

Speech before House Aerospace Caucus
By
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A Vision for the Future of Earth Observations

I. Intro / Thanks

- Thank you Chairmen (Dicks) and Weldon for your introductions and the Aerospace Industry Association for the organization of today's luncheon. Distinguished members of Congress, staff, and aerospace colleagues, it is an honor to be here with you today to discuss a topic of such importance.
- Today I wanted to speak a little about the future of earth observations, where I think we are headed and what it means for the space community.
- Where the last century was clearly defined by a look to the heavens, I believe the 21st century could be remembered by a change in the way we interact with the planet.

II. Where we've been

- The earth is an integrated system and if we're going to effectively monitor global processes, study environmental changes, and manage natural resources we had better be similarly integrated.
- Historically, moving from the research observations from space that NASA is known for to the operational observations, such as weather forecasts and images on the evening news, which NOAA is known for, could be described as ad-hoc at best and a wide gap has traditionally existed between the two. Instead of focusing on an end game such as providing products and services, earth sciences has focused mostly on the scientific side of things and increasing our understanding of the planet's systems.
- Contrast this with the space program which has gone through several phases from reaching orbit to walking on the moon to an international space station and now to Mars. During each of these phases both the science and the operational community were focused on the same singular goal.
- In a time when every dollar counts, it is all the more important that we define the needs for information that our communities have to help guide scientific missions.

III. Where we are

- Last year the National Academies released a Decadal Study on earth science applications from space. The report was a comprehensive look at these very issues and it made a number of important recommendations. One of the underlying themes of the whole report was improving the transition of research information about the Earth system into environmental observations and products that can truly make a difference in people's lives
- This isn't strictly a space-based challenge, but it is clearly more pronounced in space given the long lead times and relatively larger budgets required to complete missions. I am happy to say that we continue to improve our relationship with NASA and other partners in order to continue to close this gap between research and operations.
- This re-focused partnership with NASA is already paying dividends. The President's decision to include \$74 million in the FY2009 budget to remanifest climate sensors from the NPOESS mission is a direct area where this partnership is paying off.

IV. Where we're going

- As we look to the future, our first priority is obviously continuity of operations. From weather forecasting to climate monitoring, we simply can't have a gap in coverage.
- However, in the future there will be an increased need for new products and services developed by earth observations. Population growth, coastal development, food and energy resource use, and increased globalization will ensure that demand for these products remains strong.
- There is much more to understand about the forces that affect our climate, and we should be mindful that regions will be affected differently by climate change. The next step in the science is understanding how climate will affect people on the local level and providing people with the information they need to make informed decisions.
- A National Climate Service would provide farmers with better seasonal outlooks to improve efficiency. It would allow energy companies to better anticipate demand, reducing waste and lowering costs. And it would allow coastal managers to better understand a changing coastal landscape.
- Numerous federal agencies are making substantial contributions to understanding climate change. The nation needs a way to harness these efforts

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to focus on providing products and services that address the changing planet. The nation needs a coordinated effort:

- To improve our understanding of the causes and impacts of climate change;
 - To ensure policy makers and business leaders are equipped with the most accurate and reliable information; and
 - To provide more accurate climate predictions to help communities anticipate climate changes and prepare for them.
- NOAA is undertaking a major initiative to provide climate information in an integrated and focused manner to take maximum advantage of its observational assets, assessment and prediction expertise, and service delivery capabilities.
 - Congress is also debating this need. Legislation introduced in the Senate proposes to create a National Climate Service, which would expand NOAA's climate services and charge NOAA with improving coordination across the government. The Administration supports this idea with NOAA as the lead. We intend to be ready for the challenge.
 - It is really an exciting time for earth observations. We're literally standing on the threshold of a whole new era. Our understanding of this field is still in its infancy and we're just beginning to grasp what our capabilities might be.
 - For example, I think before long we will have the capability to accurately monitor air quality and air chemistry with more refined instrumentation from space.
 - I also think space will be a key frontier in the climate change debate in terms of understanding the carbon measuring cycle. If we're going to implement any sort of regulations on carbon emissions we will need to establish a baseline, verify where carbon is coming from and where it is going. Space-based instruments hold a great deal of promise in this area.
 - We currently have ground stations that can monitor upwards of 170 different compounds. Is it really a stretch to think that in the future some of these can be calibrated for space to give us a truly global picture that ground stations alone can't?
 - That's what makes this whole idea of creating a Global Earth Observation System of Systems so exciting. GEOSS will link thousands of observation platforms around the world in the sea, on the land, in the sky and in space giving anyone, anywhere a real-time look at all of the earth's systems interacting together.

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- Inherent in this process are people from different disciplines collaborating to meet society's needs. If you want to talk about transferring research-to-operations, GEOSS personifies it in seemingly real-time.
- GEOSS is all about the data – getting the right data into the hands of the right people at the right time. Perhaps the most revolutionary change GEOSS will bring will be to fundamentally change the way people view data. Instead of earth observation data being proprietary, it will instead be open for all to access at any time.
- In the future, the key will become who can use the data in the most innovative ways. Achieving competitive advantage will shift from being the one with the data to being the one who can solve the most problems by using the data.
- This is particularly important because I'm quite certain that the future, like now, we will have to do more with less. It is difficult to imagine a scenario where we aren't operating under incredibly tight budgets.
- That being said, because of the long-term nature of earth observation programs, particularly those with a space component, future success depends on enhancing budget support in the present. We need strong support for our budget this year in order to maintain our progress into the future. A small setback now will lead to larger setbacks in the future.
- As many of you know, we are entering a critical period right now with our next generation geostationary satellite program, GOES-R. This next generation is critical for the continuity of our nation's weather forecasts. NOAA has requested a budget increase of more than \$200 million dollars in FY2009 to support the continued development of the GOES-R system to better ensure we do not have a gap in coverage that could impact critical data for weather forecasting.
- To support this significant effort and ensure it comes in on time and within budget, it is important we support this and future increases to the NOAA budget to advance these key space-based Earth observation investments for the nation.

V. What it means for NOAA

- So what does all this mean for NOAA? There will clearly be increased opportunities, but there will also be a need to make some changes in the status quo.
- We are actively engaging the space community to explore new opportunities. In January we held an Industry Day to spell out our future requirements and to

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solicit specific ideas that we can review and incorporate into our future planning.

- This process in and of itself, is a new one and inherently requires a broadening in how we at NOAA meet our mission requirements and how the space community does business.
- The winners will be those who can ensure instruments are delivered on-time and at a lower price.
- Along those lines, I believe the vehicle will matter much less than the data provided. While there may still be needs for “big bus” satellites, we will also be looking at single-use satellites, specialized missions and even to the private sector to provide data as a supplement to our next generation NPOESS and GOES-R missions.
- Current business models must reflect the need to be nimble to increased demands for new information.

VI. Challenges

- Despite the increased need for earth observations, data, and solutions, the road ahead will be challenging. Although earth observations and the environment have rightfully risen to the forefront of our nation’s attention, the space segment of earth observations hasn’t quite yet reached the same level of inspiration and awe as space exploration.
- The implications of this on everything from budgetary support to public awareness to the ability to attract young students to the earth sciences are clear. Yet, it is a reality and a challenge to overcome.
- The vision I’ve spelled out today will require skills and understanding far beyond what we’re capable of now. None of this will happen if we aren’t developing future generations of earth scientists and then bringing them into our agencies and companies.
- I believe we must continue to challenge ourselves because that is the only way we continue to achieve.