

# Surface Water Monitoring, Assessment and Research

Water Quality Division

October 29, 2004

## Results

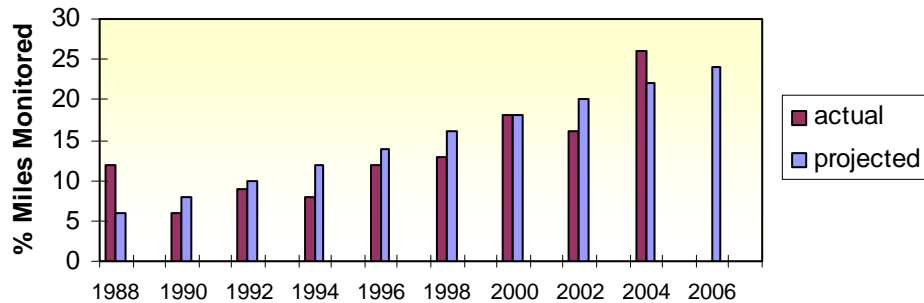
To know the status of Vermont's surface water resources and to understand the effects of actions that degrade or improve those resources.

## Key Indicators

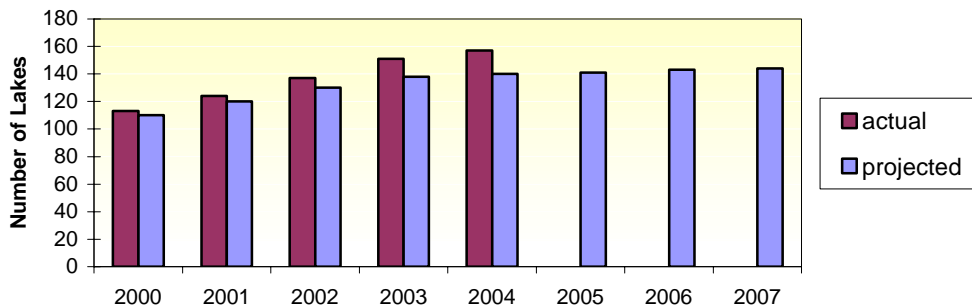
- Percent of total river miles considered monitored for the purpose of determining the support status of one or more designated uses.
- Number of lakes actually sampled each year under one or more of the Water Quality Division's monitoring programs.

**Story Behind the Baseline:** Surface water monitoring is a critical component of water quality management. Good water quality management decisions must be informed by good science. The more high-quality monitoring data that are available, the more informed water quality management decisions will be. While a goal of monitoring 100% of Vermont's river and stream miles, or all of Vermont's lakes and ponds every year, is not likely to be attained, a goal of increasing monitoring coverage as a percentage of river and stream miles and number of lakes is attainable, reasonable, and desirable.

### Percent Stream Miles Considered by 305B to be "Monitored"



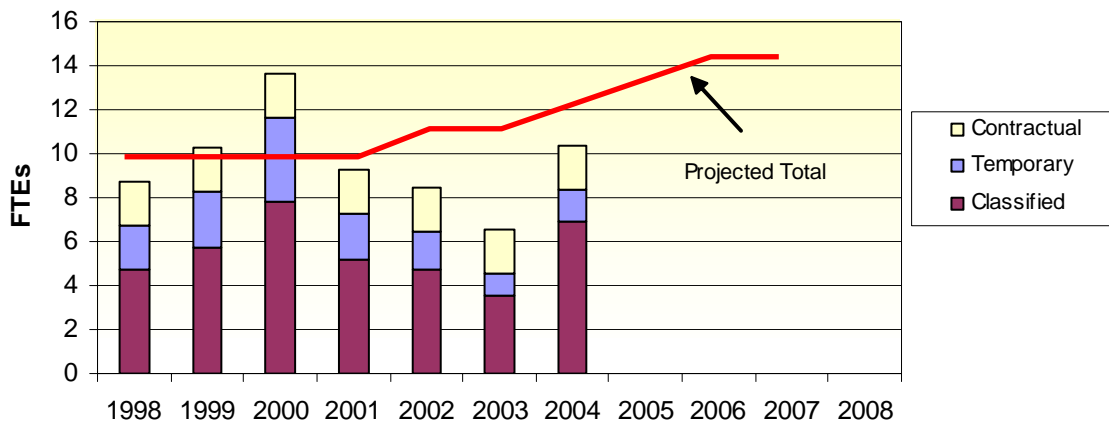
### Lakes Monitored Each Year



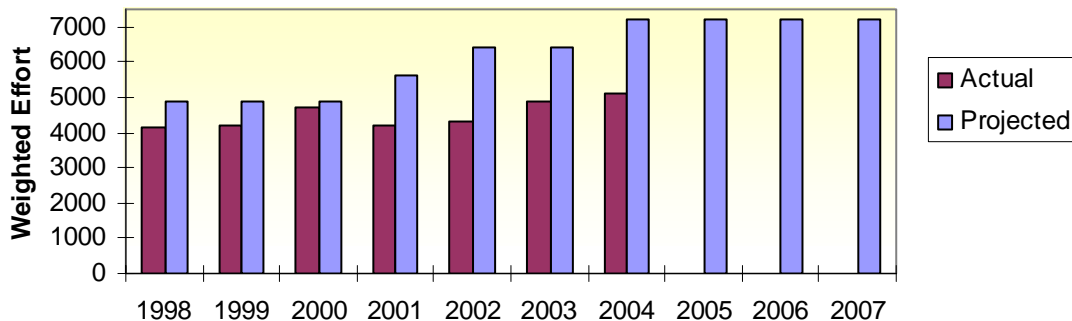
- The amount of time spent on monitoring programs by classified (permanent full-time), temporary (seasonal and part-time non-classified employees) and contractual staff provides a measure of effort sustainability. When evaluated in light of monitoring field effort, it provides a measure of program efficiency as well.
- Monitoring field effort represents the number of sites monitored weighted by factors reflecting the number of visits a site receives per year and the relative effort involved in each visit. For example, a water column water sample taken at a site once per year would receive less weight than a biological assessment or multiple sampling events during a year at a fixed station.

**Story Behind the Baseline:** The amount of weighted monitoring effort (the number of sites visited per year with adjustments for number of site visits per year and relative sampling effort per visit) that is directed toward monitoring, assessment, and research activities compared to the number of classified employee FTEs conducting that effort can be a measure of program efficiency and effective use of collateral resources. The number of sites monitored includes lay monitoring programs that generate high quantities of data per WQD FTE and as such reflects the interactions between the WQD and citizen monitoring groups. These numbers may also point out an over-dependence on non-classified employees for program implementation.

**Water Quality Division Monitoring Time**  
(full time equivalents by state fiscal year)



**Weighted Monitoring Effort by State Fiscal Year:**  
effort calculated by multiplying sites monitored by the relative effort per site



## **Strategies**

### *A. Regulation, Compliance Assistance, and Enforcement*

1) Continue to work with entities conducting regulatory, compliance and enforcement monitoring to assure quality of data and, to the greatest extent possible, the usefulness of the data for making designated use support determinations and other management decisions.

### *B. Grants, Loans and Contracts*

1) Continue to provide quality assurance oversight to ensure that monitoring data generated through third-party DEC contractors or grantees are high quality and, to the greatest extent possible, useful in making designated use support determinations and other management decisions.

### *C. Education and Technical Assistance*

1) Continue to provide technical assistance and training to public and private entities interested in conducting monitoring and assessment activities related to water resources and determination of designated use support.

2) Provide guidance on how monitoring and assessment data should be generated and used to make designated use support and other management decisions.

### *D. Monitoring, Assessment and Direct Services*

1) Maintain and enhance water resource monitoring capacity within DEC. Enhancements will be accomplished by: a) maximizing internal monitoring program technical efficiencies; b) maximizing coordination between DEC programs to reduce monitoring and assessment redundancies and optimize resource efficiency; c) enhancing coordination between other state and federal agencies to reduce redundancies and maximize use of available resources; d) utilizing available funding (grants, cooperative agreements, etc.) when appropriate to enhance monitoring and assessment activities; e) seeking funds to expand current levels of monitoring resources, to include at a minimum the addition of 1.0 FTE classified Environmental Technician; and f) as senior staff members are required to shift duties from active monitoring to management activities, ensuring that monitoring functions are not lost.

## **Key Budget Issues**

Good water quality management must be informed by good science. The development of management programs such as stormwater permitting, TMDL development and implementation, and basin planning require a strong and aggressive sustained monitoring effort by DEC. The maintenance and enhancement of the resources needed to sustain a strong monitoring presence, including highly trained and competent staff working in appropriate physical facilities with adequate equipment and supplies, is the most critical budget issue related to the sustainability of the monitoring and assessment effort. Short term needs include: 1) the maintenance of temporary seasonal employees supporting critical monitoring activities, and 2) the addition of seasonal personnel as dictated by new workloads. Current long-term classified employees involved in monitoring are increasingly involved in the management and administration of WQD programs, at the expense of technical duties involved with monitoring and assessment. This loss of technical function is not being replaced. Long-term sustainability can only be assured by the conversion of critical temporary positions to full-time classified positions (up to three full-time classified Environmental Technician positions).

## Performance Measures and Projections

Performance Measure	"P"=projected "A"=actual	SFY 1999	SFY 2000	SFY 2001	SFY 2002	SFY 2003	SFY 2004	SFY 2005	SFY 2006	SFY 2007
<i>Regulation, Compliance Assistance, and Enforcement/ Grants, Loans and Contracts</i>										
Number of external monitoring and assessment reports reviewed by WQD staff for quality assurance.	P		10	15	20	20	20	25	25	25
	A		10	10	12	16	27			
<i>Education and Technical Assistance</i>										
Number of non-DEC organizations collecting WQ data under auspices of DEC-approved QA plan or equivalent	P		2	4	6	8	10	12	14	16
	A		2	3	4	15	11			
<i>Monitoring, Assessment and Direct Services</i>										
# of Status and Trends sites monitored statewide by WQD	P		200	205	210	215	220	225	230	235
	A		242	241	240	226	278			
# of rotational watershed assessment biological monitoring sites assessed	P		50	50	50	50	50	50	50	50
	A		50	50	74	50	66			
% of randomly selected river and stream sites in a rotational watershed assessment showing acceptable biologic condition.	P		87	87	87	87	87	87	87	87
	A		NA	NA	NA	88	93			
Total monitoring effort for regulatory and basin planning activities	P	4900	4900	5600	6400	6400	7200	7200	7200	7200
	A	4216	4712	4198	4334	4895	5101			

## Highlights (2004)

The Department completed the 2004 Assessment and Listing Methodology document. The document describes the manner in which designated use support decisions are made and how waters are listed. The document guides the assessment of rivers and streams and lakes and ponds for Section 305b reporting and plays an important role in the listing of waters for Section 303d reporting. While assessment and listing procedures had been described previously, the 2004 Methodology brought a description of these two discrete activities together for the first time.

The Department completed the 2004 Water Quality Assessment Report for Section 305b Reporting. The report, prepared on a biennial basis, describes the state of Vermont's surface and ground water resources.

The ambient biomonitoring program significantly expanded the amount and type of environmental data collected during routine biological assessments of running waters. In addition to fish, macroinvertebrate and habitat data gathered, chemical and substrate data collection was expanded. At the time of biological sampling, water column grab samples are collected and analyzed for a broad suite of chemical parameters. A pebble count methodology was implemented for the purpose of quantifying the distribution of substrate size categories at the sampling site as well as qualitatively evaluating the intensity of periphyton development at the site.

The New England Wadeable Stream project was successfully completed. This was a cooperative project with EPA Region I involving the collection of biological, chemical and physical data at 50 randomly-selected sites in Vermont. The information will be used to conduct comprehensive water

quality assessments in New England. VTDEC continues to participate in the regional Biological Condition Gradient workgroup which is assessing the data.

VTDEC Water Quality Division sampled 89 lakes for Spring phosphorus, conducted 44 lake assessments and 42 aquatic macrophyte assessments, and conducted biological assessments at 129 wadeable stream sites. All of these numbers represent an all-time high for sites sampled under those programs.

A biological assessment of the Batten Kill was completed.

The Department completed a sampling of water chemistry and algal cover from 176 river sites and ten lake sites for the purpose of constructing nutrient criteria. (Added 4/11/05)