

# Water Resource Projects, Studies and Initiatives Matrix

Prepared by NHDES for the SB 162 Water Resources Committee

Revised May 6, 2011 for the Water Sustainability Commission

Matrix Overview: The following matrix was prepared by the New Hampshire Department of Environmental Services (DES) for the Water Resources Committee created under SB 162 in the 2003 legislative session and revised in May 2011 for the Water Sustainability Commission created under Governor John H. Lynch's Executive Order 2011-2. It provides information on water-related projects, studies and initiatives undertaken or funded by state agencies (DES, NH Geological Survey, and Office of Energy and Planning), New England Interstate Water Pollution Control Commission and the New Hampshire/Vermont Office of the United States Geological Survey. The matrix provides a project/program description, completion date, status, and contact information for each project, study or initiative. They have been organized into three categories: water resource characterization, water quality assessment, and water protection/planning and education. Within these categories, projects have been color-coded and grouped to indicate whether they primarily address groundwater, surface water, both ground and surface water, coastal, or both coastal and freshwater projects. Many projects overlap categories and a judgment was made on placement. With some exceptions, ongoing programs of DES are generally not included in the matrix.

Water Resource Projects, Studies and Initiatives  
 Prepared by NHDES for SB 162 Water Resources Committee  
 Revised for the Water Sustainability Commission

Projects, Studies, and Initiatives of Statewide Significance

**Water Resource Characterization Projects**

Project Name	Water Resource Characterization Project Description Color Key: <b>Groundwater Projects (Blue)</b> , Surface Water (Black), <b>Both (Green)</b> , Coastal (Orange), <b>Both coastal &amp; freshwater (purple)</b> .	Date Completed	Project Status	Contact Information
Stratified-Drift Aquifer Assessment & Mapping	This statewide project mapped and evaluated the following characteristics of stratified-drift (sand and gravel) aquifers: materials, hydraulic characteristics, saturated thickness, ground-water flow directions, potential yields, and ambient water quality. For more information go to <a href="http://nh.water.usgs.gov/">http://nh.water.usgs.gov/</a>	1995	Complete	Tom Mack USGS 226-7805  Rick Chormann NHGS 271-1975
Bedrock Aquifer Resource Assessment	This statewide project mapped surface fracture traces (lineaments), established relationships between bedrock well yields and fracture, geologic, and physiographic characteristics, mapped bedrock well-yield probabilities and assessed ambient water quality characteristics of bedrock aquifers throughout the state. For more information go to <a href="http://nh.water.usgs.gov/projects/">http://nh.water.usgs.gov/projects/</a>	2001	Complete	Richard Moore USGS 226-7825

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Ground Water Sustainability in the Seacoast Region	<p>The project resulted in the development of the following products:</p> <ul style="list-style-type: none"> <li>• Groundwater model of 160 square miles of the Seacoast Region (USGS SRI 2008-5222)</li> <li>• Water use estimates for 2003 and projected water use estimates for the years 2017 and 2025 for 44 seacoast towns (USGS SRI 2007-5157)</li> <li>• Seamless digital surficial geology map for 44 towns in the seacoast (available at <a href="http://www.granit.unh.edu/">www.granit.unh.edu/</a>)</li> <li>• A database of water wells, boring logs, and monitoring wells for the 44 towns in the seacoast region (available only by contacting the NHGS)</li> <li>• A depth to bedrock map for the 44 towns in the seacoast region (available only by contacting the NHGS)</li> <li>• A GIS -based water availability analysis for any catchment delineated in Seacoast Region (see “Stressed Basins Project” below or for more information go to <a href="http://des.nh.gov/organization/commissioner/gsu/nhhdps/stressed_basins.htm">http://des.nh.gov/organization/commissioner/gsu/nhhdps/stressed_basins.htm</a>)</li> <li>• Maps of potential groundwater recharge under normal and dry hydrologic conditions in the Seacoast Region (available only by contacting NHGS)</li> <li>• Maps of estimated saturated and unsaturated groundwater storage are currently under development</li> </ul>	2009	All work has been completed. Work completed by USGS has been published. Work completed by NHGS has not been published to date.	<p>Ted Diers NHDES 271-7940</p> <p>Keith Robinson USGS 226-7807</p> <p>Rick Chormann NHGS 271-1975</p>

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STATEMAP Cooperative Geological Mapping Program	<p>The New Hampshire Geological Survey (NHGS) participates in the USGS Cooperative STATEMAP geological mapping program. The NHGS is able to match federal dollars to perform geological mapping in New Hampshire at the 1:24,000 scale, which is the national standard for detailed mapping. This program concentrates on mapping of surficial geology, which comprises the base data for aquifer maps that are available for the state. NHGS cooperates with local governments to facilitate mapping to meet the needs of communities. For example, NHGS has partnered with Antrim, Dublin, Hanover, Gilmanton, and Lyme. STATEMAP products will also be integrated into the Seacoast Ground Water Availability Study. A description of the NH program is at <a href="http://des.nh.gov/organization/commissioner/gsu/gmp/categories/overview.htm">http://des.nh.gov/organization/commissioner/gsu/gmp/categories/overview.htm</a></p>	Ongoing	Currently 100 out of 213 quads (tiles) are mapped at 1:24,000 scale for NH, which represents 47% of the state's area.	Rick Chormann NHGS 271-1975
Ground Water Monitoring Network	<p>The NHGS, NHDES and the USGS routinely collect water level measurements from approximately 60 wells located throughout the state. The data are used by many state agencies, including the Governor's Drought Management Task Force. The majority of the data is shared with the USGS, and is available at <a href="http://nh.water.usgs.gov/WaterData/index.htm">http://nh.water.usgs.gov/WaterData/index.htm</a>. In 2011, NHDES will develop a web page to post the data not available from the USGS.</p>	Ongoing	On-going data collection in stratified-drift wells. NHGS installed 9 additional bedrock wells in 2008/09, some of which will be instrumented with digital data loggers during the spring/summer of 2011	Rick Chormann NHGS 271-1975  Brandon Kernen NHDES 271-0660  Keith Robinson USGS 226-7807
Hydraulic Fracturing of Drilled Water Wells in Crystalline Rocks in New Hampshire	<p>This study was completed by State Geologist Glenn Stewart, in cooperation with NH Department of Resources and Economic Development and University of New Hampshire. This study demonstrated that hydrofracturing (mechanically cracking a rock formation using high-pressure injection of water and additives) bedrock water wells could enhance yields.</p>	1977	Complete	Rick Chormann NHGS 271-1975

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Water Well Inventory Program	<p>Since 1984, water well contractors in New Hampshire have been required to submit a well completion report to the N.H. Water Well Board within 90 days of the construction of any new water well. No state-issued permit is required before the well is drilled, so the process is strictly one of after-the-fact reporting, with the construction itself subject to a set of performance standards and minimum specifications. From the beginning, the focus has been on digital data storage/retrieval and geo-referencing to enable the data to be used in a geographic information system (GIS) environment. The resulting database (more than 119,000 well records, 55 percent of which are geo-referenced) has been used to support statewide hydrogeologic investigations (i.e., stratified-drift and bedrock aquifer assessments and surficial geologic mapping) and continues to be used extensively as the state's most readily accessible and comprehensive source of subsurface hydrogeologic information. The database is available at <a href="http://www2.des.state.nh.us/DESOnestop/BasicSearch.aspx">http://www2.des.state.nh.us/DESOnestop/BasicSearch.aspx</a>.</p>	Ongoing	Ongoing data collection	Rick Chormann NHGS 271-1975
Favorable Gravel Well Analysis	<p>This GIS-based tool was developed to identify areas of high potential for future municipal gravel wells. It uses the stratified-drift aquifer data and a variety of land use information to identify sites which would meet current regulations for municipal well siting. Municipalities are encouraged to use this information to plan for the protection of future water supply sources. The 2011 update shows how much aquifer area has been lost to development in the intervening years.</p>	1999 Revised 2011	Complete	Paul Susca NHDES 271-7061  Pierce Rigrod NHDES 271-0688
Surface Water Flow Monitoring Network	<p>USGS maintains stream gages on a number of streams throughout New Hampshire. Up-to-date and historical information from these gages is available on the USGS website. This information is the basis for regulatory decision making, planning and research. In addition there is a great deal of water level information on reservoirs that are controlled by state-owned dams. Up-to-date information on these reservoirs is available through the DES Dam Bureau. USGS web site: <a href="http://waterdata.usgs.gov/nh/nwis/current/?type=flow">http://waterdata.usgs.gov/nh/nwis/current/?type=flow</a></p>	Ongoing	Ongoing	Keith Robinson USGS 226-7807  Jim Gallagher NHDES 271-3501

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Instream Flow Statistics and Water Use Summaries for Watersheds of Designated Rivers	Studies of flow statistics and water use for watersheds of designated rivers were done during development of instream flow rules and as a requirement of Env-Ws 1902. For more information go to <a href="http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/flowstats.htm">http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/flowstats.htm</a> and <a href="http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/studies.htm">http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/studies.htm</a>	Ongoing	Ongoing, summaries and reports available online	Wayne Ives NHDES 271-3548
Flood Forecasting and Reservoir Operations Modeling	DES has developed Flood-Forecasting and Reservoir Operations models for many of the river basins on which DES owns and operates state-owned dams. These include the Winnepesaukee, Pemigewasset, Baker, Newfound, Piscataquog, Mascoma, Salmon Falls, Powwow, and Suncook river basins. During precipitation events, DES water control managers use the models to predict, on a real-time basis, the amount of runoff that will flow into the basin based on the rainfall data obtained from radar imagery as well as data collected by the rain gages in the basin. They then use the operations component of the models to simulate the operation of the water control structures within the basins, and optimize the operation of those structures for flood control, recreation, fish and wildlife enhancement, and hydroelectric power.	2003	Ongoing	Jim Gallagher NHDES 271-1961
Flood-flow Frequency of New Hampshire Streams	The USGS, in cooperation with the New Hampshire Department of Transportation, developed equations for estimating flow frequency. The equations were incorporated into a web-based tool that allows users to choose locations on an interactive map, obtain the basin and climatic characteristics that are required by the regression equations, and solve the equations (USGS SRI 2008-5206). The web-based tool is available at <a href="http://water.usgs.gov/osw/streamstats/new_hampshire.html">http://water.usgs.gov/osw/streamstats/new_hampshire.html</a> .	2008	Complete	Scott Olson USGS 226-7815
Watershed Recharge, and Low Flow Characteristics	This statewide project developed methods and GIS tools for estimating groundwater recharge in NH watersheds and for estimating the low-flow characteristics of NH rivers and streams. For more information go to <a href="http://nh.water.usgs.gov/">http://nh.water.usgs.gov/</a> (USGS WRI 02-4298, OFR 2005-1172 & SIR 2004-5019)	2005	Complete	Robert Flynn USGS 226-7824

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Watershed Restoration Plans	Based on EPA guidance under Clean Water Act Section 319, DES worked with several watershed organizations to develop watershed restoration plans for impaired waters. The plans include establishment of a water quality goal based on water quality standards and a quantitative approach to reaching the goal. BMPs are specified along with costs and load reduction estimates. For the completed plans, see <a href="http://des.nh.gov/organization/divisions/water/wmb/was/watershed_based_plans.htm">http://des.nh.gov/organization/divisions/water/wmb/was/watershed_based_plans.htm</a>	Various	Ongoing	Eric Williams NHDES 271-2358
Water Use Registration and Reporting Program	Since 1987, all facilities that use 20,000 gallons or more of water per day averaged over any 7-day period, or 600,000 gallons during any 30-day period, must register with DES. These facilities include, but are not limited to, public water suppliers, industrial water users, irrigators, ski areas with snowmaking capability, wastewater treatment plants, and hydroelectric power plants. Registered water users must measure, record and report monthly water use totals for each source or destination on a quarterly basis, or once annually if use is for snowmaking or irrigation. The database currently contains approximately 800 active registered facilities with over 1,700 active sources and destinations. For more information go to <a href="http://des.nh.gov/organization/commissioner/gsu/wurpp/index.htm">http://des.nh.gov/organization/commissioner/gsu/wurpp/index.htm</a>	Ongoing	On-going	Rick Chormann NHGS 271-1975  Derek Bennett NHDES 271-6685
Verification of Water Use in the Merrimack River Watershed	Water use in the Merrimack River watershed was examined by DES and the Massachusetts Department of Environmental Protection. Quantitative and descriptive data about water use were collected from those facilities that were either known or presumed to withdraw water within the watershed. The results were analyzed and compiled in order to create a database that combines measured water withdrawals with estimated withdrawals for all facilities whose self-supplied water use exceeds 20,000 gallons per day. Records for individual facilities were then aggregated by category of use, type of water source, and season of use for each of 54 sub-basins comprising the entire Merrimack River watershed and published in a final report. The determination of water use within the watershed allows the development of plans for water resource management and conservation to protect the Merrimack River watershed from unnecessary stress and dewatering impacts.	1997	Complete	Rick Chormann NHGS 271-1975

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Historical Legislative Water Authorizations	Pursuant to Chapter 307 Laws of 1993, DES researched and compiled a list of past legislative authorizations of water withdrawals. Historic authorizations were matched with currently registered water users and their sources in order to identify those that could not be conclusively associated with a registered user or currently active withdrawal.	1999	Complete	Rick Chormann NHGS 271-1975
Water Budget Methodologies	DES conducted a literature search and evaluation of different approaches for quantifying water availability within a specific hydrologic unit, including trial application of selected methods. The research was documented in a 2-volume final report.	1989	Complete	Rick Chormann NHGS 271-1975
New Hampshire Hydrography Dataset	NHGS became the official state steward of the National Hydrography Dataset (NHD) under a formal agreement with USGS in 2008 and will also become official steward of the Watershed Boundary Dataset in 2011. NHD represents the state's surface water features as a fully connected network within a GIS and defines relationships between features that orient flow in a continuously downstream direction. It provides a systematic frame of reference for a multitude of features of hydrologic interest such as dams and water withdrawals. NHGS has been awarded a grant from USGS to research methods to enhance the accuracy and completeness of the network using high resolution elevation data (LiDAR) and digital orthophotography (for more information go to <a href="http://des.nh.gov/organization/commissioner/gsu/nhhdpcategories/overview.htm">http://des.nh.gov/organization/commissioner/gsu/nhhdpcategories/overview.htm</a> )	Ongoing	Ongoing	Rick Chormann NHGS 271-1975

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Water Related Geographic Information System and OneStop	DES and other partners have developed a geographic information system (GIS), which allows users to locate and analyze resource and facility data (e.g. hydrography, aquifers/geology, regulated facilities, etc.) related to water resource management and protection. In particular, DES has been instrumental in promoting and obtaining funding for development of a statewide digital hydrographic network data layer to support many different water resources analysis and cataloging activities. Some examples of important GIS based projects are the identification of future potential gravel wells, the assessment of watersheds and drinking water source protection areas and the determination of recharge to streams. This geographic information system is part of GRANIT, the statewide GIS. DES has also developed a web-based tool called OneStop where facility, permitting and GIS information can be obtained. For more information go to <a href="http://des.nh.gov/onestop/index.htm">http://des.nh.gov/onestop/index.htm</a>	Ongoing	GIS available to users via the internet. New uses and analysis constantly emerging	George Hastings NHDES 271-0399
Drinking Water Source Assessments	All of New Hampshire's 3000+ sources of public drinking water (wells and surface water) were assessed for their vulnerability to contamination. This project involved delineation of protection areas for each source, inventory of land use within each protection area, and ranking of vulnerability. For rivers it also involved time-of-travel studies and for lakes and reservoirs nutrient modeling. This information is being used by DES and municipalities to further protection efforts. For more information go to <a href="http://des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm">http://des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm</a>	January 2003	Complete	Paul Susca NHDES 271-7061
Estimating Withdrawal and Return Flow by Census Block for New Hampshire	This study estimated 2005 and 2020 water demand by census block for the state as part of the State Water Plan process.	2009	Completed	Marilee Horn USGS 226-7806
Trends in water levels in the bedrock aquifer	NHDES, USGS and NHGS studied the trend in observed water levels in bedrock wells constructed from 1984-2007. A report was published in 2010. See OFR 2010-1189.	2010	Completed	Brandon Kernen NHDES 271-0660

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Stressed Basins Project	This study developed a “water balance index” as an indicator of hydrologic stress and calculated the index for thousands of small (0.5 sq. mi.) catchment units in the state. The index takes into account total net water withdrawals as compared to summer stream low flow, and identifies sub-watersheds having or expected to have relatively high levels of hydrologic stress (for more information go to <a href="http://des.nh.gov/organization/commissioner/gsu/nhdp/stressed_basins.htm">http://des.nh.gov/organization/commissioner/gsu/nhdp/stressed_basins.htm</a> )	2011	Completed except for report preparation and web site	Rick Chormann NHGS 271-1975
N.H. Wetlands and Waters: Results of the National Wetlands Inventory	Inventory of wetlands based on interpretation of aerial photography conducted in the mid-1980s.	2007		U.S. Fish & Wildlife Service Hadley, MA
Fluvial Erosion and Geologic Hazards Evaluation	In cooperation with the Department of Safety, this statewide project maps and evaluates those areas adjacent to river channels that are susceptible to fluvial erosion hazards for public safety protection, recognizing that life, property, and infrastructure near rivers are at considerable risk during high flow events. The delineation of fluvial erosion hazard zones is dependent upon field geomorphic assessments where the condition of river banks and beds are evaluated to determine erosion potential. These assessments also provide valuable data on conditions that exist in river channels such as excessive sedimentation, or poor aquatic habitat, which can be used by state water resources managers to characterize aquatic habitat and water resource quality. More information about this program can be found at: <a href="http://des.nh.gov/organization/commissioner/gsu/fegh/index.htm">http://des.nh.gov/organization/commissioner/gsu/fegh/index.htm</a> .	Ongoing	Ongoing	Shane Csiki NHGS 271-2876

## Water Quality Assessment Projects

Project Name	Water Quality Assessment Project Description Color Key: <b>Groundwater Projects (Blue)</b> , <b>Surface Water (Black)</b> , <b>Both (Green)</b> , <b>Coastal (Orange)</b> , <b>Both coastal &amp; freshwater (purple)</b> .	Date Completed	Project Status	Contact Information
Occurrence & Distribution of MTBE in Public and Private Wells in NH	This project included sampling and analysis of water from over 500 randomly selected public and private wells throughout the state. Data were statistically analyzed to determine extent of contamination and relation of contamination to environmental and land use factors. For more information go to <a href="http://nh.water.usgs.gov/projects/summaries/mtbe_nh.htm">http://nh.water.usgs.gov/projects/summaries/mtbe_nh.htm</a>	2007	Complete	Joseph Ayotte USGS 226-7810
Probability of Arsenic in Ground Waters of New England	A New England-wide statistical model of arsenic levels in bedrock waters. For more information go to <a href="http://nh.water.usgs.gov/projects/summaries/nci_bladder.htm">http://nh.water.usgs.gov/projects/summaries/nci_bladder.htm</a>	2006	Complete	Joseph Ayotte USGS 226-7810
Arsenic Contamination in Private Bedrock Wells in Southeast NH	This project included sampling and analysis of water from 400 randomly selected private wells for arsenic in Southeastern NH. For more information go to <a href="http://pubs.usgs.gov/fs/fs-051-03/">http://pubs.usgs.gov/fs/fs-051-03/</a>	2004	Complete.	Joseph Ayotte USGS 226-7810
Determining the Source of Salinity in New Hampshire Ground Water Using Br/Cl Ratios	This study was conducted for the NH Department of Transportation to assist them with determining the source of salinity (chloride) in water wells that may have been impacted by road salting. Bromide-to-chloride ratio was used to fingerprint salt sources. Limited geochemical data suggested that road salting did not impact a well in question, and that the source of chloride is most likely trapped formation water or other contamination.	2002	Project complete, report available from NHGS	Rick Chormann NHGS 271-1975
Pathogens in Public Drinking Water Wells	A multi-state study was done to evaluate the occurrence and causes of pathogens, in particular viral indicators, in public drinking water wells. The result of this study was that the occurrence was low and did not correlate with suspected sources (land uses such as septic systems, etc.)	2002	Completed	Rick Skarinka NHDES 271-2948
Ground Water Quality and Geology	NHGS has partnered with two communities where recent bedrock and surficial geological mapping has been completed. The comprehensive geologic database provided by mapping, coupled with the Water Well Inventory database, allowed wells within the mapped area to be selected for sampling to evaluate the inorganic water chemistry for individual geologic formations. Water analyses costs are supported by the towns. Presently NHGS has worked with Hollis and Dublin, NH.	2009	Complete	Rick Chormann NHGS 271-1975

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Methane in Ground Water in NH	NHGS collected water samples for isotopic and major ion chemistry to ascertain the source of methane in deep wells in NH. Partnering with USGS, a comprehensive geologic and hydrogeologic evaluation of a deep borehole in NH resulted in a published report: Bedrock, Borehole, and Water-Quality Characterization of a Methane-Producing Water Well in Wolfeboro, New Hampshire, by Degnan and others, (USGS OFR 2008-1333).	2008	A report by Degnan and others, (USGS) published in 2008.	Jim Degnan USGS VT/NH 226-7807  Rick Chormann NHGS 271-1975
Assessment of Pesticides in Drinking Water of Daycares and Schools	NHDES collected water samples at 49 daycares and schools. The samples were analyzed by laboratories contracted by the US Department of Agriculture. The samples were analyzed for over 100 pesticides or pesticide by-products at part-per-trillion concentrations. A summary of the results has been prepared.	2011	Completed	Brandon Kernen NHDES 271-0660
Assessment of Perchlorate in Drinking Water of Public Water Systems	NHDES coordinated a voluntary program for water systems to test their drinking water sources for perchlorate. Approximately 150 water sources were sampled as part of this project. A list of the sampling results has been prepared.	2005	Completed	Brandon Kernen NHDES 271-0660
Assessment of 1,4-Dioxane in Drinking Water of Public Water Systems	NHDES coordinated a voluntary program for water systems to test their drinking water sources for 1,4-dioxane. To date, 90 water sources have been sampled as part of this project. A list of the sampling results will be prepared.	Ongoing	In progress, target completion date 12/2011.	Brandon Kernen NHDES 271-0660
Geothermal/Drinking Water Dual Use Water Quality Evaluation	NHDES in coordination with USEPA will collect water samples from water supply wells that are used both as a drinking water source and as a source or sink for heat for geothermal processes. The project will assess whether withdrawing water from a well and returning water to the same well affects water quality.	Ongoing	In progress, target completion date 12/2012.	Steve Roy NHDES 271-3918
Pharmaceuticals and Personal Care Products in Groundwater Near Long-Term Care Facilities	NHDES in coordination with USGS and USEPA will collect groundwater samples from monitoring wells surrounding a septic tank and leach field at a long-term health care facility. The project will assess the occurrence of pharmaceuticals and personal-care products in groundwater.	Ongoing	In progress, target completion date 12/2012	Brandon Kernen NHDES 271-0660

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Bedrock Well Borehole Modification/ Water Quality Alteration Project	NHDES and the USGS completed a project to assess if water quality derived from discrete water bearing fractures in bedrock wells could be characterized and then the borehole of the well modified to selectively take water from fractures with better water quality. The study results for three test sites are published by USGS in OFR 2011-1019. The results for three other test sites are available by contacting NHDES.	2010	Completed	Steve Roy NHDES 271-3918
Pharmaceuticals and Personal Care Products in the Merrimack River Basin	The University of New Hampshire and the USGS collected surface water samples throughout the Merrimack River Watershed. The samples will be tested for pharmaceuticals and personal care products. The project will complete a pharmaceutical and personal care product loading analysis for the watershed. The project will also assess the effectiveness of innovative drinking water treatment technology in removing these contaminants from water.	Ongoing	In progress, target completion date 12/2012.	Robin Collins University of NH 862-1407
Assessment of Bedrock Wells Under the Influence of Surface Water	NHDES assessed whether water from bedrock water supply wells located close to surface water contains contaminants associated with surface water.	2010	Completed	Steve Roy NHDES 271-3918
Trends in sodium and chloride concentrations in water supply wells	The USGS is studying trends over time in chloride and sodium concentrations in water supply wells in New Hampshire using existing data. This study will identify areas of the state at known or potential risk for elevated chloride and sodium concentrations.	Ongoing	In progress, target completion date 12/2011.	Joseph Ayotte USGS 226-7810
Catalog of NH water bodies	A catalog of NH water bodies is being developed to facilitate information sharing about water quality data, water body characteristics, and water quality assessments. A preliminary catalog at 1:24,000 scale is complete and available online as part of the 2010 Surface Water Quality Assessment ( <a href="http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/index.htm">http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/index.htm</a> ).	Ongoing	Ongoing	Ken Edwardson NHDES 271-8864
305(b)/303(d) Surface Water Quality Assessments	Surface water quality assessments (SWQAs) involve analyses of existing water quality data to determine if the surface waters are healthy, (i.e., meeting water quality standards), impaired, threatened or if there is insufficient information to make an assessment. Assessments are conducted every 2 years in accordance with RSA 485-A:4, XIV, and the federal Clean Water Act [Sections 305(b) and 303(d)]. Assessment decisions are made in	303(d) List finalized April 2010; 305(b) watershed report	Ongoing	Ken Edwardson NHDES 271-8864

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	<p>accordance with criteria specified in a document called the Consolidated Assessment and Listing Methodology (CALM). An assessment database (ADB) is used to conduct and track assessment status. To facilitate assessments and reporting, surface waters have been subdivided into over 5,200 open water segments and nearly 24,000 wetland segments called Assessment Units (AUs). Information stored in the ADB for each AU is spatially linked to allow preparation of maps and use of GIS analysis tools. Draft SWQA results are made available for public comment.</p>	<p>cards issued June 2010</p>		
<p>Lake Assessments</p>	<p>Lake Monitoring</p> <p>NH DES operates a number of lake monitoring programs. The overall goal is to assess current conditions and trends in order to determine if the existing regulatory framework is sufficient to protect lake water quality or, conversely, if new controls are needed. The data is also used to educate the public about lakes and how to protect them.</p> <p>Lake Trophic Surveys were conducted on NH lakes from the mid-1970s through 2006. The lakes were sampled in both winter and summer for various physical, chemical, and biological parameters. The data provided information on current baseline conditions, long-term trends, and water quality compliance, and were used to classify the lakes according to trophic condition. The surveys also provided information on acid rain impacts and aquatic nuisance and exotic weed distributions. Most NH lakes were surveyed at least once and trophic reports are available upon request.</p> <p>Probability-based sampling of lakes was initiated in 2007 in conjunction with EPA's National Lake Assessment and New England Lake and Pond projects. A total of 50 randomly-selected lakes was sampled during the 2007 through 2009 period to allow for an unbiased assessment of overall lake condition. Lake condition assessments are based not only on water chemistry and bacteriology but on shoreline habitat and on the health of various biological communities (phytoplankton, zooplankton and macroinvertebrates).</p> <p>The Acid Rain-Lake Outlet Monitoring Program samples twenty accessible lake outlets twice each year, during the spring and fall overturn, for acid rain related parameters. Both short and long-term trends of the impacts of acid rain on non-remote lakes are documented. Trend data is available since</p>	<p>Ongoing</p>	<p>Ongoing</p>	<p>Jody Connor NHDES 271-3414</p>



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	<p>assessment so that a state-wide assessment can be made.</p> <p>Instream Macroinvertebrate / Fish Monitoring Bioassessments:  Biosassessments typically examine species richness, species composition, population size and trophic composition of resident aquatic organisms. Such information may help to reveal if aquatic organisms are adversely impacted by the integrated effects of different pollutant stressors over long periods.</p> <p>In 1995 DES received a grant from the EPA to initiate a long-term biological monitoring program. The DES biomonitoring program utilizes GIS-based information in order to select non-impacted “reference” sites as well as impacted or “impaired” sites each year. Potential sites are selected based on road density, population statistics, adjacent land uses, and proximity to facilities such as wastewater treatment plants, landfills, and state/federal superfund sites. Sites are then randomly selected out of the candidate pool. Approximately 150 “reference” sites have been biologically assessed since 1995 and some “stressor” sites are beginning to be selected in order to have a complete range of water quality conditions in New Hampshire for development of numerical biological criteria.</p>	Ongoing	Ongoing	
Multimetric Biological Index for Wadeable Streams (macroinvertebrates)	As part of the state’s requirement for assessing water bodies for Aquatic Life Use under the Federal Clean Water Act, a multimetric index of wadeable stream biological integrity has been developed for macroinvertebrates by the biomonitoring program. The index uses data collected since 1997 and incorporates GIS assessments of all watersheds sampled coupled with a complex statistical analysis of the responses by aquatic communities as related to the level of human disturbance. The result is an index that includes characteristics of aquatic communities that best describe water quality and the establishment of benchmarks indicative of impaired and unimpaired water bodies.	Complete	Complete	David Neils NHDES 271-8865
Stream Classification System	To facilitate biological index development the biomonitoring program has developed a stream classification system for fish and macroinvertebrates. It is hopeful that the system will eventually also be used for the full implementation of the state’s dissolved oxygen criteria	Complete	Complete	David Neils NHDES 271-8865
Ambient River Monitoring Program	DES has historically conducted ambient monitoring of rivers and streams. Approximately 300 samples are usually taken each year from approximately 100 stations, including 17 trend monitoring stations. Samples are analyzed for a variety of parameters. Data is primarily used to determine if a surface	Ongoing	Ongoing	Ted Walsh NHDES 271-2083

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	water is impaired or meeting water quality standards, and for trend analyses.			
Volunteer Assessment Programs	<p>Water quality information collected by volunteers is a valuable addition to DES monitoring programs, as well as a valuable outreach and education tool. The volunteers usually live near the water body they monitor, and possess an intimate knowledge of the history and present condition of the watershed area. Volunteers alert DES of water quality threats and potential violations for investigation. Volunteer data is used to gain an idea of water quality at times and locations not covered by DES sampling programs. With rigorous training and appropriate Quality Assurance/Quality Control (QA/QC), volunteer data can supplement the ambient sampling program and help build a strong set of baseline data statewide. Volunteer monitoring can result in the early detection of water quality changes, allowing DES to trace potential problems to their source before a more severe impact occurs.</p> <p>Volunteer Lake Assessment Program (VLAP): was initiated in 1985 in response to an expressed desire of lake associations to be involved in lake protection and watershed management. The program has grown to approximately 500 volunteer monitors collecting water quality data at approximately 175 lakes each year.</p> <p>The Volunteer River Assessment Program (VRAP): was initiated in 1998 to promote education and awareness of the importance of maintaining water quality in New Hampshire's rivers and streams. Today, over a dozen volunteer groups monitor rivers throughout the state and provide critical water quality data to the state to assist in assessing the ecological health of our rivers. Recently, a pilot program has been developed that allows volunteers to utilize a rapid field protocol for the collection of freshwater macroinvertebrates (VBAP). The protocol will be used to complete "screening-level" assessments of aquatic macroinvertebrate communities in wadeable streams and assist in making decisions on where detailed investigations must be completed. Six volunteer groups are participating in the pilot.</p>	Ongoing	Ongoing	<p>VLAP Jody Connor NHDES 271-3414</p> <p>VLAP Sara Steiner NHDES 271-2658</p> <p>VRAP Ted Walsh NHDES 271-2083</p> <p>VBAP David Neils NHDES 271-8865</p>

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Nutrient Criteria Development	<p>Large amounts of nutrients in surface water can lead to excessive growths of algae and other aquatic plants and make the surface water undesirable for uses such as swimming or fishing. Most states, like NH, have narrative water quality standards for nutrients such as nitrogen and phosphorus. EPA, however, now wants states to adopt numeric water quality standards for nutrients. To help DES determine appropriate numeric nutrient limits, DES has formed stakeholder workgroups to develop nutrient criteria for lakes and estuaries. Development of draft criteria for these water bodies is well underway. For rivers, work conducted by other states suggests that nutrient criteria are largely controlled by the health of the benthic aquatic community.</p>	Ongoing	Ongoing	<p>Gregg Comstock NHDES 271-2983</p> <p>Dave Neils NHDES 271-8865</p> <p>Phil Trowbridge NHDES 271-8872</p>
Watershed pollutant load allocation studies (TMDLs and Diagnostic Feasibility Studies)	<p>In this ongoing program, pollutant load modeling studies are conducted to estimate the relative contributions of pollution sources to water quality impairments or threats. Diagnostic Feasibility Studies estimate phosphorus loading to lakes. DES has a library of approximately 20 completed studies and can be made available by contacting the Clean Lakes Program. A subset of recent Diagnostic Feasibility Studies can be found at (<a href="http://des.nh.gov/organization/divisions/water/wmb/cleanlakes/graphics/index.htm">http://des.nh.gov/organization/divisions/water/wmb/cleanlakes/graphics/index.htm</a>)</p> <p>Total Maximum Daily Load Studies (TMDLs) are comprehensive water quality studies required by the federal Clean Water Act for most impaired waters. The studies identify the sources of pollutant loadings and the necessary reductions from each source to meet water quality standards. DES has completed numerous TMDLs to date including a regional mercury TMDL with the Northeast States and the New England Interstate Water Pollution Control Commission to address the statewide mercury fish consumption advisories due to elevated levels of mercury in fish tissue. Most of the mercury is from atmospheric deposition. With EPA Contractor assistance, DES is currently working on 30 lake phosphorus TMDLs that are impaired for swimming use because of excessive growths of algae or cyanobacteria and a statewide bacteria TMDL. In addition, DES is working with the U.S. Army Corps of Engineers and several communities to develop a TMDL for dissolved oxygen and nutrients along the Merrimack and Pemigewasset Rivers. Funding for this project is 75% federal and 25% other and is expected to be completed by 2012. For more information go to</p>	Ongoing	Ongoing	<p>Andy Chapman NHDES 271-5334</p> <p>Lakes Jody Connor NHDES 271-3414</p> <p>Rivers Gregg Comstock NHDES 271-2983</p> <p>TMDL Coordinator Peg Foss NHDES 271-5448</p> <p>Estuaries Phil Trowbridge NHDES 271-8872</p>

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	<a href="http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm">http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm</a>			
Connecticut River Sediment Quality Evaluation	In summer, 2000, EPA and its contractor, in cooperation with DES, VTDEC and the Connecticut River Joint Commissions sampled sediment at 100 locations from the Connecticut Lakes to the Mascoma River. Samples were analyzed for toxics, and a screening assessment of the potential for ecological risk was made and presented at public meetings. The data are available at DES or EPA Region 1.	June 2002	Complete	Paul Currier NHDES 271-3289
Connecticut River Nitrogen Action Plan	Following EPA's approval of the Long Island Sound (LIS) Dissolved Oxygen Total Maximum Daily Load (TMDL) in 2001, the New England Interstate Water Pollution Control Commission (NEIWPC) established the Connecticut River Nitrogen Workgroup in order to develop scientifically-defensible nitrogen load allocations, as well as an implementation strategy, for the Connecticut River Basin in Massachusetts, New Hampshire, and Vermont ("upper states"), which are consistent with TMDL allocations established for LIS. NEIWPC is coordinating with the "upper states" on providing input to the revised load allocations and implementation plan for the new TMDL.	Ongoing	Ongoing	Gregg Comstock NHDES 271-2983  Beth Card NEIWPC 978-323-7929
Assessment of Nitrogen in the Upper Connecticut River Basin, New Hampshire, Vermont, and Massachusetts	The objective is to assess nitrogen loads in the Upper Connecticut River by determining the amount of nitrogen originating from various sources and regions in the 3 states. For more information go to <a href="http://nh.water.usgs.gov/projects/summaries/ct_nload.htm">http://nh.water.usgs.gov/projects/summaries/ct_nload.htm</a>	2006	Complete	Jeff Deacon USGS 226-7812
New England SPARROW Water Quality Models	These are statistical water-quality models estimating nitrogen and phosphorus amounts in New England rivers and streams. For more information go to <a href="http://nh.water.usgs.gov/projects/sparrow/index.htm">http://nh.water.usgs.gov/projects/sparrow/index.htm</a>	2005	Complete	Richard Moore USGS 226-7825
Water Quality Database	Fashioned after EPA's STORET database, an Oracle database was created in March 2003 to store water quality related data. Data from many programs across DES (VRAP, TMDL, non-point source investigations, site remediation, VLAP, lake survey, shellfish, etc.) have been standardized and imported into the database. Data from other entities (such as UNH, NHDoT, and other monitoring groups) are also incorporated in the database. The hope	Ongoing	Ongoing	Deb Soule NHDES 271-8863

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	is to work cooperatively with agencies and organizations that collect and manage water quality data to create a statewide water quality data system.			
Watershed Pollution Source Investigations Providing Assistance and Technical Support to Local Entities and Municipalities	DES staff provide technical assistance to local entities and municipalities in priority watersheds to identify and eliminate pollution sources. Priority is given to urbanized areas where stormwater outfall pipes are surveyed during dry weather to detect direct wastewater discharges. Investigations and continued technical assistance in the Coastal watershed are ongoing and investigations in the Merrimack watershed are in progress.	Ongoing	Ongoing	Coastal Watersheds Rob Livingston NHDES 271-3398  Merrimack Watersheds Steve Landry NHDES 271-2969
Stormwater Characterization Study	In 1996, DES received a federal grant to study stormwater. Specifically, the purposes of this study were to: <ol style="list-style-type: none"> <li>1. Characterize urban stormwater which would be indicative of stormwater runoff from NH communities;</li> <li>2. Determine the quality of rain and its relative contribution to stormwater; and</li> <li>3. Show the effects of urbanization on stormwater quality.</li> </ol> Two closed (piped) stormdrain systems in Concord, NH were sampled for a variety of parameters; one drained a very urbanized area and the other a light, residential site. Seven storms were sampled. Results showed that average concentrations of the majority of the parameters in the urban stormwater were between two to 14 times higher than the residential stormwater. Copies of the final report are available at DES (Stormwater Characterization Study, November, 1997, NHDES-WD-97-12)	1997	Completed	Gregg Comstock NHDES 271-2983
Stormwater Best Management Practice Verification	Working with UNH Jackson Estuarine Laboratory, DES will evaluate the effectiveness of various stormwater treatment technologies by storm event monitoring.	2006	Completed	Sally Soule NHDES 559-0032



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Monitoring Project	contaminants in the tissues of blue mussels at estuarine stations to track water quality trends in NH's estuaries. The NH data is combined with data from the rest of the Gulf of Maine to document pollution gradients in the Gulf. For more information go to <a href="http://www.gulfofmaine.org/gulfwatch/">http://www.gulfofmaine.org/gulfwatch/</a>			NHDES 271-8872
Shellfish Program Monitoring	<p>Routine Monitoring: Water samples are collected for fecal coliform analysis from all shellfish growing waters (approximately 70 sites, sampled 6-12 times per year) to maintain an updated water quality database and annually assess the accuracy of shellfish growing area classifications.</p> <p>Emergency Closure Monitoring: Water and/or shellfish samples are collected for fecal coliform analyses following emergency closures of shellfish growing areas (wastewater treatment plant upsets, severe rainfall events, etc.) to determine when shellfish growing areas may be safely reopened for harvesting</p> <p>Post Rainfall Monitoring: Water and/or shellfish samples are collected for fecal coliform analyses following conditional (i.e., rainfall-related) closures of shellfish growing areas to determine when shellfish growing areas may be safely reopened for harvesting</p> <p>Sanitary Surveys: Sanitary surveys of shellfish growing areas are conducted, in accordance with National Shellfish Sanitation Program guidelines, to classify areas for suitability for shellfish harvesting. Completed surveys include Atlantic Coast (2000), Little Harbor/Back Channel (2001), Hampton Falls and Taylor Rivers (2001), Oyster River (2002), Great Bay (2004), Bellamy River (2005), Little Bay (2005), Cochecho, Salmon Falls, Upper Piscataqua (2006), and Hampton/Seabrook Harbor (2006). Ongoing studies are in Portsmouth Harbor, Lower Piscataqua River, and Rye Harbor.</p> <p>“Red Tide” Monitoring: Weekly shellfish tissue samples are collected from selected locations to monitor for the presence of “red tide,” or Paralytic Shellfish Poison, from April through October.</p> <p>Shellfish Program Wastewater Treatment Plant Dye Studies: The purpose of these dye studies is to develop hydrographic data on the dilution, dispersion, and time of travel of WWTF effluent in estuarine and coastal waters, for the purpose of delineating “safety zones” around WWTF outfalls, in which shellfish harvesting is permanently prohibited. Studies completed in Hampton, Seabrook, Portsmouth, Durham, Exeter, Newfields, Newmarket, Dover, Kittery, and Wallis Sands. Studies are planned for Portsmouth and</p>	Ongoing	Ongoing	Chris Nash NHDES 559-1509

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	Newington.			
Microbial Source Tracking	Working with UNH Jackson Estuarine Laboratory, DES piloted microbial source tracking techniques using DNA analysis to determine bacteria sources in Hampton Harbor. The project resulted in a DNA reference library and institutionalized the capability to perform the required laboratory analysis for future projects at UNH.	2003	Complete. Follow-up projects planned	Sally Soule NHDES 559-0032
NH Coastal Watershed Studies	Over the past 25 years the NH Coastal Program (formerly in the Office of Energy and Planning and the Office of State Planning) has funded over 400 projects related to coastal resources. This includes many watershed assessments such as ones in the Oyster River, Berry's Brook, Winnicut River and Crommet Creek watersheds. The NHCP has also funded reports such as "Assessment of atmospheric nitrogen inputs to Great Bay" and other technical studies of water. These can be found at the DES website searching under "NHCP."	Varies	Ongoing	Ted Diers NHCP 271-7940
Factors Influencing Stream Water Quality in Coastal New Hampshire	Assessed effects of urbanization on the water quality of 10 streams in the seacoast region. For more information go to <a href="http://pubs.water.usgs.gov/sir2005-5103/">http://pubs.water.usgs.gov/sir2005-5103/</a>	2004	Complete	Jeff Deacon USGS 226-7812
NHDES/US Fish and Wildlife Service's Clean Vessel Act and Boat Inspection Programs	DES operates the Clean Vessel Act (CVA) program to protect public waters from the discharge of black and grey water from boats. The state has approximately 25 pumpout facilities and two pumpout boats to service New Hampshire waters. While the CVA provides grants to place pumpout facilities on fresh and coastal waters, the boat inspection program provides enforcement action for non-compliance. The CVA provides a mechanism to pump out sewage from boats while the boat inspection program provides a thorough inspection of the boat plumbing to make sure the boat is compliant with the state's no discharge law. Non-compliant boats are given a 48-hour period to remedy defects or surrender the boat registration.	Ongoing	Ongoing	Jody Connor NHDES 271-3414
Beach Monitoring	Beach Monitoring occurs each summer at over 170 freshwater beaches while weekly monitoring occurs at 14 coastal beaches. Freshwater beaches are monitored for E. coli and cyanobacteria while coastal waters are monitored for Enterococci levels. The program is available to all beach owners throughout the state. The Beach Program focuses on sample collection,	Ongoing	Ongoing	Jody Connor NHDES 271-3414

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	quick analyses, water quality standard evaluation and quick public notification if public bathing beach bacterial standards are exceeded. EPA, DES and Earth911 all maintain websites that give up-to-date information about coastal beaches while DES maintains a website for all public designated beaches within the program. For more information go to <a href="http://www.des.nh.gov/Beaches">http://www.des.nh.gov/Beaches</a>			

## Water Protection/ Planning / Education Projects

Project Name	Water Protection/ Planning / Education Project Description Color Key: <b>Groundwater Projects (Blue)</b> , <b>Surface Water (Black)</b> , <b>Both (Green)</b> , <b>Coastal (Orange)</b> <b>Both coastal &amp; freshwater (purple)</b>	Date Completed	Project Status	Contact Information
Private Well Strategy	The goal of this award-winning initiative is to improve awareness of the need for private well testing and consequently to increase the number of private wells that are tested, expand the range of parameters for which the water is tested, and increase the frequency of testing. From 2001 to 2002, DES produced and distributed fliers and displays to local health officers, and produced and aired a series of radio public service announcements. From 2002 to 2003, DES developed and presented a series of workshops for home inspectors and real estate agents. In 2008 DES convened a working group to consider additional outreach as well as various legislative and regulatory options. The group reported to the Groundwater Commission in 2009. Legislation was introduced but defeated in 2010. Outreach and education efforts continue.	Ongoing	Ongoing	Paul Susca NHDES 271-7061
Water Well Survey	Water well contractors and pump installers are required to hold a license from the Water Well Board to conduct business in New Hampshire. DES and the Board have adopted well construction, placement, and abandonment regulations to protect drinking water quality and groundwater resources. Some communities have also adopted local ordinances pertaining to private wells including permits to construct wells, placement criteria, water quality testing, and minimum quantity needs. In a cooperative effort to gain a comprehensive understanding of local requirements, DES, the Board, the former Office of State Planning, and the NH Water Well Association (NHWWA) have contributed to the mailing and processing of questionnaires to NH towns concerning local regulation of private wells and local water resources protection. Questionnaire returns are entered into a database by DES staff and the information contributes to overall understanding of local water resources management and protection efforts. The NHWWA publishes the information in a booklet to assist licensed water well contractors and pump installers.	First survey completed in 1995, repeated in 2003	Complete	Rick Schofield NHDES 271-1974

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Best Management Practices Guidance Document to Prevent Groundwater Contamination from Activities Associated with Rock Blasting	Provides technical and regulatory information to municipalities and the regulated communities to address potential water quality impacts associated with rock blasting. See <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf</a>	2009	Complete	Brandon Kernen NHDES 271-0660
Land Use and Groundwater Quantity Management Document for Communities	Describes how communities shape groundwater use and land development through local land use planning. See <a href="http://nhgroundwater.com/yahoo_site_admin/assets/docs/toolkitweb.7595616.pdf">http://nhgroundwater.com/yahoo_site_admin/assets/docs/toolkitweb.7595616.pdf</a>	2009	Complete	Brandon Kernen NHDES 271-0660
Groundwater Commission	<p>From 2003-2010, the Groundwater Commission studied and reported on numerous groundwater management issues including:</p> <ul style="list-style-type: none"> <li>• Large groundwater withdrawal permitting regulations in NH;</li> <li>• Legal issues pertaining to groundwater, common law and international trade agreements;</li> <li>• Hierarchy of water uses;</li> <li>• Water use fees;</li> <li>• Protecting water quality to protect water quantity;</li> <li>• Data needs;</li> <li>• Large groundwater withdrawal/financial assurance requirements;</li> <li>• Development of a Pilot Groundwater Use/Land Management Plan; and</li> <li>• Increasing the role of municipalities in regulating groundwater withdrawals.</li> </ul>	2010	Complete	Brandon Kernen NHDES 271-0660

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Sustainability Initiative	<p>The Commissioner of the Department of Environmental Services authorized the Lakes Management Advisory Committee and the Rivers Management Advisory Committee on January 3, 2007 to undertake a Sustainability Initiative to develop environmental and programmatic indicators and recommendations to address eight key tools, strategies, and issues. See:</p> <p><a href="#">The Sustainability of New Hampshire's Surface Waters</a> </p> <p><a href="#">The Sustainability of New Hampshire's Surface Waters Appendix July 2009 Update</a></p>	Ongoing	<a href="#">Project status updated July 2009</a>	Jacquie Colburn NHDES 271-2959
Rivers Management and Protection Program/ River Corridor Management Plans	<p>Pursuant to RSA 483, the Rivers Management and Protection Program was established to formally recognize New Hampshire rivers characterized by outstanding natural, historic, cultural, and economic resources. The intent of the program is to complement and reinforce existing state and federal water quality laws while simultaneously respecting reasonable on-water and off-water uses of the resources associated with designated rivers. The program includes significant interaction with local communities through the development and implementation of river corridor management plans. Sixteen rivers have been designated to date, thirteen river corridor management plans have been created, and two management plans are in progress. For more information go to <a href="http://des.nh.gov/organization/divisions/water/wmb/rivers/index.htm">http://des.nh.gov/organization/divisions/water/wmb/rivers/index.htm</a></p>	Ongoing	Ongoing	Steve Couture NHDES 271-8801
Instream Flow Protection Pilot Program	<p>Under RSA 483 and Chapter 278, laws of 2002, An Instream Flow Protection Pilot Program is in progress to establish protected instream flows on the Souhegan and Lamprey Rivers, and to develop Water Management Plans for these watersheds. The Souhegan pilot began 9/2003, and the Lamprey pilot began in 2004. For more information go to <a href="http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/">http://des.nh.gov/organization/divisions/water/wmb/rivers/instream/</a></p>	Ongoing	To be completed by 10/2011	Wayne Ives NHDES, 271-3548

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Lakes Management and Protection Program/ Guidelines to Lake Management Plans and the Comprehensive Lake Inventory	Pursuant to RSA 483- A, the Lakes Management and Protection Program was established to complement and reinforce existing state and federal water quality laws. The program works with public and private sector lake user groups through the development of lake inventories and management plans. Thirty-two inventories have been or are being developed and one management plan has been developed. For more information go to <a href="http://des.nh.gov/organization/divisions/water/wmb/lakes/index.htm">http://des.nh.gov/organization/divisions/water/wmb/lakes/index.htm</a>	Ongoing	Ongoing	Jacquie Colburn NHDES 271-2959
Lakes Management and Protection Program	Public Trust Doctrine and Lake Management in New Hampshire. This document provides a common understanding of the background of public trust doctrine, how it has been applied in New Hampshire with regards to lake management issues, and what legislation, administrative rules and court rulings exist that impact lake management issues. See: <a href="#">Public Trust Doctrine and Lake Management in New Hampshire</a>	2010	Complete	Jacquie Colburn NHDES 271-2959
New Hampshire Stream Team	The NH Stream Team is an ad hoc group comprising representatives from state and federal agencies, as well as university and private entities. The NHST's primary goal is to advance the use of science in channel restoration and streambank stabilization efforts, and provide a venue for communication among river management stakeholders. This includes developing regional hydraulic reference curves which will enable river managers to properly evaluate and design river channel restoration projects based on regression analyses of fluvial geomorphic data collected at reference sites. It also includes developing a guidelines document for natural stream channel design and streambank stabilization. For more information go to <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-06-37.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-06-37.pdf</a> and <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-06-27.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-06-27.pdf</a>	Ongoing	Ongoing	Steve Couture NHDES 271-8801

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River Basin Planning & Assessment Program Report	Chapter 217 of the Laws of 1993 directed DES to design a river basin planning and resource assessment program and present it to the Governor, Senate President and House Speaker. The purpose of this act was to “further the state’s efforts toward meeting its responsibility to protect public trust interests and to authorize coordinated long-range planning and water management to enable the state to balance various demands for water and increase the likelihood that existing and future water-use demands will be met.” A progress report was presented in 1994, and with Chapter 208 of the Laws of 1995 DES was authorized and directed to continue and complete the design of such a program.	1996	Report completed	Paul Currier NHDES 271-3289
River Restoration – Dam Removal and Alteration	DES has coordinated the removal of unsafe or unwanted dams in the state, which are no longer needed for water management, to restore rivers to a healthier, free flowing condition, remove public safety hazards, improve water quality, and eliminate barriers to fish and other aquatic species. The work has been done in cooperation with the New Hampshire River Restoration Task Force.	Ongoing	Ongoing	Deb Loiselle NHDES 271-8870
Merrimack River Initiative	The overall goal of the Merrimack River Initiative (MRI) was to develop and implement a Watershed Management Plan that would help restore and maintain the physical, chemical, and biological integrity of the Merrimack River and its watershed to meet existing and future multiple uses and to protect natural resources. New England Interstate Water Pollution Control Commission (NEIWPCC) was involved with the MRI since its inception in 1988 when an agreement to protect the watershed was signed by EPA, NH, MA, and NEIWPCC. With a grant from EPA, NEIWPCC served as coordinator for MRI activities. NEIWPCC worked with NH DES staff to prepare outreach materials, develop the management plan, and cultivate local watershed action through small local involvement grants.	2000	Complete	Beth Card NEIWPCC 978-323-7929

Project Name	<b>Water Protection/ Planning / Education Project Description</b> <b>Color Key: Groundwater Projects (Blue), Surface Water (Black), Both (Green). Coastal (Orange) Both coastal &amp; freshwater (purple)</b>	Date Completed	Project Status	Contact Information
Merrimack River Combined Sewer Overflow and Watershed Assessment Study	The 5 cities on the Lower Merrimack River with combined sewer overflows (CSOs) (Manchester, Nashua, Lowell MA, Greater Lawrence MA, Haverhill MA) received a U.S. Army Corps of Engineers grant in 2001 for a Watershed Assessment Study of the lower Merrimack. The study's purpose was to develop a comprehensive Watershed Management Plan for the lower Merrimack that will guide financial investment in water quality improvements, integrating the requirement for CSO abatement with other water quality issues. Camp, Dresser and McKee, under contract to the Corps, conducted the \$2M study which consists of water quality monitoring and modeling from Manchester to the sea.	2006	Complete	Paul Currier NHDES 271-3289
Connecticut River Forum	Connecticut River Forum: Comprising New England Interstate Water Pollution Control Commission, CT, MA, VT, and NH, the CT River Forum has been working since 1993 to restore water quality in the CT River Watershed. During FY-97, the Forum compiled a draft report entitled The Health of the Watershed: A Report of the Connecticut River Forum, which summarized the organization's work over the prior four years. The document provided a snapshot of water quality in the Connecticut River basin, and made recommendations for the protection and enhancement of the river and its tributaries. The report encouraged the establishment of a watershed-wide management approach which will consider the cumulative impacts of all activities affecting the river basin. The Connecticut River Fish Tissue Study was a collaborative effort that resulted from the research and assessments of the CT River Forum.	2001	Complete	Paul Currier NHDES 271-3289  Beth Card NEIWPC 978-323-7929

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Winnepesaukee River Basin – Enhanced Septage Capacity Project	The state-owned, DES-operated Franklin Wastewater Treatment Plant (WWTP), which was built to address wastewater disposal needs of the Winnepesaukee River Basin, has increasingly become a regional treatment resource for septage processing. In FY '03, more than half of the septage treated at the Franklin facility originated from communities outside of the Winnepesaukee River Basin Program's service area. To enable the WWTP to continue to provide these much-needed septage treatment services, the plant's solids handling capacity was upgraded with high efficiency dewatering equipment. This \$5 million project was completed in 2007 and replaced the plant's existing, 25-year old dewatering system with high efficiency centrifuges. Septage, along with the wastewater sludge produced at the WWTP, is treated to become biosolids and is recycled to area farms for use as a high nitrate fertilizer for animal feed crops. Additional evaluations including improving the septage and wastewater sludge handling capabilities at the Franklin WWTP and augmenting septage capacity at alternate regional WWTP locations are currently underway. Recommended improvements will be implemented as funding becomes available.	Ongoing	Phase I Dewatering Project completed in 2007, septage and WWTP residuals handling evaluations are ongoing	Sharon McMillin NHDES 934-4032
Winnepesaukee River Basin – Phase II WWTP Improvements Project	This project is designed to prioritize and then implement recommended upgrades to the 30-year old Franklin WWTP in a phased approach that minimizes disruption to ongoing operations and best utilizes available funding. Priority projects include: updating the UV disinfection system for the WWTP discharge to the Merrimack River; modernizing the monitoring/control/communications system that links the treatment plant's operational processes and the sewer collection system remote pumping facilities; and maximizing the energy efficiency of operations.	Ongoing	Ongoing	Sharon McMillin NHDES 934-4032
Wastewater Residuals	A legislative study commission was established under Senate Bill 87 to look at setbacks to designated rivers for the land application of biosolids septage and short paper fiber. Water quality impact is just one of the concerns related to wastewater residual treatment and disposal. There have been a number of studies and initiatives addressing this concern.  A legislative study commission was established under HB 699 to examine the methods and costs of sewage, sludge and septage disposal.	Final Report submitted 7/1/2004  Final Report submitted 11/1/2008	Completed	Patricia Hannon NHDES 271-2758

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Stormwater Phase II Assistance	Federal stormwater management requirements took effect in 2003. Urbanized municipalities are required to develop and implement local stormwater management plans, construction sites over one acre require a federal permit, and municipally owned industrial facilities require stormwater permits. While DES is not the permitting authority, it provides needed technical assistance to the regulated community. See our web site for more details: <a href="http://des.nh.gov/organization/divisions/water/stormwater/index.htm">http://des.nh.gov/organization/divisions/water/stormwater/index.htm</a>	Ongoing	Ongoing	Jeff Andrews NHDES 271-2984
Exotic Species Program	The primary purpose of the Exotic Aquatic Species Program is to “prevent the introduction and further dispersal of exotic aquatic weeds and to manage or eradicate exotic aquatic weed infestations in the surface waters of the state” (RSA 487:17, II). The DES program has five focus areas: 1) Prevention of new infestations, 2) Early detection of new infestations, 3) Control of established infestations, 4) Research towards new control methods with the goal of reducing or eliminating infested areas, and 5) Regional and national cooperation.	Ongoing	Ongoing	Amy P. Smagula NHDES 271-2248
Water Related Public Outreach and Youth Education Initiatives	There are a variety of water related programs and initiatives throughout the state dedicated to public outreach and youth education. At DES there is a public information office that routinely distributes information. There is also a speaker’s bureau and a variety of annual outreach events. There are many other key players dedicated to water related public outreach including UNH Cooperative Extension and a myriad of river, lake and watershed groups. In terms of youth education, DES sponsors Project WET (Water Education for Teachers) which trains teachers in a water-centered curriculum. There are also a number of water fairs and teacher workshops that DES and others hold annually to target New Hampshire’s youth. The other key players mentioned above are also very involved in youth education efforts. For more information go to <a href="http://des.nh.gov/organization/divisions/water/dwgb/dwspp/educ.htm">http://des.nh.gov/organization/divisions/water/dwgb/dwspp/educ.htm</a>	Ongoing	Ongoing	Public Information Tim Drew NHDES 271-3503  Youth Education Alicia Carlson NHDES 271-4071

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Water Conservation Initiative	This initiative involved developing and promoting four water conservation case studies and other outreach materials including a pamphlet and multiple fact sheets. These materials are available in hard copy or electronically via the DES website and have been used in partnership with WasteCap at workshops. For more information go to <a href="http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm">http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm</a>	2005	Completed	Derek Bennett NHDES 271-6685
Drought Management Plan Revision	In 2011, DES will coordinate the update of the state's Drought Management Plan. The existing Plan was created in 1991. Given the state's experience in recent years with droughts, it is prudent to evaluate and improve the existing process for responding to droughts. A grant of \$250,000 has been awarded by the Department of Safety to assist NHDES with updating the Drought Management Plan.	Ongoing	Initial planning stage	Jim Gallagher NHDES 271-3505
Regional Environmental Planning Program	DES provides funds annually to each of the nine Regional Planning Agencies to implement environmental planning programs. Under the REPP, DES released Innovative Land Use Techniques: A Handbook for Sustainable Development in 2008. REPP funds are used to work with municipalities implementing innovative land use techniques as well as other priority environmental planning projects.	Ongoing	Ongoing	Eric Williams NHDES 271-2358
Regional Water Supply	RSA 485 charges DES with evaluating regional water supply needs. Since the 1950s a number of regional water supply studies have been performed. The most recent is dated 1988: Southern New Hampshire Water Supply Study by Roy Weston Engineers. Under legislation passed in 2001, DES and the PUC undertook a study to examine barriers to regional sharing of drinking water. Subsequent legislation passed in 2003 established a state grant program providing 25 percent reimbursement of costs related to planning, design and construction of facilities for public water system interconnections. In addition, with federal funds from the EPA security grant program, DES has supported several studies examining means of interconnecting public water systems. This program has funded a study of 10 Seacoast communities, communities in the Nashua/Manchester region, and an interconnection between Milford and Wilton, among others. A study of interconnections in the Concord area is ongoing. For more information go to <a href="http://des.nh.gov/organization/divisions/water/dwgb/capacity/pwsg.htm">http://des.nh.gov/organization/divisions/water/dwgb/capacity/pwsg.htm</a>	Ongoing	Legislation passed in 2001  Funding for interconnection grants is determined on a biennial basis and is not included in the current budget.	Rick Skarinka NHDES 271-2948

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Groundwater and Drinking Water Protection Strategy	This strategy was developed to identify what more DES and partners should be doing to protect these resources. In 2009, DES and partners completed the second major update of the plan to improve protection. The plan consists of a number of action items under three broad headings: prevention, education, and resource assessment. Information on the strategy can be viewed at <a href="http://des.nh.gov/organization/divisions/water/dwgb/dwspp/strategy.htm">http://des.nh.gov/organization/divisions/water/dwgb/dwspp/strategy.htm</a>	2009	Completed	Paul Susca NHDES 271-7061
Drinking Water and Wastewater System Security	Drinking Water System Security: Since the terrorist attacks on 9/11/01, DES has assisted with improving security at public water systems. This includes training operators in assessing and addressing water system vulnerability, improving internal and external emergency readiness, and providing grants for source security. NH is also involved in piloting a program to involve local distributors of security equipment in providing low cost supplies to water systems. NH and New England Interstate Water Pollution Control Commission (NEIWPCC) have also been involved in a pilot in Manchester to install and test a state-of-the-art drinking water security monitoring system. <a href="http://www.des.state.nh.us/wseb/EmergencyPlanning/index.asp">http://www.des.state.nh.us/wseb/EmergencyPlanning/index.asp</a>	Ongoing	Ongoing	Johnna McKenna NHDES 271-7016
	Wastewater Treatment Facility Security: With EPA funding, NEIWPCC contracted with a security and wastewater operations firm to assist 13 communities in NH (Nashua, Franklin, Exeter, Manchester, Concord, Keene, Durham, Portsmouth, Merrimack, Rochester, Milford, Claremont, and Lebanon) with Vulnerability Assessments of their wastewater treatment facilities. This was done through three phases of funding from EPA. The contractors reviewed the plants' assets, identified vulnerabilities, and made recommendations for security improvements to protect the facilities from intentional or unintentional threats. Four of the first five selected treatment plants were chosen due to their locations within the Merrimack River watershed (a public water supply system). Additional facilities were selected based on size, potential threat, or recommendation of DES staff. A statewide workshop was held after each round of visits to discuss findings and to instruct other facilities on the process. Workshops were held in May 2003, June 2004, and June 2005 to share benefits with other WWTFs and discuss other free EPA-funded tools available for them to conduct these assessments themselves.	Ongoing	Ongoing	Tom Groves NEIWPCC 978-323-7929

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Funding Local Water Protection Initiatives	There are a number of established grant and loan programs at DES that annually make money available for local water protection planning and implementation projects. Examples include the clean water and safe drinking water state revolving loan funds, and grants for watershed assistance and restoration, drinking water source protection, water supply land protection, and exotic aquatic plant control. More information on any of these loan or grant programs can be found at <a href="http://des.nh.gov/organization/commissioner/pip/categories/grants.htm">http://des.nh.gov/organization/commissioner/pip/categories/grants.htm</a>	Ongoing	Ongoing	NHDES 271-3503
Electronic Permitting Project	A project is underway to introduce electronic permitting to DES. This project will be piloted in the Subsurface Disposal System Permitting Program and will then be expanded to include the Alteration of Terrain and Wetlands Permitting Programs. The purpose is to increase efficiency and reduce costs associated with permitting.	Ongoing	Ongoing	Subsurface Systems Bureau NHDES 271-3304
Unused Medicine Disposal Policy	Work with stakeholders to develop a unified approach to properly disposing unused medicines in the state to protect New Hampshire's water resources. Focus areas include disposal practices at long-term health care facilities and at private residences. A state web page focusing on proper medicine disposal has been established. Additionally, state law has been amended in 2011 to more directly address the legal requirements associated with conducting medicine collection and disposal. See <a href="http://www.nh.gov/medsafety">www.nh.gov/medsafety</a> .	Ongoing	Ongoing	Brandon Kernen NHDES 271-0660
Land Conservation Plan for NH Coastal Watersheds	Prepared by NH Coastal Program, Society for the Protection of NH Forests, Nature Conservancy, and Rockingham and Strafford Planning Commissions, the plan identifies the 70 most ecologically significant areas of the coastal watershed.	2006	Completed	Ted Diers NH Coastal Program 271-7940
Coastal Regional Outfall Sewer System Project	Senate Bill 70, effective July 7, 2003 established a commission to study, among other things, the feasibility of collecting the effluent from all coastal municipal wastewater treatment facilities discharging the effluent in the ocean.	Completed	Report available	Steve Roberts NHDES 271-2980
Clean Watershed Needs Survey	Every four years, USEPA conducts a survey to assess capital costs needed to address water quality and water quality-related public health problems.	2008	Ongoing	Sharon Nall NHDES 271-2508

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Flood Management Study Commission	Scope included land use management to reduce flood runoff, flood hazard assessment, evaluation of dams and reservoirs, implementing possible zoning and floodplain regulations, cooperative efforts between private dam owners and NH Office of Emergency Management, and flood forecasting.	2008	Completed	Jim Gallagher NHDES 271-1961