

Six Degrees: Our Future on a Hotter Planet, by Mark Lynas
Earth QUEST Additional Information
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Penn State Brandywine, Spring 2010

Introduction

- **Terminology:** Hurricane Katrina, climatologist, hydrologic cycle, flooding, storm surge, global warming, greenhouse gases, paleoclimate, tundra, Ice Age, climate change, CO₂, long-wave infrared radiation, short-wave infrared radiation
- **Locations:** Cape Hatteras, New Orleans
- **Names:** IPCC's Fourth Assessment Report (AR4), Oxford University's Radcliffe Science Library, Intergovernmental Panel on Climate Change (IPCC)

One Degree

- **Terminology:** Holocene, monsoon, Palmer Drought Severity Index, permafrost, bulwarks, UNESCO World Heritage site, coral bleaching, pika, golden toad, epidemic, Hurricane Catarina (2004), atoll, Jeffrey pine, cotton woods, sagebrush, giant sequoia, megadrought, salinity, diatoms, flash flood, flood-debris flows, Medieval Warm Period, hyper-arid, Dust Bowl, aquifer North Atlantic Ocean Current, Gulf Stream, Atlantic Meridional Overturning Circulation (MOC)
- **Locations:** Kilimanjaro, Sahel, Sahara, Arctic, Matterhorn, Mont Blanc, Pontresina Switzerland, Queensland Wet Tropics rain forest, Great Barrier Reef, Heron Island, Cape Floristic region of South Africa, Island of Tuvalu, West Walker River Canyon in the eastern flanks of California's Sierra Nevada, Mono Lake near state border with Nevada, Yosemite National Park, Sequoia and Kings National Park, Moon Lake North Dakota, Yellowstone National Park, Sand Hills Nebraska, Chaco Canyon New Mexico
- **Names:** Lonnie Thompson, Wilfried Haerberli, Ove Hoegh Guldberg, Earthwatch

Two Degrees

- **Terminology:** albedo-flip, badlands, loess, paleoclimatologist, paleosol, monsoon, Eemian interglacial, alkali, carbon dioxide, calcium carbonate, carbonic acid, plankton, phytoplankton, coccolithophores, heat stress, heat wave, snowpack, Dust Bowl, emblematic species, sixth mass extinction, UN Millennium Ecosystem Assessment, hydroponics, Biosphere 2
- **Locations:** port of Churchill Canada, Gobi Desert, Mongolia, Cayman Islands, West Antarctic ice sheet, Greenland ice sheet, India, Bangladesh, Nepal, Himalaya, Peru, Peruvian Andes, Colorado River, San Joaquin River, Burkina Faso, Swaziland, Gabon, Zimbabwe, Mali
- **Names:** James Hansen (NASA scientist), Inuit people, Lonnie Thompson, SEDAPAL, Charles Darwin, Edward O. Wilson, Rachel Carson

Three Degrees

- **Terminology:** Batswana, famine, aerosols, Pliocene Epoch, Japan's Earth Simulator, The Hadley Centre's HadCM3 model, El Niño, bushfire, aboriginal, pyro-cumulonimbus, cirrus clouds, Mayan ruins, hieroglyphs, limestone, cenotes, drought, deforestation, monsoon, aerosols, hydroelectric power, malaria, Thames flood barrier, tepuis
- **Locations:** Botswana, Kalahari Desert, Okavango River, Zambia, Angola, Namibia, Zimbabwe, Ethiopia, Transantarctic Mountains, Ellesmere Island, Yangtze River, Shanghai, Indonesia, Malaysia, Amazonia, Brazil, Venezuela, Columbia, Peru, Bolivia, Australia (Sydney, Perth, Adelaide, Melbourne, Tasmania, Canberra), the Icelandic ice caps of Vatnajökull and Hofsjökull, Chichen Itza, Mount Everest (Nepal and Tibet), K2 (Pakistan and China), Indus River, Ganges River, Brahmaputra River, Mekong River, Yangtze River, Yellow River, Colorado River
- **Names:** National Center for Atmospheric Research, Yanomami and Ashaninka, Mayan, Britain's Department for International Development

Four Degrees

- **Terminology:** Gaia, scree, permafrost, methane
- **Locations:** Egypt, Alexandria, Nile delta, Cairo, Ross and Ronne ice shelves, Transantarctic Range, West and East Antarctica, Siberia
- **Names:** Poseidon, James Lovelock

Five Degrees

- **Terminology:** methane hydrate, Paleocene-Eocene Thermal Maximum (PETM), tsunami, Anthropocene, zones of uninhabitability, Storegga Slide
- **Locations:** Ellesmere Island (Canada), Axel Heiberg Island (Canada)
- **Names:** (none)

Six Degrees

- **Terminology:** Pangea, chalk, Cretaceous Period, dinosaur, tempestites, Gaia theory, red tides, Permian Period, limestone, mudstone, shale, foraminifera, conodonts, hypercane, ozone, ultra-violet (UV) radiation, hydrogen sulfide
- **Locations:** Negev Desert (Israel), Karoo Basin (South Africa), Graphite Peak (Antarctica), Lake Nyos (Cameroon)
- **Names:** James Lovelock

Choosing Our Future

- **Terminology:** anticline, wind turbines, deforestation, reforestation
- **Locations:** Ghawar oil field (Saudi Arabia)
- **Names:** International Energy Agency (IEA)