

## ICNet Members' New England Research & Project Survey



<b>Research/Project Focus</b>	Climate Change Impacts on Pavement Performance in New England
<b>Research/Project Description</b>	This research used climate model forecasts in the Mechanistic-Empirical Design Guide (M-E PDG) and developed a methodology to assess the implications of climate and climate change for temperature on pavement deterioration processes.
<b>Primary Category*</b>	Pavement
<b>Geographic Location</b>	Berlin, New Hampshire; Boston, Massachusetts; Concord, New Hampshire; and Portland, Maine.
<b>Funding</b>	None
<b>Contact</b>	Jennifer Jacobs, UNH : Jennifer.Jacobs@unh.edu, Jo Daniel, UNH: Jo.Daniel@unh.edu, Ernst Linder, UNH
<b>Infrastructure sectors effected, subject area</b>	Pavements
<b>For modeled climate or sea level rise projections, AOGCM or other sources used</b>	<p>NARCCAP with A2 Emissions</p> <ol style="list-style-type: none"> <li>1. CRCM + CGCM3: Canadian Regional Climate Model (CRCM) combined with the Canadian Global Climate Model version 3 (CGCM3) AOGCM.</li> <li>2. RCM3 + CGCM3: Regional Climate Model version 3 (RCM3) combined with the Canadian Global Climate Model version 3 AOGCM.</li> <li>3. RCM3 + GFDL: Regional Climate Model version 3 combined with the Geophysical Fluid Dynamics Laboratory Climate Model version 2.1 (GFDL) AOGCM.</li> </ol>

<b>Other Information, data, models, used</b>	Hourly climactic file were obtained from the M-E PDG station data (four sites) for the period of July 1, 1996 to June 30, 2000. The sources of these data are NOAA NCDC stations.
<b>Time periods analyzed</b>	Current period 1971-2000 and for the future period 2041-2070.
<b>Status /Date submitted to ICNet</b>	Status: completed. Submitted to ICNet : 10/2013
<b>Brief key findings to date</b>	The application of the methodology demonstrated the importance of matching the overlap periods prior to using climate forecast output in M-E PDG. While the simulated impact of future temperature changes on pavement performance are negligible for alligator cracking for the four study sites, the AC rutting differences were great enough to warrant additional consideration and to suggest that climate change and variability in future climate scenarios could potentially impact the design and evaluation of pavements.
<b>Key publications/reports?</b>	Meagher, W., J.S. Daniel, J.M. Jacobs, and E. Linder. 2012. A methodology to evaluate the implications of climate change on the design and performance of flexible pavements. Transportation Research Record. Vol. 2305/ 111-120. DOI: 10.3141/2305-12.
<b>Other information (e.g., web links to technical reports).</b>	Also presented at 2012 Transportation Research Board Annual Meeting

**\* Categories: Roads, bridges, and culverts; Pavement and/or soils; Hydrology (study of data/floods); Environmental/water resources (stormwater, drinking water); Transportation assets (network); Climate model output**