

## **Session A2: Climate Change Impacts and Landscape Adaptation Strategies**

**by David Tuch**

\*Please refer to Mr. Tuch's presentation for more detailed information

From the outset Mr. Tuch stressed that, although the statistics on climate change are sobering, the landscape planning and design professions have a major role to play in developing solutions. He spoke from four discussion points: how has climate already changed, how is it projected to change, what can we do about it and how does the landscape profession fit in?

### **How has climate already changed?**

The presentation included a review of ten indicators of a warming world that are now underway based on the current science. Several changes noted include reduced snow cover, glaciers and ice sheets, and increased sea level, water vapor and ocean heat content.

- Winter temperatures have increased and there are fewer frost days, to include a 10-day increase in the NE region. This warming trend is expected to become increasingly beneficial to insect pests.
- A change in heavy precipitation is underway; there has been a 71% increase in heavy rain events in the NE region, and this is projected to grow.

### **How is it projected to change?**

A number of significant changes are projected to occur. Several of these include:

- There will be impacts to ecosystem services and biodiversity. The climate may change faster than some plants can adapt; may overwhelm the capacity of the ecosystem to buffer impacts from extreme events; and landscapes and seascapes may rapidly change and lead to species loss.
- Natural areas and croplands will be increasingly challenged; conditions will favor increases in invasive species, and there will be shifts in forest types.
- Climate change will bring about more threats to human health; more pollen, heat stress and reduced air quality can be expected.
- Climate change impacts in the Northeast, including the Chesapeake Bay Region, will increasingly compromise both infrastructure and ecosystems, and bring about

heat waves, extreme precipitation events, coastal and river flooding, a longer frost-free season, higher summer and winter temperatures, and stronger hurricane and tropical storms.

### **What can we do about it?**

Climate change can be addressed in three ways that are distinct but can also be integrated:

Mitigation—reduce GHG emissions in the atmosphere (examples include energy efficient systems, renewable energy, reduction of CO<sup>2</sup> and other GHGs)

Adaptation—adjustment in natural or human systems (an example includes adaptive plans; 15 states have completed adaptive plans; Maryland’s plan is the Living Shorelines Act)

Resilience—how natural systems adjust and deal with major events (an example includes a human activities and global carbon dioxide budget; forests and oceans absorb CO<sup>2</sup>; planning and design professions have a role to play in building resilience)

### **Role of Landscape Planning and Design Professions**

There are a number of opportunities for the planning and design professions to create more functional landscapes by crafting design, planning and management solutions that can sequester carbon and help communities and regions adapt and be resilient to climate change. Some examples include:

Sustainable Landscape Design (energy efficient design, like green roofs and walls; mitigating urban heat islands by increasing street tree plantings; siting plants to help conserve energy; understanding hardiness zones so plants will survive long-term; and rainwater collection).

Integrated Stormwater Management (ways to deal with water quality and volume at same time). Noted Morse Park stormwater wetland project.

Green Infrastructure (designing for ecosystem services; looking to landscape ecology; creating functional landscapes). Noted New Belgium Brewing and Lake Craig project examples.

Multi modal/active transportation that offer non-polluting forms of transportation; greenways, sidewalks, walking and biking paths, greenway corridors for stormwater management, and preserving open spaces.

Land Use Planning (conservation and rolling easements; natural areas for species movement; linked conservation areas; vegetated buffers; preserving ecosystem function, and land development).

Suburban-Urban areas (transit-oriented development; mixed use, walkable communities, LID). Noted Dockside Green, Victoria, BC efforts.

Rural areas (conservation-based development and conservation subdivisions; LID)

One discussion point addressed the concept of assisted migration, where plants are intentionally moved to new locations in order to help them survive the impacts of climate change. Should the landscape professions be planting species into new locations based on anticipated future conditions in order to help ensure long-term survival? And because soils effect where plant species grow, is it reasonable to expect that they can migrate to other areas with differing soils?

Resources noted:

US Climate Resilience Toolkit, <https://toolkit.climate.gov/>

Equinox, [www.equinoxenvironmental.com](http://www.equinoxenvironmental.com)

[www.AskNature.net](http://www.AskNature.net)

US Forest Service Climate Change Tree Atlas, <http://www.fs.fed.us/nrs/atlas/>