

NASA Climate Change Policies

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Outline

- Overarching climate risk policy
- Existing NASA policies
- New NASA policy

Overarching Climate Risk Policy

- Climate risk assigned to and owned by **Centers** and by the **Programs** that rely on those Centers.

NOTE: HEO is carrying sea level rise (SLR) as a risk and tracking ESD/OSI efforts.

- Policy changes / improvements can happen because of Center interest and need
- Different approaches based upon Center location

Existing NASA Policy

- NASA Environmental Management (NPD 8500.1B, currently in NODIS)
- Master Planning (NPD 8810.1A and NPR 8810.1) – not specifically called out but included as an element of sustainability; specifics in *Master Planning Procedural Requirements Handbook* (in draft)
- Design and Construction of Facilities – (NPD 8820.2C and NPR 8820.2F) - not specifically called out; specifics in *NASA Facilities Design Guide*

NASA Environmental Management

(NPD 8500.1B, currently in NODIS)

1.b.5: To carry out this environmental policy, NASA will:

(5) Apply NASA's scientific expertise and products so that we can incorporate climate information into our decision-making and planning, create innovative, sustainable, and flexible solutions, and share best practices; in order to create climate-resilient NASA Centers.

Master Planning Procedural Requirements Handbook – in draft

Current draft includes both a general reference to mitigation and adaptation, and a specific note about land preservation, excerpted below:

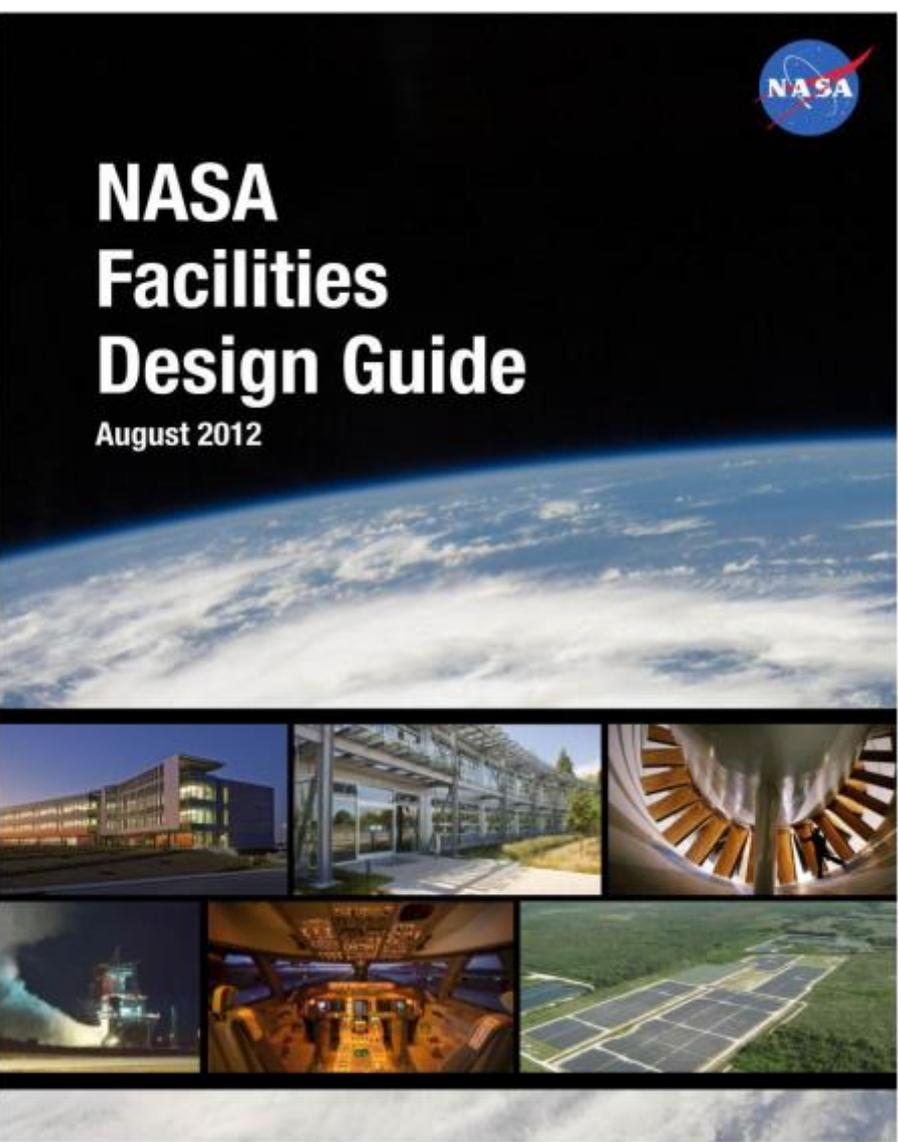
5.2.6 Climate Change Forecast

*Most climate scientists agree that the main cause of the current global warming trend is human expansion of the “greenhouse effect”—warming that results when the atmosphere traps heat radiating from Earth toward space (<http://climate.nasa.gov/causes/>). **Center planners should work with the NASA Climate Adaptation Science Investigators (CASI) Workgroup to help in the development of Climate Change Adaptation strategies, to ensure that Center master plans address climate change proactively. Center plans should be as carbon neutral as possible. Center master plans should prepare for results of global warming such as sea rise and extreme weather where appropriate.***

5.3.1 Land Preservation [Note: text pre-dates land management policy]

Land is a valuable natural resource to NASA for Field center sustainability and future viability. Center master planners should employ policies and plans that preserve land to the maximum extent possible. All NASA Centers should include land stewardship as a primary consideration in campus master planning.

NASA Facilities Design Guide



NASA Facilities Design Guide

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- Communicates and describes NASA's facility design philosophies
- Provides a single document that lists federally mandated laws, national standards, codes
- Complement – not replace – local design practices and standards

[http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/NASA_Facilities_Design_Guide_Final_Submittal - 8 8 124.pdf](http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/NASA_Facilities_Design_Guide_Final_Submittal_-_8_8_124.pdf)

Applicable Sections

CHAPTER 13 DESIGNING FOR NATURAL DISASTERS

- Facilities will be sited and designed to:
 - Safeguard human life
 - Minimize damage to NASA properties
 - Allow for immediate restoration of essential functions and services after a disaster.

CHAPTER 14 DESIGNING FOR CLIMATE CHANGE

- Recommended design & planning actions:
 - Identify current and future climate hazards
 - Consider potential adaptation strategies:
 - Raising elevations
 - Increased cleaning of drains and gutters
 - Install/Increase height of flood barriers (levees, seawalls, etc)
 - Use of construction materials that are more resilient to increased temperatures, periodic inundation
 - Deal with climate change at regional/local levels by pursuing partnership and coordination with local and regional agencies



New NASA Policy: Land Management at NASA

Why

Center institutional stewards manage extreme weather and climate risks; HQ institutional stewards support, monitor, and coordinate

- In dialog with Centers, OSI notes that in the long term, extreme weather combines with sea level rise to create a significant, shared vulnerability
- OSI can support Center change by drafting policy relating to best practices for such vulnerabilities

What

Given the importance of flooding vulnerability at many NASA Centers, and the resulting need to protect land for managed retreat, establishes

- A risk-based means of assessing flooding risk as a part of siting (and funding) facilities acquisition and substantial renewal at NASA
- A new consideration in NASA land actions to preserve the potential for managed retreat of mission activities to higher ground

How

- Incorporate elevation-based zoning based on FEMA flood plain mapping into Center master plans
- Add flooding risk to evaluations of investments to create or renew facilities, using a waiver process when policy adherence is impractical or unwise
 - Seawalls, port facilities
 - Related support systems like roads and utilities
 - Short-term or risk-tolerant land uses

How this workshop can help

Workshop discussions will hopefully address:

- Do Centers need something else? Is additional policy necessary? A NID?
- Is there existing NASA policy that needs to be changed to help them?
- Should state/local regulatory codes and design standards be changed?

Backup

The original slides follow

ZONING at NASA Centers

- Elevation based Zoning – Above mean sea level
 - 0-3 feet above mean sea level, construction is limited to:
 - Support water front activities such as wharfs, docks, barge terminal, temporary covered storage and maintenance of marine and dock equipment
 - Buffer zones
 - Recreational purposes
 - Existing facilities or structures that are in the 0-3 foot zones must be:
 - Hardened or raised to accommodate future climate and weather
 - Retreat to higher ground – 6 feet or above
 - Move critical facilities outside the 500 year flood plain or if not practicable hardened to withstand a 500 year flood event

ZONING at NASA Centers

- 3-6 feet above mean sea level, construction is limited to:
 - Construction will be for temporary low value or movable buildings and structures that will be needed for 30 years or less
- 6 feet and above mean sea level:
 - No restrictions other than regulated by other policy, regulation, or law
- High ground – areas with an elevation of 6 feet or above – will be safeguarded for future use
 - No leases or disposal actions of this land
- Office of Strategic Infrastructure approves land management activities and grant waivers to this policy

Planning

- Zoning areas and high ground will be depicted on Master Plans
- Centers to safeguard from internal encroachment
 - Buffer zones around structures and capabilities will be delineated – blast zones, sound/noise zones, etc.
- Centers will develop Climate adaptation strategies
- All CoF projects will be designed and built to accommodate climate change predictions and included in the CoF prioritization process
 - E.G. - Flood control, hardening, heating, ventilation and air conditioning, elevation or water proofing of horizontal infrastructure and data systems....
- On site generation of renewable energy
- Partner with local communities, public and private.