Alaska DIVING SAFETY

Workshop Proceedings

University of Alaska Sea Grant College Program Report No. 97-03

Alaska DIVING SAFETY

Workshop Proceedings

July 25, 1997
Sitka, Alaska

University of Alaska Sea Grant College Program

Price $4.00
AK-SG-97-03

Sea Grant
Alaska

Elmer E. Rasmuson Library Cataloging-in-Publication Data

Alaska Diving Safety Workshop (1997 : Sitka, Alaska)
Alaska Diving Safety Workshop Proceedings, July 25, 1997, Sitka, Alaska. (University of Alaska Sea Grant College Program ; AK-SG-97-03)
1. Deep diving—Safety measures. I. Alaska Sea Grant College Program. II. Alaska Marine Safety Education Association. III. Title. IV. Series: Alaska Sea Grant College Program report ; 97-03.

GV840.S78A24 1997

ISBN 1-56612-052-7

Citation for this volume is Alaska Diving Safety: Workshop Proceedings. Alaska Sea Grant College Program Report No. 97-03, University of Alaska Fairbanks, 1997.

Credits

Book contents were compiled by Shawn Newell and Dan Falvey of the Alaska Marine Safety Education Association. Editing is by Kurt Byers, cover design and layout are by Dave Brenner, and proofreading is by Sue Keller of Alaska Sea Grant. Book production is by the University of Alaska Sea Grant College Program, which is cooperatively supported by the U.S. Department of Commerce, NOAA Office of Sea Grant, under grant no. NA46RG-0104, project A/75-01; and by the University of Alaska with state funds. The University of Alaska is an affirmative action/equal opportunity employer and educational institution.

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AMSEA is an independent non-profit group of people and organizations united to promote education aimed at reducing the rate of accidental injuries and fatalities in the Alaska marine environment.

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Alaska Sea Grant

The Alaska Sea Grant College Program sponsors research and education to promote the wise use and conservation of Alaska's marine and coastal resources. Alaska Sea Grant is part of the University of Alaska Fairbanks School of Fisheries and Ocean Sciences and is jointly administered by UAF/SFOS and the National Oceanic and Atmospheric Administration.

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Why a Workshop?

The goal of this workshop was to identify the nature and scope of safety concerns in Alaska's dive industry and discuss education and information opportunities that will enhance diving safety in Alaska.

As the Alaska visitor industry expands and the commercial harvest of sea urchins and sea cucumbers grows, so too does the number of people who dive in Alaska waters. In addition, the state's coastal mineral extraction and dredging industries demand skilled industrial divers, as do Alaska's government and academic research communities.

Various methods of diving are becoming more commonplace in Alaska, and this is accompanied by a need to educate divers about the challenging conditions in Alaska waters and to remind divers of good safety practices. With that goes the need for efficient ways to respond to dive casualties—an especially difficult task given the immense distances and remote locations emergency responders must cope with in a state that has more shoreline than the rest of the United States combined.

The National Sea Grant College Program, a Great Lakes and ocean research and public education program administered jointly by the National Oceanic and Atmospheric Administration and state universities, has long been involved with dive safety research and education.

The Alaska Sea Grant College Program and the Alaska Marine Safety Education Association (AMSEA) have been close partners in commercial fishing safety education since AMSEA's formation in 1985. Since that time, AMSEA has compiled an impressive record of training more than 400 marine safety and survival instructors in Alaska and nationwide, who in turn have educated over 65,000 mariners.

As diving for fun and profit grows in Alaska, Alaska Sea Grant and AMSEA are pleased that this gathering of experts has revealed what needs to be done to improve diving safety in Alaska. We also hope this gathering introduced people to each other who share a common interest in keeping Alaska divers alive and well, and will lead to productive collaborations aimed at ensuring the well-being of people who dive Alaska waters.

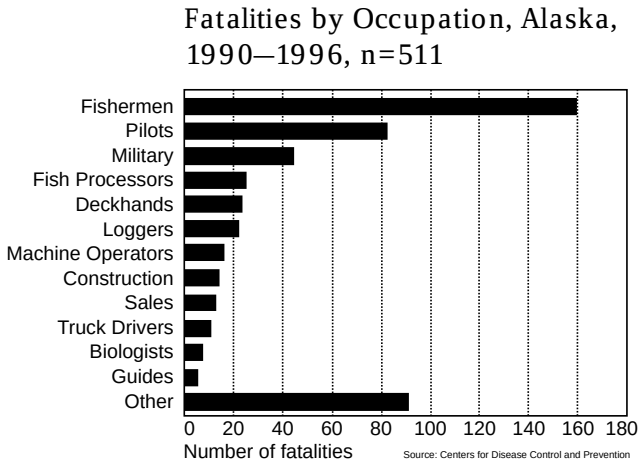
—Kurt Byers

Occupational Diving in Alaska

The Cold Facts: Occupational Diving Injuries and Fatalities in Alaska

Jennifer Lincoln
National Institute of Occupational Safety and Health (NIOSH), Anchorage, Alaska

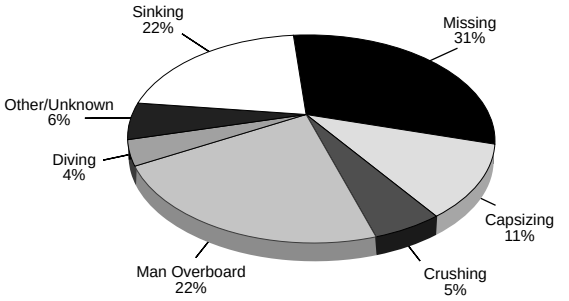
NIOSH established a research field station in Anchorage, Alaska, in 1991 after identifying Alaska as the highest risk state in the United States for traumatic worker fatalities. For the years 1980 through 1989, 34.8 worker deaths per year occurred for every 100,000 workers employed in Alaska. This workplace death rate is the highest for any state and is almost five times the U.S. rate (7.0 deaths per 100,000 workers) for the same period.



One hundred fifty-nine fishermen were killed on the job in Alaska, resulting in the occupation with the highest number of workplace deaths for the 7-year period 1990 through 1996. Six (4%) of these fishermen were diving when they died.

These six diving victims were all male, 20-32 years old, and diving in 10-44 feet of water. Three of these divers were harvesting sea cucumbers; the other three were diving to clear lines or nets. Four of the divers were using scuba gear and two were using hukka gear. One was highly trained, but the rest were newly certified with minimal experience or with no training. Four of the six drowned after getting entangled, one after exhausting his air supply, and it is unknown why the sixth victim drowned.

Commercial Fishing Fatalities by Type of Incident, Alaska, 1990—1996, n=159



Source: Centers for Disease Control and Prevention

Diving Fatality Profile

Age: 20-32 year old white males

Activity: 3 sea cucumber divers/ 3 clearing nets

Equipment: 4 scuba/ 2 supplied air

Depth: Diving in 10-44 feet of water

Drowned after: getting entangled (4), exhausting air supply (1), unknown what happened (1)

Training: Only one was highly trained from USCM, the other 5 victims were either newly certified, or had no certification

From 1993 to 1995, there were four divers listed in the Alaska Trauma Registry (ATR) whose injuries were occupation-related. All were male, 24-58 years old. One diver was repairing his boat, another was harvesting sea cucumbers, and it is unknown what the other two divers were doing. Two of the divers were using surface supply equipment, but it is unclear what the other two divers were using. Training and experience are not recorded in the ATR. One victim got his hose entangled in the prop, another had dive suit problems, another had a decompression problem, and the fourth got his hose caught by a passing boat and was pulled rapidly to the surface.

NIOSH is researching worker deaths in Alaska to identify preventive measures that may be used to reduce the number of occupational fatalities in Alaska and in other states where workers face similar risks. Due to the elevated fatality rates in commercial fishing, logging, and air transportation, NIOSH is focusing research efforts on these dangerous occupations.

Seafood Harvest Diving Safety

Dive Harvest in Alaska: A Rising Industry

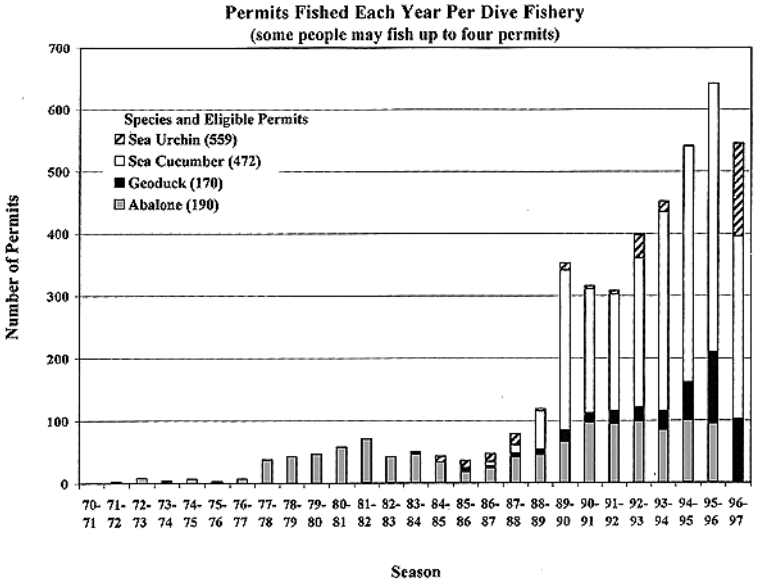
Scott Marshall
Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau, Alaska

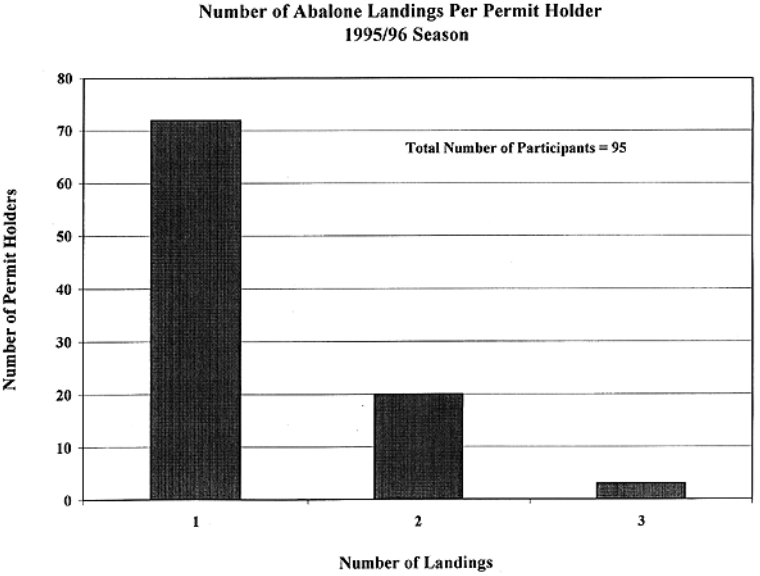
Dive fisheries throughout Alaska are relatively new. While conservative management is practiced as more biological data is accumulated on the primary dive fishery species, there appears to be considerable potential for growth. Sea cucumbers, geoduck clams, and red sea urchins are the main species harvested. The abalone fishery is closed for rebuilding.

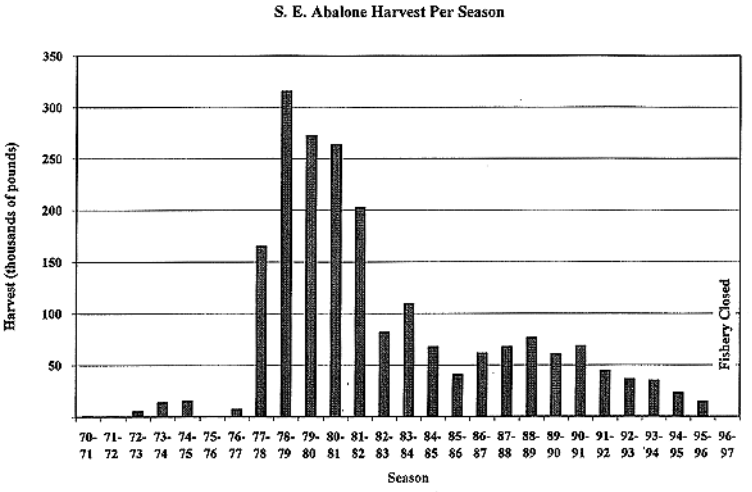
The majority of dive fisheries currently take place in Southeast Alaska with a few also occurring in the Aleutian, Kodiak, and Prince Williams Sound regions. Dive fisheries take place in both protected waters and highly exposed coastlines far from towns.

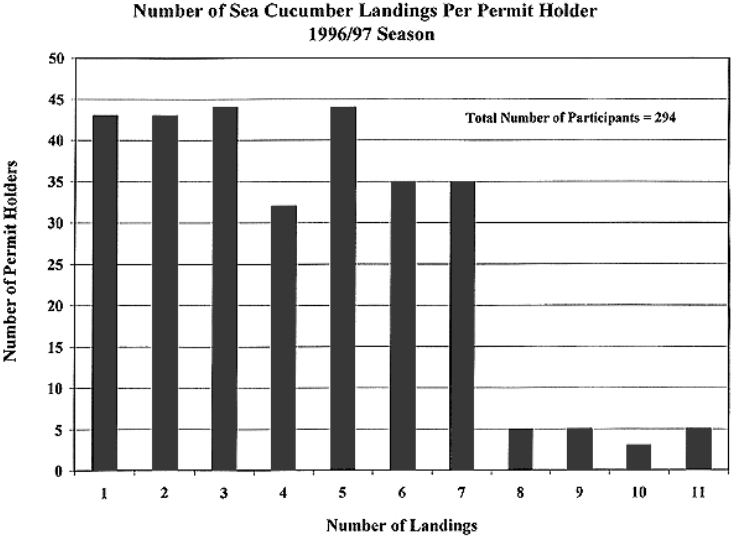
In Southeast Alaska there are slightly under 600 divers who qualified for permits under a recent moratorium on entry to the dive fisheries. However, only about 300-400 of these people actually participate in the fisheries each year. Many of those who do participate in the fisheries are part-time divers and make only one or two landings per year. Thus, a relatively small number of permit holding divers account for the major proportion of annual landings.

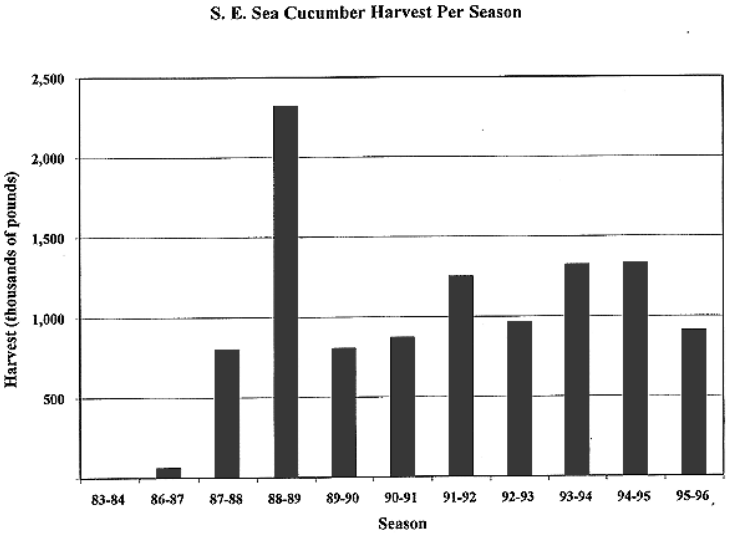
Alaska's dive fisheries take place in the fall and winter to maximize market value and to avoid conflict with salmon and other fisheries that occur in the summer. However, diving in the fall, winter, and early spring months means divers and tenders must be prepared to deal with the increased likelihood of bad weather. Most harvesters use small open vessels, not well-suited for Alaska's adverse weather, which further exacerbates the danger. The experience and training of the divers and tenders vary greatly. Cold weather especially increases the threat of hypothermia to tenders who must be prepared to cope with long exposures to the elements.

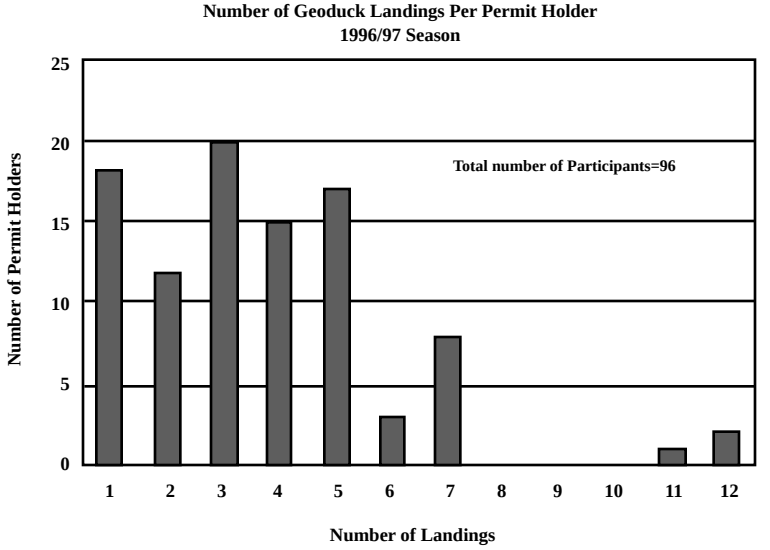

Permits Fished Each Year Per Dive Fishery
(some people may fish up to four permits)
Species and Eligible Permits
Sea Urchin (559)
Sea Cucumber (472)
Geoduck (170)
Abalone (190)
Number of Permits
0
100
200
300
400
500
600
700
70- 71
71- 72
72- 73
73- 74
74- 75
75- 76
76- 77
77- 78
78- 79
79- 80
80- 81
81- 82
82- 83
83- 84
84- 85
85- 86
86- 87
87- 88
88- 89
89- 90
90- 91
91- 92
92- 93
93- 94
94- 95
95- 96
96- 97
Season

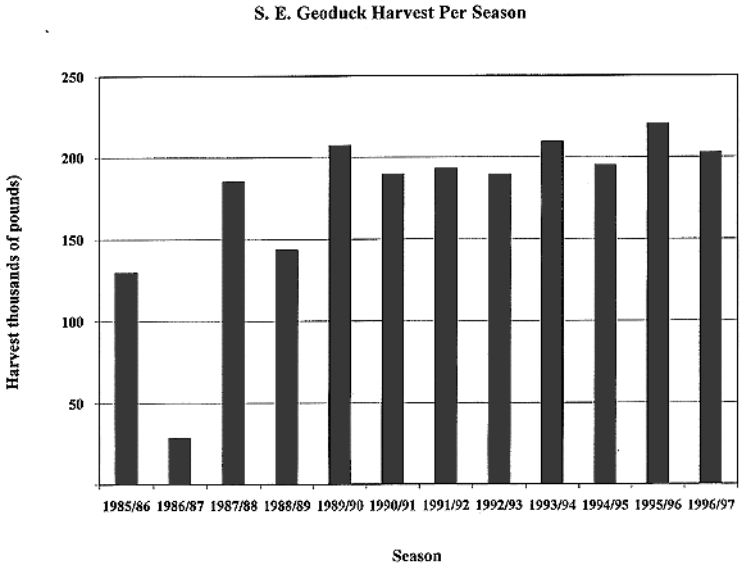

Number of Abalone Landings Per Permit Holder
1995/96 Season
Total Number of Participants = 95
Number of Permit Holders
0
10
20
30
40
50
60
70
80
1
2
3
Number of Landings

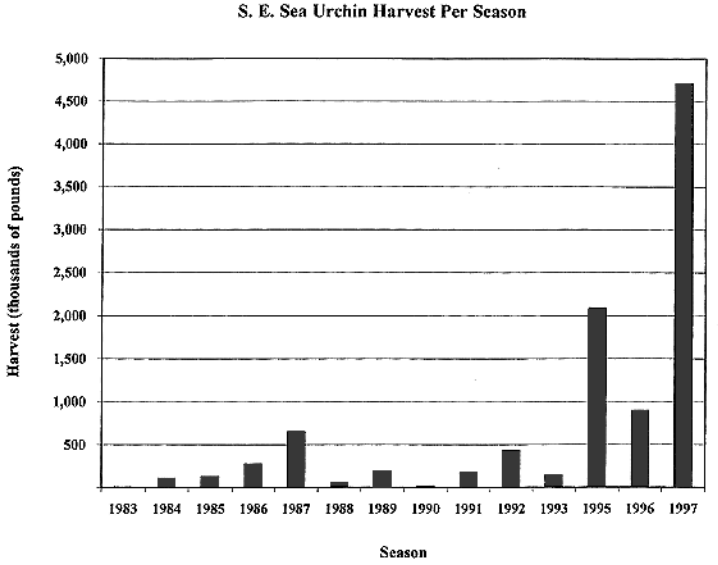

S. E. Abalone Harvest Per Season
Harvest (thousands of pounds)
350
300
250
200
150
100
50
Fishery Closed
70-71 71-72 72-73 73-74 74-75 75-76 76-77 77-78 78-79 79-80 80-81 81-82 82-83 83-84 84-85 85-86 86-87 87-88 88-89 89-90 90-91 91-92 92-93 93-94 94-95 95-96 96-97
Season


Number of Sea Cucumber Landings Per Permit Holder
1996/97 Season
Number of Permit Holders
50
45
40
35
30
25
20
15
10
5
0
Total Number of Participants = 294
1 2 3 4 5 6 7 8 9 10 11
Number of Landings


S. E. Sea Cucumber Harvest Per Season
Harvest (thousands of pounds)
2,500
2,000
1,500
1,000
500
83-84
86-87
87-88
88-89
89-90
90-91
91-92
92-93
93-94
94-95
95-96
Season


Number of Geoduck Landings Per Permit Holder
1996/97 Season
Number of Permit Holders
25
20
15
10
5
0
Total number of Participants=96
1
2
3
4
5
6
7
8
9
10
11
12
Number of Landings


S. E. Geoduck Harvest Per Season
Harvest thousands of pounds)
250
200
150
100
50
1985/86 1986/87 1987/88 1988/89 1989/90 1990/91 1991/92 1992/93 1993/94 1994/95 1995/96 1996/97
Season


S. E. Sea Urchin Harvest Per Season
Harvest (thousands of pounds)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1995 1996 1997
Season

What Are the Safety Issues?

Michael Bangs
Alaska Harvest Divers Association, Petersburg, Alaska

One of the goals of the Alaska Harvest Divers Association (AHDA) is to promote safety among divers. The AHDA wants the safety practices to come from within the industry and believes that regulations which do not come from divers will not be accepted or effective. Management changes to enhance safety such as different seasons or implementing an individual quota system have been discussed, but each presents problems. Education and training may be the key to improving safety. AHDA would like to see an educational program and emergency protocols for treatment come from this meeting.

Dive Harvest Safety in Maine: Education That Works

John Fetterman
Maine Department of Marine Resources, Portland, Maine

In 1992 the Maine urchin fishery experienced an explosive, gold-rush like development. The number of fishermen issued permits in the urchin fishery increased from 200 in 1992 to 2,439 in 1993 with an ex-vessel value of approximately $35 million. Fishermen used small fishing vessels or recreational boats that were not appropriate for the rough-water, exposed areas where they fished, nor were they stable with the loads they carried while urchin fishing.

Many of the fishermen were untrained and inexperienced. Approximately 30% of the divers were not certified. Safety practices were poor: black market air supplies were often used; tenders, when used, did not wear PFDs, had no training in vessel handling, anchoring, or first aid; divers worked alone under water, overweighted themselves, and made repetitive dives without fully understanding the physiological effects.

In 1992 there were five fatalities and hundreds of casualties. In 1993, there were six fatalities in the first six months and the urchin fishery accounted for 25 percent of the total fishing-related casualties.

In 1993, the Maine State Legislature passed laws requiring training as a prerequisite for licensing, and directed the Maine Department of Marine Resources to develop and implement a training program for divers and tenders before the beginning of the next season, only eight months away. A task force of harvesters, dive instructors, hyperbaric chamber operators, and enforcement personnel created a course outline for a three-day program: day 1, first aid/CPR; day 2, operations management and emergency procedures for divers and tenders; day 3, advanced dive tables and physiology for divers only.

The course was offered through the Maine College Technical center for insurance reasons, and taught by Jamestown Marine using commercial dive instructors. Waivers were available for people who could demonstrate prior training at an equal or higher level. The first classes were offered in mid-September and by the January start of the season approximately 1,800 divers and tenders were trained. The cost of the class was $170.

In the two years since the implementation of the diver safety program, there has been just one fatality.

Should Anything Be Done to Make Dive Harvest Safer in Alaska?

Dan Falvey: Discussion Leader
Alaska Marine Safety Education Association, Sitka, Alaska

Participants were split into three groups and asked to:

- Identify safety issues associated with harvest diving in Alaska.
- Identify the best methods of addressing these issues.
- Identify factors that will prevent these issues from being effectively addressed.

The responses were presented to the workshop as a whole and discussed. Following are the safety issues identified:

- The need for training divers, tenders, and vessel operators on vessel and equipment safety and emergency procedures.
- Accessibility of hyperbaric chambers.
- Seaworthiness, stability, and condition of vessels used in the dive fisheries.
- Seamanship skills of divers, tenders, and vessel operators.
- The need for a central dive emergency phone number.
- Bad weather during openings.
- Availability and access to diving safety information and training.
- Economic pressure of dive fisheries.
- Communications with dive emergency responders.
- Availability of oxygen in the field.

The best methods to address the above issues were:

- Education and training.
- Change fishery management to allow for safer operations.
- Develop emergency response network, equipment, and procedures.

- Develop and distribute safety guidelines and standards applicable to harvest diving.
- Develop and distribute “awareness” videos and educational materials.
- Contact with Divers Alert Network (DAN) 1-800-DAN-EVAC.
- Use local dive groups to access divers.
- Implement state-required training.
- Identify existing training and resources.
- Provide safety and emergency response information on dive licenses and log books.

Factors that might prevent these issues from being effectively addressed were:

- Resistance to regulation and change in general.
- No training available relevant to commercial harvest diving.
- Limited budgets and time for training agencies and OSHA.
- Lack of communication.
- Lack of follow-through.

Industrial Diving Safety

What Are the Safety Issues?

Terry Wilson
Arctic Diving and Exploration, Nome, Alaska

Underwater dredging for gold in Nome presents real safety issues. There are currently nine gold dredges mining the nearshore areas off Nome. The shallow water these dredges are working in makes divers believe they are safe. They are not. Divers can embolize in as little as 1 ft. The majority of divers currently working are not trained divers and are using marginal equipment with major safety problems such as:

- Air intakes adjacent to compressor engine exhaust.
- Safety tenders (when present) have no training or equipment.
- Caribou running along beach rub their antlers on divers' air lines.

There have been no casualties yet, but some very close calls. Wilson is currently working on an awareness video that could be available in January 1998. He would like to see an awareness program first, followed up by education and training. Association of Dive Contractors, Inc. (ADC) has an excellent resource book, *Consensus of Safe Commercial Diving Standards*. U.S. Coast Guard and OSHA have standards, but have no enforcement in Nome.

What Could Be Done to Make Industrial Diving Safer in Alaska?

Julia Navarro: Discussion Leader
Occupational Safety and Health Administration (OSHA), Anchorage, Alaska

There have been two dive-related fatalities investigated by OSHA recently. Citations were issued for the following safety violations:

- No standby diver.
- No line tender.
- Equipment had no reserve air supply.
- No buoyancy compensator.
- No weight belt.
- No safe practices manual.
- No decompression tables.

In terms of jurisdiction, OSHA regulations apply only to employer/employee relationships. Because the fishery permits are issued directly to the harvest diver in Alaska, OSHA regulations may not apply in many harvest dive operations. However, in the case of a skipper who has a crewmember dive on his/her vessel to clear the prop, courts have upheld OSHA's jurisdiction and fines because "the divers perceived the boat owner as the boss!" In Maine, OSHA regulations were made part of the state-mandated dive safety program to avoid these jurisdictional problems.

Workshop participants noted that the standard for a dive team is now three people for a team that includes two divers, and four people for a team that includes three divers. It was also noted that National Oceanic and Atmospheric Administration divers are under OSHA regulations.

This is causing some problems because current OSHA regulations were written in the 1970s, and advances in equipment design and technology are not consistent with the old regulations. Examples cited were:

- OSHA regulations still require independent air supplies like J-valves, which are outdated and no longer in use.
- If a diver goes below 100 feet, a decompression chamber must be on site.
- Dive computers are not accepted as a replacement for the manual decompression tables.

Nitrox diving is considered mixed-gas diving and falls under OSHA regulations. Many participants agreed that the current OSHA regulations should be updated to encompass new technologies.

Harvest divers expressed concern that the current OSHA regulations do not reflect the unique demands of their different fisheries. In some fisheries, required safety devices may introduce greater risk to the diver than would be present without the device(s). For example, a spare air supply may be dangerous in abalone diving where risk of entanglement with underwater objects is high. It was noted that if a requirement is detrimental to the diver it can be waived. However, the waiver must be asked for in advance.

Recreational Diving Safety

What Are the Safety Issues?

Alexander Kotlarov
Dive Charter Operator/Dive Rescue Diver, Ketchikan, Alaska

Dive tourism is expanding in Alaska and a safety program for dive tourism should be established. Alaska has many different dive scenarios, including extreme tidal ranges, cold water, shipwrecks, caves, fresh-water diving, etc.

In dive charters out of Ketchikan, it's estimated that one out of every five divers has had problems during their dives. The typical diver is not always ready for the extreme tidal and depth conditions that are common in Alaska. People from tour ships are taken on dives, and many of these folks are not well-trained divers, especially not for the extreme conditions routinely encountered in Alaska.

To help dive charter operators and recreational divers increase their margin of safety, we should consider developing a recreational dive safety certification program in Alaska for recreational dive charter operators. The certification program could be modeled on the naturalist training program recently begun by the University of Alaska. This UA program provides ecotour guides, sightseeing and fishing charter operators, and others who host visitors the opportunity to enroll in a short workshop to educate themselves about the social history and natural resources of Alaska in return for university certification. A similar sort of diving safety education and certification program could be offered to dive charter operators. In addition to improving the knowledge of charter operators, the resulting university certification would also provide a marketing advantage for businesses holding such certification.

People who opt to hire these certified dive guides would be assured of getting well-informed pre-dive safety instruction, including information about how to handle conditions in Alaska waters. They would also conduct at least their first dive accompanied by the safety certified divemaster who owns or is employed by the dive charter operation. Afterward, divers could be given some memento of their Alaska dives, such as a shoulder patch, cap, tee shirt, certificate, etc.

Cave diving is growing in popularity. With the continuing discovery of new limestone caves on Prince of Wales Island and elsewhere, this growth will likely continue. Cave rescue and recoveries demand special skills from responding divers.

The amount of waterborne traffic off several bustling Southeast Alaska port cities is a disaster waiting to happen. Huge cruise ships and ferries, commercial fishing and recreational boats, floatplanes, kayakers and others all share space on the congested waters, especially near the docks. Airports are also close to the water. A collision on or over the water will require highly trained and mobile dive rescue teams.

Dive rescue teams in Southeast Alaska need more responders and training to deal with the range of scenarios developing and the geographic area that needs to be covered. Because of cost to train dive rescue teams, it will probably be necessary to coordinate training among different dive rescue groups within a region.

I recommend at least two informational products that would help improve recreational diving safety in Alaska.

- A video that would show divers what conditions to expect in Alaska. This video could be distributed to cruise ship companies, dive shops, dive charter companies, and other outlets such as scuba diving and tourist magazines. Dive guides would be encouraged to require their clients to view the video prior to their dives.

- Create software that would calculate the slack tides and currents to give the optimum dive times for popular dive locations. The original program would be difficult to write, but easy to upgrade once written.

[Editor's note: On September 29, 1997, four weeks after Kotlarov made his remarks at the Sitka dive safety workshop, a sightseeing float plane crashed on takeoff over Tongass Narrows near downtown Ketchikan. The pilot, who had just dropped off his last customers of the day, was rescued unconscious from his submerged cockpit by commercial divers and Kotlarov's dive rescue team. The pilot died the next morning from injuries suffered in the crash.]

New Approaches to Recreational Diving: Mixed-Gas Deep Diving and Other Techniques

Lee Somers
Michigan Sea Grant College Program, Ann Arbor, Michigan

Recreational dive training is the smallest economic component of the dive industry, but it is the foundation of the entire industry. The ultimate success of the dive industry depends on good recreational dive training. Individual instructors are the key element in making a good diver, not the organization sponsoring the training.

Traditionally, recreational diving was defined as diving to depths less than 130 ft with no decompression stops and no overhead obstructions. However, surveys show that a large number of recreational divers are exceeding these standards. In fact, 23 percent of recreational divers have dived to depths exceeding 200 ft.

Technical diving is defined as dives to depths greater than 130 ft, often requires decompression, and may include overhead obstructions and mixed gases. Mixed gases increase “no-decompression” dive times and, on longer dives, reduce decompression time and gas absorption.

Enriched air nitrox is a popular mixed gas used by technical divers, and will probably become a factor in commercial diving. During dives to less than 60 ft, divers using nitrox can double their no-decompression dive time. Because nitrox also reduces decompression time, it is most often used for diving on walls, caves, and shipwrecks. Currently there are about 50,000 certified nitrox divers, but fewer divers are actually using it. The Professional Association of Diving Instructors (PADI), National Association of Underwater Instructors (NAUI), and most other dive training organizations (except the YMCA) are offering nitrox training.

Different nitrox mixes use varying percentages of oxygen content. The more oxygen content is increased, the longer the no-decompression dive time. At high oxygen levels, however, oxygen toxicity is a problem. A critical symptom of oxygen toxicity is convulsions occurring without warning. Tolerances for oxygen toxicity vary widely among individuals. In general, partial pressures of oxygen less than 1.3 have little or no risk of causing oxygen toxicity. At partial pressures between 1.3 and 1.6 there is some risk and caution should be used. At partial pressures of oxygen greater than 1.6 there is extreme danger of causing oxygen toxicity reactions. Experts generally agree that a partial pressure of oxygen of 1.4 is the reasonable limit for safe diving.

Trimix diving is like a tidal wave crossing the United States, and it's coming to Alaska. Trimix adds helium in place of nitrogen and reduces the amount of oxygen and the subsequent toxicity risk. It is becoming the gas of choice beyond depths of 190 ft.

Running out of gas is a major problem associated with deep diving. Diving in a cold-water, high-stress environment means an individual's air consumption goes way up. Even experienced divers may become stressed, use more air than usual, and risk running out of gas. High pressure nervous syndrome and some bone necrosis are additional problems associated with deep diving. Gas mixing mistakes and selecting the wrong regulator are problems associated with using more than one gas during a dive.

In the past, rebreathers were used exclusively by the military. But because they can considerably extend dive times, they are now becoming popular with recreational divers. Closed circuit rebreathers are used in military and in some commercial and recreational dives. Semi-closed circuit systems (partial rebreathers) are also available. Risks associated with rebreathers include the potential for oxygen toxicity, hypoxia, carbon dioxide buildup, chemical injury, and in-water decompression sickness.

What Could Be Done to Make Recreational Scuba Diving Safer in Alaska?

Althea St. Martin: Discussion Leader
Allstate, Fairbanks, Alaska

Participants broke into three groups and discussed two questions associated with recreational diving. The individual group responses were presented and discussed.

What challenges are we faced with?

- Many recreational divers are accustomed to warm water diving and are not prepared for Alaska's cold diving environment.
- Many recreational divers are not familiar with the local tides, currents, and dive equipment used in Alaska.
- Access to mixed gases is limited and there may be quality control problems.
- Remoteness and communication problems.
- Conflicts with fishing vessels dragging gear.
- Dive groups unfamiliar with each other.
- Resort course divers unprepared for solo dives in Alaska.

How can we solve them?

- Use familiar gear such as wetsuits in summer.
- Have experienced divers with local knowledge lead dives; suggested ratio for divemaster 10:1 max; 5:1 better.
- Encourage local dive clubs.
- Create area orientation pamphlets and distribute widely.
- Create an underwater inventory of attractions, hazards, bottom conditions, tides, currents, etc.
- Fully brief divers on dive plan and conditions.
- Dive guides should screen divers and adapt the dive to their skill level.
- Establish "certified local dive guides."
- Establish set dive sites and include orientation book.
- Support and enhance dive emergency response resources.
- Advertise and promote trained, certified guides to tourist market.

Dive Emergency Response in Alaska

Dive Emergency Response in Alaska: An Overview

Matt Anderson
State of Alaska, Emergency Medical Services Program, Juneau, Alaska

The EMS system is your safety net. Dive emergency medical response training in Alaska is available for pre-hospital and clinical environments. Sitka, Ketchikan, and Juneau have EMS protocols for dive emergencies. However, some areas of the state, such as the Interior, have less familiarity and readiness to handle dive emergencies. Existing texts have different approaches to treating dive emergencies. Newer techniques are currently not a part of standard training. Do we need to fix this?

Medical response to dive emergencies includes on-scene responders, EMS pre-hospital response, dive rescue teams, U.S. Coast Guard, and other air medical providers, hospitals, and hyperbaric care-givers. Communications with the EMS system will most likely be through the Coast Guard receiving a call via VHF channel 16, or channel 22, or through the police and fire departments via a 911 call.

There are two hyperbaric chambers in Alaska. Anchorage has a stationary chamber operated by a dive group in concert with Providence Hospital. The chamber itself is located near the airport, not at the hospital. The second chamber is in Juneau at Bartlett Memorial Hospital.

Hyperbaric Chamber Facilities in Alaska

David Job
Bartlett Memorial Hospital, Juneau, Alaska

Mr. Job showed a diving accident management flow chart with information sheet for accident response and described the hyperbaric chamber at Bartlett Memorial Hospital. Most frequent use of the chamber is wound healing. Most frequent emergency is carbon monoxide poisoning. The staff at the hospital need a heads-up for dive emergencies because five people are required (ideally) for a response. Mr. Job also asked for workshop participants to list emergency response numbers for different communities in the area. Lee Somers asked the results be faxed to the Divers Alert Network (DAN).

Public Safety Diving

Lee Somers
Michigan Sea Grant College Program, Ann Arbor, Michigan

Public safety diving is different from recreational diving. There are two types of public safety diving: Search and Rescue, and Search and Recovery.

Search and Recovery diving requires meticulous search capability, recovery capacity, and skills in crime scene investigation.

Search and Rescue requires rapid response capability which can mean increased risk to divers. It is important "...not [to] promise what you cannot deliver." Preparing emergency scenario plans beforehand can help avoid confusion.

Both kinds of teams must have a defined mission, leadership structure, and standardized procedures and equipment. They need both diving and non-diving members. Most important, each member must be a team player. It is preferable to have professional public safety divers, if possible, because volunteer public safety divers are almost always recreational divers. Search and rescue divers may be exempt from OSHA diving regulations, but search and recovery divers are not exempt, though that interpretation may be questionable.

When conducting search and rescue/recovery operations, it is important to remember that equipment is vital evidence in the investigation that is bound to follow. When removing equipment from a victim, it is important to leave the equipment assembled and in its original state as much as possible. Any disassembly should be non-destructive and documented (on video tape preferably) so the original position of valves, zippers, connections, etc. can be clearly established. It is also important to control the circulation of false information, because leaks of false information that mislead people can have critical legal consequences.

What Could Be Done to Improve Dive Emergency Response in Alaska?

Matt Anderson: Discussion Leader
State of Alaska, Emergency Medical Services Program, Juneau, Alaska

Workshop participants discussed:

- What is the scope of the problem we are trying to manage?
- Where are the weaknesses in dive emergency response, and are there patterns to the weaknesses?
- Other ideas that can be implemented to improve dive emergency response/safety.

What is the scope of the problem we're trying to manage?

- Communications and emergency response training for divers, families of divers, lay rescuers, dive charter operators, pre-hospital EMS, clinical personnel.
- Improve speed of response; access to care, training, and treatment.
- Identify existing training programs.
- Encourage diver education safety efforts (dive-safety events).

Where are the weaknesses in dive emergency response, and are there patterns to the weaknesses?

- Need response systems that transcend local area boundaries.
- Availability of treatment (oxygen and chamber access).
- Need to enhance emergency medical services (EMS) protocols and curricula.
- Need to develop new EMS training materials.
- Presentations at medical and diving symposia.
- Include dive information in newsletters.
- Direct mailing of information to EMS instructors.
- Educate personnel on sources of dive information, i.e. Divers Alert Network, local divers, medical providers.

Other ideas that can be implemented to improve dive emergency response/safety.

- Set up a communications network and response plan. Information should include how to activate the EMS system and what information to relay back to dive location to assist first responders in handling the emergency. The network must involve harbormasters, Coast Guard, troopers, fire and police squads, fishing vessels, and local dive organizations. For example, Maine has communications protocols to guide response. Every dispatcher (911, State Troopers, Coast Guard) has the same protocols that lay out the available resources. Then every emergency caller, no matter what emergency response entity they call, will get the same answer.

- Print a dive emergency response card to issue with Alaska Department of Fish and Game dive fishery permits and logbooks.

- Very important for all responders to be coordinated with each other. A single clearinghouse will make all the difference in effectiveness of response.

- In most cases, EMS squads in small communities are not trained in dive emergencies and are the most likely to be first responders. There needs to be a continuing medical education (CME) module for dive emergencies available (possibly offered during statewide EMS symposium?)

- Availability of medical oxygen to everyone is critical for a dive emergency response system to work. If current regulations prohibit lay persons from getting medical oxygen, then the regulations need to be changed.

Workshop Summary

Dive Safety in Alaska: Should We Do More Now, and If So, What?

Jerry Dzugan: Discussion Leader
Alaska Marine Safety Education Association, Sitka, Alaska

What were the most important benefits of this workshop?

- The amount and quality of information collected in one place.
- Contacts and networks formed.
- Emphasis on education vs. regulations.
- Awareness and interest of divers and other individuals.
- Noting the similarity of concerns from differing areas.
- Information on Maine program can serve as a blueprint.
- Snapshot of Alaskan issues presented here today.

What are the next steps to take?

- More training for dive rescue teams in Sitka, Ketchikan, and Juneau.
- Check and coordinate response plans between the Coast Guard, EMS, Troopers, harbormasters, 911, etc.
- Involve local divers and emergency personnel in building an appropriate response plan.
- Focus future meeting on specific issues, i.e., education and training for each sector; EMS response, recreational dive clubs, educational publications.
- Hold awareness workshops pre-season, create awareness and educational videos.
- Publish and distribute proceedings from this meeting to participants and divers.
- Develop user-friendly informational publications.
- Find ways of sharing agency dive resources (equipment and personnel).
- Use e-mail and AMSEA web page to share information among participants on present and future projects.

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