



## Marine Resources for Classrooms, Distance Learning and Home Study

The following subjects are organized into three general groups. First are resources specific to Fitzgerald Marine Reserve. Next comes other material that serves to expand the awareness of tide pools and all they reveal. And, finally, we see that tide pools can lead into so much more revelation and knowledge when it comes to marine science. Tide pools serve as a key that can unlock our human connection to the fascinating ocean environment.

### Notes:

- Running time for videos given in parenthesis. To insure best viewing of some of the videos
- Check in the video settings to see if the resolution can be increased to an HD level-1080 or above.
- Some of the resources are designated for younger students while other material is labeled for students in later grades.
- Accessing closed caption translations for videos:
  - Start the video and open closed caption (cc) if available
  - Open the settings tab
  - Click the subtitles tab
  - Click the “auto translate” option if available and choose the desired language
- Last updated January 2024

## Orientation to Fitzgerald Marine Reserve

- [Enjoy a virtual tour of Fitzgerald Marine Reserve](#) (13:25)
- [Exploring the tidal zones at FMR](#)
- [Octopus sighting at Fitzgerald Marine Reserve](#) (3:25)
- [FMR is included in California’s system of marine protected areas](#) (6:36)
- [The Natural History of Fitzgerald Marine Reserve](#) (book)
- [Fitzgerald’s Own “History Detective” Delves into Seal Cove’s Mysterious Past](#)
- [The special geology of Fitzgerald Marine Reserve](#)
- [Student citizen science including FMR; The LiMPETS program](#)
- [The Friends of Fitzgerald Marine Reserve partners with San Mateo County Parks](#)
- [San Mateo County Parks encourages visitors to respect the Reserve and its wildlife](#)
- [An FMR brochure is available in English, Spanish and Mandarin](#)
- [A guest discovers the diversity at the Reserve](#) (4:26)
- [The Reserve offers exploration for all ages](#) (5:41)
- The Friends of Fitzgerald Marine Reserve supports science education in San Mateo County
  - [Environmental education providers in SMC](#)
  - [Environmental education providers in the Bay Area](#)
  - [Environmental education providers addressing science standards](#)
- [Friends of Fitzgerald Marine Reserve Naturalist Interpretation Training Handbook](#)
- [Avian wildlife at Fitzgerald Marine Reserve](#)
- [Recent issues of the FFMR \*Between The Tides\* newsletter](#)
- [Early evolution of FMR from a park to a marine reserve](#)
- [Exploring FMR with the OuterSpatial phone app](#)
- [The Etymologies of the Common Names of the Terrestrial Vegetation of the Fitzgerald Marine Reserve](#)

## Orientation to Fitzgerald Marine Reserve (continued)

- [THE CHIGUAN-The First Stewards of the Fitzgerald Marine Reserve](#)
- [Exploring Fitzgerald Marine Reserve with the iNaturalist field guide](#)
- [Terrestrial Field Guide to Fitzgerald Marine Reserve](#)
- [Coastside Land Trust introduction to FMR by their Junior Land Stewards](#) (23:43)

## The Dynamics of Tide Pools Including Fitzgerald Marine Reserve

- [Understanding tide patterns and animal distribution in the rocky shore](#) (6:23)
- [Exploration of tidal zones creating homes for marine invertebrates](#) (7:32)
- [Local tide pooling with the California Academy of Sciences](#) (1:00:07)
- [Annual natural cycles along the California central coast](#)
- [Notes from a California Naturalist-marine invertebrates](#)
- [California tide pools](#)

## Behavior of Marine Invertebrates

Animals in tide pools often are not actively “behaving” when viewed during low tide. They are waiting for the water to return. Behavior of marine invertebrates like those at FMR is a fascinating topic. Below are just a few of the many free YouTube videos available on this subject.

- [Mollusk survival strategies](#) (15:08)
- [Urchin moving in a tide pool](#) (1:31)
- [Sunflower sea star hunting behavior](#) (1:48)
- [Sea star eating mussels](#) (2:48)
- [Hermit crab searching for a new shell](#) (4:16)
- [Crab molting](#) (2:14)
- [Lobster molting](#) (2:13)
- [Barnacle feeding](#) (4:28)
- [Anemone escaping hunting sea star](#) (1:24)
- [Nudibranch color patterns and lifestyle](#) (3:34)
- [Marine snail reproduction](#) (:46)
- [Chiton locomotion](#) (:56)
- [Chiton light sensitivity](#) (1:27)
- [Urchins, sea stars and kelp forests](#) (3:49)
- [Gumboot chiton asexual reproduction](#) (2:22)
- [Gumboot chiton mouth and radula](#) (:49)
- [Sea anemones](#) (4:36)

## Local Tide Pooling With *Bay Nature Magazine*

- [Behavior of tide pool animals](#)
- [Reproductive strategies of tide pool animals](#)
- [Territorial behavior by anemones](#)
- [Tips for exploring tide pools in the Bay Area](#)
- [Discovering the local world of nudibranchs](#)
- [Survival adaptations of tide pool animals](#)
- [Diversity of algae](#)
- [Discovering marine snails](#)
- [Bringing back kelp](#)
- [Studying clams to discover the past](#)
- [Amateur guide to local tidepooling](#)

## Highly Rated Video Series for Studying Tide Pool Species

- [Life in a Tide Pool](#): expanded series providing comprehensive videos, scientific discoveries and biological orientation to marine invertebrates (Amazon Prime)
- [The Shape of Life](#): diversity of marine animal videos combined with classroom curriculum materials all orientated to NGSS

## Visual Tide Pool Discoveries for Early Learners

- Tide Pool programs from California State Parks:
  - [Junior Ranger Program from California State Parks; explore videos from Crystal Cove, engage with story time, crafts and learning activities](#)
  - [CA State Parks PORTS program introduction to Seacliff's tide pool animals with a suggested craft activity](#) (39:08)
  - [CA State Parks PORTS seashore story time from Natural Bridges](#) (37:38)
- [Exploring tide pools](#) (5:11)
- [Visual diversity of tide pools](#) (:57)
- [Wonders of Monterey Bay](#) (5:37)
- [Life in a Tide Pool; short videos from multiple locations](#)

## Best Tide Pool and Marine Teaching Resources From Local Partners

- **Steinhart Aquarium:**
  - [Example of a classroom curriculum](#) resource on the Monterey kelp forest including a simulated video. (3:19)
  - Plus a [very large list](#) of classroom-based lessons/activities/videos in the Flipside Science program.
- **Academy of Sciences:** [a citizen science opportunity for older students](#).
- **Monterey Bay Aquarium:** Several levels of engagement for teachers and parents.
  - First, [live cams from the facility](#).
  - And there are [free online courses](#) designed for different grade levels.
  - [Research-based information and activities](#) from the **MBA Research Institute**.
- **California State Parks programs:**
  - PORTS, [science standard-based video resource](#) from California State Parks including live-time broadcasts teachers can schedule.
  - CSP also provides an [extensive set of materials](#) for teachers, A Guide to the Side of the Sea, including lesson plans linked to state science standards.
- **UCSC Seymour Center:** [Suggestions for distance learning on marine subjects](#) from UC, Santa Cruz.

## Learning with NOAA

### Concept of Ocean Literacy:

- [National Marine Education Association-Ocean Literacy](#)
- [Ocean Literacy Guide](#)
- [Ocean Literacy Principles](#)

### Curriculum Resources:

- [NOAA education resources](#)
- [Seventeen lesson plans for Ocean Literacy](#)
- [The Ocean Foundation-Youth Action Tool Kit](#)
- [Winged Ambassadors curriculum](#)

### Marine Sanctuaries:

- [National Marine Sanctuary Association](#)
- [NOAA National Marine Sanctuaries](#)
- [Exploring marine sanctuaries with virtual reality](#)
- [Learning about marine sanctuaries](#)

### Learning with Maps:

- [National Geographic Mapmaker](#)
- [NOAA Global Data Explorer](#)

### Sanctuary Art:

- [NOAA sanctuary poster art](#)

## Environmental Lesson Plans for Teachers Based on Science Standards

- [Monterey Bay Aquarium](#)
- [Aquarium of the Pacific](#)
- [California Marine Protected Area Collaborative](#)
- [Aquarium of the Bay](#)
- [World Ocean Observatory](#)
- [Lawrence Hall of Science](#)
- [Smithsonian](#)
- [PBS](#)
- [National Geographic](#)
- [American Museum of Natural History](#)
- [Ocean Literacy](#)
- [Ocearch](#)
- [Marine Mammal Center](#)
- [California Marine Protected Areas](#)
- [Pacifica Beach Coalition](#)
- [Marine Science](#)
- [Nautilus Live](#)

# The Oceans and Climate Change

## For younger students:

- [National Geographic discusses climate change \(2:54\)](#)
- [Physics of ocean warming \(3:49\)](#)
- [Ocean acidification explained \(2:49\)](#)
- [NASA looks at the oceans](#)
- [Broad collection of material for educators](#)
- [Finding solutions in the ocean \(2:00\)](#)
- [Kids ask a scientist about oceans and climate change \(7:30\)](#)
- [Ocean literacy and climate change from EVNautilus \(7 videos\)](#)

## For older students:

- [NOAA summary of latest international report \(3:00\)](#)
- [Monterey Bay Aquarium offers perspective on climate change](#)
- [Challenges for coastal ocean communities](#)
- [Academy of Sciences climate change lesson plans](#)
- [The Ocean Foundation's discussion for older students](#)
- [The Fifth National Climate Assessment](#)
- [European Space Agency looks at climate change \(3:33\)](#)
- [The problem of ocean acidification \(15:50\)](#)
- [Surfrider organization seeks solutions through government action \(6:42\)](#)
- [Problem with plastics \(9:00\)](#)
- [Perspective of an ocean scientist \(16:03\)](#)
- [International concern about oceans and climate change \(1:30\)](#)
- [Why are the oceans important \(4:48\)](#)
- [One Planet-One Ocean \(8:19\)](#)
- [2022 impact reports from NOAA](#)

## Individual Inspirational Voices for Older Students

- Renowned marine biologist Sylvia Earle provides [her inspirational perspective](#) on the importance of understanding and caring for the oceans (18:16)
- How the marine environment inspired Rachel Carson to become one of the [first and most influential conservationists](#) (2:32)
- The inspiration of three women who [saved San Francisco Bay](#) (8:01)
- David Gallo shares why he is so [astonished by marine animals](#) (6:01)
- Henry Horn provides his engaging philosophy for developing the [outlook of a true naturalist](#) (3:10)
- Recognized leader in the field of connecting with nature, Joseph Cornell discusses [his experiences and philosophy](#) (22:19)
- A high school teacher discusses her [favorite inspirational science and nature stories](#) (video series)
- David Attenborough, a universal voice for environmental discovery and conservation, discusses the [state of the natural world and need for action](#) (8:27)
- Marine biologist Octavio Aburto provides his personal insights into [the importance of marine protected areas](#) (4:43)
- Marine biologist Frida Lizardi studies [shark natural history](#) in west coast marine protected areas (2:08)
- Conservationist and activist Majora Carter enthusiastically relates [the importance of sustainable development](#) (18:18)
- National park ranger Shelton Johnson provides [personal insights on his life and defining value of experiencing the natural world](#) (10:07)
- 10-year-old activist Mari Copeny proves it is [never too early in life to care for the environment](#) (3:09)
- In her work as a marine biologist, [Ayana Johnson](#) (6:34) has developed essential action steps for [protecting and restoring ocean habitats](#) (6:32)
- [A climate scientist letter to her kids](#) (1:10)
- [The perspective of youth: Greta Thunberg](#) (2:42)
- [Barbara Block and Michel Andre describe their groundbreaking ocean research](#) (2:46 and 2:58)
- [Connecting Kids and Nature with Richard Louv](#) (1:03:38)
- [TED talk by Peter de Menocal](#) (16:40)

## Field Guides for Home and Onsite Discovery

- *The Beachcomber's Guide to Seashore Life of California REVISED*, J. Duane Sept
- *National Audubon Society Field Guide to North American Seashore Creatures*, Norman A. Meinkoth
- *Pacific Intertidal Life: A Guide to Organisms of Rocky Reefs and Tide Pools of the Pacific Coast*, Ron Russo
- *California's Tidepools (Weekend Naturalist © Field Guide, #1)*, Dan Richards
- *Exploring Pacific Coast Tidepools*, Vinson Brown
- *Mac's Field Guide to Northwest Coastal Invertebrates*, Craig MacGowan
- *Seashore of Northern and Central California*, Ian Sheldon
- *Fylling's Illustrated Guide to Pacific Coast Tide Pools*, Marni Fylling
- *California Seashore Life: A Folding Pocket Guide to Familiar Plants & Animals (A Pocket Naturalist Guide)*, James Kavanagh
- *California Coastal Invertebrates (Mac's Guides)*, Craig MacGowan
- *The Marine Biology Coloring Book, Second Edition*, Tom Neisen
- *Beachcomber's Guide to California Marine Life*, Neisen/Wood
- *Seashore life of Northern and Central California*, Ian Sheldon
- *Encyclopedia of Tidepools and Rocky Shores*, Mark Denny and Steven Gaines, ed.
- *Tide Pools of the California Coast*, Val Kells
- *Between the Tides*, Ryan Kelly, et al



## Passing the Torch: Connecting Children to Nature

### Media:

- [Children and Nature, narrated by Jane Goodall and Sylvia Earle \(26:05\)](#)

### Websites:

- [Connecting Kids and Nature, National Wildlife Federation](#)
- [Children and Nature Network](#)
- [iNaturalist](#)
- [Lawrence Hall of Science BEETLES Program](#)
- [Latino Outdoors](#)
- [North American Association for Environmental Education](#)
- [National Science Teaching Association](#)
- [National Association for Interpretation](#)

### Articles:

- [Natural Teachers Network E-Guide](#)
- [Nature-child Reunion](#), National Wildlife Federation
- [Leave No Child Inside](#), Richard Louv
- [Outdoors for All](#), Richard Louv
- [Whole Child: Developing Mind, Body and Sprit Through Outdoor Play](#), National Wildlife Federation
- [Growing up Green](#), Louise Chawla
- [How to Protect Kids from Nature-Deficit Disorder](#), Jill Suttie
- [Children's Contact with the Outdoors and Nature](#), Children and Nature Network
- [How Environment-based Learning Encouraged Me to Master Next Generation Science Standards](#), Katherin Konomi
- [Nature Field Trips: Making Learning Come Alive for Young Children](#), Natural Start Alliance
- [Do Experiences with Nature Promote Learning](#), Kuo, et al.
- [Environmental Education And Nature-Rich Experiences](#)
- [Overview of Value and Efforts to Make Environmental Education More Inclusive](#)
- [Early Childhood Environmental Education](#)
- [Research supporting the connection of kids to nature](#)
- [Growing Families With Nature](#)

**Books:**

- *The Kid's Guide to Exploring Nature*, Brooklyn Botanical Garden
- *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder*, Richard Louv
- *Vitamin N: The Essential Guide to a Nature-Rich Life*, Richard Louv
- *The Nature Connection: An Outdoor Workbook for Kids, Families, and Classrooms*, Claire Leslie
- *Sharing Nature®: Nature Awareness Activities for All Ages*, Joseph Cornell
- *Beyond Ecophobia: Reclaiming the Heart in Nature Education*, Joseph Sobel
- *EcoKids: Raising Children Who Care for the Earth*, Dan Chiras
- *Teaching Kids To Love The Earth*, Marina Lachecki, et al
- *How to Raise a Wild Child: The Art and Science of Falling in Love with Nature*, Scott Sampson
- *Curious Kids Nature Guide: Explore the Amazing Outdoors of the Pacific Northwest*, Marni Fyelling
- *Leave No Child Inside*, Belle Bogs, et al
- *Our Wild Calling*, Richard Louv
- *Engage, Connect, Protect: Empowering Diverse Youth as Environmental Leaders*, Angellou Ezeilo