

Sustainability and the Obama Administration

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Outline of these remarks

- The character of well-being and the meaning of sustainability
- Key sustainability challenges and their interactions
- The role of science & technology in sustainability
- Obama Administration initiatives in the sustainability space
- Update on recent progress on a subset of these
- The challenges ahead

Foundations of human well-being

Human well-being is supported by three pillars:

- economic conditions and processes
employment, income & wealth (magnitude & distribution), markets, trade...
- sociopolitical conditions and processes
law & order, national & homeland security, governance, liberty, justice, equity, education, health care, science, culture & the arts...
- environmental conditions and processes
air, water, soils, mineral resources, the biota, nutrient cycles, climatic processes...

About the three pillars

- Historically, development discussions and planning have emphasized the economic leg (primarily), the sociopolitical one (secondarily), and environment at most as an addendum.
- But the environmental leg is at least co-equal in importance and plausibly even paramount...
- ...and in any case the three are interconnected:
 - the economy needs environmental inputs, sociopolitical stability;
 - many sociopolitical & environmental improvements must be paid for;
 - sociopolitical stability can't survive environmental disaster.

“Development” and “sustainability”

- Development should mean improving human well-being in all 3 dimensions — economic, sociopolitical, and environmental.
- Sustainable development should mean doing so by means & to end points consistent with maintaining the improvements indefinitely.

Getting to sustainability entails...

- Not only employing sustainable development to achieve well-being where it's now absent,
- but also putting the maintenance & expansion of well-being where it's now present onto a sustainable basis.

We are far from doing either...and moving too slowly on both.

Key sustainability challenges

- Eradicating extreme poverty
- Defeating preventable diseases
- Providing the energy our economies need without wrecking the climate our environment needs
- Adapting to the degree of climate change that can no longer be avoided
- Managing the intensifying competition for the planet's land, water, & biomass
- Stemming the toxification of terrestrial ecosystems
- Maintaining the productivity & ecological integrity of the oceans

These challenges are interconnected

- Poverty & local environmental degradation are linked in a vicious circle of cause & effect.
 - deforestation for fuelwood, subsistence farming; desertification & erosion from overgrazing
- Preventable disease is linked to environment & poverty.
 - lack of sanitation & clean water, acute air pollution in rural dwellings from traditional fuels, malnutrition & low birth weight from inadequate diets

Interconnections (continued)

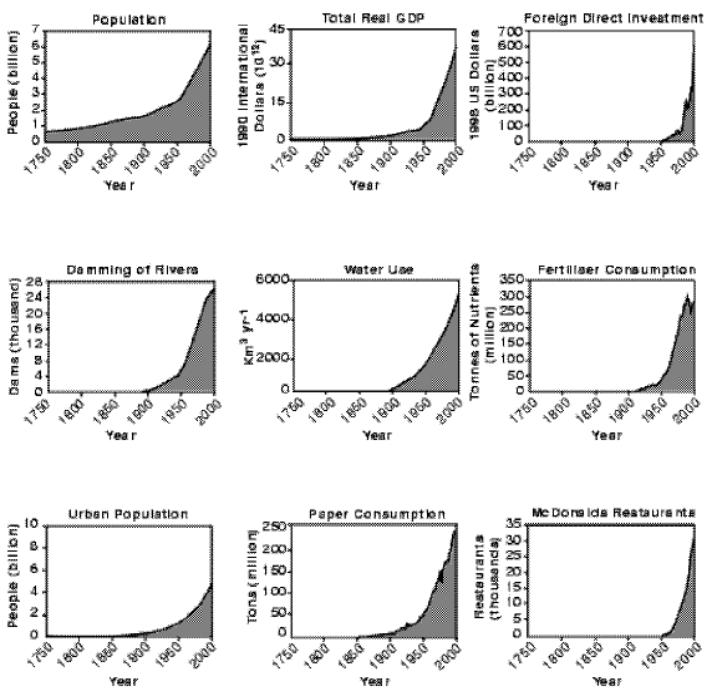
- Economic progress & population growth intensify the competition for land, water, & terrestrial biota, as well as the energy/economy/climate dilemma and the toxification challenge:
 - improved diets for more people increase demand for grain (for food & animal feed), water, fertilizers, pesticides, grazing land, soybeans...
 - other uses of water and energy also rise with population and income
 - climate change, driven largely by CO₂ from fossil fuels, imperils food production & water supply, as well as increasing demand for biofuels (to replace fossil fuels) and standing forests (to keep CO₂ out of atmosphere).

Interconnections (continued)

- The oceans too suffer when people get richer:
 - improved diets → overharvesting of fish & shellfish
 - aquaculture for same → pollution
 - fertilizer runoff → dead zones
 - oil tankers & drilling rigs → oil spills
 - heating from GHG → reduced phytoplankton productivity, changes in species composition & distribution
 - heating, construction runoff, cruise ships, live-fish trade, acidification from CO₂ buildup → coral-reef destruction

Population and affluence: 1750-2000

Crutzen & Steffen,
Climatic Change
61, 2003



S&T for the sustainability challenge

- Science:
 - improving understanding of shortfalls, threats, and possibilities
 - enabling advances in technology
- Technology:
 - meeting human needs & wants at lower cost with reduced use of material resources & reduced environmental impact
- S&T together:
 - integrated assessment of options
 - advice to decision-makers & the public about costs, benefits, dangers, uncertainties
 - S&T education toward a more S&T-literate society

Obama Administration initiatives

- \$80 billion for clean & efficient energy in Recovery Act, plus large boosts for energy R&D in subsequent annual budgets
 - including creation of ARPA-E and energy-innovation hubs (academic-business-nat'l lab partnerships) to accelerate development of better energy options
- first-ever fuel-economy/CO₂ tailpipe standards
- PCAST energy-innovation study → DOE Quadrennial Technology Review (completed Oct 2011) and launch of interagency Quadrennial Energy Review in mid-2012
- restructuring Earth-observation satellite programs with increased budgets & improved management
- Executive Order 13514 on Sustainability

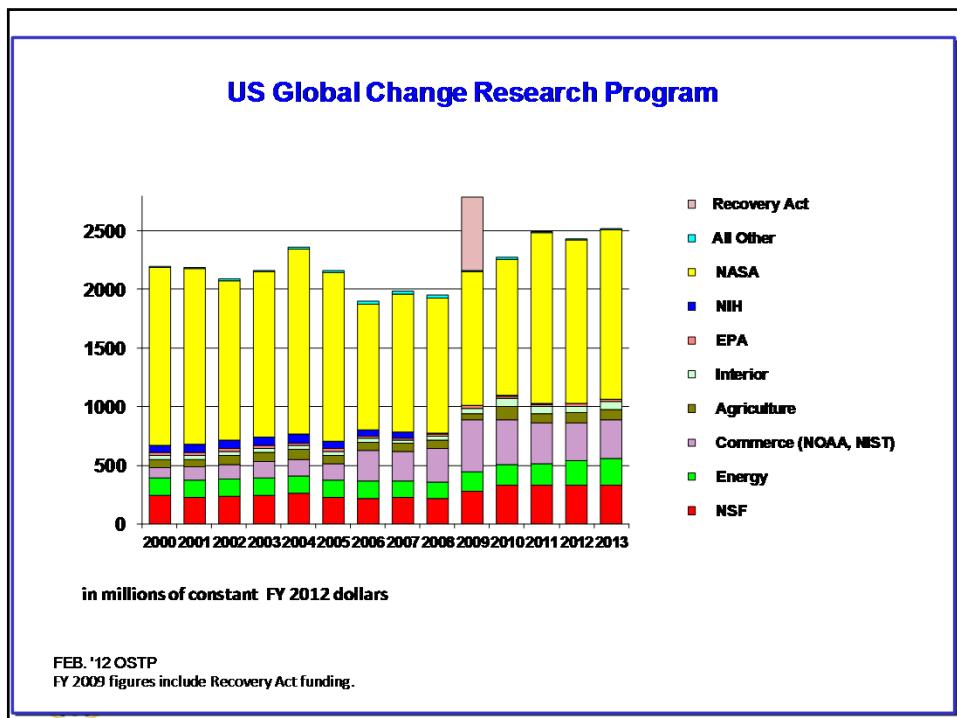
Obama Administration initiatives (continued)

- Dept of Interior Climate Change Response Centers and Landscape Conservation Cooperatives
- Interagency Task Force led by OSTP, CEQ, NOAA on coordination of government's climate-change adaptation activities; Adaptation Summit
- strengthened bilateral partnerships on energy & climate change w China, India, Brazil, Russia...
- revitalization & refocusing of USGCRP
 - including strengthened Arctic and Antarctic research efforts
- launch of & rapid progress on the Third National Climate-Change Assessment
- development, launch, and early-stage implementation of National Oceans Policy / National Oceans Council
- PCAST study of environmental capital & ecosystem services



Global change research in the 2013 budget

- \$2.6 billion for USGCRP, an increase of 5.6 percent or \$136 million over 2012 enacted level
- Reaffirms commitment to addressing the climate change challenge
- New USGCRP 10-Year Strategic Plan (issued last month) will guide efforts to understand, assess, predict, and respond to global change; adaptation is a new emphasis.
- Science for sustainability is a priority at NSF, EPA, Interior (USGS, FWS...), NOAA...



Sustainability in the US Arctic Research Plan

- One of 7 research themes in the IARPC's draft five-year Arctic research plan
- Priority tasks include:
 - Identify current vulnerabilities of Arctic communities and ecosystems to climate change and explore the interaction of climate vulnerabilities with socio-economic and other stressors.
 - Develop projections of future climate scenarios and demographic conditions to forecast potential strengths and weaknesses of Arctic human and ecological systems.
 - Design new research, education, and outreach tools and processes to assist Arctic communities in language and heritage preservation and in cultural revitalization efforts.

Overview



The National Climate Assessment (NCA) is being conducted under the auspices of the Global Change Research Act of 1990. The GCRA requires a report to the President and the Congress every four years that integrates, evaluates, and interprets the findings of the U.S. Global Change Research Program (USGCRP); analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years.

National climate assessments act as status reports about climate change science and impacts. They are based on observations made across the country and compare these observations to predictions from climate system models. The NCA aims to incorporate advances in the understanding of climate science into larger social, ecological, and policy systems, and with this provide integrated analyses of impacts and vulnerability.

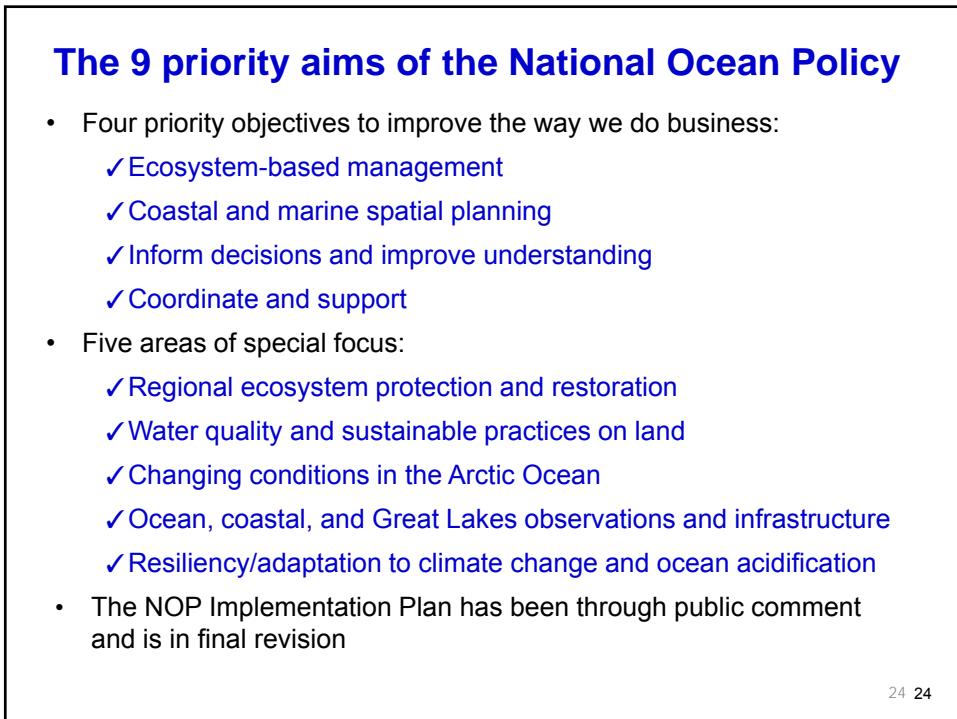
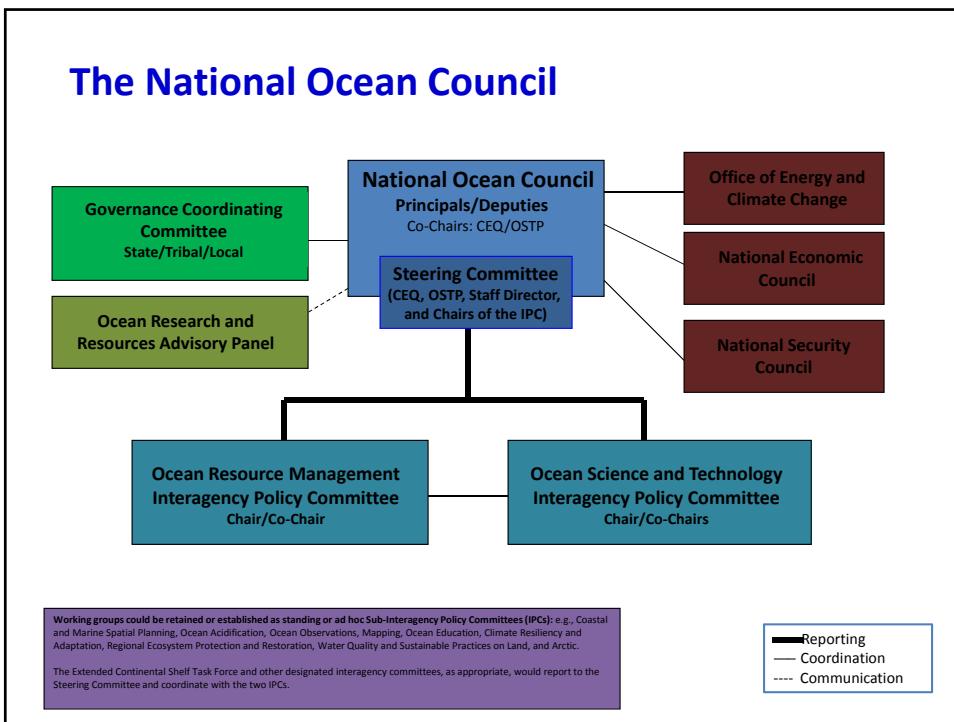
<http://www.globalchange.gov/what-we-do/assessment/nca-overview>

The Third National Climate Assessment

- The first NCA was completed in 2000, the second in 2009.
- This third one is expected to be released in late 2013 – the first of the three to be delivered on schedule.
- The first two were focused mainly on potential impacts and vulnerabilities.
- This third one greatly increases attention to adaptation opportunities and to the interaction of physical and sociopolitical factors.
- Structural aspects include:
 - Participation by 13 Federal agencies, coordinated by an NCA staff in the Washington DC USGCRP office, with a technical support unit in Asheville, NC
 - Overseen by a 60-member Federal Advisory Committee based in NOAA, which has met 5 times since May 2011
 - So far there have been 40 workshops covering regions, sectors, crosscuts
 - 240+ authors are working on 30 chapters totaling ~300 pages; there will be 50-60 page high-level synthesis; full report will be produced only as an e-book

The National Ocean Policy: signing Executive Order 13547 (19 July 2010)





The PCAST report on protecting environmental capital & ecosystem services (July 2011)

- Central messages:
 - *Economic and environmental dimensions of societal well-being are both indispensable, as well as tightly intertwined*
 - *Government must not fail to address the threats to both the environmental and the economic aspects of well-being that derive from the accelerating degradation of the environmental capital – the nation's ecosystems and the biodiversity they contain – from which flow "ecosystem services" underpinning much economic activity as well as public health, safety, and environmental quality.*

The July 2011 PCAST report (continued)

- Recommendations:
 1. The US government should institute and fund a Quadrennial Ecosystems Services Trends (QUEST) assessment.
 2. OSTP and State should take a lead role in developing the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).
 3. Federal agencies that implement biodiversity and ecosystem conservation programs should prioritize expenditures based on cost-efficiency in attaining conservation goals.
 4. Federal agencies should improve their capabilities to develop valuations for ecosystem services affected by their decisions and factor the results into their decision-making/.
 5. The USG should identify the most important data gaps within existing biodiversity inventories and monitoring systems and clarify agency roles & funding for filling these.
 6. The NSTC should establish an Eco-informatics-based Open Resources & Machine Accessibility (EcoINFORMA) initiative.

The challenges ahead

- Sustaining support for sustainability under budget cuts
 - Particularly difficult will be sustaining support for...
 - NOAA (polar-orbiting satellites, ocean & coastal science and management, climate services)
 - DOE (renewables, efficiency, CO₂ capture)
 - NSF (social science)
 - USDA (peer-reviewed agricultural science)
 - USGCRP (climate science, sustainability science)
 - all international cooperation in sustainability

The challenges ahead (continued)

- Getting key messages across
 - what sustainability is and why it matters
- Advancing a coherent energy-climate policy
 - with large public investments in both mitigation and adaptation
- Increasing “sustainability literacy” so policy-makers will understand & voters will insist that they act
 - entailing strengthened STEM-education at K-12 and college levels, including more ecosystem science and interdisciplinary studies

The best news for the sustainability agenda going forward: we have a President who is paying attention.



Office of Science & Technology Policy
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