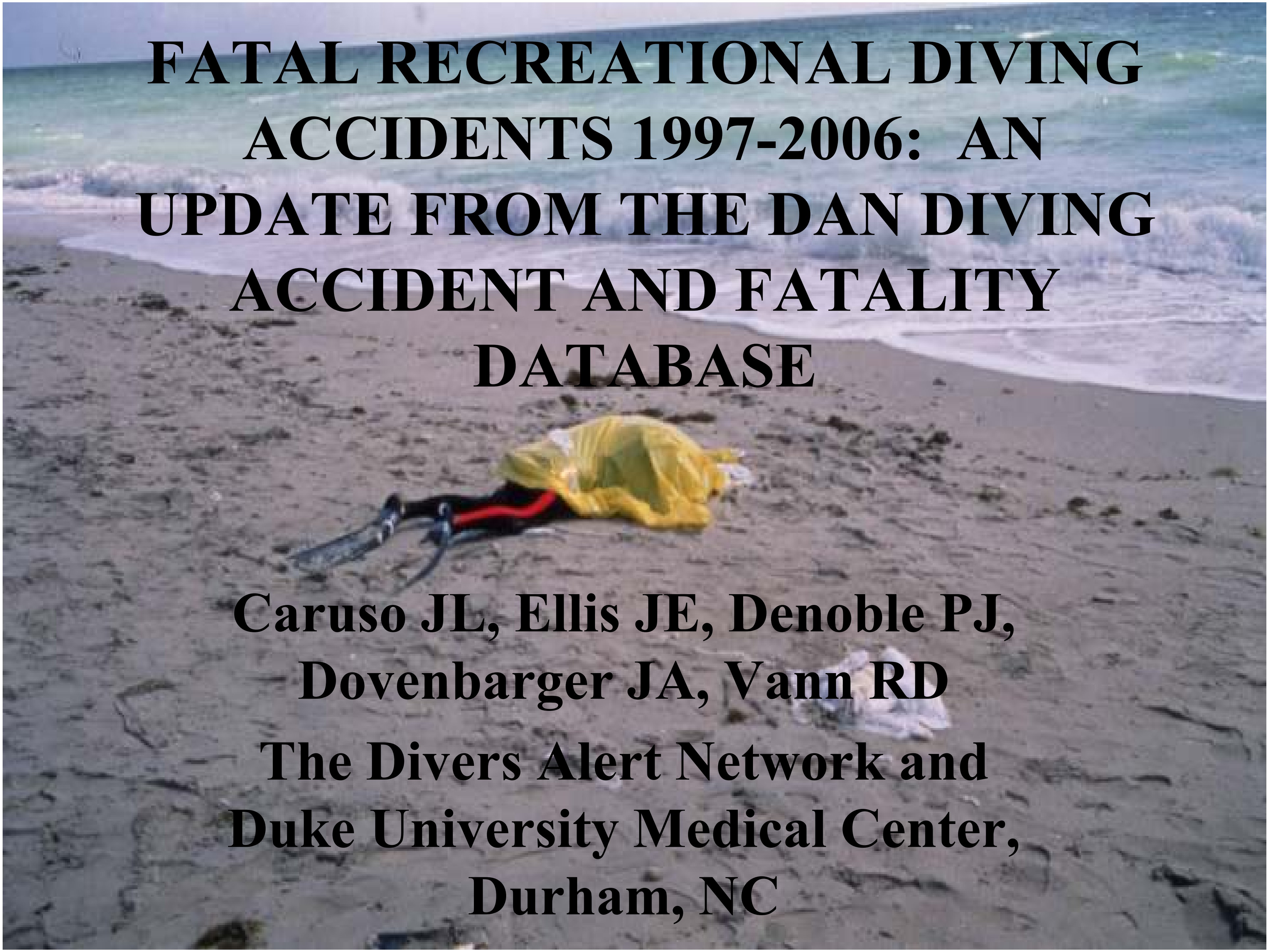

FATAL RECREATIONAL DIVING ACCIDENTS 1997-2006: AN UPDATE FROM THE DAN DIVING ACCIDENT AND FATALITY DATABASE

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Recent Diving Related Death

- Twenty-six-year old male using a 100% oxygen rebreather rig at a shallow depth suffers a seizure toward the end of the dive and drowns

- Without a detailed investigation and autopsy this death would have been attributed to an oxygen induced seizure that resulted in drowning

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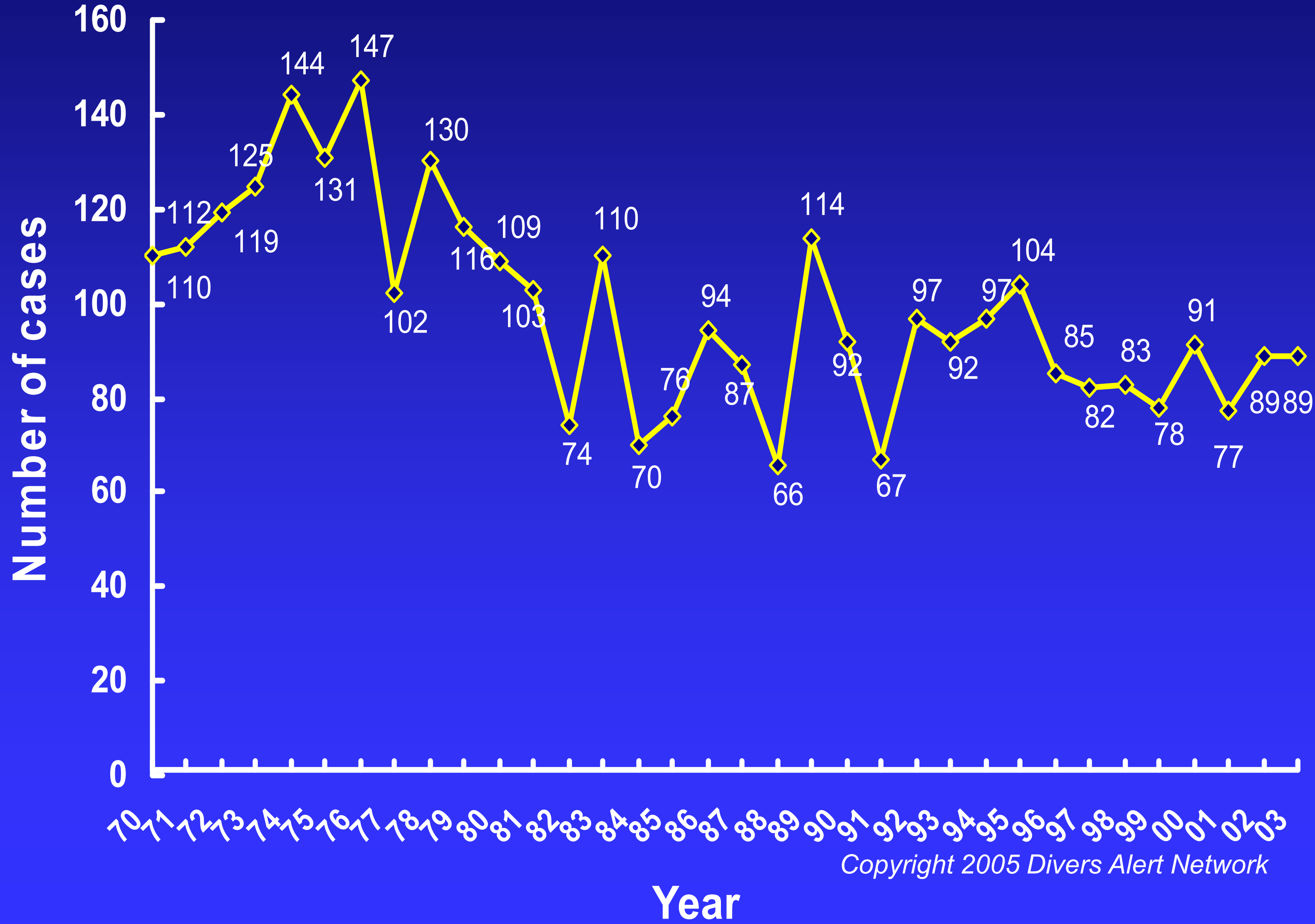
DAN Diving Fatality Database

- In an effort to improve diving safety, DAN collects and analyzes all available information on diving related fatalities that occur in the U.S. and Canada or involve U.S. citizens diving abroad
- The goal is to generate a lessons learned and hopefully avoid/minimize future diving related deaths

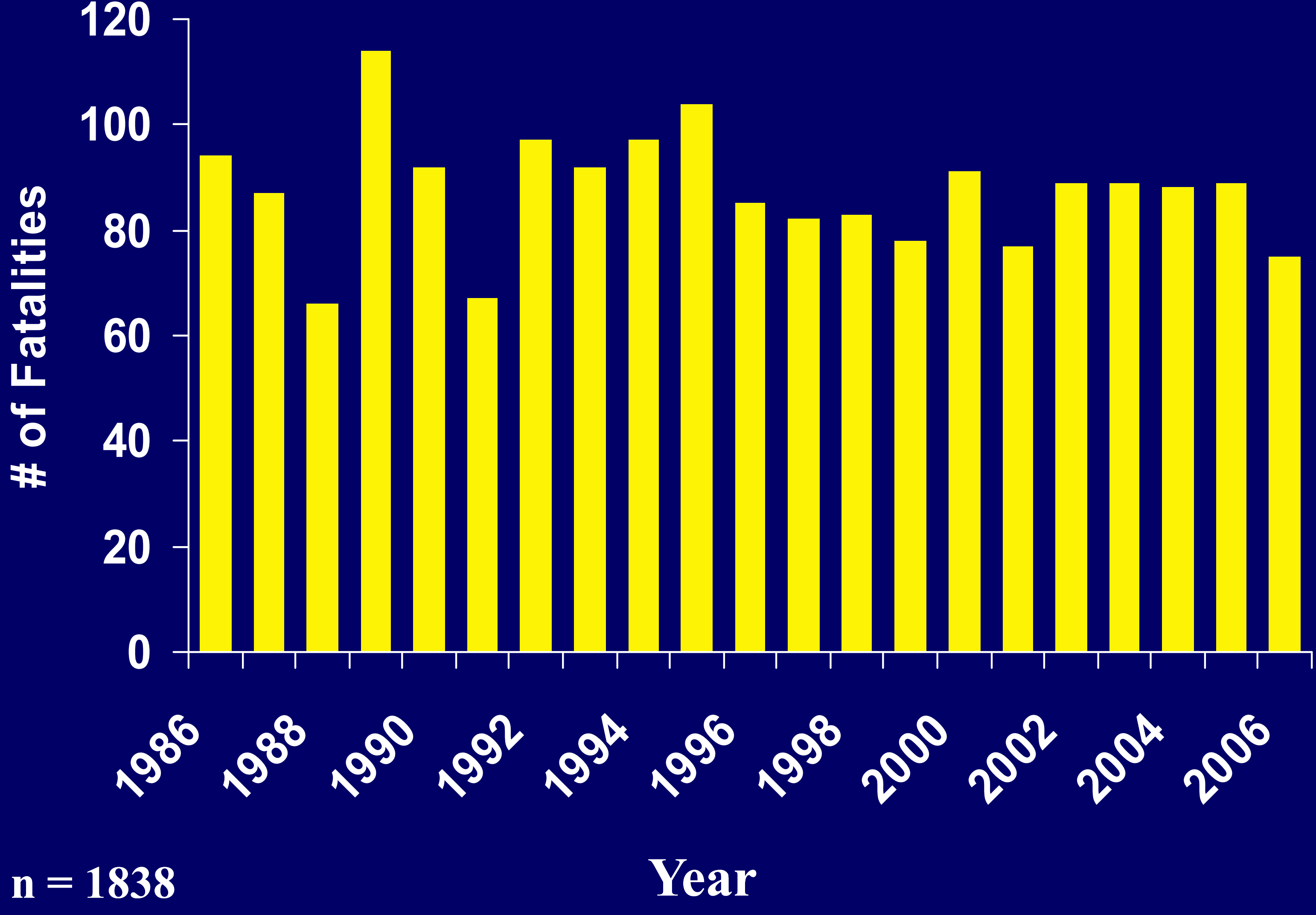
Data Collection

- DAN staff collects investigational, law enforcement, and USCG reports, training records, dive logs, medical records, witness input, and the results of a postmortem examination
- Sources include media, internet, DAN referral physicians, DAN members/divers, and direct input from the investigational and law enforcement offices and Medical Examiner/ Coroner offices

DIVING FATALITIES
1970 - 2003



Annual Record of U.S. & Canadian Diving Fatalities



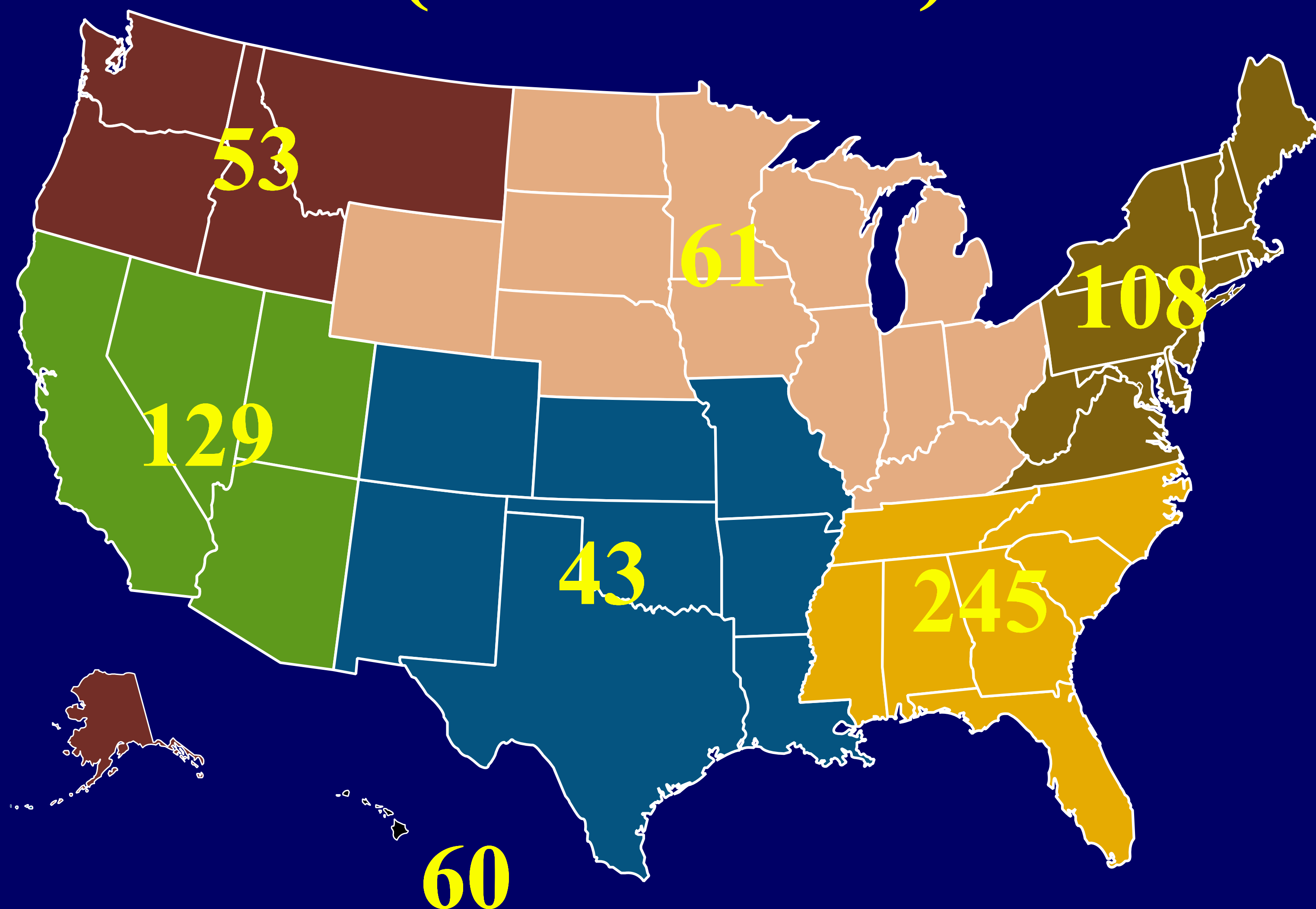
Results

- 841 diving related deaths were added to the database during the period 1997-2006
- Completeness of data varied from the bare minimum amount of information about the incident to a complete case file with investigation and autopsy reports

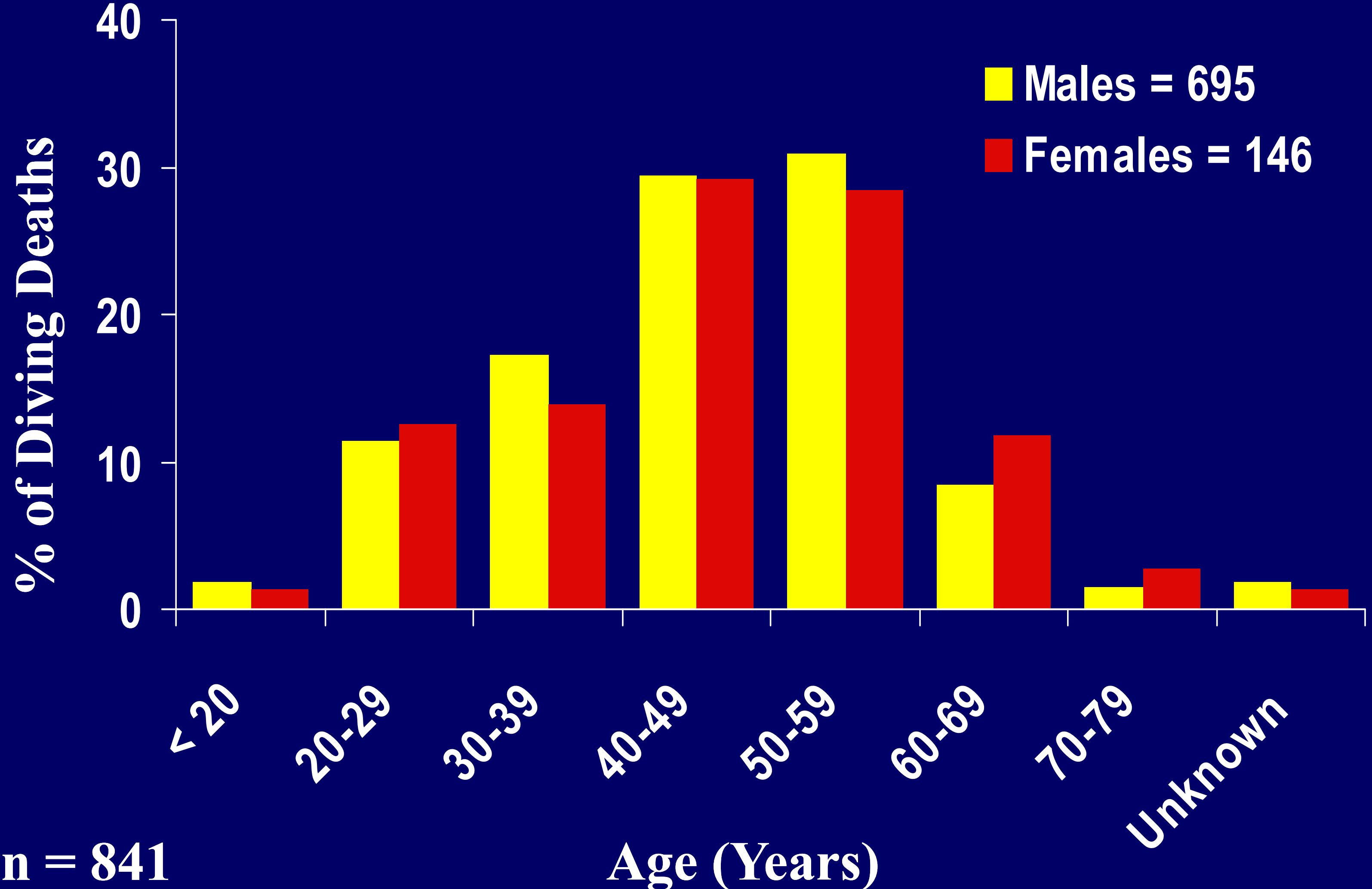
Results

- More diving related fatalities occurred in the Southeast USA than any other region
- Cases included 695 males and 146 females
- The median age was 47-years
- Most deaths involved divers who were on "pleasure/sightseeing" dives but some involved students under instruction and others who were performing a task

U.S. Fatalities by Region (1997 - 2006)



Age and Gender of Diving Fatalities (1997 - 2006)



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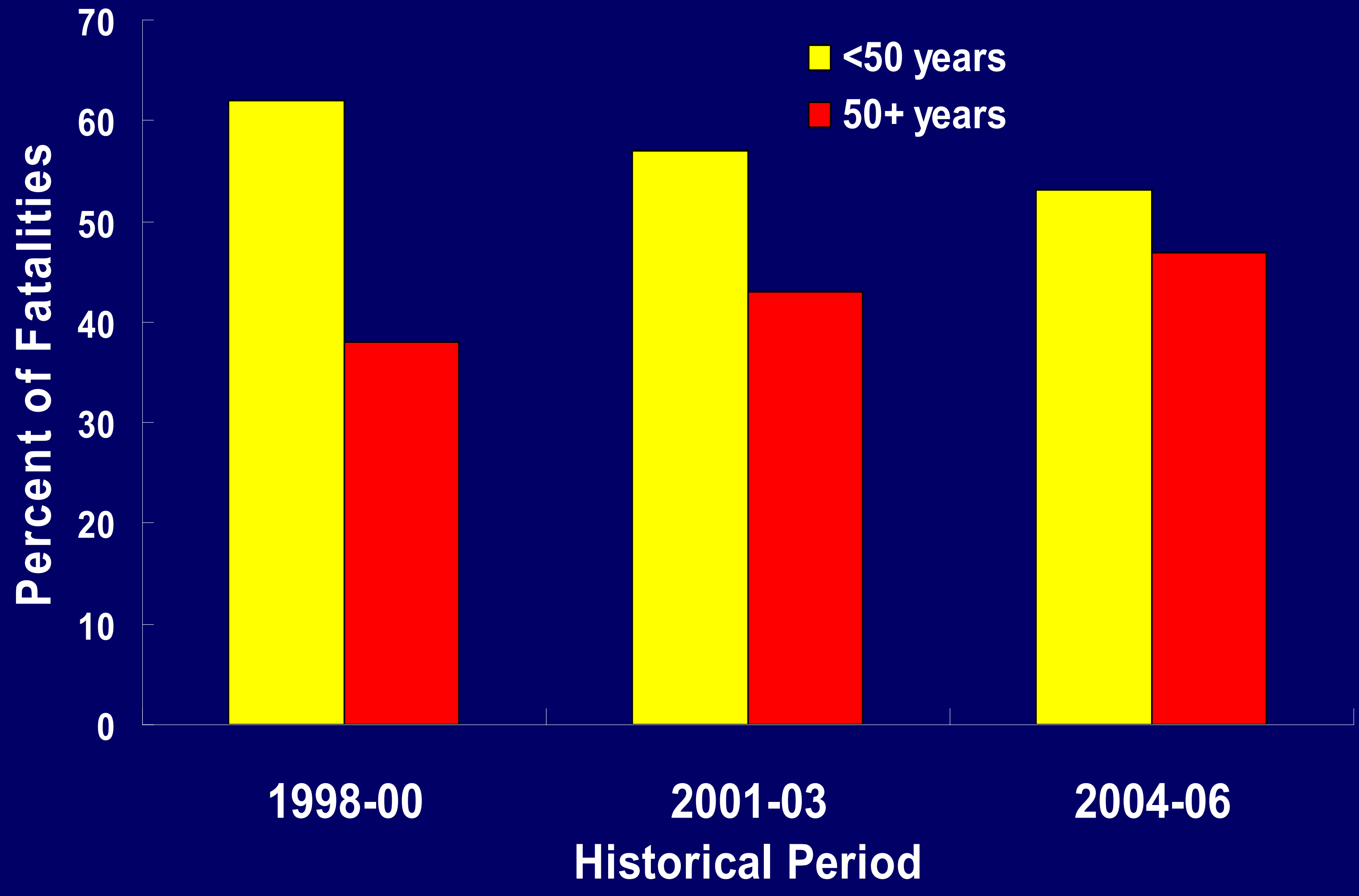
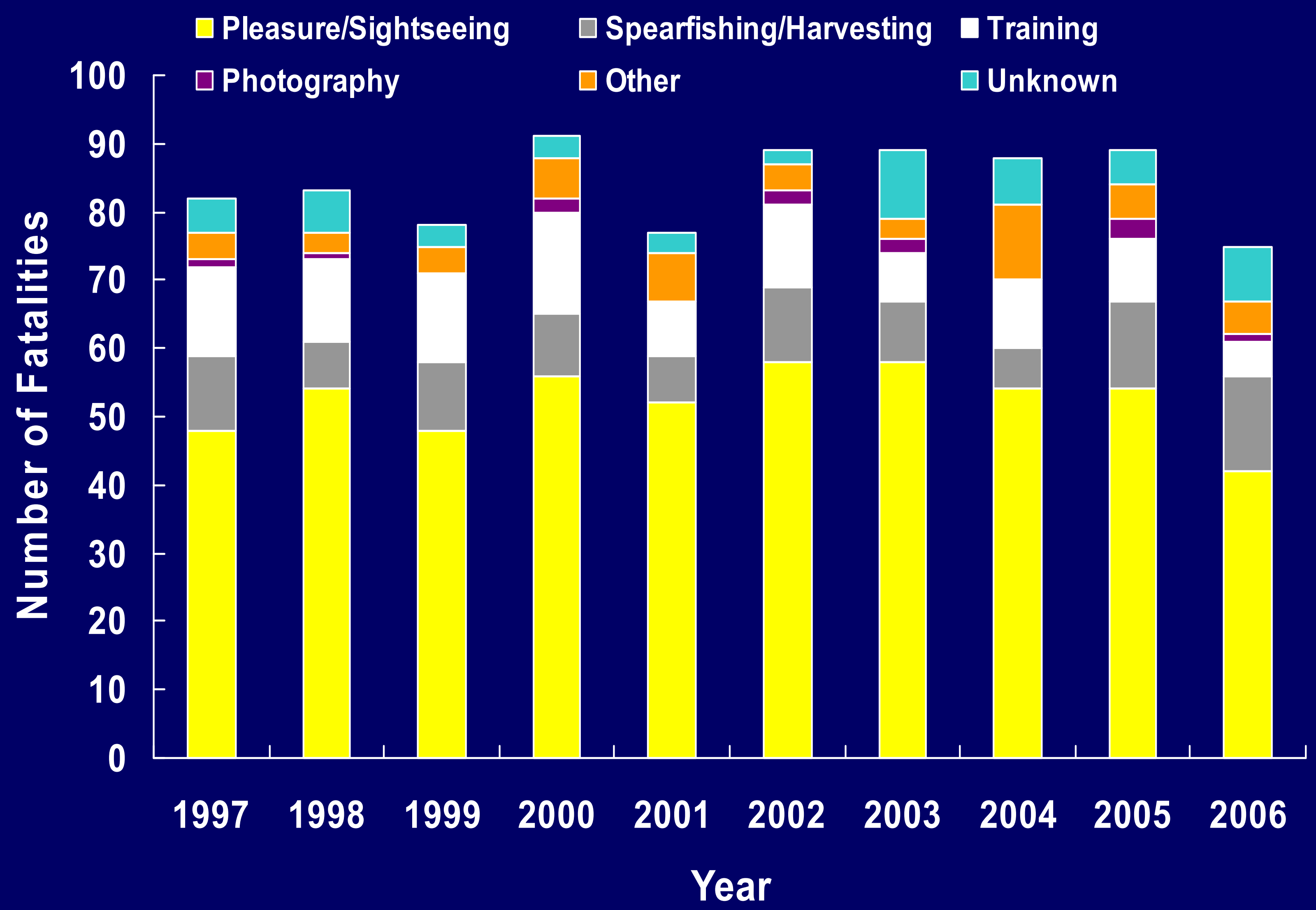
DAN Fatalities over Age 50



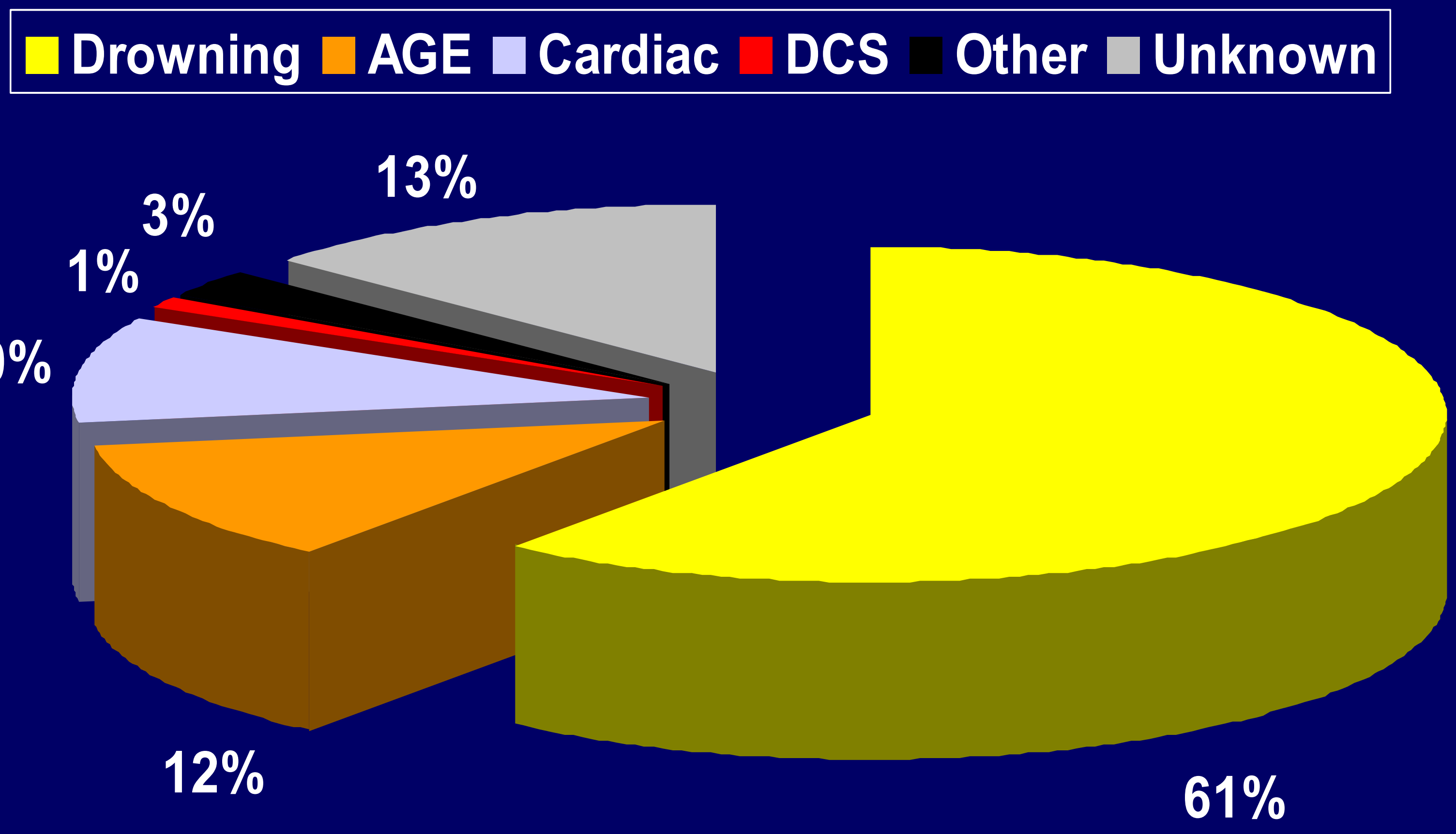
Diving Activity (1997 - 2006)



Primary Cause of Death

- The physiological event that directly results in death
- In an immersed environment this is most often drowning, though contributing factors may be far more important to elucidate
- The primary cause of death for over half of the cases in this study was drowning, followed by cardiac events and air embolism

Primary Cause of Death 1997 - 2006



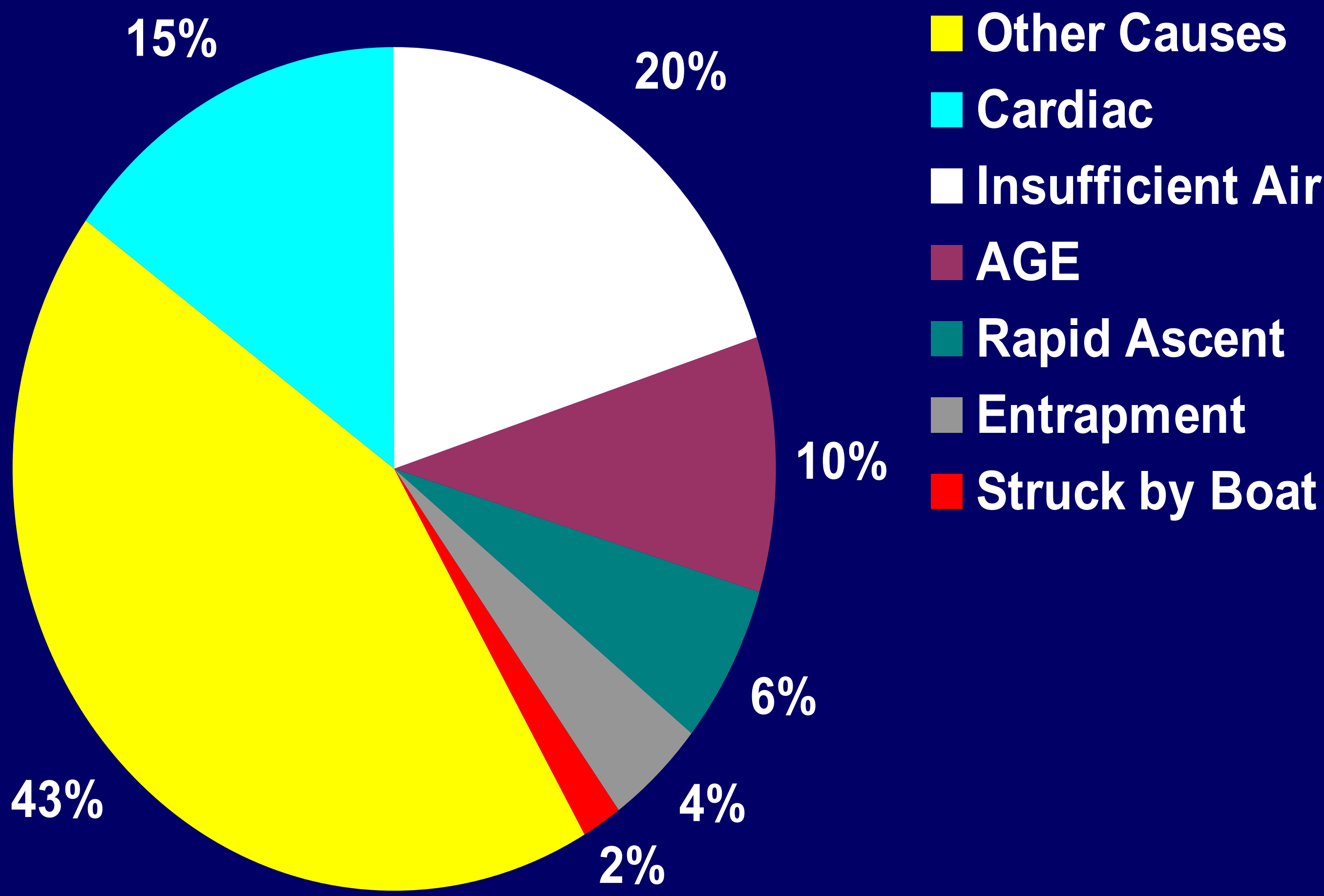
n = 841

Major Contributing Factors

Important physiological or environmental factors that directly contribute to the primary cause of death

Examples include incapacitating events such as air embolism or a cardiac dysrhythmia (which would both be primary causes of death when not immersed) or environmental/ circumstantial events such as entrapment or insufficient air

Major Contributing Factor Leading to the Primary Cause of Death



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Major Contributing Factor Leading to the Primary Cause of Death

Cause	Totals	Percentage
Insufficient Air	**159**	**19.9**
Cardiac	**120**	**15.0**
AGE	**79**	**9.9**
Rapid Ascent	**50**	**6.2**
Entrapment	**32**	**4.0**
Struck by Boat	**14**	**1.7**
Other Causes	**348**	**43.4**

n = 802

Conclusions

- Drowning is the most common cause of death in a fatal diving mishap, but a significant number of diving related deaths involve either an insufficient air scenario or a cardiac related health problem
- Insufficient air situations are frequently linked to rapid ascent and air embolism. Air embolism is both a leading cause of death and a significant contributing factor

Conclusions

- Efforts to reduce the total number of diving related fatalities should focus on avoiding out of air situations and emphasize diving within one's training and experience levels
- Improved diver awareness of cardiovascular health problems and possibly increased screening for significant cardiovascular disease in divers would likely decrease the number of diving related deaths

Credits

- In addition to the individuals on the title slide, there are several DAN staff, particularly the medics, who tirelessly followed up on these cases
- The Divers Alert Network is also indebted to the scores of divers, medical personnel, and investigators who contributed information on these fatal diving accidents