

Occupational Diving Fatalities in Alaska

Samantha Case
CDC/NIOSH
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Objective: To describe the frequency of work-related diving fatalities in Alaska.

- Background on diving
- NIOSH surveillance
- What the data tell us
- Case reports
- Recommendations
- Resources

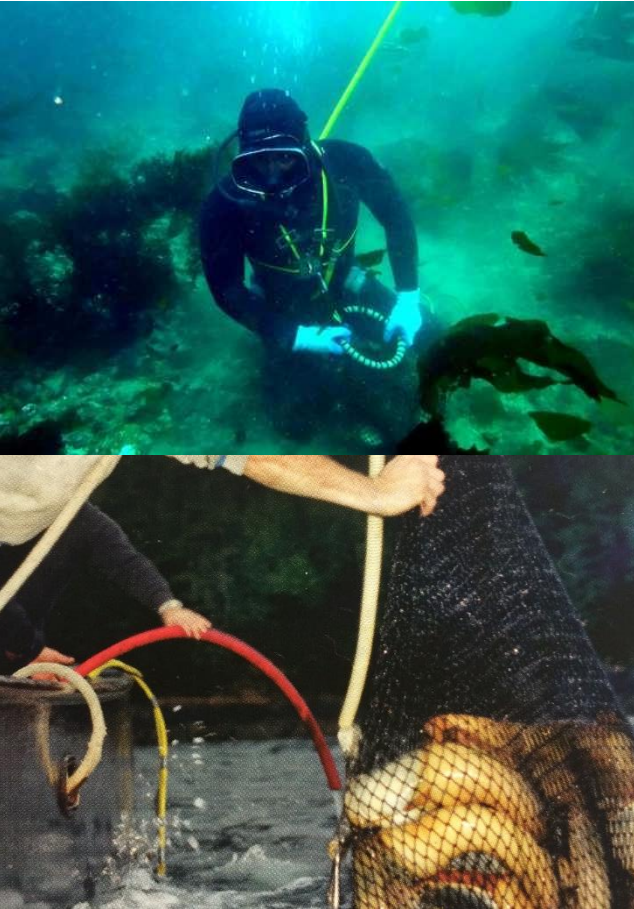
INTRODUCTION

Types of Occupational Diving Underwater Maintenance and Repairs



- Welding
- Clearing lines/nets from propellers
- Inspecting vessels
- Setting anchors

Types of Occupational Diving Dive Harvesting



- Species: Sea cucumbers, sea urchins, and geoduck clams
- Fisheries around Kodiak Island and Southeast Alaska
- Diver training/experience not required

Types of Occupational Diving Scientific Diving



- Scientific research and assessment
- Measurements and counts
- Sample collection
- Photography

Types of Occupational Diving Gold Dredging



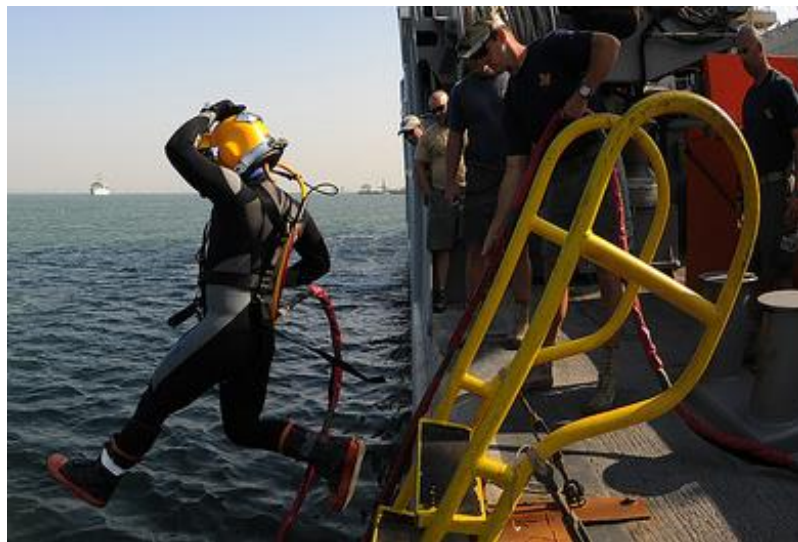
- Suction dredge
- Bering Sea, offshore Nome
- Diver training/experience not required

Diving Gear

SCUBA



Surface-Supplied Air



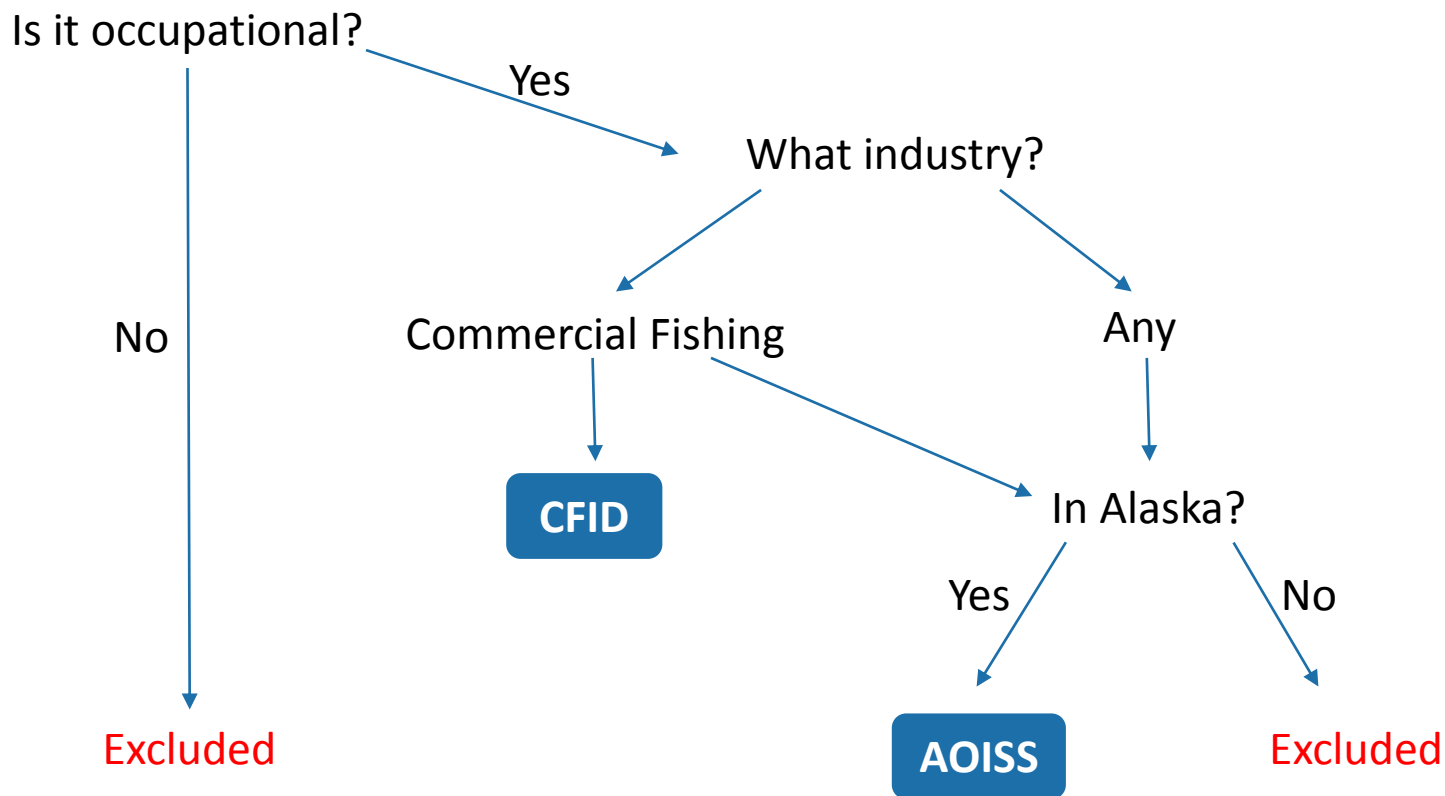
Dangers of Diving

- Water hazards
 - Drowning
 - Respiratory/circulatory problems
 - Hypothermia
- Process hazards
 - Cutting/welding
 - Operation of heavy equipment
 - Work with power tools
 - Equipment malfunctions

METHODS

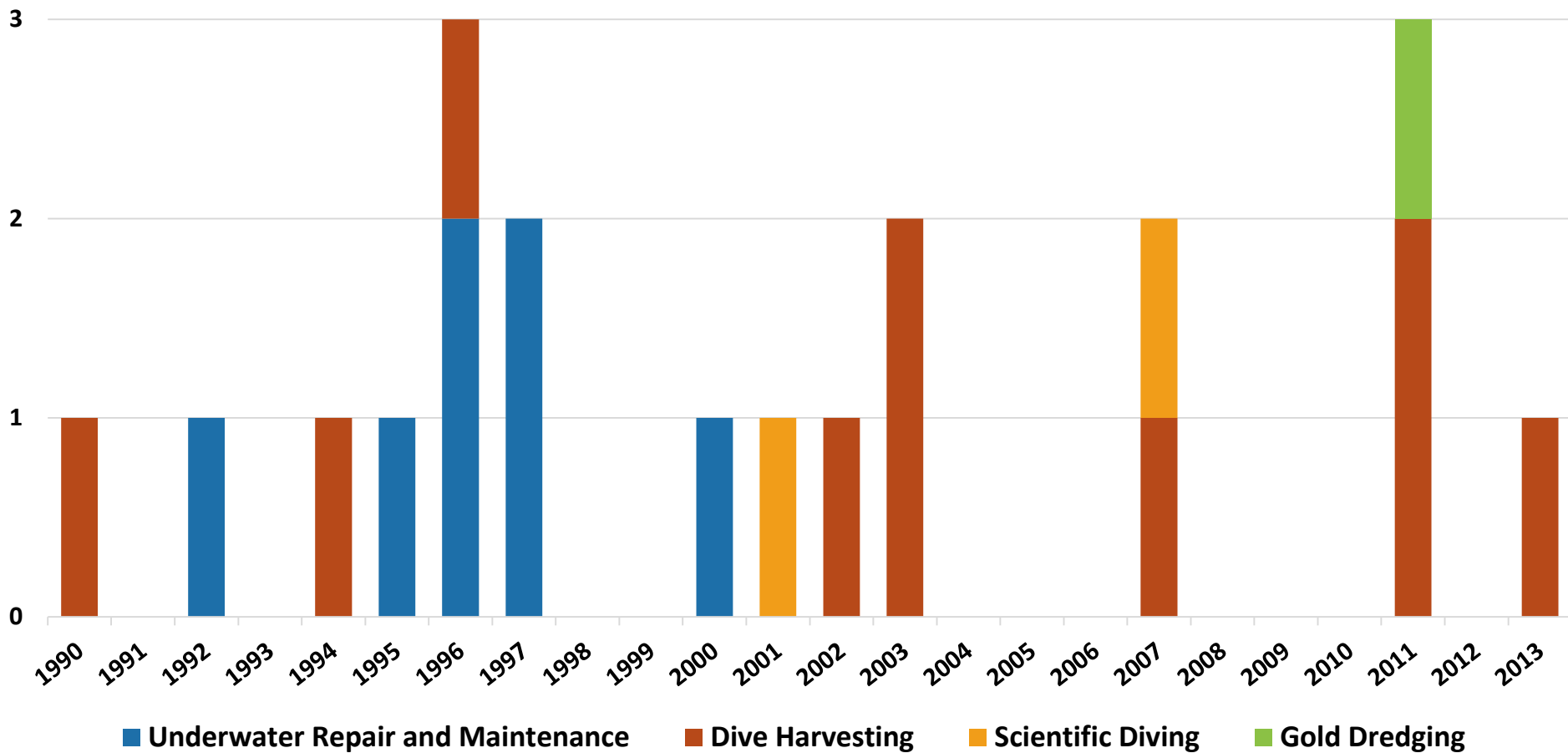
NIOSH Surveillance

Diving fatality identified in media, US Coast Guard activities, police reports, and/or death certificates



RESULTS

Alaska Diving Fatalities by Activity, 1990 – 2013 n=20



■ Underwater Repair and Maintenance

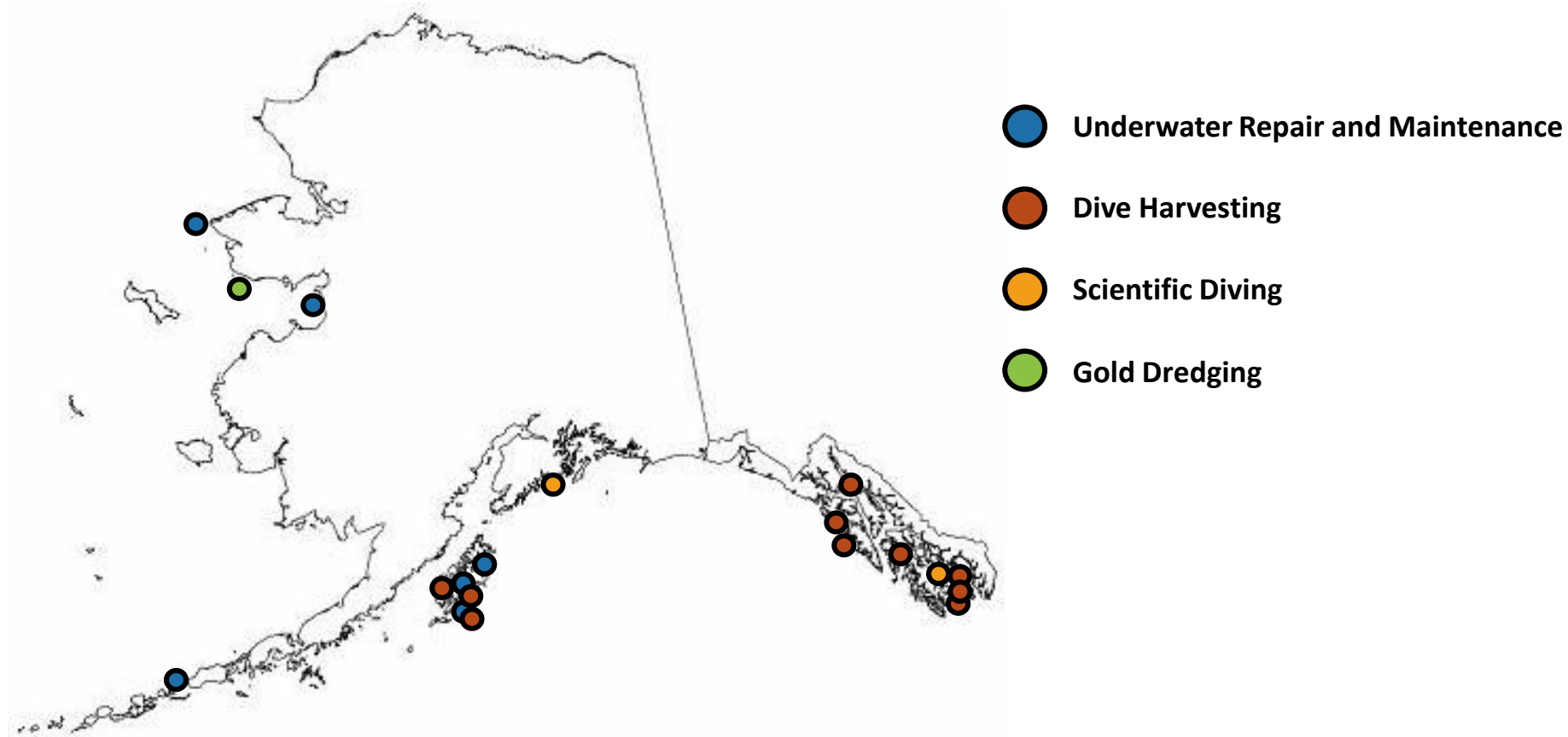
■ Dive Harvesting

■ Scientific Diving

■ Gold Dredging

Alaska Diving Fatalities, 1990 – 2013

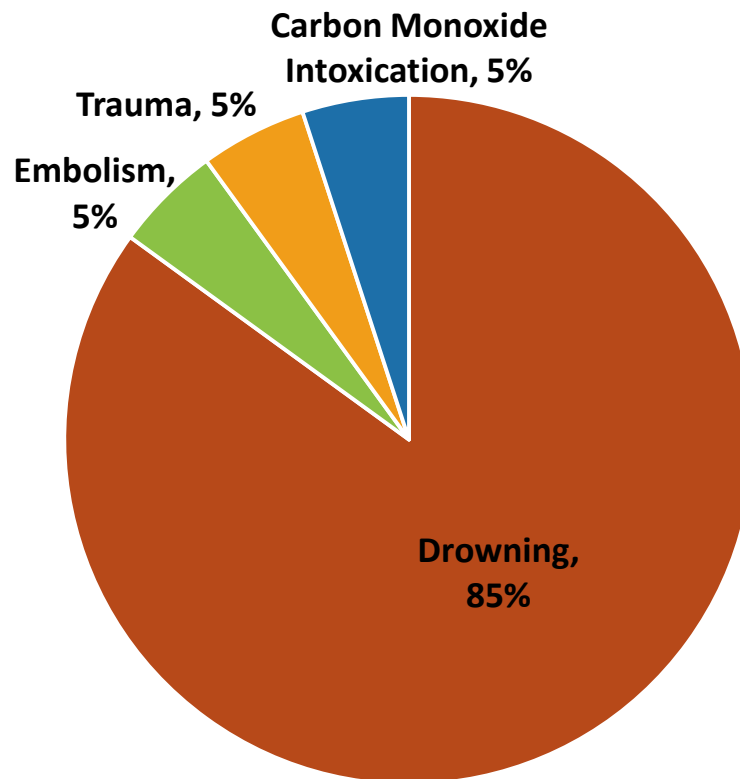
n=20



Alaska Diving Fatalities, 1990 – 2013 n=20

- Male divers aged 19 – 70
- Gear types:
 - SCUBA (50%)
 - Surface-supplied air (50%)
- Contributing factors:
 - Diving inexperience
 - Gear entanglement

Cause of Death



Case Report #1

October 2003:

- 33 y.o. harvesting cucumbers in 30 ft. of water with surface-supplied air
- Previous experience as recreational diver and dive tender, but not commercial harvester

- Air line became entangled with vessel anchor line
- Victim briefly surfaced, then descended without mask
- Did not use bailout bottle or remove weights
- CPR administered unsuccessfully when recovered

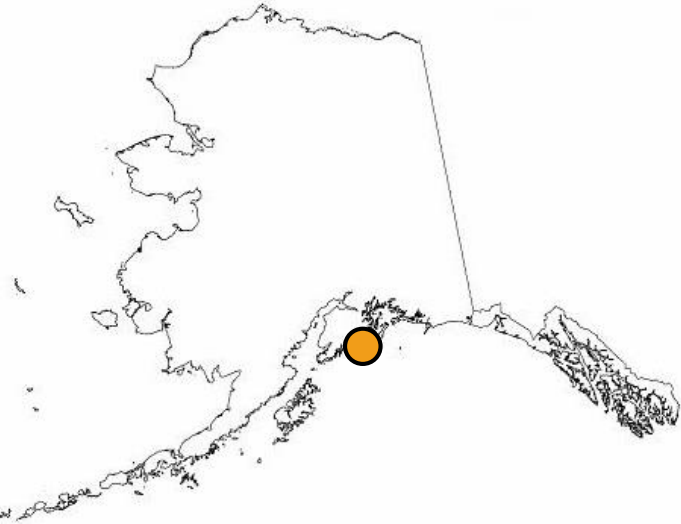


Case Report #2

September 2007:

- 43 y.o. diver with scuba gear was on his final dive to become certified as a scientific diver
- Certified in open water and advanced diving

- Ran out of air and attempted to surface and swim to shore
- Unable to remove weight belt and went under the surface



DISCUSSION

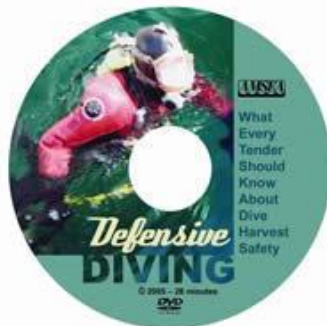
Mitigating the Risks

- Dive with an experienced partner and/or tender
- Proper gear
- Drill – become familiar with bailout and other emergency procedures
- Training/Certification
- Follow (or adopt!) diving standards



Recommendations

- Increase awareness to divers and employers about diving safety



PREPARE FOR A SAFE BOAT TRIP

Before You Go:

- File a FLOTT PLAN with a responsible person who will monitor you if you do not return as scheduled.
- Check the weather.
- Where you are going.
- What water you will use.
- What survival equipment you have.
- When you will return.

Check the WEATHER.

Check winds and tides enough to get to an unobscured spot on the beach.

Make sure all relevant wear personal flotation devices (PFDs).

Do not overtake the boat.

KNOW WHO TO CALL IN AN EMERGENCY

Everyone Onboard Should Know How To Make An Emergency Distress Call

RESPONDING TO DIVE EMERGENCIES

EMERGENCY GUIDELINES

Dive emergencies such as moderate to severe hypothermia, an embolus, decompression sickness and an injury can quickly become life-threatening without prompt treatment. Emergency response begins with recognizing the symptoms associated with these conditions and providing the necessary on-scene treatment.

MODERATE OR SEVERE HYPOTHERMIA

Signs/Symptoms

- A person feels cold AND exhibits any ONE of the following symptoms:
 - Altered level of consciousness
 - Shivering, shivering, shivering
 - Disoriented mental state, not responsive to verbal or physical stimuli
 - Disoriented mental state, not responsive to verbal or physical stimuli
 - Body core temperature less than 32°C
 - No shivering (This sign may be intermittent and altered due to another rescuer's actions)

On-Scene Treatment

- Call for immediate help and medical advice.
- Trust gently.
- Remove wet clothes.
- Provide skin-to-skin re-warming or place heat packs on patient's neck, armpits, and groin.
- DO NOT give food or water.
- DO NOT provide a hot shower or bath.

THINGS TO REMEMBER WHEN DIVING IN ALASKA

- Alaska's cold, harsh conditions and remote dive locations present many challenges. Careful planning and preparation enable divers to meet these challenges and enjoy the natural beauty and abundant recreational benefits Alaska's waters have to offer.
- City calls or state toll-free calls are required for thermal protection.
- Clear water increases the body's demand for air.
- HALO bubbles recommended using the most gradual bottom time when diving in cold water.
- HALO bubbles recommended adding 2 meters in depth reductions when diving in cold water.
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- Remote locations mean help may be hours away. At least two rebreathers on each dive trip should be treated as CPFR, oxygen delivery and first aid reserve.
- Oxygen should be available on board every dive vehicle.
- Never dive under a boat to clear a hole or line, unless the engine is secured and a hook-up device is used.

DIVE EMERGENCIES

Signs/Symptoms

- A person has been diving in the past 24 hours and exhibits one or more of the following symptoms:
 - Shy or nervous
 - Headache
 - Itchy skin
 - Parosmia (change of smell)
 - Itchy, itchy, itchy
 - Fatigue and tired in the neck
 - Confusion
 - Unusual dizziness
 - Unusual dizziness

On-Scene Treatment

- Call for immediate help and medical advice.
- Administer oxygen – high flow, high concentration.
- Place under warm blankets.
- Use CPFR, if necessary.
- Monitor oxygen, energy, oxygen in level of consciousness and vital signs.
- Transport dive gear, dive computer and logs to treatment facility with patient.

The above is a summary of Alaska emergency guidelines and should not be relied upon as a replacement for the actual guidelines. The complete guidelines are available at 800-442-3007 or www.divealaska.gov/emergencyguidelines_2010.pdf.

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- Continued surveillance of occupational diving fatalities is essential for identifying risks and implementing safety policies/standards
- Opportunities: nonfatal diving injuries, working with industry

Resources

Diving Safety

AMSEA <http://www.amsea.org/>

DAN <http://www.diversalertnetwork.org>

Dive Harvesting

Alaska Department of Fish and Game

<http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherydive.main>

Southeast Alaska Regional Dive Fisheries Association

<http://www.sardfa.org/>

Gold Dredging

Alaska Department of Natural Resources

<http://dnr.alaska.gov/mlw/mining/index.cfm>

Scientific Diving

University of Alaska <https://www.sfos.uaf.edu/dive/>

American Academy of Underwater Sciences

<http://www.aaus.org/>

Underwater Maintenance and Repairs

OSHA

<https://www.osha.gov/SLTC/commercialdiving/index.html>



Thank You!

Samantha Case

CDC/NIOSH

wst5@cdc.gov