

## ICNet Members' New England Research & Project Survey



<b>Research/Project Focus</b>	Annual Floods in New England (USA) and Atlantic Canada: Synoptic Climatology and Generating Mechanisms
<b>Research/Project Description</b>	We are analyzing long-term precipitation gauge and synoptic climatology records associated with flood records in climate-sensitive watersheds. We use this information to better understand causal mechanisms for flooding and how they vary spatially across the region; flood seasonality; and how the region's flood hydroclimatology may have changed over time. This work may inform the interpretation of various climate model predictions for the region with respect to flood magnitude, frequency, and timing. In turn, such understanding will improve NOAA Fisheries' ability to plan and design fish passage and fish habitat restoration projects in the region.
<b>Primary Category*</b>	Hydrology
<b>Geographic Location</b>	New England and Atlantic Canada
<b>Funding</b>	NOAA, Cornell University, Environment Canada
<b>Contact</b>	Matt Collins, NOAA: <a href="mailto:mathias.collins@noaa.gov">mathias.collins@noaa.gov</a>
<b>Infrastructure sectors effected, subject area</b>	Bridges, culverts, dams. In particular, our work informs design flood estimates for sizing these structures in the context of climate variability/change.
<b>For modeled climate or sea level rise projections, AOGCM or other sources</b>	N/A

<b>used</b>	
<b>Other Information, data, models, used</b>	USGS and Water Survey of Canada (WSC) stream gauge data; NOAA COOP and Meteorological Service of Canada precipitation gauge data; archived surface analysis maps from NOAA Central Library Data Imaging Project and Daily Mean Composites of surface sea level pressure from NCEP/NCAR Reanalysis data (Kalnay et al. 1996); NCAR NAO indexes and NOAA Climate Prediction Center SOI indexes;
<b>Time periods analyzed</b>	Early twentieth century to 2006
<b>Status /Date submitted to ICNet</b>	In progress (nearly done) Submitted to ICNet Oct,2013
<b>Brief key findings to date</b>	The Great Lakes region is a dominant source area for annual floods in the region and Coastal lows are also very important. Coastal lows are associated with higher magnitude annual floods while Great Lakes-sourced storms are associated with lower magnitude annual floods. Tropical cyclones account for surprisingly few of all annual floods, including extreme events, despite causing some of the region's largest and most destructive floods. Late winter-early spring is when the greatest number of annual floods occurs region-wide, and rainfall is the dominant flood-producing mechanism. We find little evidence for associations between flood-producing synoptic storm types or precipitation mechanisms and large-scale atmospheric circulation indices or time periods, despite upward trends in New England annual flood magnitudes.
<b>Key publications/reports?</b>	Collins, M.J., Kirk, J.P., Pettit, J., DeGaetano, A.T., McCown, M.S., Peterson, T.C., Means, T.N., and Zhang, X., in revision, Annual floods in New England (USA) and Atlantic Canada: synoptic climatology and generating mechanisms. Resubmitted
<b>Other information (e.g., web links to technical reports).</b>	N/A

**\* 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**