Value of CAMNET:
Rural and Urban Visibility Camera Views

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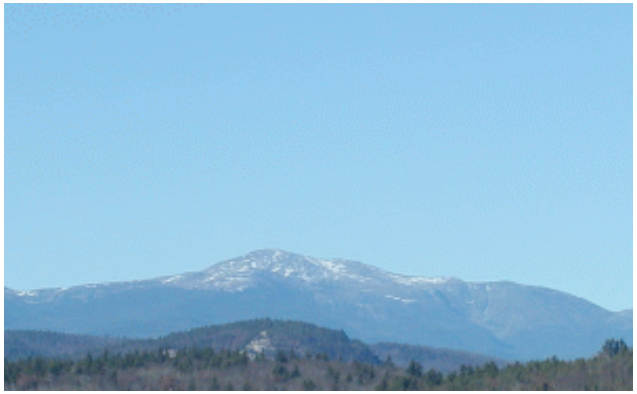
NESCAUM



MANE-VU Board Meeting
September 15, 2011 Manchester, VT

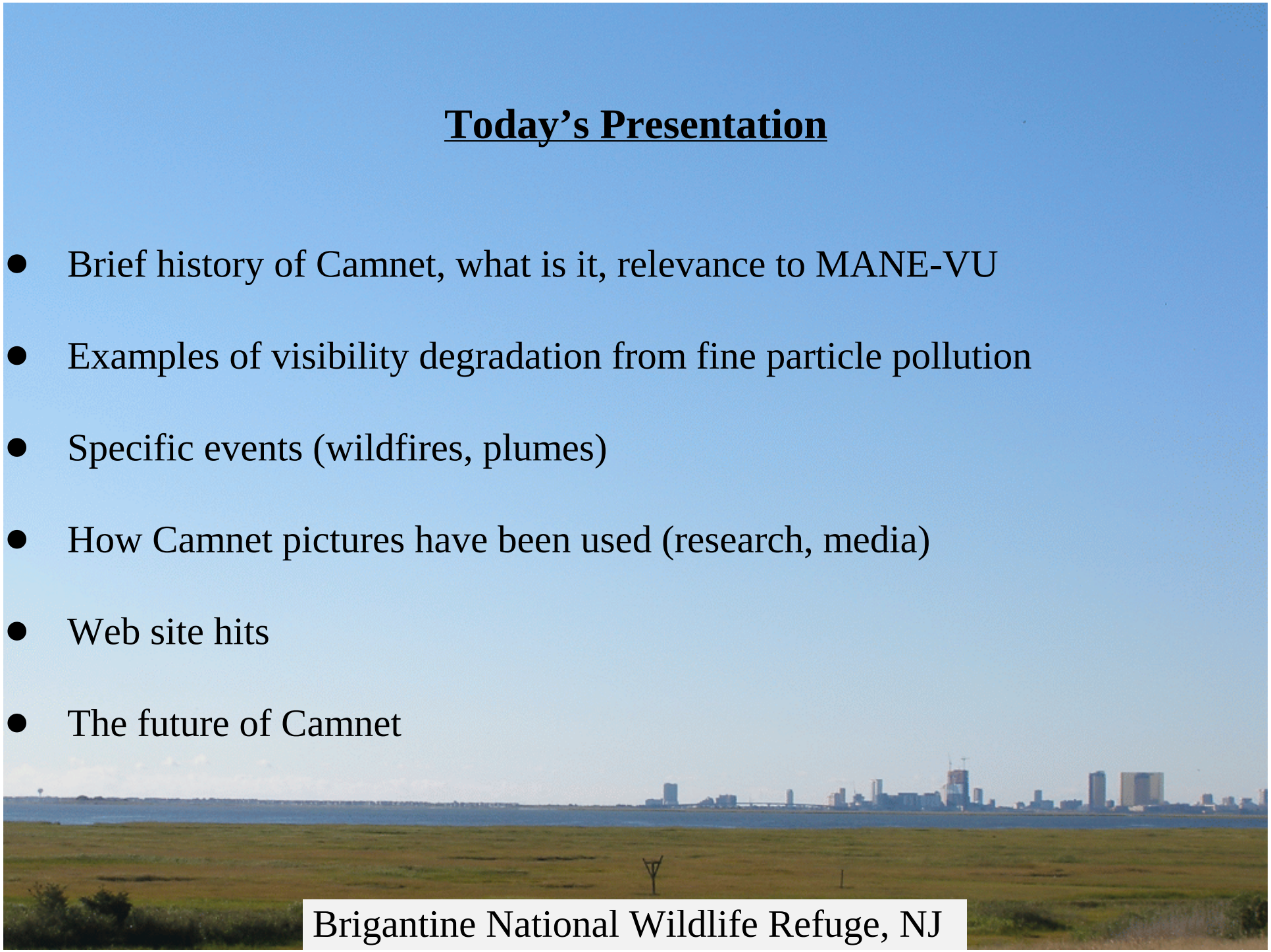
Acknowledgments

The following agencies and organizations make CAMNET possible:
State Air Agencies of MA, ME, NY, NJ, MD
Federal Land Managers (NPS, FWS, NFS)

On-site support from a wide range of organizations that host sites:
University of VT-Burlington
Blue Hill Observatory
Conway NH school system
NJ Transit Authority
University of MD, Frostburg

Today's Presentation

- Brief history of Camnet, what is it, relevance to MANE-VU
- Examples of visibility degradation from fine particle pollution
- Specific events (wildfires, plumes)
- How Camnet pictures have been used (research, media)
- Web site hits
- The future of Camnet



Brigantine National Wildlife Refuge, NJ

Brigantine / Atlantic City NJ Sunrise, 11/21/09 6:15 am

CAMNET: Goals and Program History

Purpose:

Raise public awareness about the effects of air pollution on visibility
Document visibility impairment at four Class I areas in the MANE-VU area
All pictures are archived (several million)

What it is:

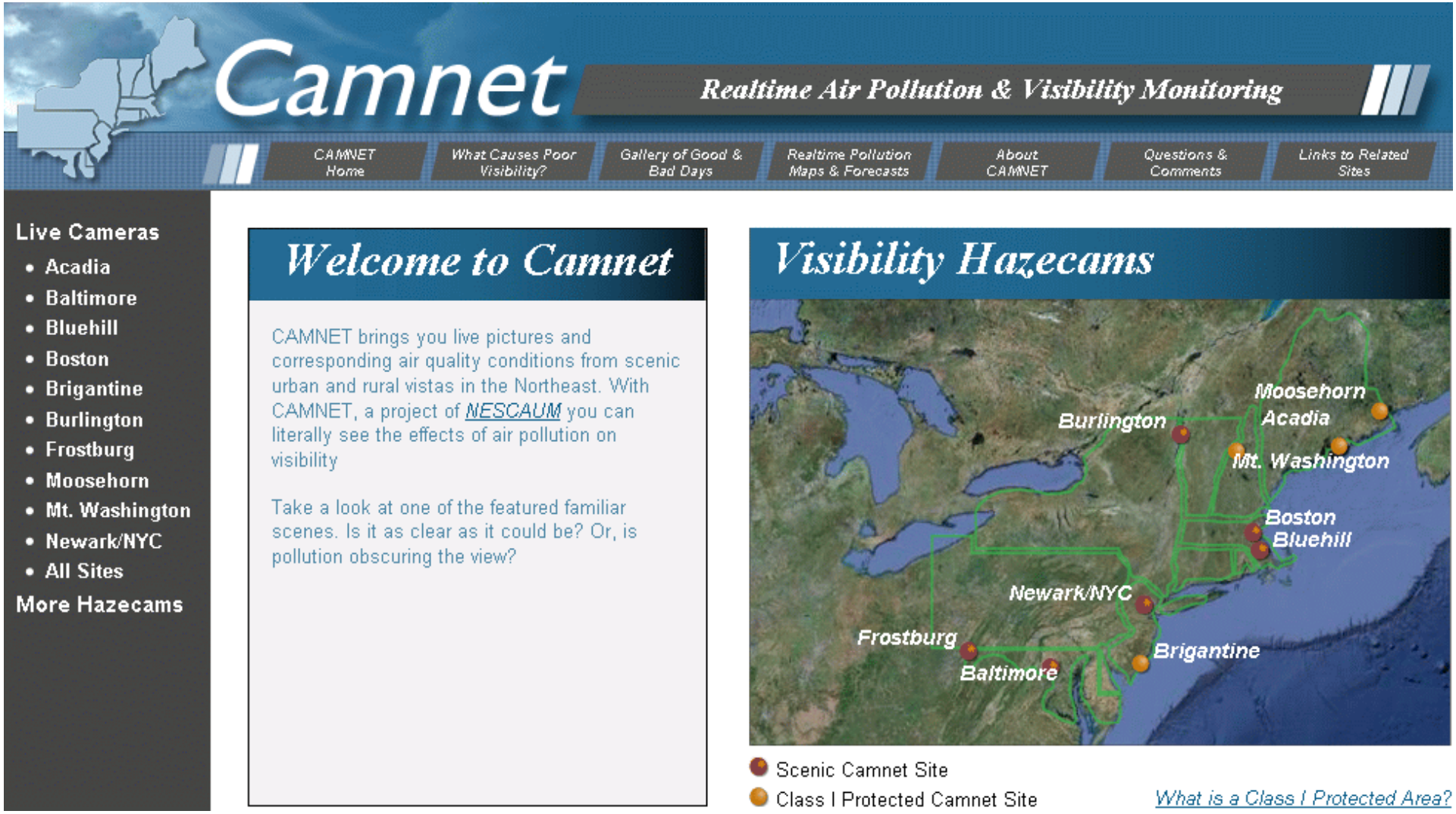
Network of realtime visibility (high-resolution) cameras
scenic urban and rural locations
updated every 15 minutes
network developed and run by NESCAUM

Air pollution and meteorological data are provided
distinguish natural from man-made causes of poor visibility

Above: looking towards Boston, 7/16/99 7 PM
Visual Range ~ 2 miles in severe regional haze
Similar to visibility conditions near Martha's Vineyard

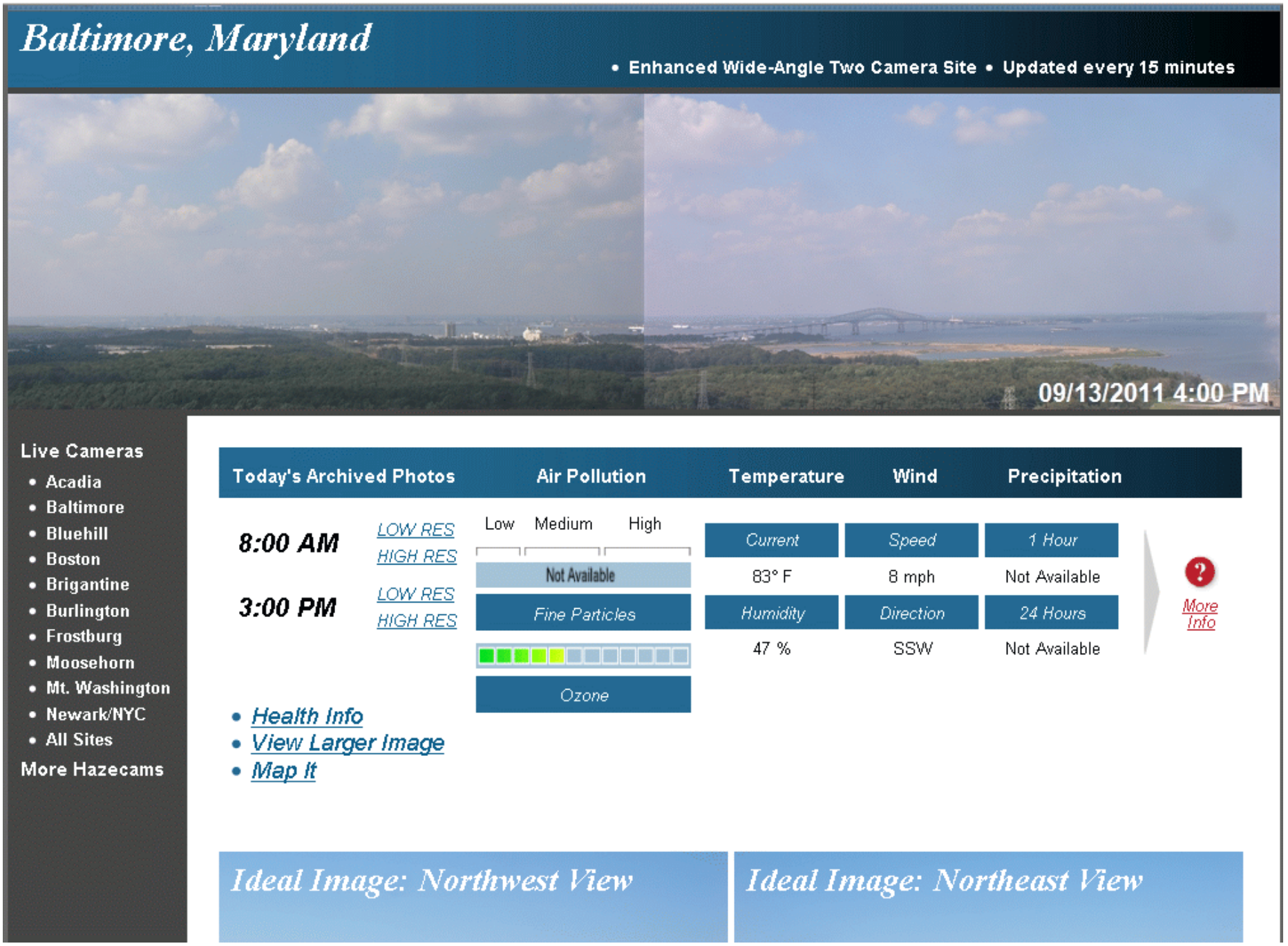
Blue Hill, MA. NW view 7/4/10 8:30 pm

Camnet Home Page: www.hazecam.net



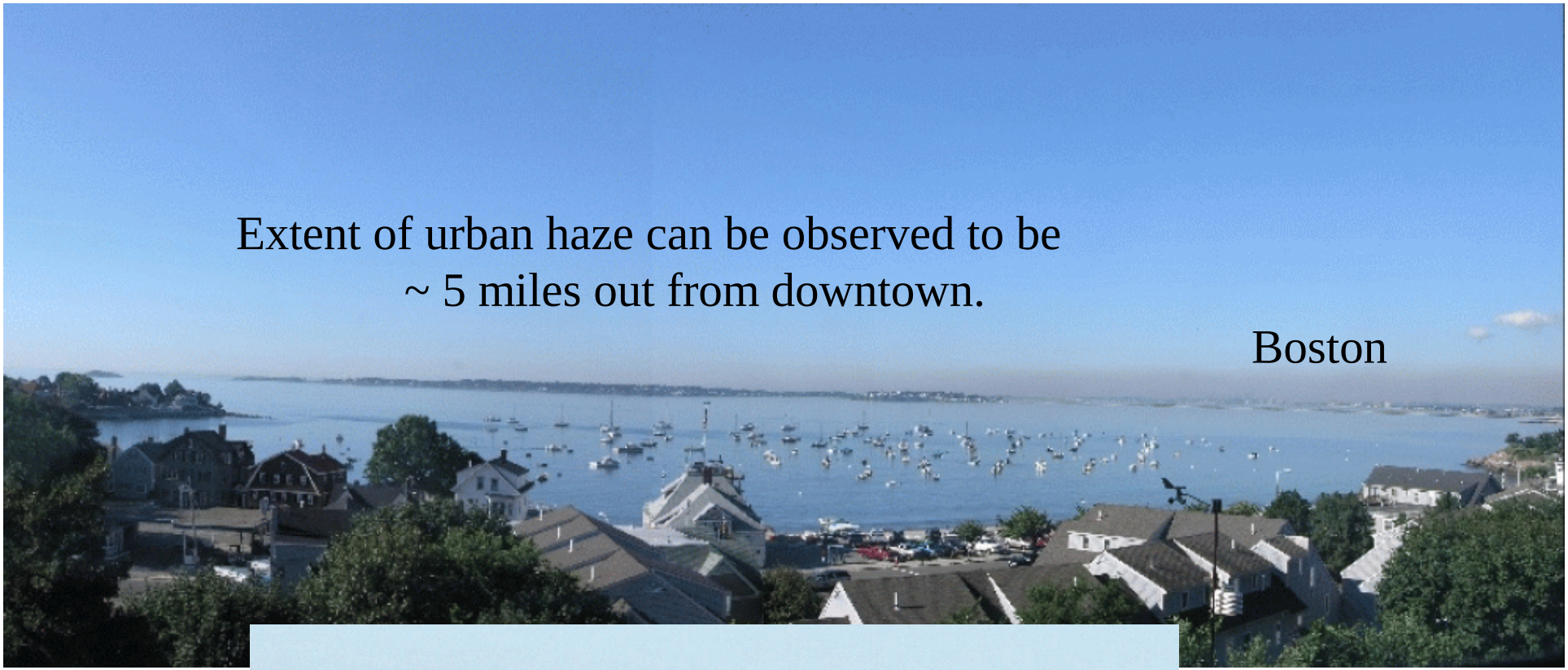
Currently ten sites; six are wide format; four are Class-I protected airsheds

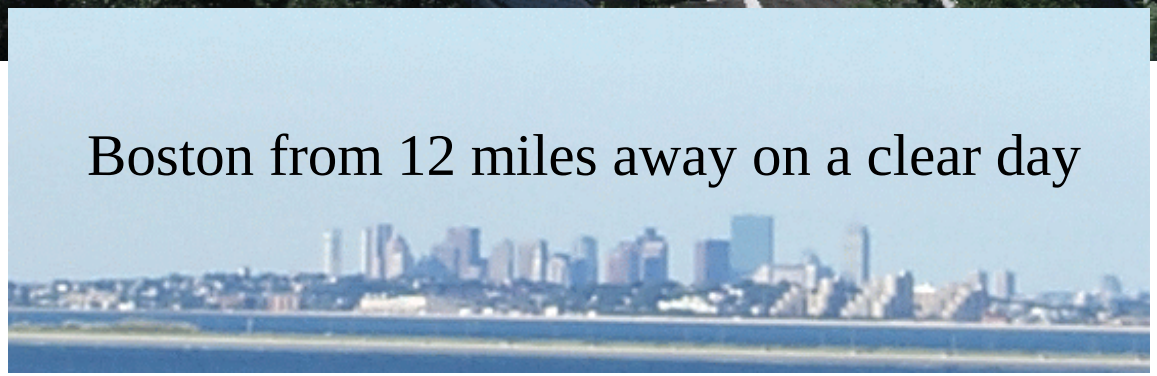
Example of wide-site home-page.



Examples of visibility degradation from fine particle pollution

Wide 2-camera format provides much wider scene than single camera:
Boston site, August 24, 2004: layered urban “haze” (outside looking in)



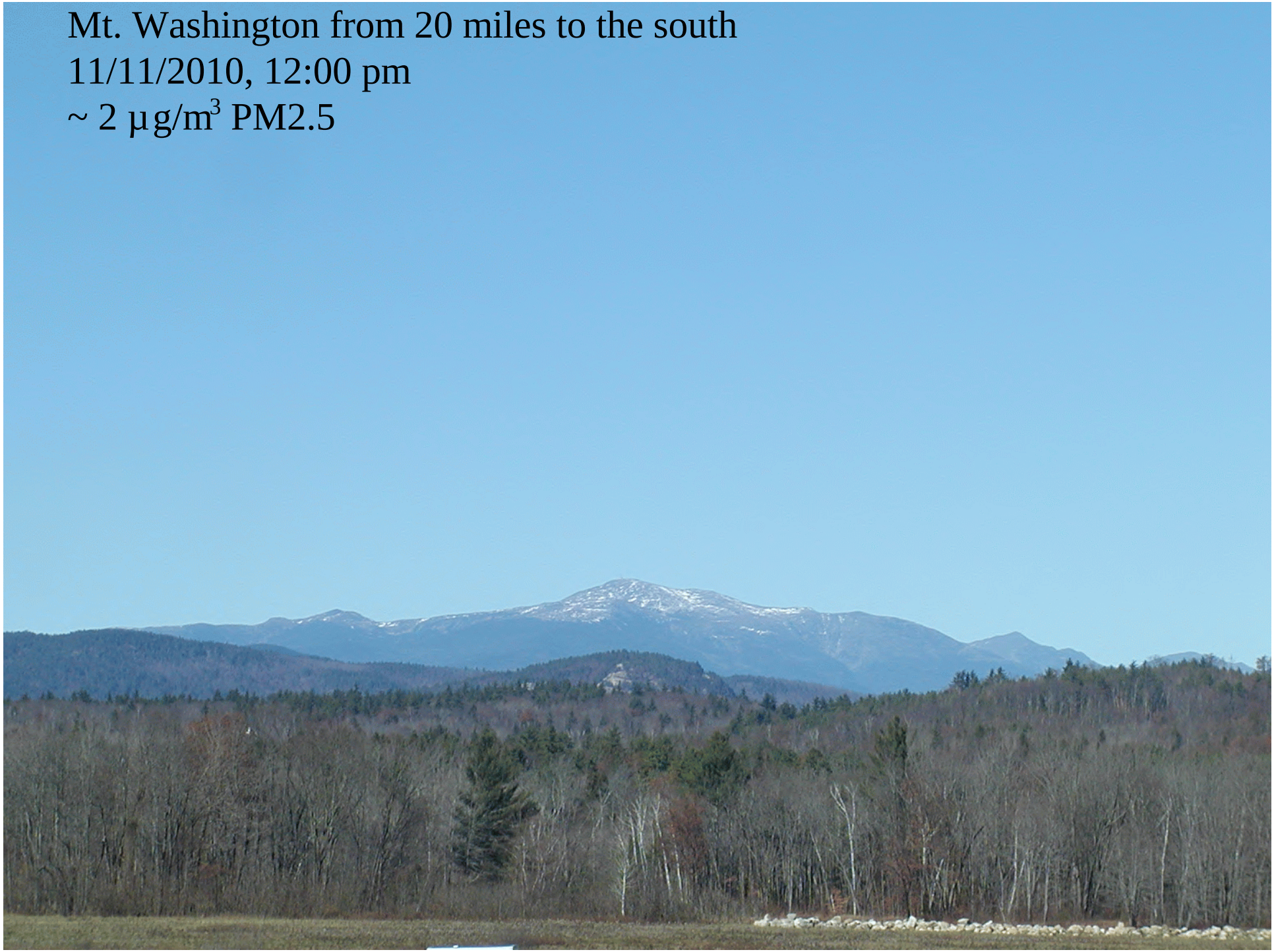


Haze-cam photo of NYC from Newark NJ on a clean day.

Haze-cam photo of NYC from Newark NJ 3/14/08 at 1130am EDT

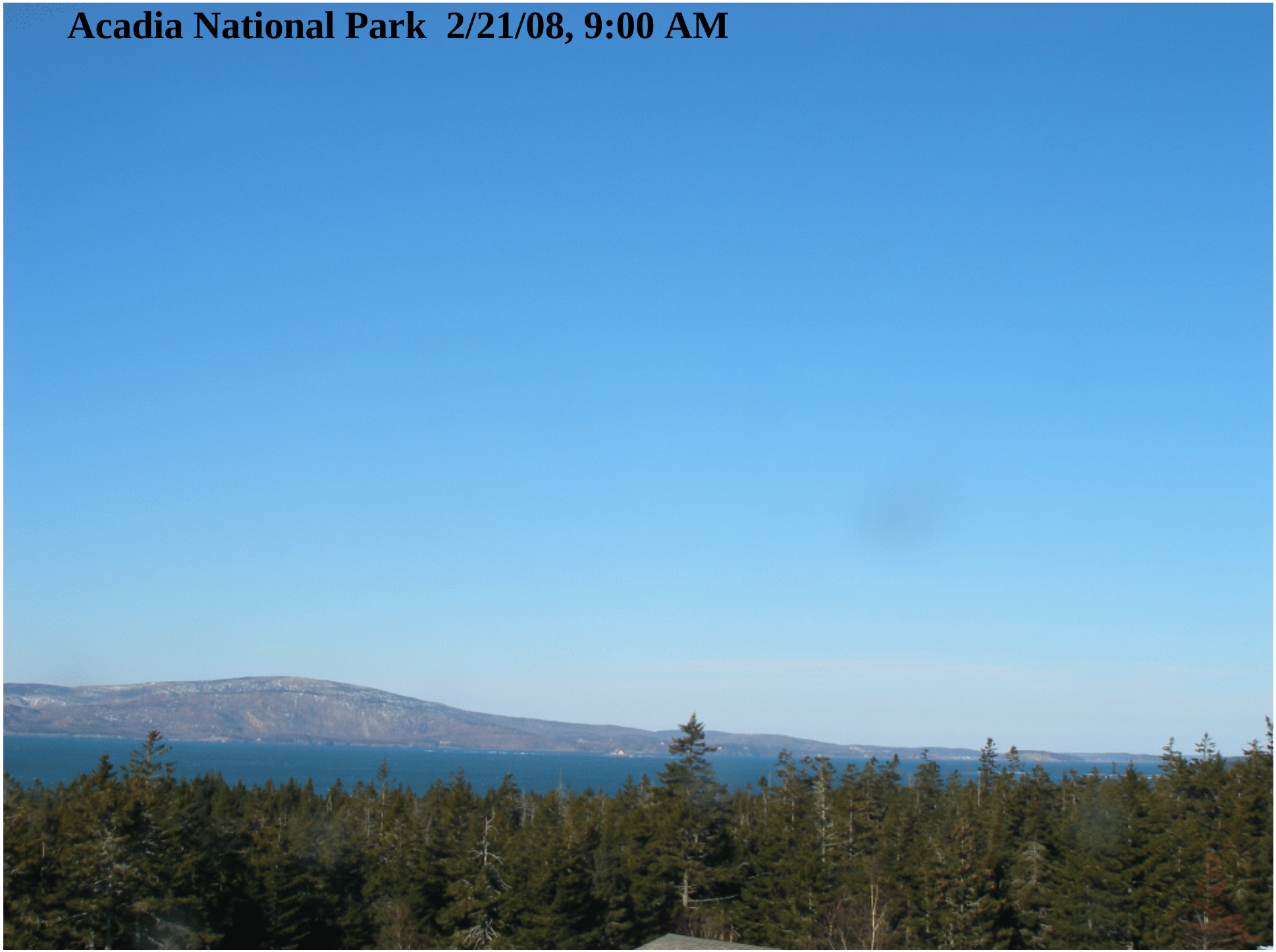
Estimated visual range is 8 mile (the distance to the NYC skyline).

Measured PM levels are ~25μg/m^3 with measured relative humidity of ~65%.

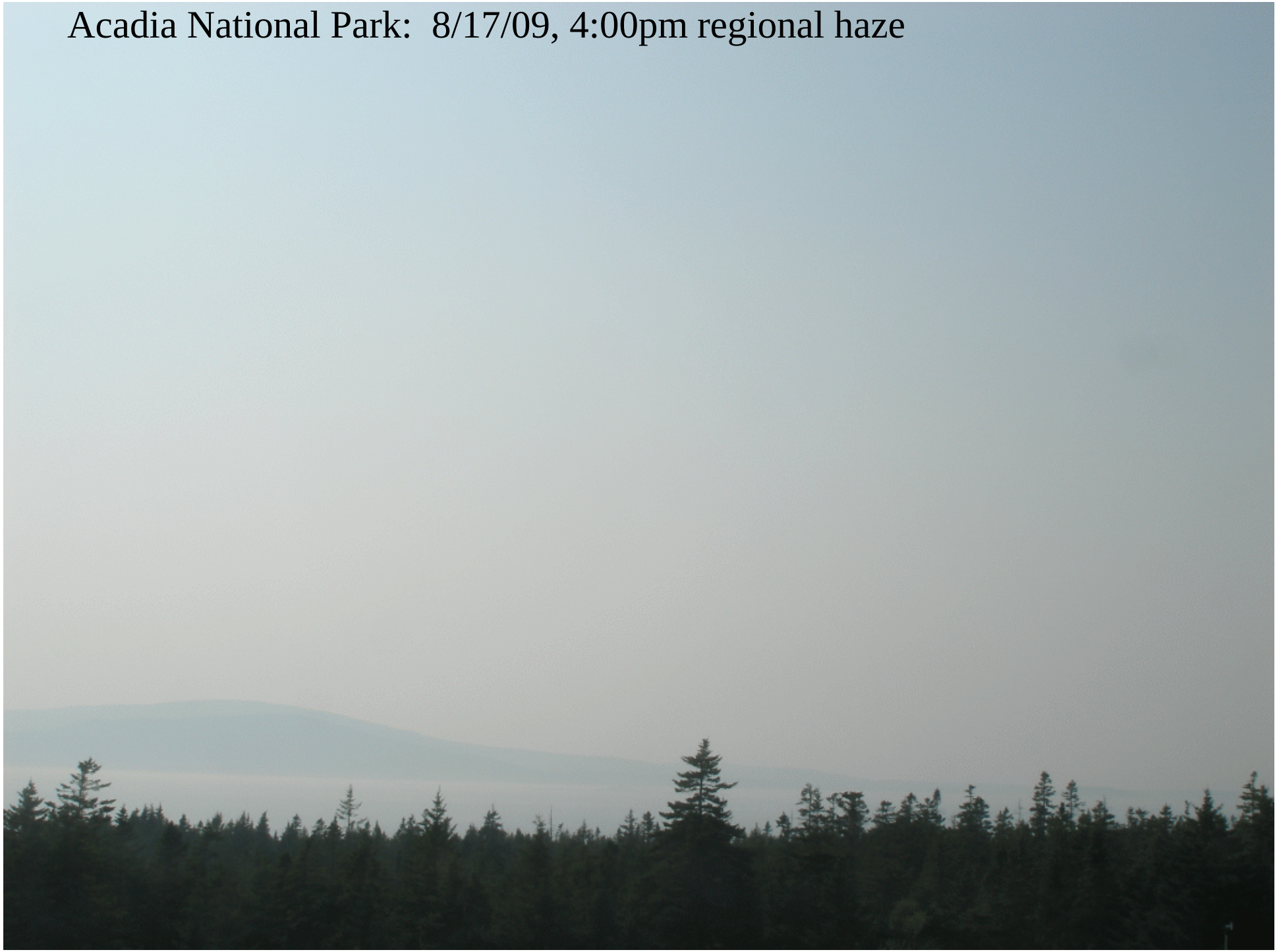

Mt. Washington from 20 miles to the south
11/11/2010, 12:00 pm
~ 2 µg/m3 PM2.5

Mt. Washington - regional haze
9/2/2010, 10:30 am
~ 30 µg/m3 PM2.5

Acadia National Park 2/21/08, 9:00 AM



Acadia National Park: 8/17/09, 4:00pm regional haze



Burlington VT, 10/3/03 10:00 am, clean. 24-h PM2.5 = 3 µg/m^3

Burlington VT, 8/12/02 2:00 pm, regional haze event. 24-h PM2.5 = 38 µg/m^3
Primarily sulfate, some organic carbon aerosol

Burlington VT, 7/6/02 5:00 pm, transport woodsmoke event.
24-h PM2.5=38 µg/m^3. ~ 60 µg/m^3 at time of photo, 90% organic carbon

Boston, 7/12/99 8:15am - Mystic power plant plume and urban inversion.
View from Swampscott, 12 miles NE of downtown

Moosehorn NWR 11/3/10, 10:00 am paper mill plume

3/31/11, 9:00 am

WTC Plume, 9/16/01, 10:00 am
Camnet NYC photos helped document direction and dispersion of plume

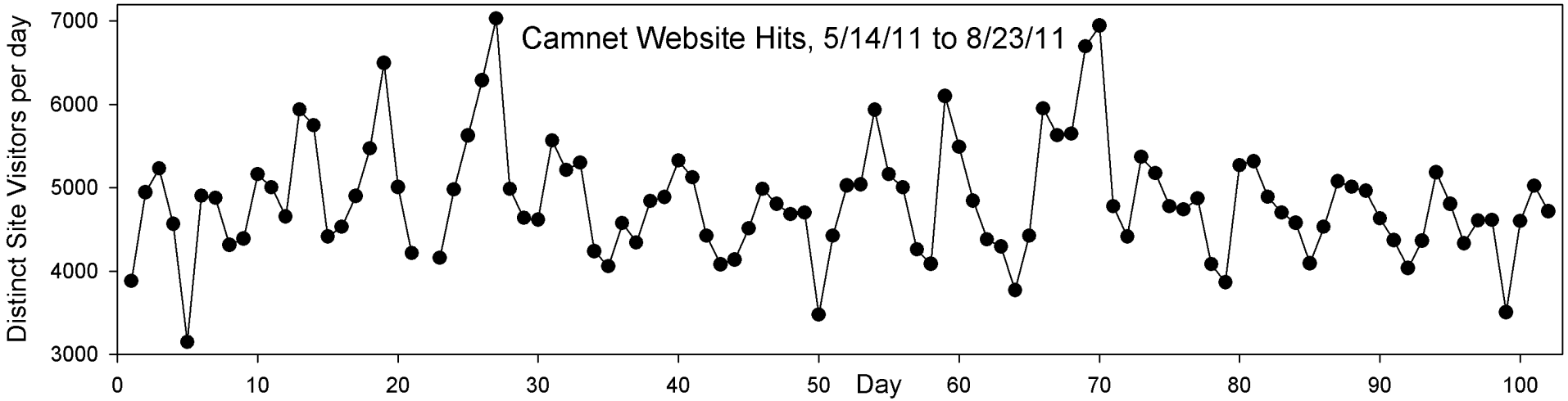
NYC skyline, 10/3/01, 10:00 am - regional haze event.

PM was elevated this day - a regional haze event
Some researchers incorrectly attributed it to the WTC plume

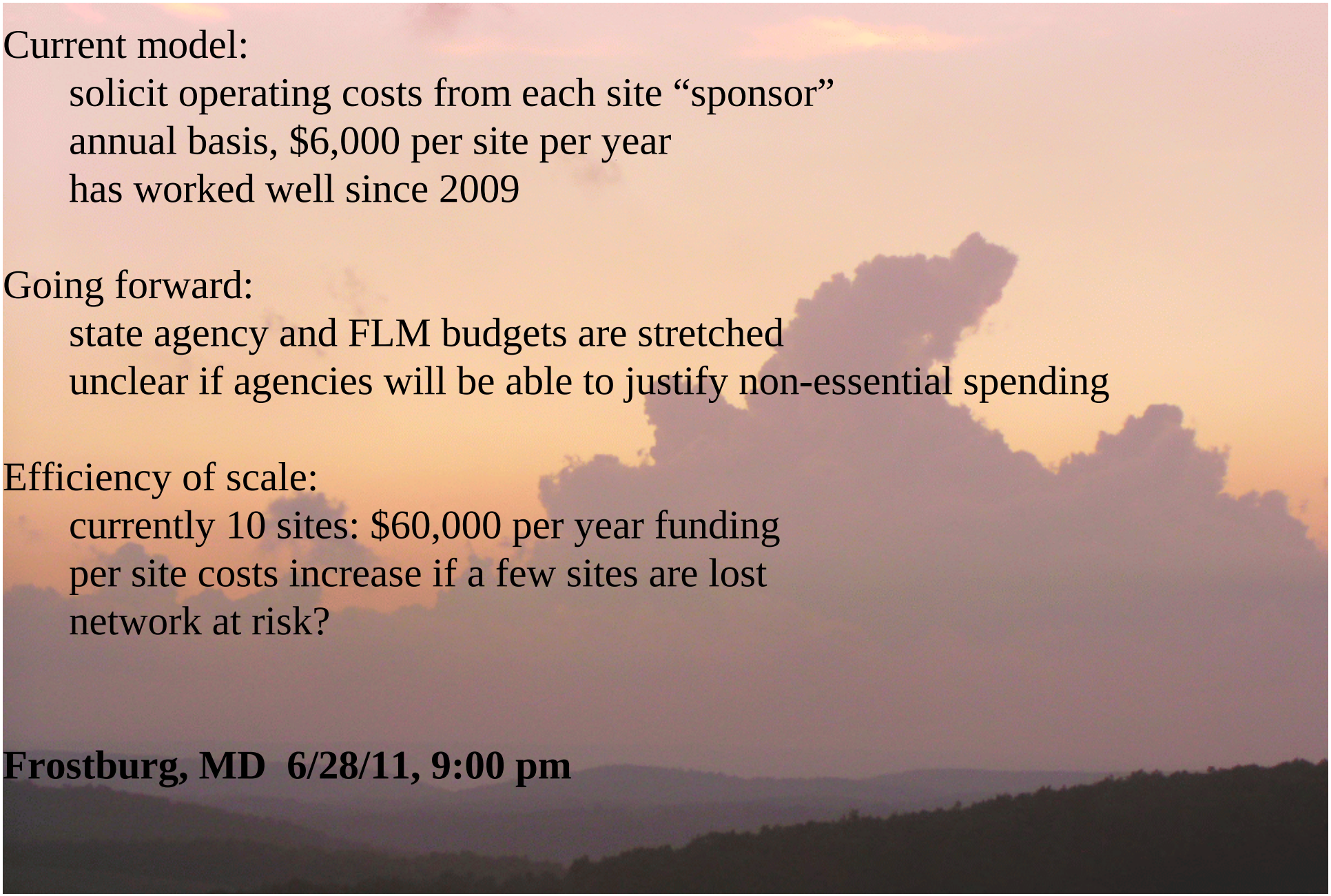
Media use example: NECN weather forecast, 7/16/11.

http://home.comcast.net/~geo.allen/NECN_16July5pm-Burlington-wx.html

Web site hits: number of distinct site visitors per day average ~ 5000:



The Future of Camnet



Current model:

- solicit operating costs from each site “sponsor”
- annual basis, $6,000 per site per year
- has worked well since 2009

Going forward:

- state agency and FLM budgets are stretched
- unclear if agencies will be able to justify non-essential spending

Efficiency of scale:

- currently 10 sites: $60,000 per year funding
- per site costs increase if a few sites are lost
- network at risk?

Frostburg, MD 6/28/11, 9:00 pm

Questions?

Acadia NP
Cadillac Mt.
from Schoodic