The Endless Voyage - Oceanography Video Series - Episode Summaries

Chapter equivalents (approximate) are Trujillo & Thurman, Ninth Edition

The Endless Voyage

Each 26 half-hour video combines on-location footage with computer graphics in a way that is both engaging and informative. Individual case studies focus on polar and tropical extremes, an ongoing coastal project, and life at a major research institution. Learners will also hear from leading scientists and academicians whose work has helped define the field of oceanography.

Major topics covered in The Endless Voyage include:

* The nature of our water planet
* The history of oceanographic exploration
* Plate tectonics
* Continental margins and ocean basins
* Water and ocean structure
* Seawater chemistry
* Atmospheric and ocean circulation
* Tides and waves
* Coastal processes
* Marine organisms and communities
* Marine resources and environmental concerns

Correlated Textbook: The textbook for the course is **Essentials of Oceanography,** 12th or 11th Ed.;
Authors: Trujillo & Thurman

This introduction to oceanography text uses an interdisciplinary approach, emphasizing the discipline's connection with astronomy, physics, chemistry, meteorology, geology, biology, ecology, history, and economics. Written in a clear and compelling narrative voice, the authors convey their enthusiasm for the subject as well as presenting objective scientific fact.

Video 1: The Water Planet **Chapter One**

- The profound influence of water and the ocean on planet Earth
- The formation of the solar system and the origin of Earth
- The origins of life on Earth
- The science of oceanography

Video 2: First Steps **Chapter One**

- Cartographers, early Greek exploration and Chinese contributions
- The Age of Discovery: From Prince Henry to Magellan
- Voyaging for Science: James Cook, Matthew Maury, Charles Darwin and the HMS Beagle, and the Challenger Expedition, including major milestones in oceanic exploration, such as the development of the first chronometers and breakthroughs in sampling
- The last hundred years: voyages for science in the twentieth century
- The rise of oceanographic institutions

Video 3: Making the Pieces Fit **Chapter Two**

- Toward a new understanding of Earth: The search for patterns and order in the development and location of Earth's features
- Alfred Wegener and the theory of continental drift
- The work of Benioff and Wadati (orderly pattern of deep Earthquakes)
- The Breakthrough: From seafloor spreading to plate tectonics
- John Tuzo Wilson and the Mechanism of Plate Tectonics: Lithospheric plates floating on the heated and expanding asthenosphere (including discussion of "the layered Earth," i.e. the evidence for layering, classification of layers, isostatic equilibrium, and sources of internal heat)

Video 4: World in Motion **Chapter Two**

- The confirmation of plate tectonics (paleomagnetic orientation; polar wandering)
- Characteristics of plate boundaries (divergent, convergent, and transform)
- Hot Spots: Volcanoes, volcanic islands, atolls, guyots
- Earthquakes

Video 5: Over the Edge **Chapter Three**

- The topography of ocean floors
- The continental margin: continental shelf, slope, and rise
- Exploring the deep ocean floor: challenges and solutions
- The deep ocean floor: oceanic ridges, hydrothermal vents, abyssal plains, seamounts and guyots, deep trenches, island arcs

Video 6: The Ocean's Memory **Chapter Four**

- The challenges of studying sediments
- Sediments as historical records: what they tell us, how long they last
- Sediment characteristics and classification (size, source/composition, and distribution)
- The economic importance of sediments

Video 7: It's in the Water **Chapter Five**

- The importance of water, including its influence on global temperatures
- Physical properties of water: its chemistry, different forms, behavior changes as it absorbs or loses heat
- Temperature and water density
- Salinity: Components and sources of the ocean's salts
- Chemical equilibrium and the principle of constant proportions
- Dissolved Gases
- Acid-Base Balance

Video 8: Beneath the Surface **Chapter Five**

- Ocean structure: density stratification, water movement, surface conditions
- Refraction, light and sound

Video 9: Going to Extremes **Chapter Twelve**

- Locations and interviews illustrate a series of interrelated and dynamic oceanographic principles and elements

Video 10: Something in the Air **Chapter Six**

- Introduction: The impact of Hurricane Mitch
- Atmospheric composition, properties and circulation
- The Coriolis effect
- Wind patterns
- Air masses and cyclones

Video 11: Going with the Flow **Chapter Seven**

- Wind over water
- Surface currents and gyres
- Effects of surface currents on climate, including upwelling and downwelling (focusing on El Nino)

Video 12: Deep Connections **Chapter Seven**

- Formation and fate of deep water masses
- Deep ocean storms
- Tracers

Video 13: Surf's Up **Chapter Eight**

- Introduction: The water mechanics of surfing, introduction to waves
- Ocean waves (including the distinct parts of ocean waves, classification, and water depth)
- Wind waves (including rogue waves and waves approaching shore)
- Wave refraction, diffraction, and reflection
- Internal waves

Video 14: Look Out Below **Chapter Eight**

- Introduction: A look at the destructive impact of a well-documented tsunami
- Storm surges
- Seiches
- Tsunamis and seismic sea waves
- Long-term sea level change

Video 15: Ebb and Flow **Chapter Nine**

- Tides and the forces that generate them
- The equilibrium theory of tides (the role of the sun and moon)
- The dynamic theory of tides

Video 16: On the Coast **Chapter Ten**

- An introductory look at coasts, with a discussion of the forces that have shaped them
- Large-scale features of coasts (e.g. sand spits, bay mouth bars, barrier islands, sea islands)
- Coasts formed by biological activity (e.g. coral reefs)
- Estuaries, lagoons and wetlands
- Characteristics of U.S. coasts

Video 17: Due West **Chapter Ten**

- Human impact on the southern California coast (the bad and the good), shown through:
- Harbor/beach creation and maintenance
- Erosion/landslides
- Water Pollution
- Wetlands preservation

Video 18: Building Blocks **Chapter Twelve**

- A working definition of life (including discussion of matter and energy)
- Biogeochemical cycles
- Evolution and life in the ocean: the theory of evolution by natural selection
- Evolution in the marine environment

Video 19: Water World **Chapter Twelve**

- The biological classification (taxonomy) of ocean life
- Physical factors affecting marine life (light, temperature, salinity, gas, nutrients, dissolved gases, acid-base balance, and pressure)
- Marine processes that affect ocean life (e.g. diffusion, osmosis, and active transport)
- Classifications of the marine environment (by light, location and environment)

Video 20: Food for Thought **Chapter Thirteen**

- The capture and flow of energy
- Primary productivity (including how it's measured, and limiting factors)
- Plankton: types, distribution, production of energy, and effects of seasons
- Larger marine producers (e.g. algae and seaweed)

Video 21: Survivors **Chapter One**

- The oxygen revolution and the origin of animals
- Burgess shale, architectural forms
- Survivors: the intertidal zone
- Invertebrate chordates

Video 22: Life Goes On **Chapter Twelve**

- Vertebrate evolution
- Gas exchange
- Osmotic considerations
- Feeding and defense

- Fish
- Marine Reptiles (sea turtles, marine crocodiles, sea snakes)
- Marine Birds (tubenoses, pelicans, gulls, penguins)
- Marine Mammals (orders Cetacea, Carnivora, and Sirenia)

Video 23: Living Together **Chapter Thirteen**

- Introduction: The concept of community (marine and otherwise)
- The influence of physical and biological factors
- Competition, growth rate and carrying capacity, types of distribution, change
- Examples of marine communities (rocky intertidal, seaweed, sand beach and cobble beach, salt marshes and estuaries, coral reefs, the open ocean, the deep-sea floor, hydrothermal vent)
- Symbiotic interactions and dependencies

Video 24: Treasure Trove **Chapter Eleven**

- Physical resources (including petroleum and natural gas, various minerals and deposits, and fresh water)
- Marine energy resources (waves and currents, thermal gradient)
- Biological resources (various animals and plants used for food and pharmaceutical purposes, fishery management, aquaculture)
- Nonextractive resources
- Classification as renewable or nonrenewable
- Legal issues

Video 25: Dirty Water **Chapter Eleven**

- Characteristics of a pollutant
- Types of pollution (examples, costs)
- Habitat destruction
- Global changes
- What can be done?

Video 26: Hands On

An in-depth look at the science of oceanography at a major research institution *(Guess which one?)*