

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE  
ADAPTING TO A CHANGING CLIMATE

Rising Seas Summit, November 2015

## Agenda

- Who We Are and What We Do?
- How Could Climate Change Impacts Affect OSWER's programs and activities?
- What are OSWER Programs Doing to Adapt to a Changing Climate?
- Case Study

## Who We Are and What We Do?

- Office of Solid Waste and Emergency Response (OSWER)
  - Preserves land
  - Restores land
  - Responds to emergencies
  
- Program offices include:
  - Superfund
  - Resource Conservation and Recovery
  - Brownfields
  - Underground Storage Tanks
  - Emergency Management

## Potential Climate Change Impacts

Key potential climate change impacts agreed upon by climate experts and included in EPA's Climate Change Adaptation Plan are:

Increased extreme temperatures	Sustained changes in average temperature	Sea level rise
Decreased permafrost in Arctic regions	Decreased precipitation days, increasing drought intensity	Increased heavy precipitation events
Increased flood risk	Increased frequency and intensity of wildfires	Increased intensity of hurricanes

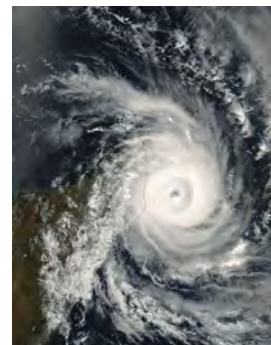


Image credit: U.S. Global Change Research Program ([www.globalchange.gov](http://www.globalchange.gov))

## How Could Climate Change Impacts Affect OSWER's programs and activities

### Temperature Rise, Drought, and Wildfires:

- Increased average temperature and increased extreme temperatures may result in more frequent and longer lasting heat waves, increasing risk of wildfires capable of spreading to OSWER sites and affecting remedy performance.
- Increased drought may reduce remedy effectiveness and current assumptions about contaminant form and volatility may no longer be accurate.



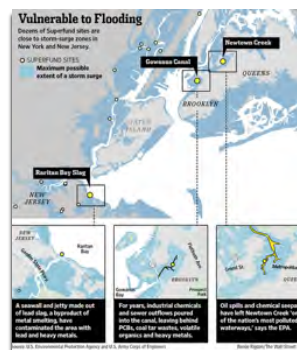
## How Could Climate Change Impacts Affect OSWER's programs and activities

### Sea Level Rise:

- Rising sea level may inundate OSWER sites in coastal areas and increase flooding from storm surge, both of which could damage cleanups and increase exposures to contaminants.

### Flooding and Inundation:

- Flooding and inundation from more intense and frequent storms may lead to contaminant releases through surface soils, ground water, surface waters, sediments, and/or coastal waters at OSWER sites.



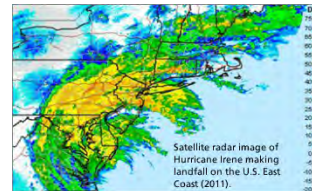
## How Could Climate Change Impacts Affect OSWER's programs and activities

### Changing Precipitation:

- An increase in very heavy precipitation may increase the risk of contaminants from OSWER sites
- Permitting requirements for RCRA TSDFs may need to be updated to reflect precipitation-related vulnerabilities

### Increased Intensity of Hurricanes:

- May also increase storm debris that will need to be appropriately managed
- May also lead to flooding of OSWER sites, causing the spread of contaminants



## Climate Change Adaptation Planning

- The *USEPA Policy Statement on Climate-Change Adaptation* (2011) directed each national program office and region to develop a climate change adaptation implementation plan by June 2013
- Executive Order 13653 (2013) directed each federal agency to evaluate climate change risks and vulnerabilities to manage the effects of climate change on the agency's mission and operations in both the short and long-term
- On October 31, 2014, the White House released the final EPA Climate Change Adaption Report and 17 plans developed by Regional and Program Offices, including OSWER.

## OSWER Climate Change Adaptation Implementation Plan

- Identifies 27 unique vulnerabilities due to climate impacts.  
For example:
  - Hazardous waste permitting requirements may need to be updated
  - Changing climate conditions may impact continued remedy effectiveness
  - Spill Prevention Plans may need to be updated due to significant increases of flooding and storm events
  - Current waste management capacity may be insufficient to handle surges in necessary treatment of hazardous and municipal wastes

## What are OSWER Programs Doing to Adapt to a Changing Climate?

- The Superfund program is developing criteria to identify cleanup remedies where performance may be impacted by climate change.
- The Emergency Response and Prevention program identified actions to ensure Emergency Operations Center staff are provided with the most accurate and comprehensive information that takes into consideration changes in climate.
- The Brownfields and Land Revitalization program revised language in grant terms and conditions to include language requiring recipients of certain grants take potential changing climate conditions into consideration when evaluating cleanup alternatives.
- The Resource Conservation and Recovery program proposed working with states and tribes to develop recommendations to incorporate consideration of climate change impacts into permitting programs.
- The Underground Storage Tank program proposed working with states to gather information about whether and how states currently alter remediation planning or risk factors and ranking in response to climate change.

## Case Study: American Cyanamid Superfund Site

- From 1915-99, pharmaceuticals, chemical intermediates, petroleum-based products, dyes, and pigments were manufactured at the site
- 435-acre site with 100 acres of waste disposal areas adjacent to the Raritan River
- Almost the entire site is located within a flood hazard area
- An 8-10 ft. flood control berm was designed and installed to protect the site from a 100-year flood

## Case Study: American Cyanamid Superfund Site

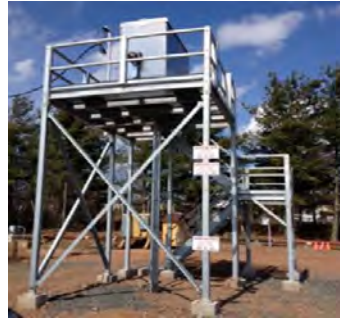
- In August 2011, Hurricane Irene made landfill, dumping 7 inches of rainfall at the site and flooding several of the impoundments. Impacts included:
  - 214 million gallons (5-ft) of standing water in North Area of the site
  - Flood control berm, office trailers and records were damaged by floodwaters
  - Electrical power was knocked out of service
  - Groundwater extraction system used to maintain hydraulic control of North Area did not operate for 30 days



## Case Study: American Cyanamid Superfund Site

### □ Adaptive Measures Taken:

- Elevated critical electrical instrumentation 5 feet higher than Hurricane Irene flood waters
- Installed submersible pumps in bedrock wells to maintain hydraulic control during future floods
- Reinforced earthen berms surrounding two highly contaminated waste impoundments
- Requiring future capping systems to be designed to withstand a 500-year flood



Elevated Electrical Controls

## Contact Information

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[OSWER Climate Change Adaptation Implementation Plan](http://www3.epa.gov/climatechange/Downloads/OSWER-climate-change-adaptation-plan.pdf)  
[www3.epa.gov/climatechange/Downloads/OSWER-climate-change-adaptation-plan.pdf](http://www3.epa.gov/climatechange/Downloads/OSWER-climate-change-adaptation-plan.pdf)