

International Symposium on Land, Transport and Marine Technology

Keynote Speech

Ocean 2.0: Resources and Challenges for the 21st Century

Tony Haymet

Director, Scripps Institution of Oceanography, USA

Trends and Technology Issues in the Construction and Transportation area to meet Climate Change

Jerome C. Glenn

President, The Millennium Project World Federation of UN Associations, USA



Ocean 2.0: Resources and Challenges for the 21st Century

Dr. Tony HaymetDirector, Scripps Institution of Oceanography, USA

Dr Tony Haymet is a highly distinguished researcher. His personal scientific interests include Antarctic fish antifreeze proteins and nucleation. Between 1981 and 1991 Dr Haymet worked in the USA at Harvard University, Berkeley University and University of Utah. He returned to Australia in 1991 and worked as Professor and Chair of Theoretical Chemistry at the University of Sydney. In 1998, Dr Haymet became Distinguished University Professor of Chemistry at the University of Houston, and two years later founded the University of Houston Environmental Modeling Institute. In January 2003, Dr Haymet became Chief of CSIRO Marine Research, and in July 2005, became Chief of the newlymerged CSIRO Marine and Atmospheric Research.

Abstract

Societies throughout the world continue to expand the use of the oceans for commerce, food, and recreation. Many challenges await us in the next 30 years. The world's mega-ports continue to expand, and some, including Los Angeles - Long Beach, will soon be at capacity. Blue water fisheries continue to expand with even more sophisticated "high-tech" equipment more familiar from military operations, even as the cost of the catch continues on an alarming decade-long rise. The rising price of fuel has caused a rethinking of manufacturing and distribution strategies, especially in the Pacific Rim, while the global community continues to negotiate agreements on CO2 reduction. In North America, both cod (East Coast) and salmon (West Coast) fisheries have crashed, even while under strict professional fisheries management, humbling even the most optimistic scientists. Marine ecosystems from Thailand to the north Atlantic show unprecedented changes. Coastal real estate continues to be prized in developed and developing economies, as the recreation and inspiration human beings derive from the ocean becomes ever more precious. Due to human encroachment over the last 50 years, it is likely that our oceans will never return to their original state, Ocean 1.0. Faced with such daunting challenges, it may seem surprising that there are new opportunities. Thanks to a combination of satellite technology, and economical in situ diving robots, we are now within reach of gathering all the information we need to monitor the "health" of the ocean, in the same way as we have for many centuries for productive terrestrial land. The networks also provide cheap monitoring of this "ocean commons" to prevent rogue national or groups from destroying communal resources. The United Nations Law of the Sea Convention provides a framework for managing the world's most important communal resource. The year 2009 brings new opportunities for countries to join and strengthen this management framework.





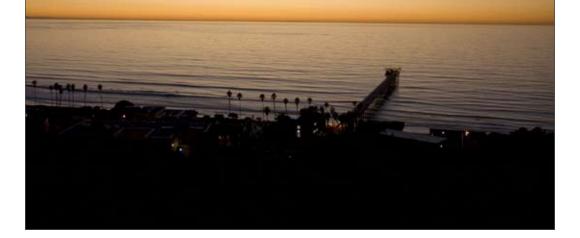
Ocean 2.0: Resources and Challenges for the 21st Century

UC San Diego

November 6, 2008

Professor Tony Haymet Director

- We are land animals and mostly look at the surface of the ocean. It all looks much the same and fine on the surface.
- But what is going on beneath the surface?



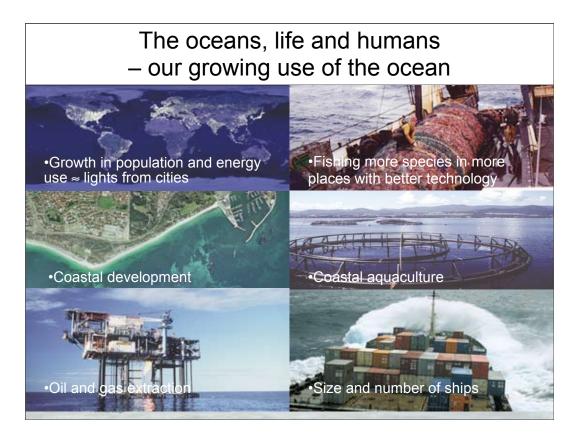


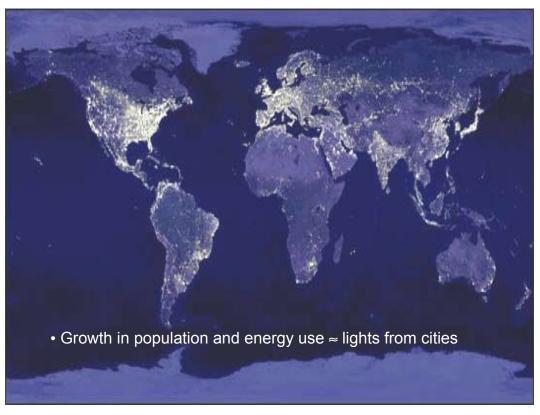


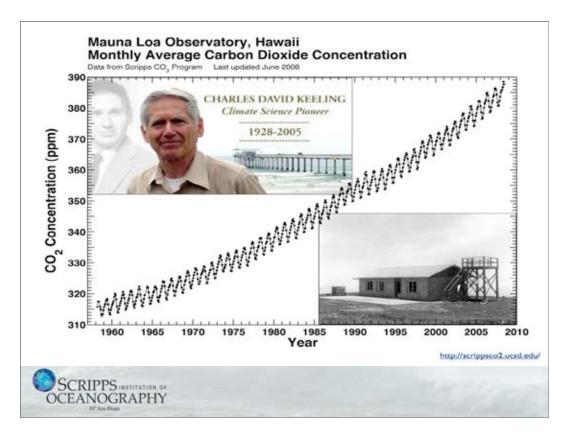
Thomas Huxley (1883) "all the great sea-fisheries are inexhaustible; that is to say **nothing** we can do seriously affects the number of fish."

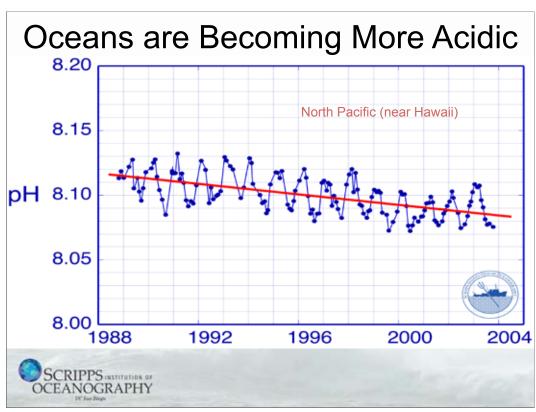
Northern Bluefin Tuna



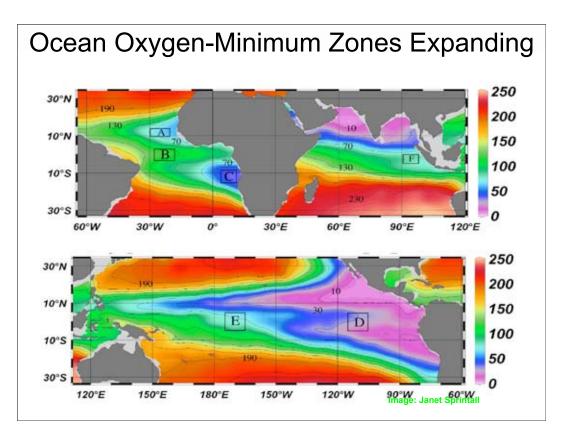


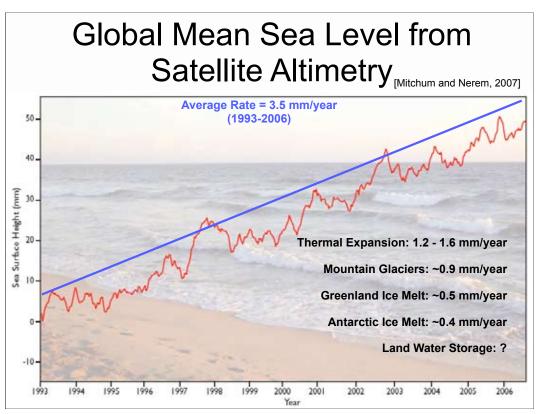










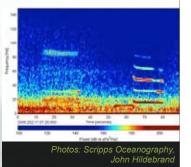


Ocean Noise Rising

- Tenfold noise increase since the 1960s
- Culprit appears to be global shipping trade
- Unknown impacts on marine animals and their habitats









Fish Stocks Disrupted

- Fishing disrupts targeted fish stock species' population bases
- Using CalCOFI data, scientists found that fished species "age pyramid" is disrupted
- Removing older members leaves population dynamically unstable
- "Throw the big ones back"







Threats to Marine Ecosystems

Rise of "Slime"

Due to:

- Habitat Destruction
- Overfishing
- Pollution





Threats to Marine Ecosystems

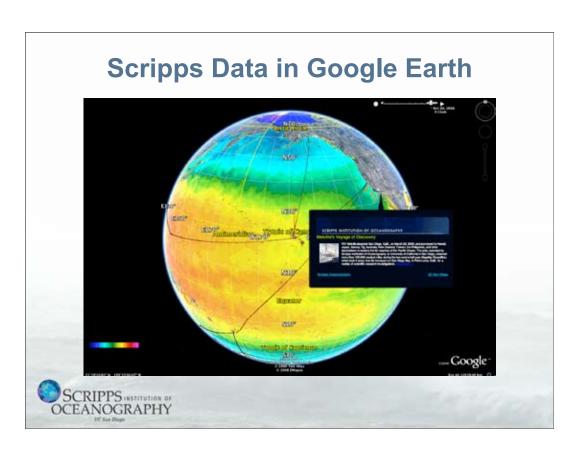
Rise of "Slime"

Also due to:

- Increased Ocean Acidification
 - Ocean Warming
 - Climate Change

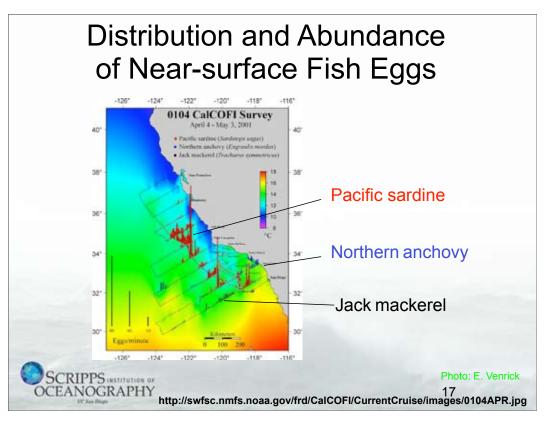








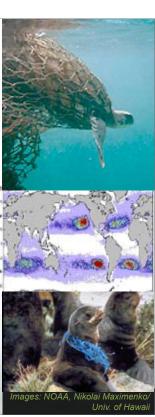


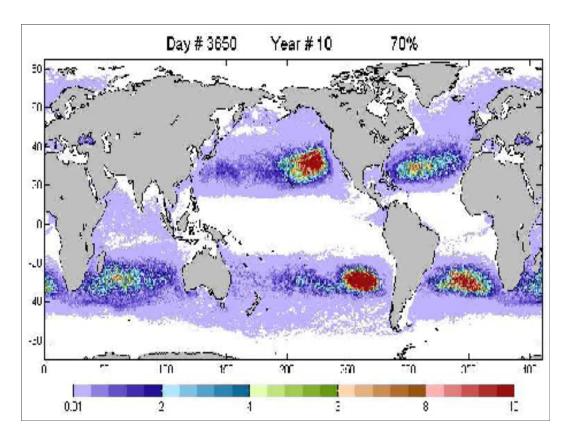


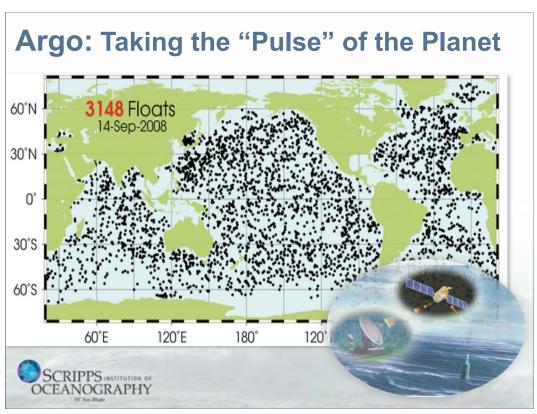
Garbage in the Oceans

- Ocean currents in subtropical gyres converge at the surface, create "dead maelstroms."
- One gyre NE of Hawaii could contain Texas-sized mass of mostly plastic garbage.
- Scripps drifters find larger convergent gyre in south Pacific. Even more trash?



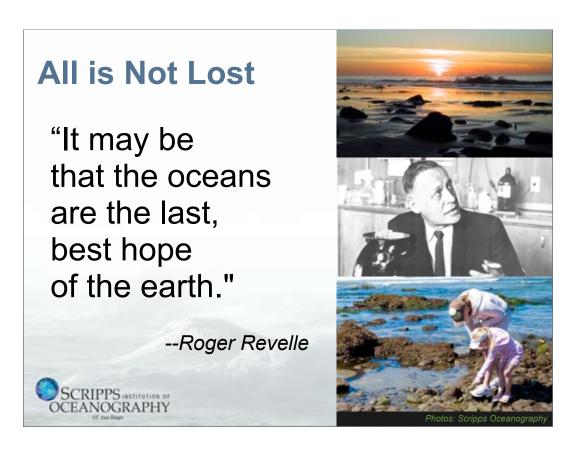








Argo: Taking the "Pulse" of the Planet Insert movie 2 here







Trends and Technology Issues in the Construction and Transportation area to meet the Climate Change

Jerome C. Glenn

President, The Millennium Project World Federation of UN

Associations, USA

Jerome C. Glenn is co-founder and Director of the Millennium Project of the World Federation of UN Associations. He is known for inventing of the Futures wheel technique and is cited as an expert on Future studies methodology by RAND Corporation. Millennium Project is a leading global participatory think tank supported by international organizations, governments, corporations, and NGOs, which produces the internationally recognized State of the Future annual reports for the past ten years. He is also the executive director of the American Council for the United Nations University since 1988, which represents the UNU in Washington, D.C. Glenn received a BA in Philosophy at The American University and holds an MA in Teaching Social Science focused on Futuristic Curriculum Development from the Antioch University New England.

Abstract

The accelerating rate of change will make the changes of the last 25 years appear slow compared to the next 25 years. The build environmental will have ubiquitous artificial intelligence imbedded. Humans will also have nanotech imbedded on and in there bodies with transceivers making a continuum of the built environment, human bodies, and our minds. Before we get to this "Conscious-Technology" age we have to address climate change in a variety of ways. Carbon based fuel systems have to be retrofitted with carbon sequestration systems and as much of constructed surfaces should be retrofitted with solar electric and thermal systems. We have to shift from petroleum to electric-based transportation systems and change the base-load electricity systems of the world eventually to Solar Power Satellites (Japan is the first country to make this a national goal). The new field of "Urban Systems Ecology" should be taught in universities and developed as the basis for urban planning and construction industries. A collective intelligence fro the transportation, construction, and marine industries to address climate change will be helpful as will the integration of archeology, urban systems ecology, and cyberspace.





Outline Accelerating rate of change Conscious-Technology Carbon Sequestration Shift to Electric transportation Solar Power Satellites (Japan) Urban Systems Ecology Construction retrofit with solar energy Transportation and Construction Collective Intelligence for Climate Change Integration of archeology, urban systems ecology, and cyberspace

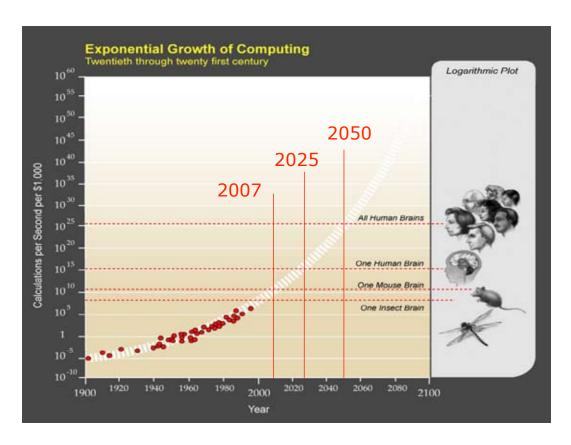
Just 25 years ago, who would have believed that Korea's...

- Businesses could compete successfully with the USA in
 - Transportation
 - Communications
 - Information systems
- GDP would be 13th in the world and close to both Russia's and India's GPD
- GDP per capita (PPP) would be US\$10,000 more than Russia's
- Computer games would be played by millions around the world?

Just 25 years ago, there was no

- Euros, WTO, or NATO in Afghanistan
- Internet, camera-phones, few PCs
- Talk of globalization, genetically modified food, stem cells, or AIDS pandemic
- Asymmetrical warfare, and
- ... and most believed that a nuclear WW III would have destroyed the world by now

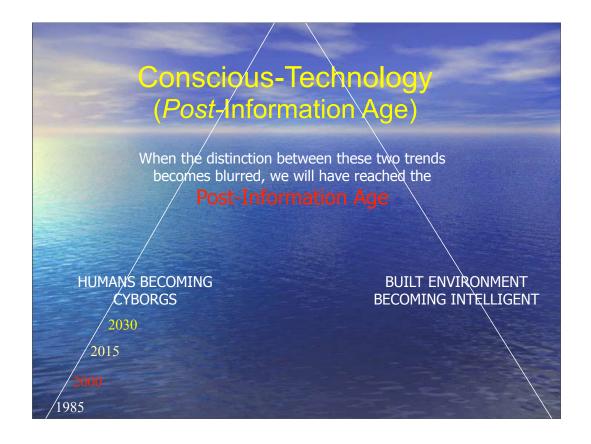






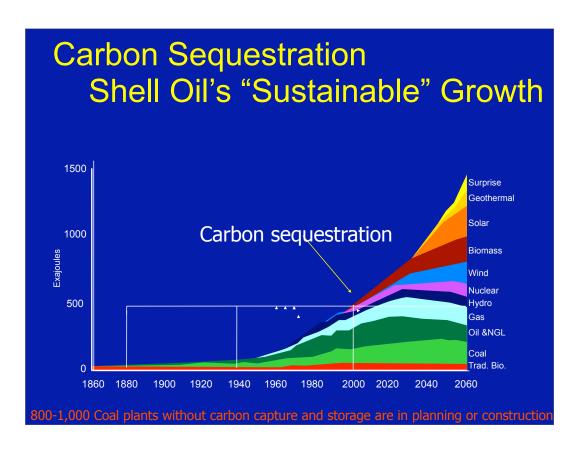
What's possible in next 25 years?

- Nanotech in all transportation and construction for efficiencies and reduced environmental impacts
- Urban systems ecology as well established field
- Collective Intelligence software (personal, local, and global)
- "Just in time knowledge" in the build environment
- The race to connect anything not yet connected
- Lines of genetic code written like software code making biotecture (integrating biology and architecture)
- More than half the world spends more than half its time in cyberspace being more "real" that 3D reality
- A global brain(s) emerging from Internet
- …evolving into Conscious-Technology





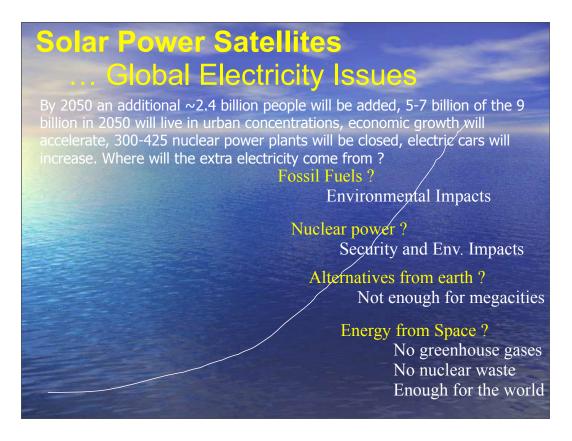
Simplification of History and an Alternative Future						
Age or Era	Product	Power	Wealth	Place	War	Time
Agricultural Extraction	Food/Res	Religion	Land	Earth/Res	Location	Cyclical
Industrial	Machine	Nation- State	Capital	Factory	Resources	Linear
Information	Info/serv	Corporatio n	Access	Office	Perception	Flexible
Conscious- Technology	Linkage	Individual	Being	Motion	Identity	Invente d



We need an overview of Carbon Sequestration Options					
Technology Option	State of Scientific Knowledge now	Cost, benefit, time-to- impact	Policy Options		
Option 1					
Option 2					
Etc.					









Urban Systems Ecology

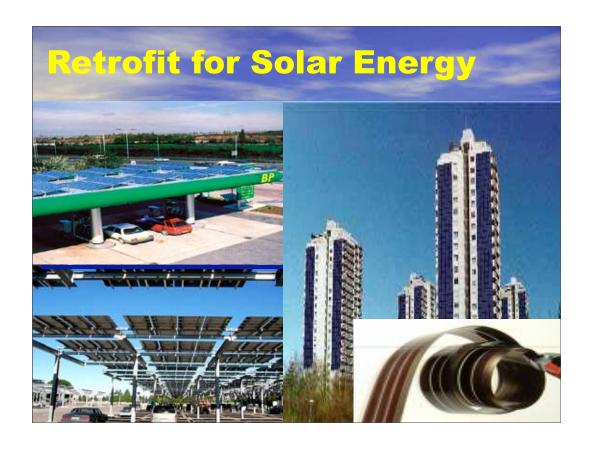
- Ubiquitous computing
- Nanotech sensors
- Collective Intelligence
- To optimize efficiencies with just in time knowledge
- City becomes a Conscious-Technology Meta-organism
- Resilience Systems for anticipation, identification, response











Collective Intelligence (CI) to support future transportation and construction

- CI is an emergent property from synergies among data/information/intelligence, software/hardware, and experts, that continually learns from feedback to produce just in time knowledge for better decisions than these elements acting alone.
- Wikipedia is an early example. GENIS is another.



GENIS (Global Energy Network and Information System)

- The Global Energy Network (GEN), providing communications and collaboration capabilities for a worldwide community of experts and others working on, or concerned with, energy issues;
- The Global Energy Information System (GEIS), a repository (knowledge base) and associated interactive access facility for as much of the world's total knowledge (actual content, pointers to external systems, and ability to mashup from other databases into one integrated set of outputs) about energy as can be accumulated.

