



Summary of findings about volunteer monitoring programs' online databases Survey conducted spring/summer 2005

In spring 2005 nineteen volunteer monitoring programs with online databases completed an online survey about the development and ongoing maintenance of their databases so that this information could be compiled and shared with other volunteer monitoring program coordinators across the nation to aid in development of additional databases.

These programs developed their online databases in just under 2.5 years on average (median 2 years). Individually, it took as little as 3 months and as long as 12 years to develop these databases – several of which program coordinators tell us continue to be developed over time (and some claim to still in their trial period even 12 years later!). Of the nineteen programs, thirteen initiated use of the database with a trial period to work out glitches with their systems.

Funding development and ongoing support of online databases

Six programs (World Water Monitoring Day, PEARL, Great North American Secchi Dip-In, Maine Shore Stewards, Water Action Volunteers, and St. Louis River – Riverwatch) used federal funds to initiate their online databases. All of these programs continue to use federal funding to support ongoing development and maintenance of their online database, and Hoosier Riverwatch does now as well (Figure 1).

Ten programs used state funding to initiate their online databases (e.g., IOWATER, PEARL, RiverWatch, Missouri Volunteer Water Quality Monitoring Program, Water Action Volunteers, Environmental Alliance for Senior Involvement, Westchester County Citizens' Volunteer Monitoring Program, Alabama Water Watch, Hudson Bay River Watch, and NatureMapping). Of these, only NatureMapping no longer uses state funds to support ongoing development and support of their database (they use independent grants). Hoosier Riverwatch, that initially used independent grants to fund development of their database, uses state (as well as federal) funds to support their database now.

Four programs used independent grants to initiate their databases and the same number use independent grants to support their databases today. Two of the programs remain the same (Alabama Water Watch and Environmental Alliance for Senior Involvement) while two used such funds initially (Hoosier Riverwatch and Maine Shore Stewards) and two others use these type of funds today (World Monitoring Day and NatureMapping).

Three programs used donations to develop their databases initially (World Water Monitoring Day, Environmental Alliance for Senior Involvement, GREEN). Two programs use donations to support their databases today (Alabama Water Watch, Environmental Alliance for Senior Involvement).

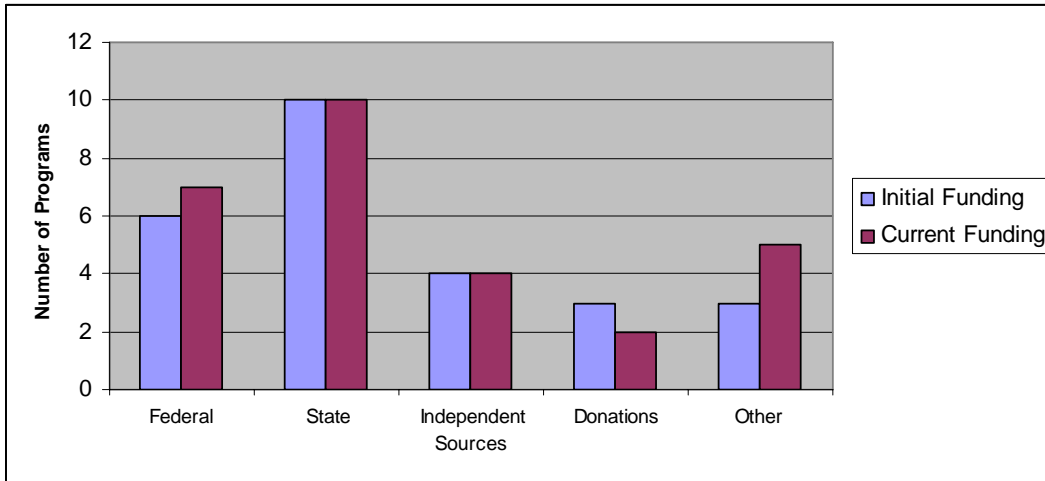


Figure 1: Number of programs using a specific funding type for initial database development compared to number of programs using a specific funding type for continued development and support of database.

Programs that indicated other sources of initial funding cited the following sources:

- Iowa Infrastructure Funds - excess gambling monies that are used to support the Water Monitoring Program in Iowa
- In-kind services
- Winn Dixie I think (whoever sells the best peanuts)
- and in-kind service among partner organizations, New York State and County Agencies

Programs that indicated other sources of current funding cited the following:

- Iowa Infrastructure Funds - excess gambling monies that are used to support the Water Monitoring Program in Iowa
- Volunteer workers
- We've gained a few sympathetic people over the last 14 mos.
- None at this point
- In-kind service

Security measures of online database

We asked about security features that are programmed in to these online databases. Three programs have no measures of security in data searching, entry, editing, deletion, or administrative processes. Of the 20 programs, 17 have security measures related to data editing and deletion, 16 have administrative security measures, and 15 have data entry security measures. Just four have security measures that limit web users from searching the data in the database (Environmental Alliance for Senior Involvement, Hudson Basin River Watch, Alabama Water Watch, and Missouri Volunteer Water Quality Monitoring Program).

Specific database security measures were described in more detail by respondents. The main security measure, used by fourteen programs, was that users need to register and use passwords. Other security measures include:

- Volunteers are not provided access to data editing, deletion or administrative functions
- Data initially entered by volunteers are stored in a separate database until they can be checked by program staff and input to the functioning database
- Backing up data regularly
- Firewalls and other internet security
- Keeping a log of activity

Site registration

Sites are registered primarily by staff (8 programs indicated this), next most often by programmers (5 programs). Three programs each indicated that local coordinators and trained volunteers registered sites. Other ways sites are registered are:

- Any program participant
- Hourly employees
- Users/school programs
- Public

Data Entry

Most programs (11) indicated that trained volunteers enter data directly to the database. Eight of those programs also have staff doing data entry, along with two other programs that only have staff entering data (though one, Maine Shore Stewards indicated that volunteers would be able to enter data soon). Hoosier Riverwatch, World Monitoring Day and A River Runs Through Us have all of their volunteers enter data directly to the database (Table 1).

Table 1. Data entry is done by a variety of individuals involved with a volunteer monitoring program.

	Staff	Local Data Coordinator	Trained Volunteers	All Volunteers	Other	Comments
PEARL	yes	no	yes	no	no	
Maine Shore Stewards	yes	no	no	no	no	
Water Action Volunteers	yes	yes	yes	no	no	
Westchester County Citizens' Volunteer Monitoring Program	yes	yes	yes	no	no	
GREEN	yes	no	no	no	no	
Hudson Basin River Watch	yes	yes	yes	no	no	
Alabama Water Watch	yes	yes	yes	no	no	
A River Runs Through Us	yes	yes	yes	yes	yes	Data Entry on the web open to all monitors with Real Time charting.
Waquoit Bay NERR	yes	yes	yes	no	no	
Missouri Stream Team Program	yes	no	yes	no	no	
Hoosier Riverwatch	no	no	no	yes	no	
IOWATER	no	no	yes	no	yes	Program staff will submit data for volunteers who do not have access to a computer
World Water Monitoring Day	no	no	no	yes	no	
Great North American Secchi Dip-In	no	no	no	no	no	
Environmental Alliance for Senior Involvement	no	no	no	no	no	
St. Louis River - River Watch	no	no	yes	yes	no	
Missouri Volunteer Water Quality Monitoring Program	no	no	yes	no	no	
River Watch	no	no	no	no	yes	Users/school programs
NatureMapping	no	no	no	no	yes	Public submitting data

Volunteer management as related to the program's database

Most groups (11) train people as a group to use the database for data entry, editing, and deletion (when applicable). Nine programs train individuals to use the database (Table 2).

Table 2. Programs train database users to do data entry individually or in groups

	Group	Individually	Other	Comments
Hoosier Riverwatch	yes	no	yes	during regular Riverwatch volunteer stream monitoring training workshops - there is not a special training held on data entry
IOWATER	yes	no	no	
World Water Monitoring Day	no	no	yes	Follow simple on-line instruction
PEARL	no	yes	no	
A River Runs Through Us	no	no	no	
River Watch	yes	no	no	
Great North American Secchi Dip-In	no	yes	yes	None, other than following instructions
Waquoit Bay NERR	no	no	no	
Maine Shore Stewards	yes	yes	yes	via email, phone, in person and with on-line help
Missouri Stream Team Program	no	no	no	
Missouri Volunteer Water Quality Monitoring Program	no	yes	no	
Water Action Volunteers	no	yes	no	
Environmental Alliance for Senior Involvement	yes	yes	yes	on line
Westchester County Citizens' Volunteer Monitoring Program	yes	no	no	
Alabama Water Watch	yes	yes	no	
AWW (Alabama Water Watch)	yes	no	no	
GREEN	no	yes	no	
Hudson Basin River Watch	yes	yes	no	
St. Louis River - River Watch	yes	no	no	
NatureMapping	yes	no	no	

Day to day questions about the databases are most often fielded by program staff (15 programs), while programmers and trained volunteers field questions occasionally (5 and 2 programs respectively). One program indicated that no one is responsible for answering day to day questions.

Program staff most often train users on database use (12 programs). Online tutorials are available from five programs, while programmers and trained volunteers teach others to use the database, each in four programs (Table 3).

Table 3. Most programs have staff that trained their volunteers

	Staff	Online	Programmer	Trained Volunteer	Manual
Hoosier Riverwatch	yes	no	no	yes	no
IOWATER	yes	no	no	no	no
World Water Monitoring Day	no	yes	no	no	no
PEARL	no	yes	yes	no	yes
Great North American Secchi Dip-In	no	no	no	no	no
Maine Shore Stewards	yes	no	no	no	no
Water Action Volunteers	no	yes	no	no	no
Environmental Alliance for Senior Involvement	no	no	no	no	no
Westchester County Citizens' Volunteer Monitoring Program	yes	no	no	no	no
AWW (Alabama Water Watch)	no	no	no	no	no
GREEN	yes	no	no	no	no
Hudson Basin River Watch	yes	no	no	no	no
St. Louis River - River Watch	yes	yes	yes	yes	yes
Missouri Volunteer Water Quality Monitoring Program	yes	no	no	no	no
Alabama Water Watch	yes	no	yes	yes	no
A River Runs Through Us	yes	no	no	yes	no
River Watch	no	yes	no	no	no
Waquoit Bay NERR	yes	no	yes	no	no
Missouri Stream Team Program	yes	no	no	no	no
NatureMapping	no	no	no	no	yes

Quality Assurance and Quality Control of Data

Quality Assurance and Quality Control (QA/QC) measures are often built into these online databases. The most often used form of QA/QC is to put limits on range of scores allowed for a parameter (e.g., pH 0-14 only) with 16 programs indicating use of this method of QA/QC. This was followed closely by having data that are entered shown on screen for review before final entry to database (15 programs). Eleven programs indicated that they have programmed in limits on numbers of decimal places allowed to be entered for certain parameters, and that they have fields that are automatically calculated for users to help minimize calculation errors (e.g., automated conversion between degrees F and C). Only three programs require that only trained staff can enter data to database (Table 4).

Table 4. Quality Assurance and Quality Control measures of online databases.

	Limit on Range	Review Before Dbase	Set Decimal Places	Programmed Calculations	Staff Check	Staff Enter Data	Other	Comments
Hoosier Riverwatch	yes	yes	no	yes	no	no	no	
IOWATER	yes	yes	yes	yes	no	no	yes	IOWATER staff periodically check for unusual values; annual report allows for data review
World Water Monitoring Day	yes	yes	yes	yes	no	no	no	
PEARL	no	yes	no	no	yes	no	no	
A River Runs Through Us	no	no	no	no	no	no	no	
River Watch	yes	no	yes	no	yes	yes	no	
Great North American Secchi Dip-In	yes	yes	no	yes	yes	no	yes	Comparison against previous readings and statistical filter for +/- 1 or 2 SD
Waquoit Bay NERR	no	no	no	no	no	no	no	
Maine Shore Stewards	yes	no	no	no	no	no	yes	weekly check of all datasheets entered by UMCE/sea Grant staff; email alerts when values are exceeding the criteria or standards
Missouri Stream Team Program	no	no	no	no	no	no	no	
Missouri Volunteer Water Quality Monitoring	yes	yes	yes	yes	yes	yes	no	
Water Action Volunteers	yes	yes	yes	yes	no	no	no	
Environmental Alliance for Senior Invlmnt	yes	yes	yes	yes	no	no	no	
Westchester County Citizens' Vol. Mon. Prog.	yes	yes	yes	yes	no	no	yes	data have to be entered into the database twice
Alabama Water Watch	yes	yes	yes	yes	yes	no	no	
AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	no	yes	Implementing Real Time Charts in which user can see recent charts before hitting submit. Adding JavaScript to put the current var. into chart
GREEN	yes	yes	yes	no	no	no	no	
Hudson Basin River Watch	yes	yes	no	no	no	yes	no	
St. Louis River - River Watch	yes	yes	no	yes	no	no	yes	Staff also receives paper copy of data sheets and does QA
NatureMapping	yes	yes	yes	no	no	no	no	

Searching the Database

Primary Search Options

The primary provision for searching in these online databases is by waterbody (14 programs), with watershed the next most common option provided by which to search (10 programs). Searching by county, site, parameter or Hydrologic Unit Code (HUC) is available with about half of the programs. No programs offer the option to search by STORET number (Table 5).

Table 5. Primary search options available on volunteer monitoring programs' online databases.

	Water-body	Water-shed	County	Site	Parameter	HUC	WBIC	STORET	Other	Comments
Hoosier Riverwatch	yes	yes	yes	yes	no	yes	yes	no	yes	They can choose to use an 'Advanced Search' in which any of these options could be selected - or follow the Basic Search which goes: Watershed (8-digit HUC), which dynamically creates a list of all the Stream/River Names, then chose from a list of al
IOWATER	yes	yes	yes	no	no	yes	no	no	yes	An ArcIMS application allows sites to be searched geographically
World Water Monitoring Day	no	no	no	no	no	no	no	no	yes	Results are available by country or state as spreadsheet files that can be searched for any field
PEARL	yes	yes	yes	no	yes	yes	yes	no	no	
A River Runs Through Us	no	no	no	no	no	no	no	no	no	
River Watch	yes	yes	no	yes	yes	no	no	no	no	
Great north American Secchi Dip-In	no	no	no	no	no	no	no	no	yes	State/Province/Country
Waquoit Bay NERR	no	no	no	no	no	no	no	no	no	
Maine Shore Stewards	yes	no	no	yes	no	no	no	no	yes	Group, date
Missouri Stream Team Program	no	no	no	no	no	no	no	no	no	
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes	no	no	no	no	no	no	
Water Action Volunteers	yes	no	yes	yes	no	no	no	no	no	
Environmental Alliance for Senior Involvement	yes	yes	yes	yes	yes	no	yes	no	no	
Westchester County Citizens' Volunteer Monitoring Program	yes	no	no	no	yes	no	no	no	yes	date, stream and/or lake data, weekly or biannual data, affiliation
Alabama Water Watch	yes	yes	yes	yes	yes	yes	no	no	no	

AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	yes	yes	no	yes	We have plans in the works of linking STORET, USGS data - currently have Rain and Discharge overlays on the charts - updated every 3no days (they also have links to their live gages on the NET, as well as dozens of other links connected to Lat/Long, Co
GREEN	no	no	no	yes	no	yes	no	no	no	
Hudson Basin River Watch	yes	yes	no	no	yes	no	no	no	no	
St. Louis River - River Watch	yes	no	no	no	no	no	no	no	yes	Can pick site off a map
NatureMapping	yes	yes	yes	no	no	no	no	no	no	

Secondary Search Options

Secondary search options include anything that users are allowed to search by to narrow their search after an initial, or primary, search option has been selected. Some programs call this an advanced search, while the primary search options are called a basic search. The most common secondary search options are date and waterbody (7 programs each) followed by county and watershed (6 programs each). Seven programs don't have secondary search options (Table 6). Other secondary search options mentioned by respondents included organization, site number (vs. site description), and school name.

Table 6. Secondary search options

	Date	Waterbody	County	Watershed	Parameter	HUC	Site	WBIC	STORET
Hoosier Riverwatch	yes	yes	yes	yes	yes	yes	yes	yes	no
IOWATER	no	no	no	no	no	no	no	no	no
World Water Monitoring Day	no	no	no	no	no	no	no	no	no
PEARL	yes	yes	yes	yes	yes	yes	no	yes	no
A River Runs Through Us	no	no	no	no	no	no	no	no	no
River Watch	no	no	no	yes	no	no	no	no	no
Great north American Secchi Dip-In	no	yes	yes	no	no	no	no	no	no
Waquoit Bay NERR	no	no	no	no	no	no	no	no	no
Maine Shore Stewards	no	no	no	no	no	no	no	no	no
Missouri Stream Team Program	no	no	no	no	no	no	no	no	no
Missouri Volunteer Water Quality Monitoring Program	no	no	no	no	no	no	no	no	no
Water Action Volunteers	yes	no	no	no	yes	no	no	no	no
Environmental Alliance for Senior Involvement	no	yes	yes	yes	yes	no	yes	yes	no
Westchester County Citizens' Volunteer Monitoring Program	no	no	no	no	no	no	no	no	no
Alabama Water Watch	yes	yes	yes	yes	yes	yes	yes	no	no
AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	yes	yes	no	no
GREEN	yes	no	no	no	no	no	no	no	no
Hudson Basin River Watch	yes	yes	no	no	no	no	no	no	no
St. Louis River - River Watch	no	no	no	no	no	no	no	no	no
NatureMapping	no	no	no	no	no	no	no	no	no

Problems that have arisen with the online databases

Half of the responding programs have had browser incompatibility problems with their databases. For instance, a feature of the database might work fine in Internet Explorer, but not in Netscape or Firefox. Similarly, half of the programs have had problems with data entry to their systems. Just under half of the programs (9 and 7 programs respectively) have had data editing and searching problems. Few have had issues with data deletion, GPS data entry or with storage capacity (Table 7). Other problems that have occurred with these databases include:

- Duplicate entries
- When the database was initially in Access, we had problems with people being able to submit data, as Access would only allow one person to submit data at a time. That forced us to quickly move to SQL.
- People reading posted directions. Many people fail to follow clear directions.
- Obtaining basic information, esp. Site/waterbody location (not GPS). Crashes/loss of link between database and retrieval page. Limits of FrontPage for such things as security/graphics. The list of problems for all of the above categories is quite long.
- Site delineation
- The data base is constantly being revised and updated the biggest problem other than the initial training of volunteers which is a constant need is responding to new requests for generating reports this is why we are going to an open source data base that any one could modify to fit their individual recording and reporting needs

Table 7. Areas of online databases that have caused specific problems in successful operation of online databases.

	Browser incompatibility (e.g., built for I.E. vs. Netscape)	Data entry	Data editing	Data searching	Data deletion	GPS entry	Storage capacity
Hoosier Riverwatch	yes	yes	yes	no	no	yes	no
IOWATER	yes	no	no	no	no	no	no
World Water Monitoring Day	yes	no	yes	no	yes	no	no
PEARL	no	no	no	no	no	no	no
A River Runs Through Us	no	no	no	no	no	no	no
River Watch	yes	yes	no	yes	no	no	no
Great north American Secchi Dip-In	yes	yes	yes	yes	yes	yes	no
Waquoit Bay NERR	no	no	no	no	no	no	no
Maine Shore Stewards	no	yes	yes	no	yes	no	no
Missouri Stream Team Program	no	no	no	no	no	no	no
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes	yes	yes	no	yes
Water Action Volunteers	yes	yes	yes	no	no	yes	no
Environmental Alliance for Senior Involvement	no	no	yes	yes	no	no	no
Westchester County Citizens' Volunteer Monitoring Program	no	yes	no	yes	no	no	no
Alabama Water Watch	yes	yes	no	no	no	no	no
AWW (Alabama Water Watch)	yes	no	no	no	no	no	no
GREEN	no	yes	yes	yes	yes	yes	no
Hudson Basin River Watch	yes	yes	yes	yes	no	no	yes
St. Louis River - River Watch	no	no	no	no	no	no	no
NatureMapping	no	no	no	no	no	no	no

Uses of Data within Online Databases

The primary use of data in volunteer monitoring programs' online databases is for education (17 programs). Sixteen programs indicated the data in their online databases is used as baseline information. Half of the programs indicated data are used in state water quality reports. Eight programs indicated their data are used for impaired waters listings, while just three indicated that the data are used for regulatory purposes. Three programs did not indicate any specific data uses for their databases (Table 8).

Table 8. Uses of data in volunteer monitoring programs' online databases.

	Education	Baseline Information	State Water Quality Reports	Impaired Waters Listing	Regulation	Other (please specify)
Hoosier Riverwatch	yes	yes	no	no	no	yes
IOWATER	yes	yes	yes	yes	no	yes
World Water Monitoring Day	yes	yes	no	no	no	no
PEARL	yes	yes	yes	yes	no	no
A River Runs Through Us	no	no	no	no	no	no
River Watch	yes	yes	yes	yes	no	no
Great north American Secchi Dip-In	yes	yes	yes	no	no	no
Waquoit Bay NERR	no	no	no	no	no	no
Maine Shore Stewards	yes	yes	yes	yes	no	yes
Missouri Stream Team Program	no	no	no	no	no	no
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes	yes	no	no
Water Action Volunteers	yes	yes	no	no	no	no
Environmental Alliance for Senior Involvement	yes	yes	yes	yes	yes	yes
Westchester County Citizens' Volunteer Monitoring Program	yes	yes	no	no	no	no
Alabama Water Watch	yes	yes	yes	yes	yes	no
AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	yes
GREEN	yes	no	no	no	no	no
Hudson Basin River Watch	yes	yes	no	no	no	no
St. Louis River - River Watch	yes	yes	no	no	no	no
NatureMapping	yes	yes	yes	no	no	no

Data users

Sixteen programs indicated that school groups are users of their online database. Fifteen programs indicated that citizens and local governments use their databases. Twelve programs see local conservation organizations and state agencies using their databases, while just 5 programs reported that the federal government uses their databases (Table 9).

Table 9. Online database users, as described by program coordinators.

	School groups	Citizen volunteers	Local Government	Local Conservation Organizations	State Agencies	Federal Government
Hoosier Riverwatch	yes	yes	yes	yes	yes	no
IOWATER	yes	yes	yes	yes	yes	no
World Water Monitoring Day	yes	yes	yes	yes	yes	yes
PEARL	yes	yes	yes	yes	yes	yes
A River Runs Through Us	no	no	no	no	no	no
River Watch	yes	yes	yes	yes	yes	no
Great north American Secchi Dip-In	yes	yes	yes	yes	yes	no
Waquoit Bay NERR	no	no	no	no	no	no
Maine Shore Stewards	no	no	yes	no	yes	yes
Missouri Stream Team Program	no	no	no	no	no	no
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes	yes	yes	yes
Water Action Volunteers	yes	yes	yes	no	yes	no
Environmental Alliance for Senior Involvement	yes	yes	yes	yes	yes	no
Westchester County Citizens' Volunteer Monitoring Program	yes	yes	yes	yes	no	no
Alabama Water Watch	yes	yes	yes	yes	yes	no
AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	yes
GREEN	yes	no	no	no	no	no
Hudson Basin River Watch	yes	yes	no	no	no	no
St. Louis River - River Watch	yes	yes	yes	no	no	no
NatureMapping	yes	yes	yes	yes	no	no

Uploading data to other databases

Three programs (IOWATER, Maine Shore Stewards, and the Environmental Alliance for Senior Involvement (EASI)) indicated that they upload their data to other databases. IOWATER and Maine Shore Stewards upload their data to STORET. IOWATER also submits their data to the World Water Monitoring Day website. The EASI has the capacity to upload their information to any other database they want; currently they upload it to the International Water Monitoring Data Base.

Graphical Capabilities of Databases

Half of the programs have graphing capabilities built into their databases. Of these, eight have the ability to compare a parameter's score at one site over time. Of the remaining two, one program's graphing capabilities were under development at the time of the survey, so those abilities were unknown, while the respondent for the second was unaware what graphing capabilities existed for that program's database. Seven of the online database allowed users to compare a single parameter between sites. Just five or six programs' databases had the ability to compare multiple parameters (Table 10).

Table 10. Graphing capabilities of volunteer monitoring programs' online databases.

	Does your program's database have the ability to produce graphical output of data results?	Comparison of a parameter over time at one site	Comparison of a single parameter between sites	Comparison of multiple parameters over time at one site	Comparison of multiple parameters between sites	Comparison of a parameter over time at multiple sites	Comparison of multiple parameters over time at multiple sites
Hoosier Riverwatch	no	no	no	no	no	no	no
IOWATER	no	no	no	no	no	no	no
World Water Monitoring Day	no	no	no	no	no	no	no
PEARL	yes	yes	yes	no	no	yes	no
A River Runs Through Us		no	no	no	no	no	no
River Watch	no	no	no	no	no	no	no
Great North American Secchi Dip-In	no	no	no	no	no	no	no
Waquoit Bay NERR		no	no	no	no	no	no
Maine Shore Stewards	yes	yes	yes	yes	yes	no	no
Missouri Stream Team Program		no	no	no	no	no	no
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes	yes	yes	yes	yes
Water Action Volunteers	yes	yes	yes	yes	yes	no	no
Environmental Alliance for Senior Involvement	yes	yes	yes	yes	yes	yes	yes
Westchester County Citizens' Volunteer Monitoring Program	yes	yes	yes	no	no	yes	no
Alabama Water Watch	yes	yes	no	yes	no	no	no
AWW (Alabama Water Watch)	yes	yes	yes	yes	yes	yes	yes
GREEN	no	no	no	no	no	no	no
Hudson Basin River Watch	yes	no	no	no	no	no	no
St. Louis River - River Watch	yes	no	no	no	no	no	no
NatureMapping	no	no	no	no	no	no	no

For those programs that have graphical capabilities of their databases, most (9 programs) have the ability to view those graphs on the computer screen (one respondent did not know). Eight programs offer users the ability to print the graphs, and one program was working to offering that as an option (again, one respondent did not know). Finally, the information in five programs' databases is able to be exported to another program (Table 11). One program indicated needing assistance from a consultant to do this.

Table 11. Ability to export data from programs' online databases.

	Viewed on screen	Printed	Exported to another program
Hoosier Riverwatch	no	no	no
IOWATER	no	no	no
World Water Monitoring Day	no	no	no
PEARL	yes	yes	no
A River Runs Through Us	no	no	no
River Watch	no	no	no
Great North American Secchi Dip-In	no	no	no
Waquoit Bay NERR	no	no	no
Maine Shore Stewards	yes	yes	yes
Missouri Stream Team Program	no	no	no
Missouri Volunteer Water Quality Monitoring Program	yes	yes	yes
Water Action Volunteers	yes	yes	no
Environmental Alliance for Senior Involvement	yes	yes	yes
Westchester County Citizens' Volunteer Monitoring Program	yes	yes	no
AWW (Alabama Water Watch)	yes	no	yes
GREEN	no	no	no
Hudson Basin River Watch	no	no	no
St. Louis River - River Watch	yes	yes	no
NatureMapping	no	no	no

Other capabilities

Nine programs indicated that their databases have the ability to accept upload photos, while eleven programs' online databases have mapping capabilities (Table 12).

Table 12. Mapping and photo storage capability of programs' online databases.

	Upload photos	Mapping
Hoosier Riverwatch	no	no
IOWATER	yes	yes
World Water Monitoring Day	no	yes
PEARL	yes	yes
River Watch	no	no
Great North American Secchi Dip-In	no	no
Maine Shore Stewards	yes	yes
Missouri Volunteer Water Quality Monitoring Program	no	yes
Water Action Volunteers	no	no
Environmental Alliance for Senior Involvement	yes	yes
Westchester County Citizens' Volunteer Monitoring Program	no	yes
Alabama Water Watch	yes	yes
AWW (Alabama Water Watch)	yes	yes
GREEN	yes	yes
Hudson Basin River Watch	no	no
St. Louis River - River Watch	yes	no
NatureMapping	yes	yes