

## NASA's facilities don't fit its future


- A legacy reflecting our Cold War heritage
  - encroachment and security challenges
- A risky match v. intended mission
  - largely science/research/technology development
  - many unique legacy capabilities, some oversized
  - 82% due/overdue for major renewal
  - unsustainable and costly
- 68% by value sit < 5 m above sea level

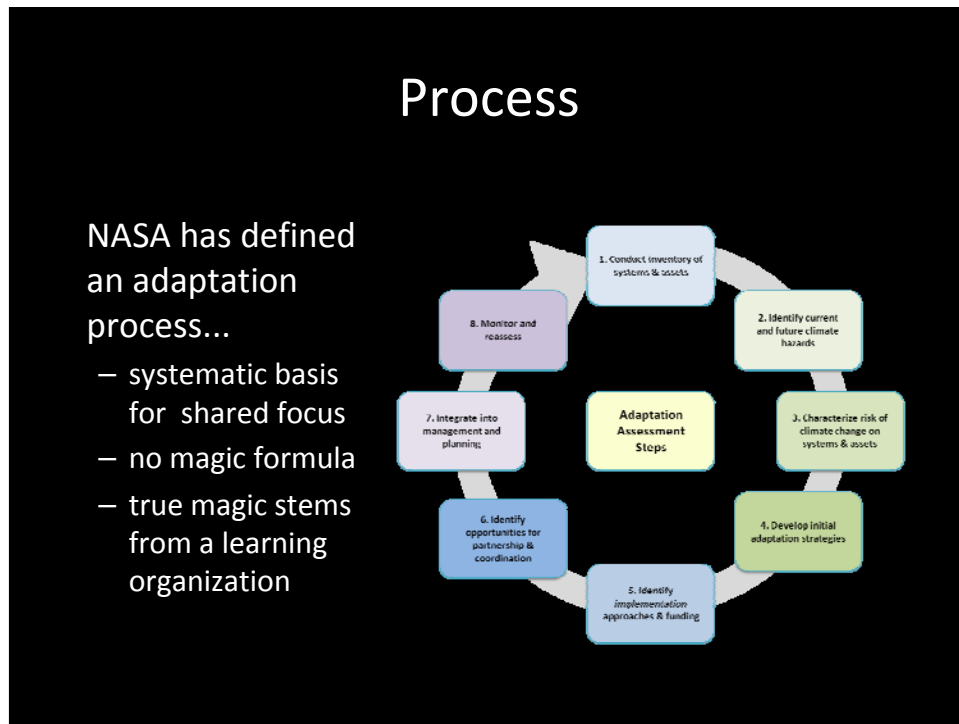
**OCTOBER 4th, 1957 . . . the Day the Whole World Listened**

## NASA and DoD sometimes diverge...

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- NASA is smaller and largely research-focused
    - even our “operations” are “research ops”
    - We’re small (~14 major sites, almost all distinct)
  - Discretionary...and **really discretionary!!!**
    - especially hard to quantify NASA’s ROI
    - Multi-generational paybacks typical
  - NASA lacks a rightsizing toolset (i.e. BRAC)
    - facilities valuation (~\$30B) at an all-time high
    - in 20 years we disposed < 5% of total holdings
    - not one substantial location closed, ever...

## Principles

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- Gather appropriate scientific expertise/data
    - Earth science research is a core NASA mission
  - Engage local institutional stewards
    - Workshop process to explore data, implications
  - Enable the stewards to own the challenge
    - Global policy but close-to-the-work management
  - Address problems in parallel, not in series
    - Recognize risks/costs of stand-alone solutions



# Products

**what's at stake?**

NASA's most recent (2010) annual scientific report, reporting on climate change risks, 1200+ pages, is the first ever by NASA Research Park, to be fully built out by 2015 as an integrated research and education on climate, with emphasis on climate change impacts and 15,000+ pages of scientific data.

**our responsibility**

What happens around the world is affecting about the best way to slow the rate of climate change through reduction in greenhouse gas emissions, the time to develop and implement advanced strategies to slow. *Executive Order 13527*

## projected changes

### Adapting Nature to a Changing Climate

Adapting Nature to a Changing Climate

Adaptation Research Center

### The Climate Science Center

NASA's first climate science center and center of excellence for climate science research, as well as the largest climate science center in the world. The center is located at NASA's Goddard Space Flight Center, Greenbelt, MD. The center is the first of its kind, and is the largest climate science center in the world. The center is the first of its kind, and is the largest climate science center in the world.

### Climate Variability

The United States is experiencing a significant increase in extreme weather events, including hurricanes, droughts, and heavy precipitation. This is due to a combination of factors, including climate change, natural variability, and human activities. The United States is experiencing a significant increase in extreme weather events, including hurricanes, droughts, and heavy precipitation. This is due to a combination of factors, including climate change, natural variability, and human activities.

### Projected Changes

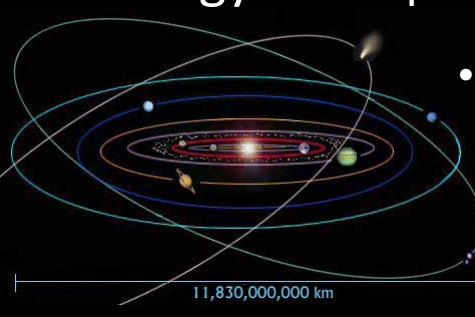
Model results of projected changes in climate variables for the United States. The table below shows the projected changes in temperature, precipitation, and other variables for the United States under different scenarios.

Variable	Scenario	Change
Average Temperature	2020-2050	+1.5 to +2.5
Annual Precipitation	2020-2050	+10 to +20%
Sea Level Rise	2020-2050	+1 to +2 m
Sea Level Rise	2050-2100	+2 to +4 m
Sea Level Rise	2100-2150	+4 to +6 m
Sea Level Rise	2150-2200	+6 to +8 m

### Rapid Ice Melt Scenario

This scenario suggests that we have reached a point where the ice sheets are melting rapidly, leading to a significant rise in sea levels. This scenario suggests that we have reached a point where the ice sheets are melting rapidly, leading to a significant rise in sea levels.

# Strategy: seek patterns and models...



- Build upon relationships
  - proximity, community
  - mission, functionality
  - nature of the climate change
  - Addressing other institutional investment needs
- Many prior cycles of integrating new issues
  - design for accessibility, design/management with electronic toolsets, design for sustainability...
  - strange at first, we integrate them over time (usually reflected in how we characterize them)

