
The Environment and Our Future

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Aims for Today

- Identify opportunities for using a futures perspective in all courses, with “environment” as an illustration
- Discuss two examples of environment: energy and global climatic change
- Review tools and approaches for studying the future

Case History on Oil Transport: Torrey Canyon tanker, March 1967

- First major oil spill, caused new laws
- Liberian flag, chartered from Union Oil to BP, experienced Italian crew
- Hit a known object while hauling from Persian Gulf to Wales, went off course while on autopilot, good visibility, in range of lightship, 3 lighthouses, and a radio beacon
- Problem: scaled up from regular tanker size, early warnings missed. In 1989 the Exxon Valdez in Alaska repeated much of this.

Why Should We Better Understand the Future

- The future is just a continuation of the past – but often it cannot be simply extrapolated
- Where have we been? Where are we going?
- What are the driving forces of change?
- What are possible changes and their implications to us and others?
- How do we build futures literacy in our students (and us)?

Looking Back 30 Years (then think about looking ahead 30 years)

- 1978 – Personal computer
- 1979 – Bar codes and LCD panels
- 1980 – CNN established by Ted Turner
- 1987 – DNA first used to convict criminals
- 1993 – GPS satellite system (24th completed)
- 1993 – World Wide Web (internet, graphics)
- 1995 – Palm pilot, DVD (in 1997)
- 1999 – Morse code SOS replaced by GPS
- 2000 – dot.com (and market) bust
- 2006 – Last Western Union telegram

Looking Way Back to Anticipate the Future

- Major eras (major focus at that time)
 - • *Hunter/Gatherer*. The old days! All your time was essentially spent collecting food.
 - • *Agricultural*. Farming. Mechanized/scientific - 16th - 19th century.
 - • *Industrial*. Steam, iron, - mid 1800s followed by manufacturing and communications in 20th century.
 - • *Service*. Service by others for needs (e.g., restaurants, all types - mid 20th century
 - • *Technology*. Info, bio, nano, materials - late 20th century
- What is next? *Sustainability?*

Looking Backward and Forward: Environment

- Environment pre-1970 was more natural conservation, post 1970 was more pollution control, and post 1990 more pollution prevention
- The future will add a more systems perspective, looking at sustainability as well as complex interactions
- For many people the past approaches were controlling and had a pessimistic tone

7 Driving Forces of Change: Organize Your Reference Points

Big changes are coming - with multiple origins

- Economy and Financial
- Political and Governance
- Population and Demographics
- Resources and Environment
- Science and Technology
- Social and Cultural
- Work and Leisure

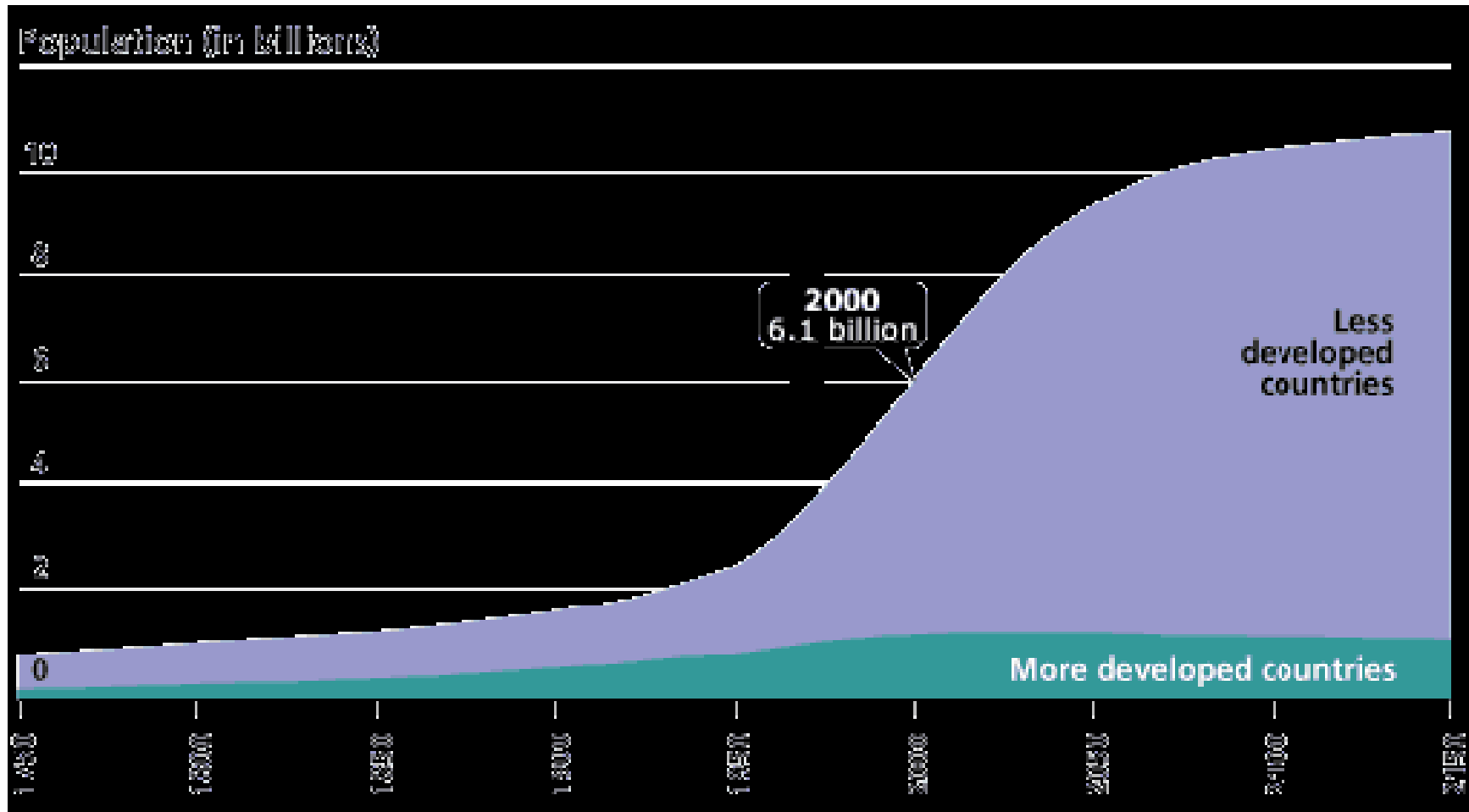
Environment for the Future Differs for Developed vs Developing Nations

- Commonly (current) stated items (alpha sort)
 - Biological diversity and habitat
 - Pollution prevention and effects
 - Population growth and distribution
 - Resource availability and use
 - Health and safety
- Sustainability as an overarching term
 - Long term perspectives, incentives
 - Complexity, uncertainties, change

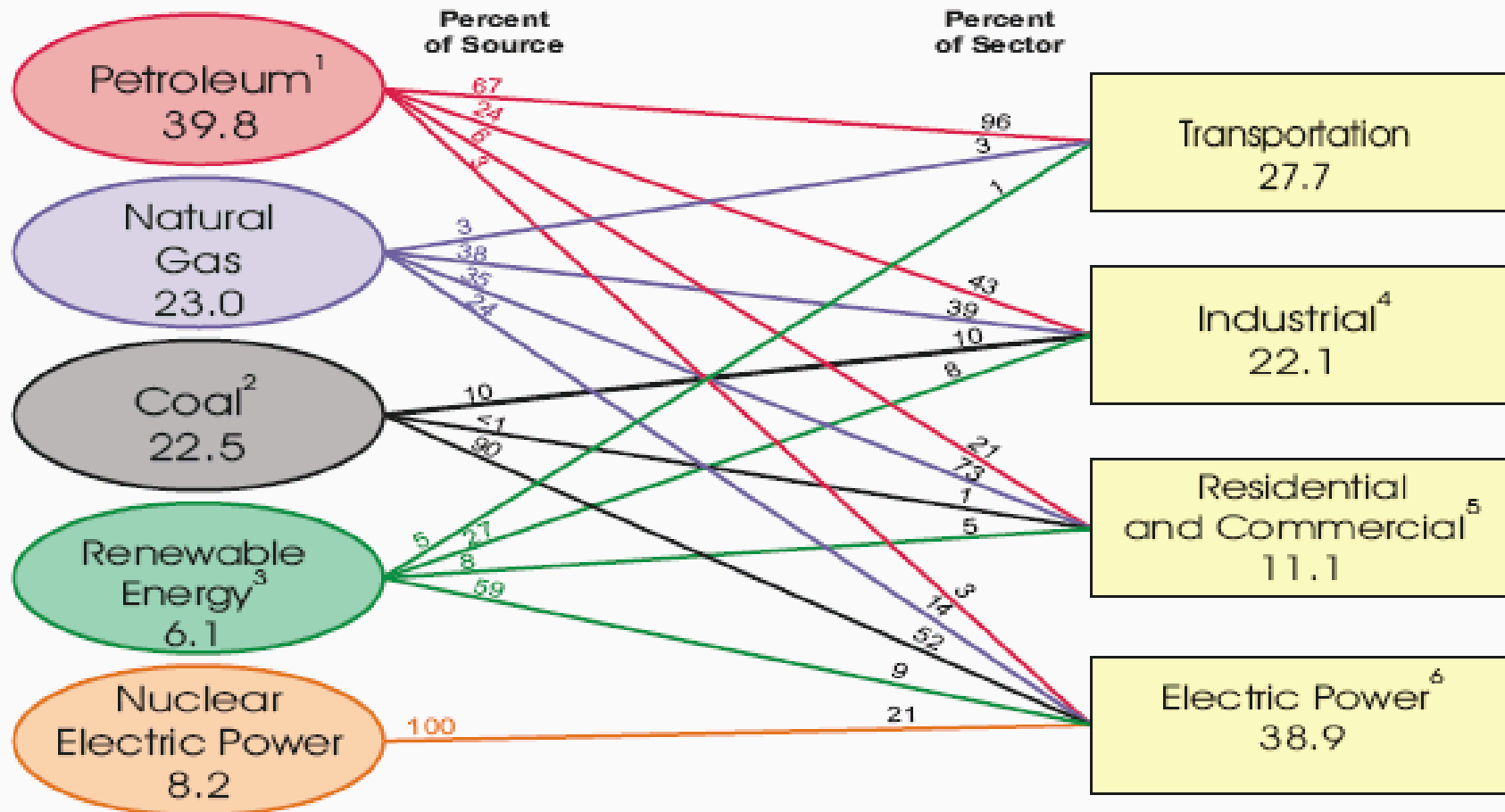
Selected Interrelated Trends – think about the implications and wildcards

- Population – growth rate lower in developed countries, overall leveling next-century. See current population - ([popclocks](#))
- Energy – efficiency and alternative sources gaining, some traditional sources limited
- Global temperature and CO₂ changes – lots of uncertainty, lots of evidence of change and implications are potentially huge

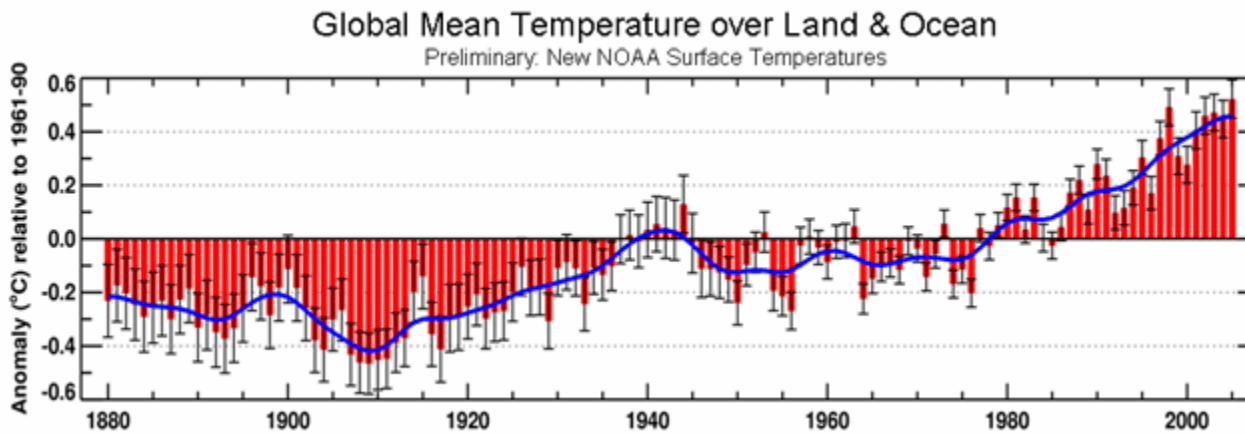
World Population 1750-2150 (PRB)



US/EIA U.S. Energy Consumption 2004 (Quads) - total = 99.6



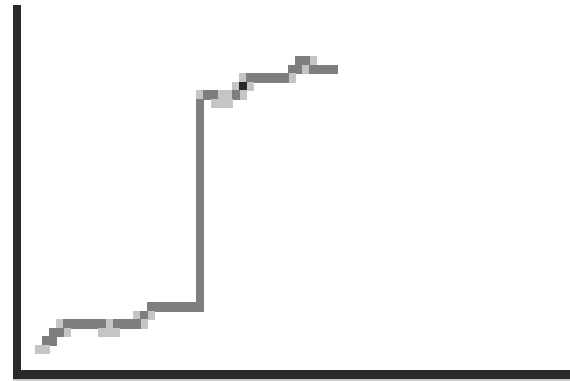
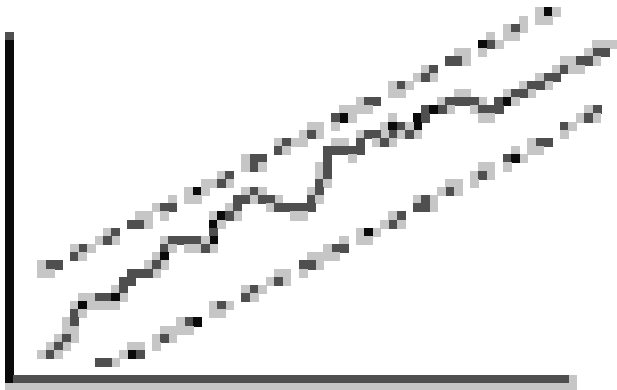
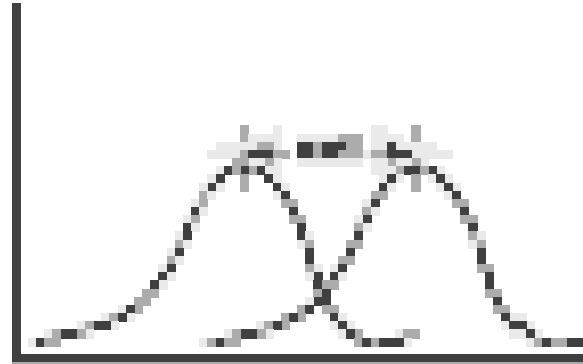
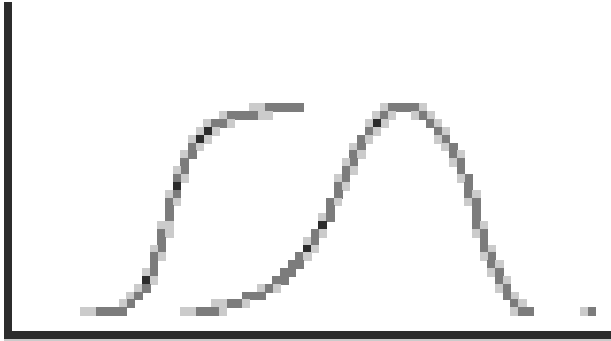
Global Temperature Change



Toolbox for Futures Studies: develop comfort in several areas

- Chaos, complexity, simplicity (all are related)
- Uncertainty and flexibility, ignorance and knowledge
- Vision, foresight and anticipatory perspectives
- Creative thinking (including pondering and other "informal" activities)
- Scenario development and strategic thinking (rather than strategic planning)

Forecasting the Future Graphically



Context for Understanding Possible Futures

■ VUCA World

- Volatile
- Uncertain
- Complex
- Ambiguous

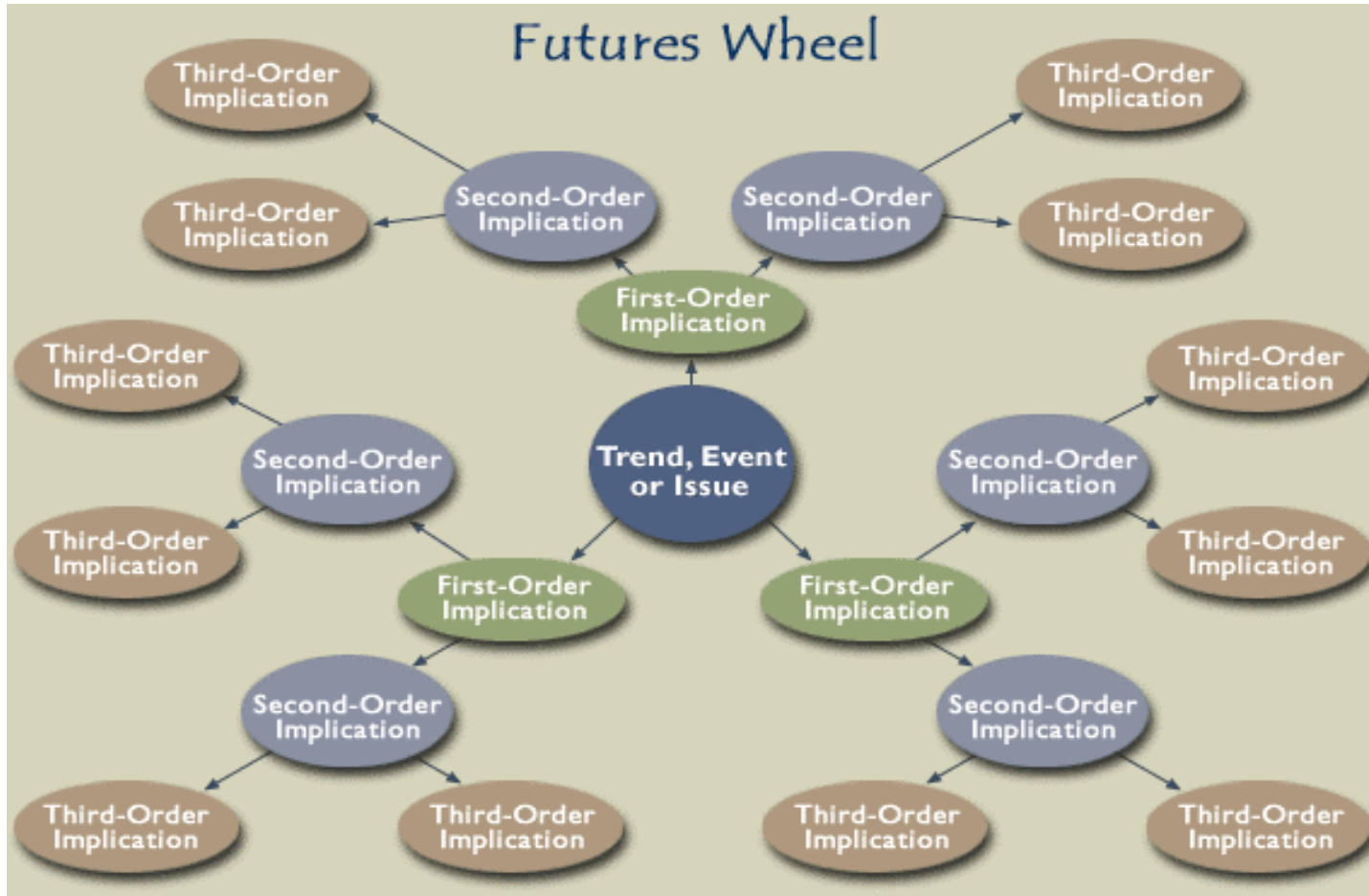
■ FAIR Response

- Flexible
- Agile
- Innovative
- Responsive

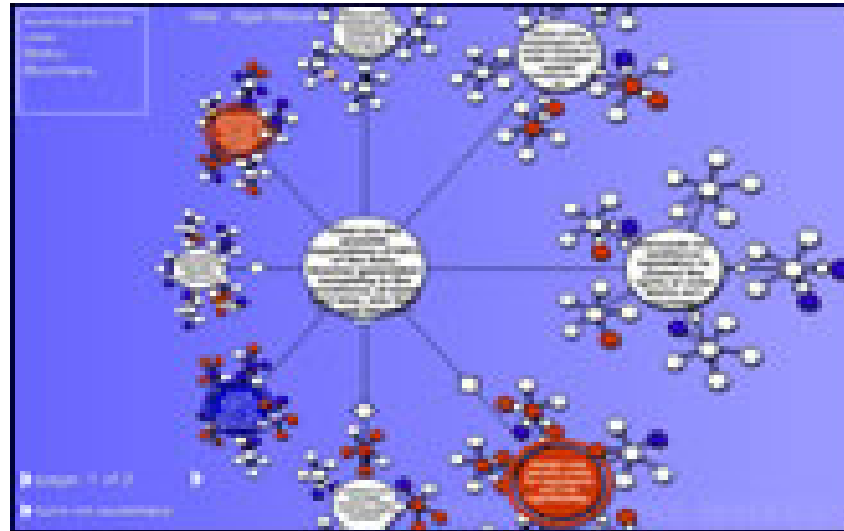
The Philosophical Perspective

- The only certainty is that nothing is certain - *Chinese Fortune Cookie*
- If everyone is thinking alike, then somebody isn't thinking - *George Patton*
- To predict the future, we need logic; but we also need faith and imagination, which can sometimes defy logic itself - *Arthur C Clarke*
- We always plan too much and always think too little - *Joseph Schumpeter*
- The herd instinct among forecasters makes sheep look like independent thinkers – *Edgar Fiedler*
- Think - *IBM slogan*, Imagine - *Apple slogan*

Futures Wheel (from <http://www.prospectiva.net/>)



Implications Wheel – note multiple implications not single impacts



Examples to Make Students Think

- From “500 Year Delta” published in 1997
 - Use as wildcards or for implications wheel
- 500 weeks (9.6 years)
 - Your most important employee will be working for your biggest competitor
 - Harvard will have branches on each continent
- 500 days (1.4 years)
 - You will become intensely interested in a totally alien idea
 - Global terrorism will make boarding an airplane a life-threatening decision

Your Turn (as a group) ...

- Select an important event or issue
- List some possible outcomes
- Think about some implications
- List a few of wildcards
- Think about some uncertainties
- List some likely outcomes

Selecting a Teaching Approach

- Historic approach
 - Diversity, pollution, global climatic change
 - Facts
 - Often has negative “feeling”
- Futures approach
 - Trends, implications, scenarios, options
 - Demographic trends, world, US, state
 - New technologies (electronic, nanotech, biotech)
 - Ask questions and expect multiple “right” answers

The Future: The Essential Few

- Understanding where we are today
- Having an idea of where we want to go
- Recognizing your areas of ignorance (know what you don't know)
- Understanding relevant paradigm shifts, driving forces and wildcards
- Identifying uncertainties and assumptions
- Identifying implications and developing several scenarios for better understanding of what is possible
- Revising the idea of where you want to go and how to get there

What I Have Learned About Teaching the Future

- Learn from others and understand change management
- Create an classroom or on-line atmosphere of questioning, critical thinking, investigation, discussion, and collaboration
- Take advantage of student curiosity about new things, and recognize students learn differently than some teachers learn or teach
- Make class fun: involve students on topics that interest them and they believe important

Classroom Exercise: How can the U.S. reduce our dependency on oil?

- Investigate how energy is used, where it comes from, and what its effects are on the economy, environment, and security.
- Do a 'what if' analysis using a futures wheel and implications wheel
- Define a range of possible results and write (4) scenarios to integrate them
- Role play with class members and summarize what was learned

References for Environment and the Future

- US EPA Environmental Futures
 - <http://www.epa.gov/osp/efuture.htm>
- UK Environmental Futures
 - http://www.environment-agency.gov.uk/science/922254/922694/922696/?lang=_e
- Middle East Environmental Futures
 - <http://www.watsoninstitute.org/meef/english/index.cfm?CFID=146571&CFTOKEN=35724204>
- UN Division of Sustainable Development
 - <http://www.un.org/esa/sustdev/>

Teaching the Future Info

- Survey of global futures courses
 - http://www.wfsf.org/resource/docs/Global_FS_Courses.pdf
- Thirty years of teaching futures studies
 - <http://www.futures.hawaii.edu/dator/futures/behind.html>
- My class is online – addresses lot of environment but mostly futures
 - <http://cals.arizona.edu/futures>

Conclusions

- It is a great time to learn (for students and faculty) – much new is happening
- The future is a bit hazy (but not clear) so take advantage of this to try new approaches
- There are many resources available (to students and faculty) through internet and all its variations
- Getting some experience as a futures person might energize you (it did me)
- New teaching toolbox: driving forces of change, major themes of future, defining possible events and their implications, doing something about what you learn