March 1, 2013

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426

RE: Comments on Integrated Licensing Process and Study Request for FERC project numbers P-1904 (Vernon), P-1855 (Bellows Falls), P-1892 (Wilder), 1889 (Turners Falls), No. 2485 (Northfield Mountain).

Dear Secretary Bose:

The Connecticut River Joint Commissions (CRJC) is comprised of New Hampshire's Connecticut River Valley Resource Commission (CRVRC) and Vermont's counterpart, the Connecticut River Watershed Advisory Commission (CRWAC). Each commission was created by its respective state legislature and directed to cooperate to preserve and protect the resources of the Connecticut River and its watershed.

In 1992, the New Hampshire Legislature designated the Connecticut River into the New Hampshire Rivers Management and Protection Program pursuant to NH RSA 483. Upon designation, CRVRC was appointed the local river management advisory committee for the Connecticut River to work with the CRWAC "to consider and comment on any federal, state or local governmental plans to approve, license, fund or construct facilities that would alter the resource values and characteristics for which the river or segment is designated."

The Connecticut River possesses a variety of significant federal, state and local resources which qualified it for designation into the Rivers Management and Protection Program. These resources were inventoried in the 1991 nomination document prepared by CRVRC. Aided by bi-state subcommittees of riverfront town representatives, CRJC developed and adopted its Connecticut River Corridor Management Plan in 1997, and published amplified plans for Water Resources and Recreation in 2009. The corridor management plans contain recommendations to protect the multiple uses and resources of the river and its watershed..

CRJC has reviewed the Preliminary Application Documents and Scoping Documents for the relicensing of the following hydropower projects:

- Wilder Dam (Wilder Project No. P-1892)
- Bellows Falls Dam (Bellows Falls Project No. P-1855)
- Vernon Dam (Vernon Project No. P-1904)
- Turners Falls Dam (Turners Falls Project No. 1889), and
- Northfield Mountain Pumped Storage Project (No. 2485).

On the basis of the Legislature's designation, the nomination document, and the three plans cited above, CRJC wishes to provide comment on how the Federal Energy Regulatory Commission's relicensing of these five projects may affect the resources of the Connecticut River and its watershed. This review is included as Attachment A.

Attachment B contains a study request by the Connecticut River Joint Commissions for a watershed-wide stormwater model to:

1. assess the effect of dam operations, under current flow conditions and future conditions when more extreme weather events are anticipated, on public interests; and
2. recommend measures to manage stormwater through dam operations to protect, preserve and enhance public interests.

Sincerely,

Rebecca Brown
President

Attachment A:

Resources of the Connecticut River Watershed and Potential Impacts on these Resources by Relicensing of the Wilder, Bellows Falls, Vernon, Turners Falls and Northfield Mountain Projects

Natural Resources:

The Connecticut River designation documents and subsequent river corridor management plans recognize a number of state and federally-listed rare, threatened and endangered (RTE) species in the Connecticut River and its banks, including the dwarf wedge-mussel and Jesup's milk vetch populations between Wilder Dam and Bellows Falls, the cobblestone tiger beetle, and the round whitefish. The Atlantic salmon restoration project was also recognized. In addition, the Connecticut River is home to numerous exemplary natural communities along the river's edge – floodplain forests, riverside seeps and outcrops (where Jesup's milk vetch grows), calcareous wetlands, and steep, rocky cliffs. The Connecticut River serves as a migratory corridor for waterfowl, hawks and songbirds. The operation of Wilder, Bellows Falls and Vernon Dams causes fluctuating water levels that can cause erosion and degradation of riverside habitat and natural communities, as well as alteration of aquatic habitat, including the mainstem, tributaries and backwaters or "setbacks", on which aquatic species and migratory waterfowl rely.

The Connecticut River designation documents and subsequent river corridor management plans emphasized the valuable open space in each town along the river. This open space includes riverside lands and islands owned by New England Power (now TransCanada), e.g. at Wilder Dam in Hartford and Lebanon, Sumner Falls in Hartland, farmland in Charlestown, Rockingham and Springfield, Upper Meadows and Herrick's Cove in Springfield, setbacks and islands above Vernon Dam in Hinsdale and Vernon.

Managed Resources:

The Connecticut River's water is used in many ways. In addition to the hydropower operations at Wilder, Bellows Falls and Vernon Dams, river water is used by farms for irrigation and by wastewater treatment plants in Lebanon, Charlestown, Hartford, Windsor, Bellows Falls, and Brattleboro. The designation process identified concerns for the adequacy of water quantity, specifically with respect to the demand for new and expanded water withdrawals in the future, in New Hampshire, Vermont and Massachusetts.

Cultural Resources:

Several Archaic and Woodland archeological sites are located on the banks of the Connecticut River and several tributaries – specific mention is made of sites in Hanover, Claremont, West Chesterfield, Hinsdale and sites on terraced banks of Connecticut River in Orford, Plainfield, Charlestown, Walpole and North Walpole. Historic resources on the river include Porter Cemetery in Lyme, Gilman Island in Hanover, site of old mill at Wilder Dam in Hartford,

original village site of Lebanon, Mast Camp in Cornish, an historic settlement at the confluence of Blow-me-down Brook in Cornish, Hubbard and Jarvis Islands in Claremont, Fort at No. 4 in Charlestown, and a recreational boat club near Bellows Falls-North Walpole bridge. Also historic ferry crossings are located in Norwich, Hanover, Weathersfield, Claremont, Putney, Westmoreland, Dummerston, Chesterfield, Hinsdale and Vernon.

Current-day community cultural resources include several attractions on the river, including the Montshire Museum in Norwich, Ledyard Canoe Club in Hanover, Lyman Point Park in Hartford, Cornish-Windsor Covered Bridge, Fort at No. 4 in Charlestown, and the fish ladder at Vernon Dam. Bass tournaments and fishing derbies are important cultural events.

Recreational Resources:

The Wilder Dam, Bellows Falls Dam and Vernon Dam impoundments, including the bays and setbacks above Vernon Dam, serve as a warmwater fishery and boating resource. Fishermen access the river primarily by boat, but there are many fishing spots on the banks, as well as ice fishing. Fishermen also fish in free-flowing sections of the river: in the eddy at outwash of Wilder Dam, near 1-89 bridge in Hartford and West Lebanon, and below Bellows Falls and Vernon Dams.

The Wilder Dam impoundment was reported as a very popular boating spot, with the 1991 nomination document noting that boat launch parking lots were full on weekends. There is diversity in the types of boats used in these areas - canoes, fishing boats, party boats, speedboats, plus rowing shells, canoes and kayaks from Ledyard Canoe Club, also tubing, water skiing in wider parts of the river. Below Wilder Dam to Sumner Falls, the river can be very shallow, which limits recreation to mostly canoes, but is still well-used. Sumner Falls offers a portage around the falls, as well as an opportunity for whitewater canoeing and kayaking; below the falls, powerboats and canoes are typical. Between Bellows Falls and Vernon and then below Vernon Dam, there is again diversity in the types of boats used: pleasure boats, jon boats, water ski boats, canoes and rowboats, with canoes and rowboats accessing the shallow back inlets.

The 1992 designation recognized that canoeists engaged in day trips as well as longer trips by staying at different inns along the river. In the years following, the Connecticut River Paddlers' Trail has developed, allowing canoeists to camp at designated sites along the river in New Hampshire and Vermont. The 2009 Recreation Management Plan, part of the Connecticut River Corridor Management Plan recommends that TransCanada maintain their property to continue to provide campsites at Gilman Island, Lower Meadow, Stebbins Island and Wantastiquet/Hinsdale, portage trails around the dams, and public river access at Sumner Falls and Herrick's Cove.

Potential Impacts on Resource Values:

Fluctuating water levels: The fluctuation of water levels due to dam operations may impact instream and riparian biological communities and rare, threatened and endangered (RTE) species

through bank erosion, flooding and drought. Dam operations may also alter spawning and feeding habitat upon which aquatic species and migratory waterfowl rely. Furthermore, fluctuating water levels may affect many other uses, from the experience of boaters and fishermen to archaeological, historic and cultural resources on the banks.

The 2009 Water Resources update of the Connecticut River Corridor Management Plan recommends that "dam owners should thoroughly evaluate impacts of impoundment cycling on riverbank erosion as part of relicensing studies, and undertake mitigation as appropriate." CRJC supports requests submitted by resource agencies to study the effect of water level fluctuations on public interests.

Water quantity: The Connecticut River's designation recognized the need for the dams to maintain minimum flows when they are not generating power. Participants in the designation process raised concerns over the allocation of water, specifically with respect to the future. Furthermore, the designation of the river into the Rivers Management and Protection Program statutorily requires the establishment of instream flows to support a variety of public interests (e.g., fisheries, water quality, recreation, power, scenic values, etc).

CRJC is submitting a study request (Attachment B) for a watershed-wide stormwater model that will provide a methodology to optimize dam operations, during existing and projected future flows, to ensure the availability of water for uses that include:

1. maintenance of natural communities including wetlands, flood plains and fish and wildlife habitats;
2. promotion of human uses such as water-based recreation and agriculture, and
3. society's needs for water supply, waste water assimilation, flood control, hydropower generation.

Water quality: The designation recognizes the resource values of aquatic RTE species, the warmwater fishery and recreational uses, which are all dependent on clean water. Dam operations may impact river water quality, especially in the future when more extreme weather events and flows are anticipated. Of particular concern is sediment and pollutant transport, water temperature, dissolved oxygen and turbidity. Therefore, CRJC supports the study requests submitted by state and federal resource agencies that propose to study the effect of dam operations on water quality with respect to these uses and other public interests.

Recreation: The designation recognizes the effect of dam operations on recreational values of the river, specifically fishing for warmwater species and boating of many types. It should be noted that all reaches of the river are used for recreation, both impoundments and free-flowing reaches below the dams. The 2009 Recreation update of the Corridor Management Plan makes several recommendations to maintain recreational opportunities. These include maintaining existing portage trails, campsites and public access points, and improving safety to ensure

enjoyable recreational experiences. Specific recommendations to improve safety include providing:

- signage at Sumner Falls,
- notices at boat ramps regarding draw down of the Bellows Falls impoundment, and
- signage that calls attention to boat speed regulations, bank erosion, nuisance aquatics and boater responsibilities.

Recreational uses are largely dependent on water levels controlled by the dams and the management of lands owned by TransCanada. The land holdings provide access points to the river and recreational sites. CRJC supports study requests submitted by state and federal resource agencies that propose to study the effect of dam operations and land management by the licensee on recreational uses, particularly with respect to providing safe experiences for users. CRJC would like to emphasize the fact that the Local River Subcommittees composed of citizen representatives from riverfront communities possess extensive local knowledge of existing recreational uses. Thus, the CRJC recommends that the local river advisory committees be consulted as a resource in the assessment of alternative land management and river flow proposals on recreational uses.

Attachment B:
Study Request for Watershed-wide Stormwater Model

1. *Goals, Objectives and Required Information*

Goals:
(1) Take a cumulative watershed approach to the management of surface water, a public trust resource;
(2) determine the effect on public interests from projected future stormwater flows and the operation of the dams; and
(3) recommend measures to manage stormwater flows through the operation of the dams to protect public interests.

Objectives:
(1) Identify public interests in the watershed that have a nexus to dam operations,
(2) develop an integrated, sharable, and scientifically-rigorous stormwater model for the entire watershed,
(3) assess the cumulative effect of the dams on public interests, and
(4) recommend license conditions to protect, preserve and enhance public interests.

Required Information:
(1) High resolution base maps from LiDAR (Light Detection and Ranging) imagery of the watershed north of the Turners Falls Project (Exhibit 1), with LiDAR data collection recommended at Quality Level 2 as defined by the National Enhanced Elevation Assessment.

Elevation Quality Levels (QL)	Source	Horizontal Resolution Terms			Vertical Accuracy Terms	
		Point Density	Nominal Pulse Spacing (NPS)	DEM Post Spacing	Vertical RMSEz	Equivalent Contour Accuracy
QL 1	LiDAR	8 pts/m^2	0.35 m	1/27 arc-sec ~1 meter	9.25 cm	1-ft
QL 2	LiDAR	2 pts/m^2	0.7 m	1/27 arc-sec ~1 meter	9.25 cm	1-ft
QL 3	LiDAR	1 – 0.25 pts/m^2	1 – 2 m	1/9 arc-sec ~3 meters	≤18.5 cm	2-ft
QL 4	Imagery	0.04 pts/m^2	5 m	1/3 arc-sec ~10 meters	46.3 cm – 139 cm	5 – 15 ft
QL 5	IFSAR	0.04 pts/m^2	5 m	1/3 arc-sec ~10 meters	92.7 cm – 185 cm	10 – 20 ft

(2) land uses and characteristics in the watershed, and
(3) locations and assessments of existing and future public interests (e.g., fish habitats, archaeological and historic resources, actual and potential pollutant releases, farmland, wetlands, recreational locations, flood plains, water withdrawals, etc.).

2. Resource Management Goals

Develop a rigorous stormwater model (model) that incorporates the precise location and elevation of each public interest resource to enable an assessment of the effects of dam operations under a number of different stormwater scenarios. These analyses may be used as the basis for assessing the effect of dam operations, determining *cumulative impacts* and identifying potential *compensatory mitigation measures*.

The model may be used to (1) inform coordinated operations of main stem and tributary dams to regulate normal flows in order to reduce adverse effects and enhance beneficial effects on public interests, (2) predict future low and high water flows, based on a range of precipitation events, and (3) modify dam operations to lessen impacts during extreme precipitation events on specific resources.

Furthermore, the model may be used for emergency planning if, for example, during a severe storm event there is a catastrophic dam breach, the model could be used to predict the extent of downstream flooding.

3. Public Interest Considerations

The Connecticut River Joint Commissions are requesting this study. The public needs to know the effect the dams and their operations have on our natural and human environment, particularly in the decades ahead when precipitation is expected to be more extreme than in prior decades. They also need to know if and how the dams can be operated to benefit public interests in addition to hydropower.

The dams are the most significant factor in regulating stormwater flows in the mainstem of the river. They create detention ponds that collectively extend for more than a hundred miles in length between Vermont and New Hampshire (Exhibit 2). They slow the velocity of the water and promote the deposition of sediment and pollutants. They also play an important role in providing recreational opportunities, desynchronizing flood flows, diluting toxic discharges, and sustaining instream and riparian habitats.

A diversity of water users need access to timely, accurate, reliable data in order to determine anticipated availability of water for the maintenance of natural communities including wetlands, flood plains and fish and wildlife habitats, for the promotion of human uses such as water-based recreation and agriculture, and for society's needs for water supply, waste water assimilation, flood control, hydropower generation, and other uses that can be anticipated over the forty-year time period of the forthcoming licenses.

4. Existing Information and Need for Additional Information

Existing data on the location of resources of concern, while well-intentioned, are too often incomplete or inaccurate. Since instream and riparian uses are closely tied to the frequency, depth

and duration of the inundation by the river, stormwater information needs to be modeled and modernized, as precisely as possible, for accurate application.

For example, the dams currently coordinate with the United States Army Corps of Engineers to provide flood control. However, a model needs to be developed that will accurately predict flooding from storm events that are projected to be more frequent and intense than the historical pattern. The Northeast has experienced a greater increase in extreme precipitation over the past few decades than any other region in the United States. Between 1958 and 2010, the Northeast saw a 74% increase in the amount of precipitation falling in very heavy events (http://ncadac.globalchange.gov). Recent flooding events in Vermont and New Hampshire highlight the issue.

Moreover, better elevation data needs to be acquired to more accurately predict the extent of flooding during storm events. The accuracy of the floodwater extent portrayed on Flood Insurance Rate Maps (FIRM) varies with the accuracy of the digital elevation model used to simulate the land surface. During tropical storm Irene areas in our bi-state region were flooded that were not within a mapped flood plain whereas other areas escaped the floods even though they had been depicted clearly within a mapped floodplain. Irene and other storms have highlighted the fluvial erosion risks throughout the watershed, and how management of streams and rivers throughout the watershed have exacerbated those risks. Better understanding stream and river geomorphology, including the extent to which streams and rivers have lost access to their floodplains due to incision, is critical to understanding the hydrology of the watershed, including updated model of low and high flow events. Better elevation data is needed for the entire watershed. A recently published report by the National Academy of Sciences, *Elevation Data for Flood plain Mapping, 2007* highlights the deficiencies of available land surface elevation data.

5. Nexus between Project Operations and Development of License Requirements

Stormwater flows in the river effect nearly every resource under study, from providing white water recreational activities to sustaining flood plain biological communities. The operation of the dams, in which they impound and then release the water, relies entirely on available stormwater. Integrated, accurate information about storm frequency, precipitation intensity, topography and land uses in the watershed is essential to allocate water for specific uses and, at the same time, maintain acceptable water quality standards.

A model with precise elevation data will help us better assess potential effects on all our resources and then develop appropriate mitigation measures for those effects. For example, riverbank erosion, with its attendant loss of land and accumulation of sediment is a costly and prevalent problem on the reaches of the river affected by flow modification from the dams. A refined model will (1) allow a better understanding of the causes and effects of riverbank erosion and (2) assist in identifying measures to mitigate the problem. Mitigation of erosion and other effects should be an important component of eventual dam license provisions.

A rigorous model is essential so that license permit conditions can be developed to protect river resources through coordinated management of the dams. The challenge will be to identify and designate specific uses for each reach of the river and to identify and regulate specific flows in each of these reaches to ensure that designated uses are not degraded, and where feasible can be enhanced as a consequence of the impoundment and release of flows by the dams.

6. Proposed Study Methodology is the Preferred Scientific Practice

The watershed approach to analyzing water flows is the preferred methodology for forecasting flows, and evaluating environmental and economic outcomes based on various dam management scenarios. This approach is being utilized in the Connecticut River Watershed Restoration project that is being undertaken by the Nature Conservancy, United States Army Corps of Engineers New England District Office, University of Massachusetts Amherst, and United States Geological Survey. This study is being performed to help determine how management of large mainstem and tributary dams and water systems can be modified for environmental benefits while maintaining beneficial human uses such as water supply, flood control and hydropower generation.

The use of airborne LiDAR technology is the preferred methodology for the preparation of digital elevation models. Coastal studies, in progress, are using LiDAR imagery to interpret the effect of sea level rise due to climate change are on our coast lines. The Northeast LiDAR Project is a collaboration between a number of agencies to acquire accurate, high-resolution LiDAR data for coastal areas of New York, Connecticut, Rhode Island, Massachusetts, New Hampshire and Maine (www.ma.nrcs.usda.gov/technical/lidar/index.html).

Moreover, scientists at the University of New Hampshire are using LiDAR data to model potential future inundation areas in the Lamprey River watershed based on projections of land use changes and increased precipitation (http://www.unh.edu/news/cj_nr/2012/may/ds16landscape.cfm#ixzz2LuUVDFLF). Furthermore, the New Hampshire Geographic Information System (GIS) Strategic Plan points out that airborne LiDAR technology is recommended as the preferred method for acquiring data of sufficient accuracy and resolution for the assessment and management of water resources (Exhibit 3).

7. Cost of Proposed Study and Relationship to Other Studies

To our knowledge, none of the other proposed studies suggest LiDAR mapping be undertaken and a stormwater model be developed for the entire watershed. Existing hydrological studies lack precise elevation data and are based on historic United States Geological Survey gage data. The historic record will be of limited usefulness in predicting flows under the changed climate regime of the decades subject to the new permit.

The model we propose, utilizing LiDAR, will have much more precise elevation data and will incorporate land uses, topography, cover types and other characteristics within the entire

watershed. This will be a refined tool that may be used to better predict the timing and quantity of future flows and to some extent address issues related to water quality (e.g., identify the locations of pollution discharges that could become incorporated in storm flows).

Moreover, we anticipate specific agencies will request the preparation of high-resolution maps and assessments of resources under their jurisdiction. For example, we expect federal and state resource agencies responsible for protecting wetlands will request the delineation and assessment of wetlands bordering the mainstem. We also expect other resource agencies will request bathymetric studies of the river channel to assess instream habitats. Together, these studies and the proposed stormwater model will provide the basis for identifying measures to reduce adverse effects and compensate for unavoidable ones.

Development of the proposed stormwater model utilizing LiDAR data could cost two million dollars or more. Amortized over the life of the permits this puts a yearly cost at about $50,000. Moreover, we strongly argue that the model be shared with cooperating agencies, the LiDAR data be made available, i.e. in the public domain, and the specifications for the LiDAR data collection are adequate for broad uses of the data. As such we might anticipate the cost will also be shared among these agencies which could include National Oceanic and Atmospheric Administration, United States Environmental Protection Agency, United States Fish and Wildlife Service, United States Army Corps of Engineers, Federal Emergency Management Agency, United States Geological Survey, and state resource and transportation agencies and academic institutions in Massachusetts, Vermont and New Hampshire. NH GRANIT, New Hampshire's state GIS clearinghouse, has reviewed and supports this request, and furthermore has the capacity to disseminate and archive the LiDAR data for use by the licensees, the potential funding agencies involved in cost-sharing and the public at-large.

EXHIBITS:

Exhibit 1. Watershed Map.
Exhibit 2. Operations Summary.
Exhibit 3. An Enhanced Statewide Elevation Dataset for New Hampshire: The Case for LiDAR.

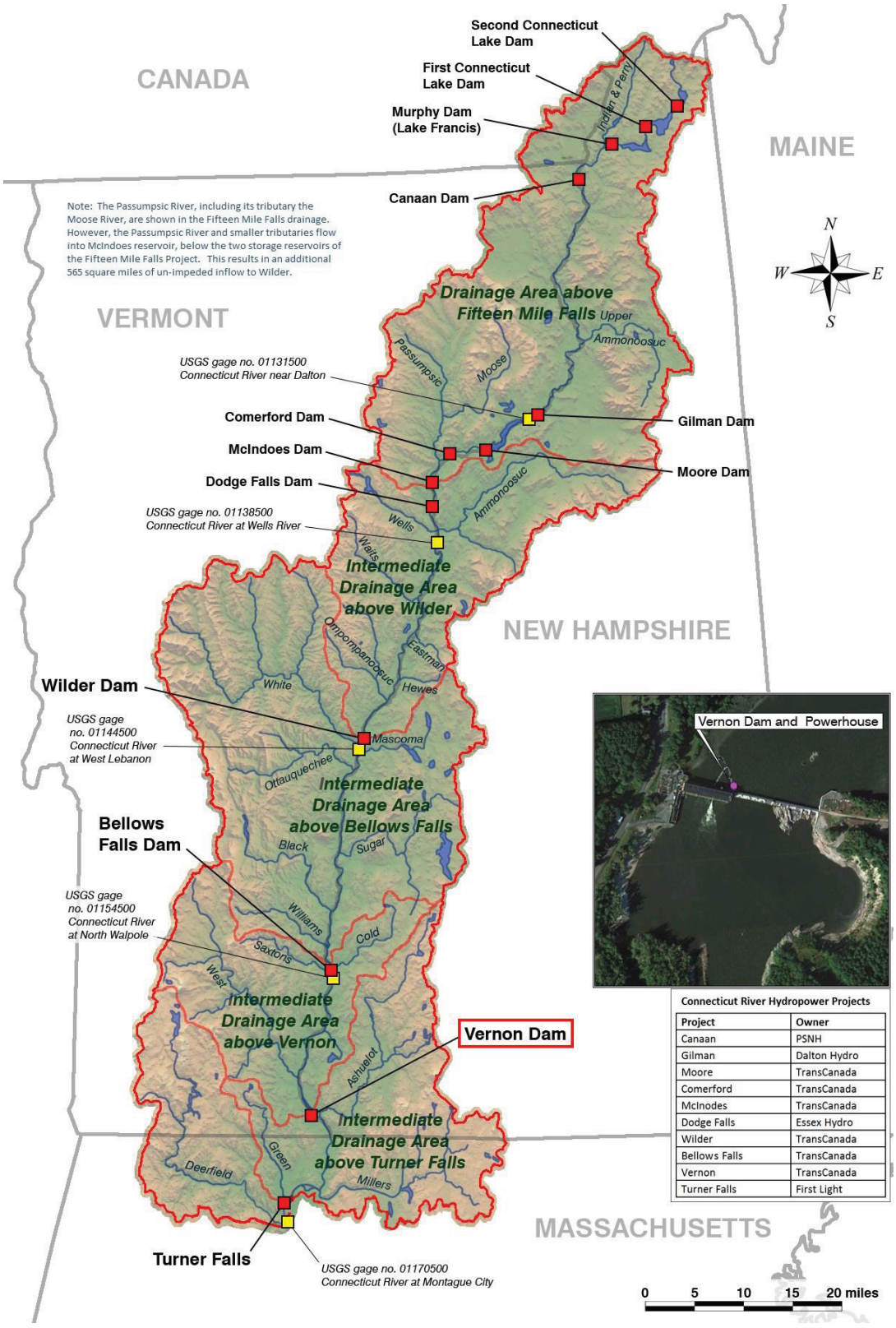


Figure 3.2-1. Project and the upper Connecticut River Basin (Source: EPA, 2012, as modified by TransCanada).

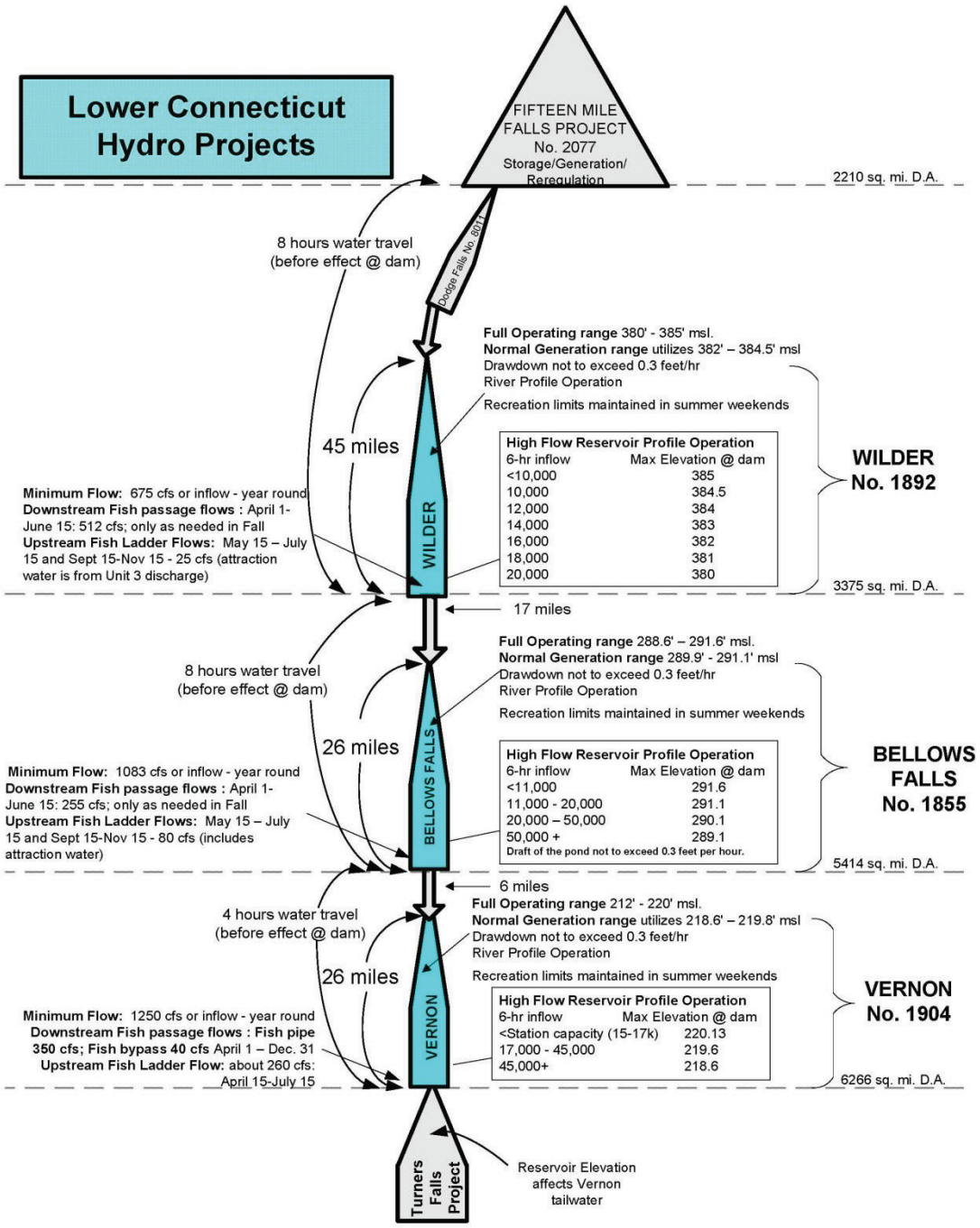
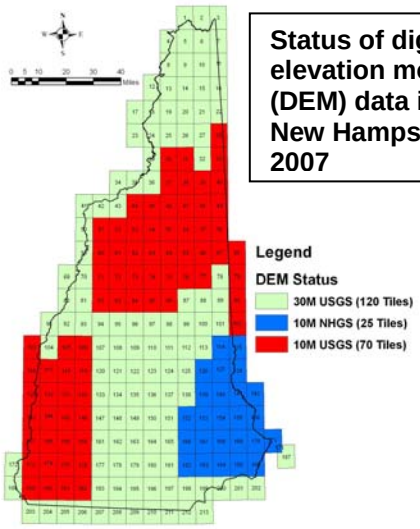


Figure 2.5-1. Connecticut River operations summary.

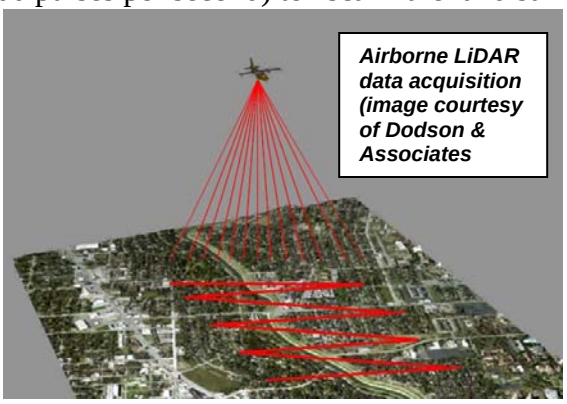
AN ENHANCED STATEWIDE ELEVATION DATASET FOR NEW HAMPSHIRE: THE CASE FOR LIDAR

The NH Geographic Information System (GIS) Strategic Plan identifies the need to develop statewide high-quality topographic data to replace the existing mixed resolution data for NH (statewide 30-meter and partial 10-meter digital elevation models) available as part of the US Geological Survey (USGS) National Elevation Dataset. The cost associated with a project of this scope together with the recognition that a variety of GIS users have the potential to benefit significantly from the availability of an enhanced topographic dataset, suggest that a number of funding partners should be engaged in any development effort. Perhaps the most critical use of these data has been highlighted by recent flooding events in the state. A recently published report by the National Academy of Sciences (*Elevation Data for Floodplain Mapping, 2007*) (http://www.nap.edu/catalog.php?record_id=11829 – Hidden) points out the deficiencies of available land surface elevation data to support modernization of floodplain maps under the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). The report states that "FEMA needs land surface elevation data that are about ten times more accurate than data currently available for most of the nation."

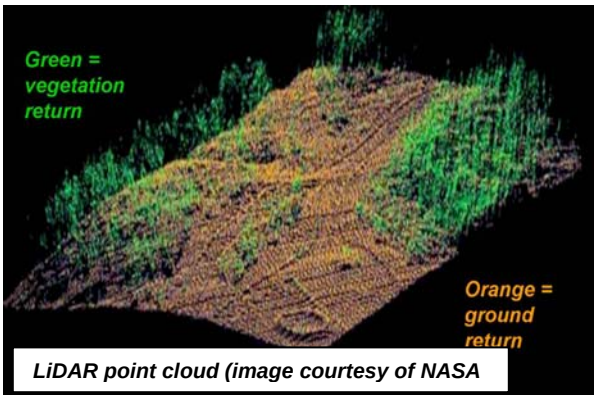


Status of digital elevation model (DEM) data in New Hampshire, 2007

Airborne LiDAR (Light Detection And Ranging) technology is recommended as the preferred method for acquiring data of sufficient accuracy and resolution. This method uses laser pulses (between 5,000 and 50,000 pulses per second) to "scan" the land surface. The LiDAR sensor detects the travel time of reflected energy from each pulse, including a 'first return" for the first reflective surface in its path, but also potentially records multiple returns as the light beam penetrates to different "soft" surfaces at lower levels within a vegetated area. Post-processing of the collected data is then performed to extract a bare earth terrain model, but also can be used to derive vegetation characteristics (such as forest canopy height and density) and/or to extract structural features within the built environment.



Airborne LiDAR data acquisition (image courtesy of Dodson & Associates



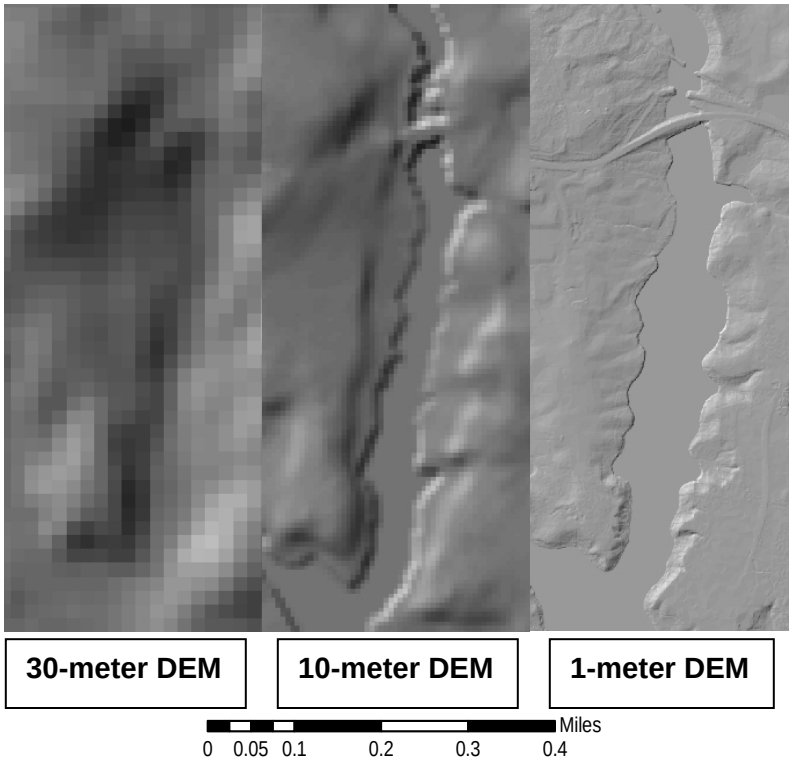
LiDAR point cloud (image courtesy of NASA

As the availability of LiDAR data has increased through statewide initiatives (i.e. North Carolina, New Jersey, Florida, Pennsylvania, New York) and more localized projects, the number and range of demonstrated uses and experimental applications has grown tremendously. A high-resolution bare-earth digital elevation model (DEM) supports the detailed classification of landforms. These data in turn serve as the framework for ecological and habitat assessments used to prioritize land conservation and restoration efforts, but also enable geologic hazards, such as potential landslides, to be mapped. Many of the uses are

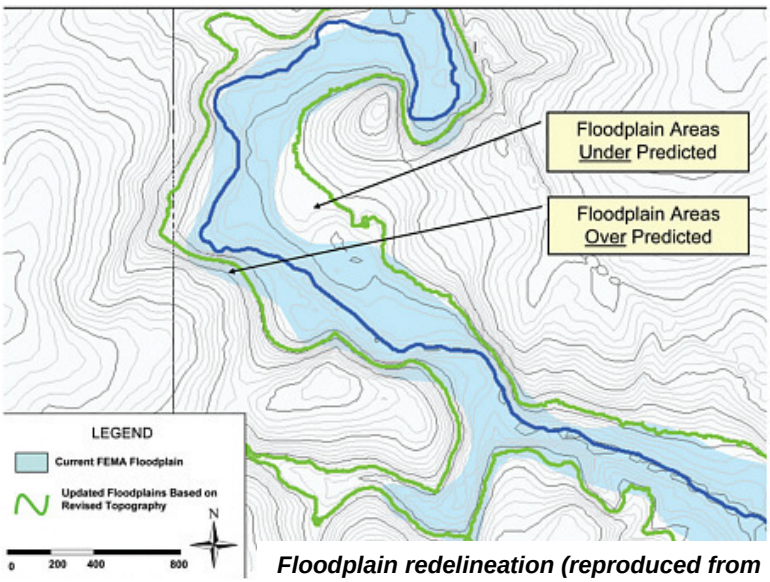
focused on activities related to the assessment and management of water resources, such as watershed delineation, floodplain mapping, stormwater management, water quantity and quality modeling within watersheds, land cover/ land use mapping, etc. Other potential applications exist in the areas of transportation, forestry, agriculture, and emergency management.

The NH GIS Strategic Plan also identifies a critical need for statewide high resolution orthoimagery, with repeat coverage at some specified time interval in order to enable changes in land use/land cover to be monitored. An accurate digital terrain model (DTM) is required to orthorectify the original aerial photographs so that the resulting imagery can support detailed spatial analyses. Although this process can be performed with elevation data that have been derived photogrammetrically, a DTM created from LiDAR has the potential to support additional applications that benefit from higher resolution elevation data. Therefore, a certain economy could be realized by investing in LiDAR data as an integral part of any program to acquire high resolution orthoimagery. Because of this potential to achieve mutual benefits, advocates for developing one dataset might be enlisted to promote development of the other dataset.

Comparison of terrain models for Fresh Creek, Strafford County, NH: NED 30-meter and 10-meter DEMs versus 1-meter LiDAR



While FEMA clearly is an important stakeholder given the utility of LiDAR for updating and refining flood hazard maps, other significant interests could be served through a cost-sharing data development initiative. The "Elevation for the Nation" (http://lidar.cr.usgs.gov/downloadfile.php?file=Harding_Elev4Nation_2-15-07_small.pdf) initiative recently unveiled by the USGS is evidence of the overall importance and broad applicability of this dataset. This announcement identifies USGS as a prime advocate for a statewide LiDAR project, if not as a potential funding partner. Funding should also be solicited from other entities that would benefit directly from such a project, assuming that data acquisition and processing could be specified and coordinated in order to meet their needs.



Floodplain redelineation (reproduced from the National Academies Press, 2007)

The following summary of organizations and some of their related business needs is intended as a starting point for building the necessary partnerships:

- U.S. Environmental Protection Agency – enhanced terrain data should improve the accuracy of watershed models used to assess total maximum daily loads by better defining flow pathways across the landscape.

- U.S. Forest Service – multiple return data from LiDAR surveys can be used to determine tree canopy height and stand density (or total biomass) and also support fire fuel mapping; bare earth digital terrain models can assist with the layout of road networks for timber harvests.

- Natural Resources Conservation Service – detailed topographic data are useful for high intensity soil surveys and for designing erosion control structures or defining best management practices for minimizing erosion.

- National Oceanic and Atmospheric Administration – storm surge modeling to mitigate flood inundation and coastal erosion hazards; shoreline delineation and monitoring of sea-level rise.

- NH Department of Transportation – design of new roads and stormwater drainage systems; improved estimation of volumes of material involved in cut and fill operations.

- Various state agencies and private non-profit organizations whose mission involves environmental conservation and resource management.

- Private sector telecommunications companies – siting of cell towers to minimize gaps in coverage due to interferences from terrain and trees depend on highly accurate terrain models and forest land cover assessments.

- Private sector wind energy producers – siting of wind turbines to maximize exposure.