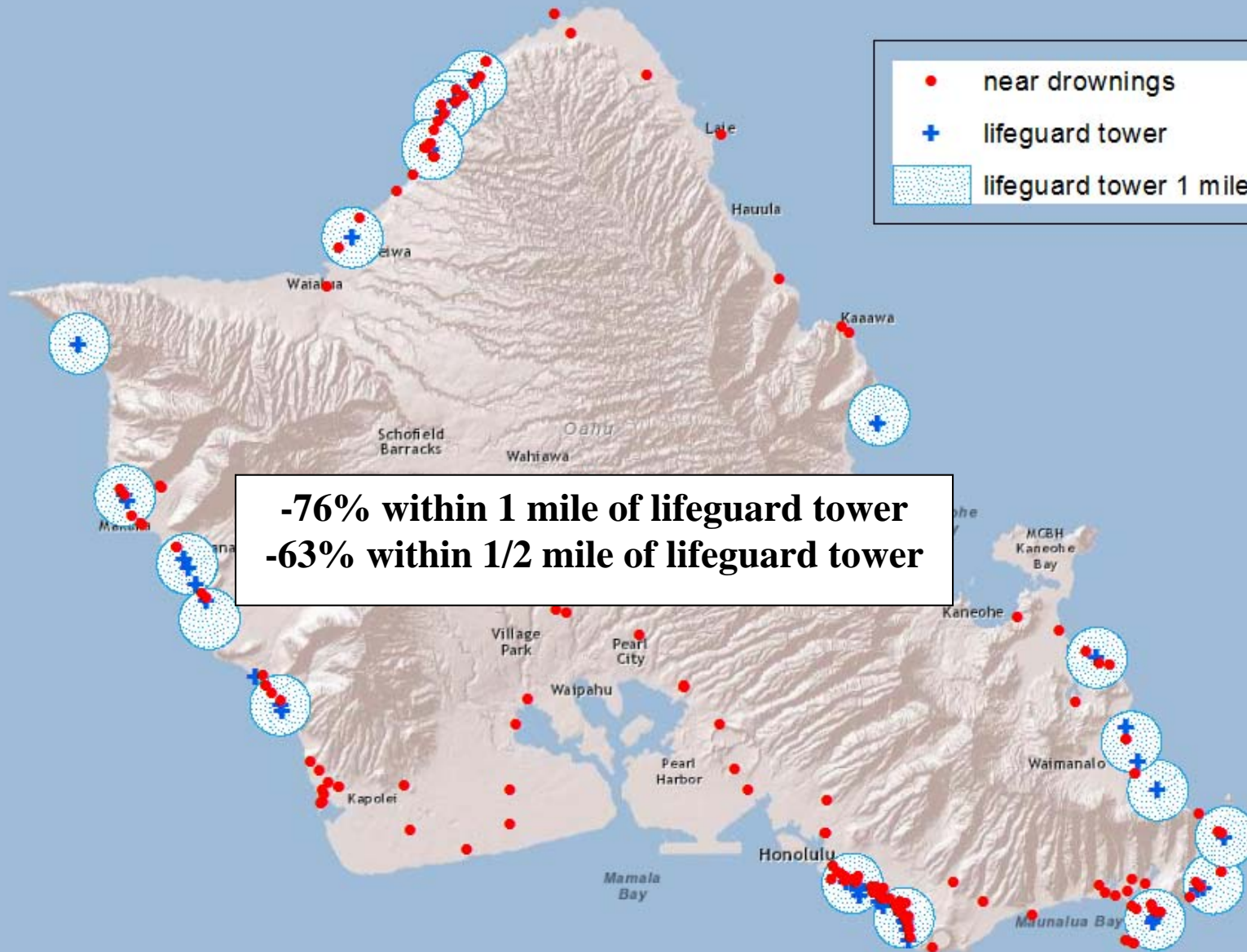


Mortality rates among patients transported for near-drownings, by two response time categories



Mortality rates among patients transported for near-drownings: time from dispatch to patient contact, by geography





-76% within 1 mile of lifeguard tower
-63% within 1/2 mile of lifeguard tower

Summary

- **Part I: Spinal cord injuries**
 - *Ocean-related activities are the leading cause*
 - Mostly non-residents
 - Statewide distribution, but also high-risk beaches
- **Part 2: Ocean drownings**
 - *Non-residents much higher rates*
 - Comprise majority of victims on Kauai and Maui counties
 - *About half (45%) of victims had circulatory diseases*
 - *About two-thirds (65%) of those 50 and older*
- **Part 3: Near-drownings in ocean**
 - *Survival is related to EMS response times*
 - Time to patient contact, time to receiving facility
 - *Need to study role of lifeguard 1st response*