

18. Marine Ecosystems Awareness

18.1 Introduction

Divers and snorkelers have a vested interest in protecting the aquatic environment. In many cases, these individuals do not have environmental information about the local sites. This specialty is designed to increase understanding of marine and freshwater environments, the problems facing these unique ecosystems, and the role that divers and snorkelers play in protecting our aquatic resources.

The goal of the course is to allow participants to apply best practices in their own interactions with the aquatic environment, be able to identify diver centers and boat operators that apply best practices to their services, understand how to minimize impact in their interactions with the aquatic environment, and understand how activities such as surveying, cleanups, and observation can benefit aquatic environments.

A non-diving, snorkeling certification is available to those participants who complete all requirements as outlined in Section 18.8 using snorkeling equipment. An awareness certification is available to non-divers who complete the required academic materials.

18.2 Who May Teach

An active SDI Instructor or Assistant Instructor that has been certified to teach this specialty.

18.3 Student to Instructor Ratio

Academic:

1. Unlimited, so long as adequate facilities, supplies and time are provided to ensure comprehensive and complete training of subject matter.

Confined Water (swimming pool-like conditions):

1. N/A.

Open Water (ocean, lake, quarry, spring, river, or estuary):

1. A maximum of 8 students per instructor; it is the instructor's discretion to reduce this number as conditions dictate.
2. The instructor has the option of adding 2 more students with the assistance of an active Assistant Instructor or Divemaster.
3. The total number of students an instructor may have in the water is 12 with the assistance of 2 active Assistant Instructors or Divemasters.

18.4 Student Prerequisites

1. SDI Open Water Scuba Diver, SDI Junior Open Water Scuba Diver, or equivalent if participating in the open water dives. SDI Snorkeler certification or equivalent is required for the non-diving certification. This may also be taught as an academic-only course where no prior certification is required.
2. Minimum age 18, 10 with parental consent.

18.5 Course Structure and Duration

Open Water Execution:

1. Two open-water sessions are required for the diving or non-diving snorkeling certification with complete briefs and debriefs by the instructor.
2. For scuba dives, dive plan must include surface interval, maximum no decompression time, etc. to be figured out and logged.

Course Structure:

1. SDI allows instructors to structure courses according to the number of students participating and their skill level.

18.6 Administrative Requirements

Administrative Tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the schedule to the students.
4. Have the students complete the:
 - a. *SDI Liability Release and Express Assumption of Risk Form*
 - b. *SDI Medical Statement Form*.

Upon successful completion of the course the instructor must:

1. Issue the appropriate SDI certification by submitting the *SDI Diver Registration Form* to SDI Headquarters or registering the students online through member's area of the SDI website. For academic-only courses, online registration is the only option.

18.7 Required Equipment

1. Basic open water scuba equipment as described in section three of this manual or snorkeling equipment as described in the SDI Snorkeling Course.
2. A marine life identification guide.
3. Diver's slate.

18.8 Approved Outline

Instructors may use any additional text or materials that they feel help present these topics.

The following topics must be covered.

1. Physical Attributes:
 - a. Temperature and thermoclines.
 - b. Salinity and halocline.
 - c. Dissolved gases.
 - d. Light, as it applies to photosynthesis.
 - e. Nutrient circulation.
 - f. Waves and tides.
 - g. Currents and nutrient cycling.
2. Topographical Features.
3. Marine Organisms:
 - a. Plankton:
 - i. Zooplankton.
 - ii. Phytoplankton.
 - b. Aquatic plants:
 - i. Types of algae.
 - ii. Seed plants.
 - iii. Specific local plant life.
 - c. Aquatic animals:
 - i. Sponges.
 - ii. Cnidarians.
 - iii. Mollusks.

- iv. Arthropods.
 - v. Echinoderms.
 - vi. Chordates.
 - d. Specific local animals.
 - e. Aquatic food webs.
 - f. Behavioral changes due to daily cycle.
4. Ecosystems:
- a. Tropical reef.
 - b. Temperate.
 - c. Freshwater.
5. Environmentally Friendly Diving Techniques:
- a. Buoyancy control.
 - b. Kick technique.
 - c. Local considerations.
6. Issues Facing Marine Ecosystems:
- a. Climate Change:
 - i. Global warming.
 - ii. Rising sea levels.
 - iii. Coral bleaching.
 - iv. Ocean acidification.
 - v. Changes in currents and weather patterns.
 - b. Issues of local interest:
 - i. Overfishing.
 - ii. Destructive fishing methods.
 - iii. Removal of organisms.
 - iv. Souvenir trade.
 - v. Land-based pollution.
 - vi. Overdevelopment of coastal areas.
 - vii. Anchor and collision damage.
 - viii. Other potential negative impacts – tourism, non-diving water sports, sunscreens.

7. Best Practices to reduce potential negative impacts:
 - a. Prevention of unwanted transfer of organisms.
 - b. Responsible and sustainable harvesting.
 - c. Feeding activities.
 - d. Anchoring and boat contact.
 - e. Contact with organisms.
 - f. Respect for cultural heritage and underwater resources.
 - g. Carrying capacity of sites regarding diver numbers.
 - h. Behavioral changes of organisms.
 - i. Effect of silting and bubbles.
 - j. Streamlining equipment.
 - k. Special concerns for photography/videography.
 - l. Special concerns for underwater wrecks.
8. Diver Interactions:
 - a. Intrusive.
 - b. Non-intrusive.
 - c. Feeding.
 - d. Treating marine life injuries.
9. Observation Techniques:
 - a. Grids.
 - b. Passive observation.
10. Collection Methods.

18.9 Required Skill Performance and Graduation Requirements

Students completing diving or snorkeling versions of this course are required to successfully complete the following:

1. Open Water Session 1:
 - a. Buoyancy control if applicable.
 - b. Make general observations:
 - i. Location.
 - ii. Bottom composition.

- iii. Marine life.
 - iv. Special characteristics.
 - v. Indications of human impact.
 - c. Grid observations:
 - i. Make two separate sets of grid observations during the dive.
 - ii. Describe all marine life for later identification.
 - iii. Record behavior.
 - d. Log session.
2. Open Water Session 2:
- a. Complete this dive at a different site or time of day than Session 1.
 - b. General Observations – same as Session 1.
 - c. Specific observations – same as Session 1.
 - d. Site debrief.
 - e. Compare and contrast dive sites.
 - f. Discuss the effect of human impacts.
 - g. Discuss ways to minimize human impact.
 - h. Log session.