

# Climate Change in the COG Region

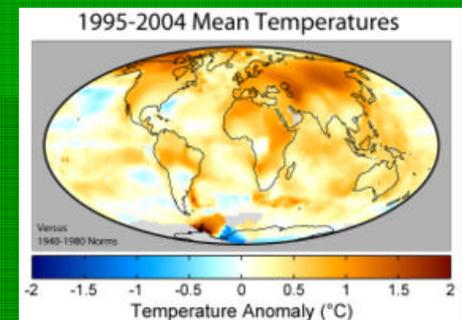
## An Introduction to Impacts and Adaptation

Climate Change Steering Committee

March 25, 2008

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Water Resources Program Director



Mean surface temperature anomalies during the period 1995 to 2004 with respect to the average temperatures from 1940 to 1980

# Mitigation vs. Adaptation

- Mitigation
  - Reducing the carbon footprint
  - Local actions for global benefit
    - May include local benefits
- Adaptation
  - Response to local impacts
  - Local actions for local benefits
    - May include global benefits

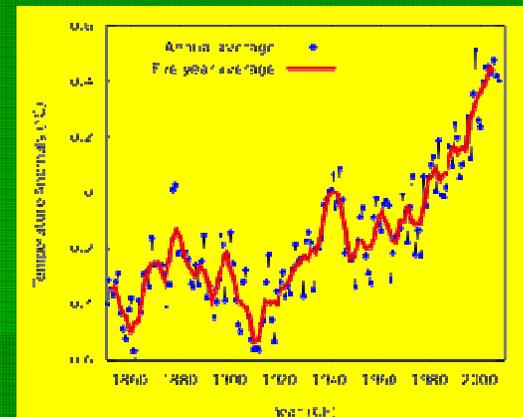
# Numerous Recent Reports

- Describe potential impacts
- Suggest adaptation strategies
- Useful to help:
  - Understand local impacts
  - Initiate adaptation plans
- 25+ source documents reviewed
  - Federal, state, local, NGO, academic



# Temperature: The Driver

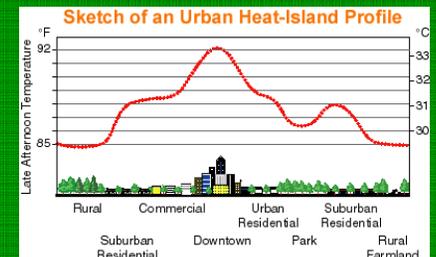
- Significant 20<sup>th</sup> century warming trend
- Warmer atmosphere
- Warmer surface
- Warmer oceans
- Melting ice
- Sea level rise



Global mean surface temperature anomaly  
1850 to 2007 relative to 1961–1990

# Anticipated Changes

- Altered Weather – intensification of:
  - Droughts
  - Storms – both wind and rain
  - Hot weather extremes
- Other potential changes include:
  - Increases in invasive species
  - Increases in infectious diseases
  - Impacts on forests and urban trees
  - Impacts on wetlands



# Potentially Affecting

- Water Supply
- Public Safety/Infrastructure
  - Flood & Wind Damage:
    - Buildings, Roads, Bridges, Pipelines...
    - Emergency Services
- Public Health
- Environmental Health/Water Quality
- Energy Demand



**“Green lawns could lead to brownouts”**  
CNN Headline, 2/15/08



# Water Supply

- More intense droughts and...
  - Increased demand
  - Insufficient reservoir capacity
  - Impaired emergency services
  - Threats to water-dependent services
- Adaptation:
  - Demand restrictions
  - New reservoir capacity
  - Water reuse



# Public Safety: Floods & Wind

- Threats from more intense storms
  - Flood damage
  - Obsolete stormwater infrastructure
  - Wind damage
  - Vulnerable roads, bridges, buildings, dams, pipelines, etc.
- Adaptation
  - Inventory vulnerable buildings & facilities
  - Strengthen flood control system
  - Revise stormwater regulations
  - Revise 100-year flood plain maps
  - Strengthen building codes



**Lake  
Needwood**



**Old Town**

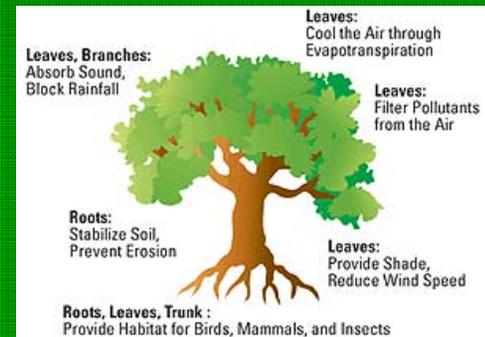
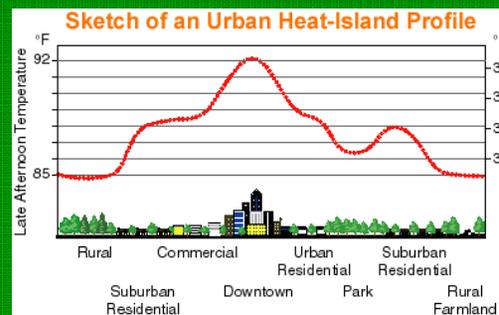


**Southern MD  
2002**



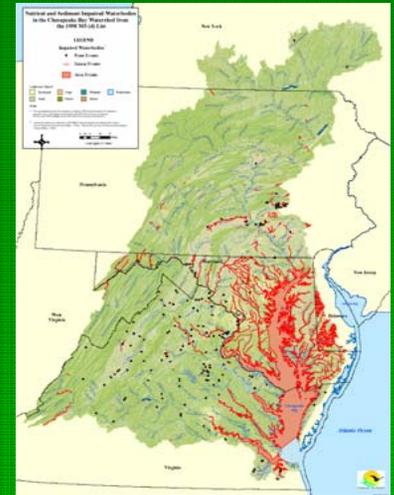
# Public Health

- Threats from general warming
  - Increased ozone levels
  - Vector- & water-borne diseases
  - Heat wave crises
- Adaptation
  - Vaccination campaigns
  - Emergency cooling centers
  - Site features, trees to reduce heat island effect



# Environmental Health; Water Quality

- Threats from general warming
  - Altered water quality
  - Increased invasive species
  - Altered birds' winter ranges
- Adaptation
  - Increased runoff & discharge controls
  - More stringent fishery rules



# Energy Demand



- Heat- and drought-driven increases in power consumption
  - Enhanced risk of brownouts & blackouts
- Adaptation
  - Renewable local power generation
  - Conservation; energy efficiency
  - Xeriscaping



March 25, 2008



Climate Change Steering  
Committee

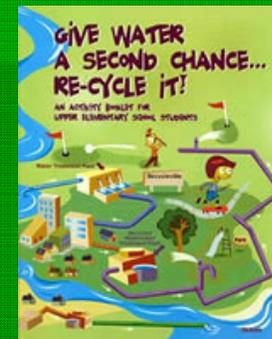
# Approaching Adaptation (1)

- Two Implementation Examples
  - Boston elevated its regional wastewater plant anticipating sea level rise
  - Los Angeles pursuing a “Million Trees L. A.” to counter the heat island effect



# Approaching Adaptation (2)

- Consider “no regrets” adaptation strategies,\* such as:
  - Water use efficiency
  - Large scale & strategic tree planting
- Assess need for water supply augmentation
  - New reservoirs; quarries
  - Water reuse
  - Access upper estuary



# Approaching Adaptation (3)

- Regional workshops with appropriate partners
- Potential workshops include:
  - Future water supply, demand & alternative sources
  - Flood and wind risks: vulnerable buildings and infrastructure
  - Public health risks and responsive strategies
  - Multiple benefits of green infrastructure
  - Toward a local energy demand strategy
- **Climate Change Strategy Includes:**
  - Realistic assessment of impacts; and
  - Practical adaptation strategy

