



UNIVERSITY OF MASSACHUSETTS
AMHERST

224 Marston Hall
130 Natural Resources Road
Amherst, MA 01003-9293



Department of Civil and
Environmental Engineering

voice: 413.545.2508
fax: 413.545.2840
<http://www.umass.edu/cee>

February 28, 2013

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: Comments on Scoping Document 1 for the Wilder (FERC No. 1892-026), Bellows Falls (FERC No. 1855-045), Vernon (FERC No. 1904-073), and Turners Falls (FERC No. 1889-081) hydroelectric projects, and the Northfield Mountain Pumped Storage Project (FERC No. 2485-063)

Dear Secretary Bose:

I am writing this letter as the University Director of the Northeast Climate Science Center. This letter is in response to the December 21, 2012 Federal Energy Regulatory Commission (FERC) filing of the Notice of Intent to File License Application, Filing of Pre-Application Document (PAD), Commencement of Pre-Filing Process, and Scoping; Request for Comments on the PAD and Scoping Document, and Identification of Issues and Associated Study Requests for the Wilder, Bellows Falls, Vernon, and Turners Falls hydroelectric projects, and the Northfield Mountain Pumped Storage Project.

The Northeast Climate Science Center (NECSC) is one of eight of the Department of Interior (DOI) funded Climate Science Centers, which are supported by the US Geological Survey's National Climate Change and Wildlife Science Center (NCCWSC). The national mission of the NCCWSC is to provide natural resource managers with the tools and information they need to develop and execute management strategies that address the impacts of climate and other ongoing global changes on fish and wildlife and their habitats. The three primary goals of the NCCWSC are to: 1) Assess and synthesize our state of knowledge about climate change impacts, 2) Work collaboratively with the resource management community to develop adaptation methodologies that minimize the effect of climate change impacts on the Nation's fish, wildlife, and habitats, and 3) Foster research that increases understanding of the interactions between climate and the physical, biological, and chemical forces that influence the structure and functioning of ecosystems and the goods and services they provide.

The Northeast Climate Science Center was established one year ago, and received its initial funding from DOI for a five year period. The NECSC is composed of a consortium of universities comprised of the University of Massachusetts Amherst, College of Menominee Nation, Columbia University, Marine Biological Laboratory, University of Minnesota, University of Missouri-Columbia, and University of Wisconsin-Madison. As one of eight

Climate Science Centers, our study area is the greater northeastern portion of the US. This region is contained within boundaries ranging from Maine southward to Virginia, westward to Missouri, then northward to Wisconsin, and the eastward back to Maine. This area is a region of enormous diversity in geography, climate, biology, and human land use. The NECSC serves 22 states, multiple ecoregions, seven of the 21 regions established for the National Landscape Conservation Cooperative (LCC) Program, and a human population of 131,000,000 (41% of the US population). One of our goals is to understand the impacts of climate change on the resources in this region. In particular, we are very interested in the interface between climate change, infrastructure and natural resource management.

The FERC relicensing of the reservoirs on the Connecticut River is a very important process and I have been following it with great interest. I have been extremely impressed with the level of engagement demonstrated by the natural resource community and the excellent work by the FERC staff. I am writing to add the voice of the NECSC to those who have expressed concerns that in this process, the impacts of climate change on the streamflows in the Connecticut River be explicitly considered in evaluating management alternatives and options.

During the last five years, researchers at the University of Massachusetts Amherst have been studying the range of impacts of climate change on the Connecticut River. We have done this using the hydrologic models of the Connecticut River basin, outputs from highly regarded General Circulation Models (GCMs) and likely emission scenarios provided by the Intergovernmental Panel on Climate Change (IPCC). These results provide a range of future possibilities; however, they consistently indicate the following: 1) An increase in annual temperatures, 2) An increase in total annual precipitation, 3) An increase in high flow events, 4) Significant shifts in the timing of the annual hydrograph, and 5) Greater variability in the low flow regime.

All of these changes can have significant impacts on the flows in the Connecticut River and on how the hydropower facilities on the river and its tributaries should be managed. The relicensing process led by FERC is the one opportunity that exists to investigate how these climate change impacts may influence reservoir operations, and in turn, the management of the aquatic resources in the river.

There is no doubt that climate change is real, that, nationally, we are already seeing the impacts of these changes in our frequency of flood events and droughts and shifts in the hydrograph, and that ignoring these changes in managing our river resources is unwise. The notion that climate "stationarity is dead" is well accepted in the water resources profession and it is important to include this change in any long term planning. With the longevity of FERC licenses, it is especially important that changes in climate be considered in the many studies that are being proposed to supplement this review process and in the final FERC relicensing process.

From our studies we anticipate that in the future, on average, there will be higher streamflows throughout the Connecticut River basin and this will have positive impacts on the quantity of hydropower that can be produced by the systems under study. However, climate change will increase the need to evaluate a wider range of possible operating alternatives and policies to deal with this change over time and to evaluate the impacts of the change, along with reservoir operations, on the aquatic resources in the river.

Although it would be easy to simply use the past as a guide to the future in terms of expected streamflows in the Connecticut River basin, we would strongly urge you against taking this approach. Because there is significant research on the climate impacts on streamflows in the Connecticut River basin, and because they suggest significant changes from the flow regimes of the past, ignoring these changes in the FERC process could lead to erroneous assumptions about future conditions and, in turn, inaccurate results.

We hope that as you review the comments from stakeholders and explore the proposed additional studies, that you will conclude that climate change projections should be a fundamental ingredient in all future work. Relying on the past 50 years for streamflow data in evaluating these facilities will be insufficient without an understanding of the changes in flows that are likely ahead during the next 50 years.

Thank you for considering this request.

Sincerely,

A handwritten signature in black ink that reads "Richard N. Palmer". The signature is written in a cursive style with a large, prominent initial "R".

Richard N. Palmer, Ph.D., PE
Department Head and Professor
Civil and Environmental Engineering

Document Content(s)

NECSC FERC Comments-RNP.PDF.....1-3