

**Lessons
Learned:**

**Planning for
and assessing
water quality
and quantity
in the Raritan
Basin**

Rutgers Center for Environmental Communication

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Introduction

Watershed management in New Jersey has taken a collaborative turn, particularly in the Raritan Basin. Since 1996, citizens have been working together to understand the quality and quantity of water in the Basin. They have done this together, with the support of funds from the New Jersey Department of Environmental Protection. Their story is an important one because they represent one of many collaborating groups beginning to take responsibility for water quality and quantity at a watershed level. Their hope, in commissioning this report, is that their story can serve to inform other watershed initiatives.

The Raritan River Basin, located in central New Jersey, provides potable water for nearly 1.2 million people, as well as recreational opportunities, habitat for aquatic life, aesthetic benefits and many other advantages. The Raritan Basin covers approximately 1,100 square miles in Hunterdon, Mercer, Middlesex, Monmouth, Morris, Somerset and Union Counties and consists of a collection of many watersheds that all drain to the Raritan Bay. Major waterways in the Basin include the North Branch and South Branch of the Raritan River, the Millstone River, the Green Brook, the Lawrence Brook and the South River, along with all their many feeder streams.

This report relies on testimonials from six highly involved participants, document reviews, direct observation and involvement by Rutgers researchers since 1996. Researchers reviewed all notes from meetings, reports, interviewed participants, and relied on their own observations. Raw material was reviewed and common themes were noted. These common themes were used to form the backbone of the report.

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Setting Priorities and Goals

From the beginning, the Raritan Project was a collaborative effort, bringing together stakeholders to determine the priority needs of the watershed. Although initiated and funded by the [NJ Department of Environmental Protection \(NJDEP\) Division of Watershed Management](http://www.state.nj.us/dep/watershedmgt/index.html) [http://www.state.nj.us/dep/watershedmgt/index.html] as part of their [statewide watershed management framework plan](http://www.state.nj.us/dep/watershedmgt/rules.html) [http://www.state.nj.us/dep/watershedmgt/rules.html], the group included representatives from local, state and federal agencies, non-profit organizations and others who actively participated in the decision-making process. The goals, priorities and eventual achievements of the group were shaped by the collective efforts of its members—not by one agency or organization alone.

Forming the group: A brief history

The Raritan Project was born in 1996, when a group of people began meeting to discuss water issues in the Raritan River Basin. These meetings were facilitated by the [NJ Water Supply Authority](http://www.njwsa.org) [http://www.njwsa.org], which maintains public water supply systems in central New Jersey. Participants in these early meetings represented a variety of groups, including NJDEP, the League of Women Voters, the USDA-Natural Resources Conservation Service (NRCS), the NJ Rural Water Association, several watershed associations, the US Geological Service, Rutgers University and the planning boards of Middlesex and Hunterdon Counties.

Start-up for the group took time because of difficulties in securing funds. By June of 1998, the NJDEP had released statewide guidelines for water quality management planning and had also expressed support for a watershed management project to be undertaken in the Raritan Basin. However, two proposals from the Raritan group for funding through the NJDEP's Non-point Source Pollution Control and Management Implementation grant process (Section 319(h) under the federal Clean Water Act) were unsuccessful.

The group tried once more in October 1997, subsequent to voter approval of dedicated funding for watershed management. In little more than a year, a Memorandum of Agreement (MOA) was signed between NJDEP and NJWSA, who became the lead agency on the project. Other organizations were funded

as subcontractors through the MOA (and are referred to in this report as the Raritan Project Team).

Determining goals

Early issues of concern for the Raritan project included addressing NJDEP's plan for state-wide watershed management, obtaining funding and inviting a variety of groups to participate. In May 1997, the Raritan project provided comments on the "Draft Framework Document," suggesting that the NJDEP should clarify its watershed management strategy with more specific, measurable goals; a shorter implementation cycle; better integration between this report and state and federal planning documents; and increased use of local information in legally required water quality reports.

The official MOA (signed in early 1998) describes three major goals for the first year of the project:

- Assemble a stakeholder group.
- Organize a public outreach and participation strategy.
- Complete a watershed characterization and assessment report.

Deciding on who to involve and developing a vision

From the beginning the Raritan *Project Team* included six core groups who were funded to engage in planning on February 1, 1999. By the time that funding was on the horizon, the Project Team had already been meeting for two years and there was a feeling of entropy among the group.

Instead of engaging right off the bat in visioning sessions, the group decided to get moving on project development. A larger *Work Group* comprised of the Project Team members plus a wide variety of interested parties decided that spending up front time on developing a vision and goals didn't make sense. There was simply no news to give people. They wanted data for the public – information to digest before they asked the public to be involved in an abstract visioning process.

This process was antithetical to that proposed by NJDEP. Essentially, NJDEP proposed an eight-step process that began with initial planning and stakeholder involvement.¹ The Raritan project instead left off massive stakeholder involvement and long-term goal setting until Phase II, the planning process.

The Work Group, charged with the responsibility of reviewing Project Team products, was diverse from the beginning, representing water

¹ See "Of Carts and Horses – Problem Assessment and Goal-Setting in Watershed Planning." By Dan Van Abs. dvanabs@raritanbasin.org

suppliers, the state environmental protection agency, data gatherers, non-profit agencies, agricultural interests and university researchers. At first, the groups all worked together, holding monthly meetings to plan and occasional meetings to draw together a wider group of interested stakeholders. All of the technical work was performed by the Project Team, the main groups of which included:

New Jersey Water Supply Authority <http://www.njwsa.org/>

The New Jersey Water Supply Authority leads, in collaboration with NJDEP, the effort to characterize and protect water quality in the Raritan Basin. NJWSA is a public body, corporate and politic, charged with maintaining the public water supply in three major reservoirs and a canal. Staff at NJWSA serve as project leaders, organizing and running meetings with all stakeholders as well as managing the technical work.

New Jersey Department of Environmental Protection, Division of Watershed Management <http://www.state.nj.us/dep/>

NJDEP, in collaboration with NJWSA, aims to collaboratively develop a watershed plan, meet the EPA mandate for Total Maximum Daily Loads and maintain water quality in the watershed. NJDEP is charged with planning, monitoring and evaluating progress towards meeting water quality goals in the Raritan region.

US Geological Survey <http://www.usgs.gov/>

USGS plays a technical role in the Raritan Project Team, gathering data on water quality and Geographic Information System (GIS) coverage. USGS is the nation's largest earth and life science agency and has the principal responsibility within the federal government of providing hydrologic information and appraising water resources. The New Jersey District of USGS collects basic hydrologic data and makes interpretive investigations of New Jersey's water resources.

US Department of Agriculture, Natural Resources Conservation Services <http://www.nrcs.usda.gov/>

NRCS helps links the project to the agricultural community. NRCS provides leadership to help people conserve, improve, and sustain our natural resources and environment. NRCS relies on many partners to help set conservation goals, work with people on the land, and provide assistance. Its partners include conservation districts, state and federal agencies, NRCS Earth Team volunteers, agricultural and environmental groups, and professional societies. Their primary role in this project was to develop GIS-based soil maps.

North Jersey Resource Conservation & Development Council
<http://www.northjerseyrcd.org/>

NJRC&DC provides the primary link the project to the agricultural community. A non-profit organization established by NRCS, regional soil conservation districts and counties, NJRC&DC established a Raritan Basin Agricultural Committee, which meets monthly and provides a distinct agricultural and soil conservation perspective to the project.

Stony-Brook Millstone Watershed Association <http://www.thewatershed.org/>

Stony Brook is a non-profit partner that provides a link to citizens in one watershed of the Basin. The group seeks to enhance the quality of the natural environment in the 265-square mile region drained by Stony Brook and the Millstone River. SBMWA addresses key issues affecting water quality and land use, educates area residents about the ecology of the natural environment, and preserves open space by maintaining a 785-acre nature reserve and a working organic farm.

South Branch Watershed Association <http://www.eclipse.net/~sbwa/>

The SBWA is a non-profit environmental organization dedicated to protecting the environment in the watershed of the South Branch of the Raritan River. SBWA assists municipalities, groups and residents with protecting natural resources through education, training workshops, seminars, environmental inventories, stream clean-ups, community well testing, and the development of model land use ordinances. SBWA also serves as a clearinghouse for public information regarding local environmental issues and provides educational outreach to local schools and camps.

Upper Raritan Watershed Association <http://www.urwa.org>

The URWA provides technical expertise to the project in the form of GIS capacity. The group seeks to preserve and protect the woods, waters and fields of the region. The group has been dedicated to conserving and restoring natural resources and has acted with vigilance and expertise to see that changes in the countryside and municipalities take place based on sound and reasonable environmental principles. The URWA's mission is achieved through advocacy, scientific research and education.

Rutgers Center for Environmental Communication <http://aesop.rutgers.edu/~cec/>

CEC is a research institute that provides feedback to the group on other watershed projects, documents the progress of the group, evaluates the process and outcomes of the project, and conducts a needs and resources assessment.

Partnerships come in handy

Early on, the group realized that the Raritan group is more than the sum of its parts. The group as a whole strengthened individual organizations by networking and co-ordinating activities and adapting materials that one group already had developed for another area of the watershed. In applying for funding, any individual group was able to speak of its participation in the greater basin effort and draw on partners' skills. As a group of well-networked organizations, the partners were much stronger than on their own.

For example, NJWSA facilitated negotiations between NJDEP, SBMWA and NRCS resulting in a \$300,000 FY2000 grant (from the federal Clean Water Action Plan funds) to restore stream banks, implement agricultural best management practices (BMPs) and conduct other non-point source controls in the Millstone River watershed. In another proposal, NJWSA was a partner with USGS and the NJ Office of State Planning for a grant proposal to NJDEP that would have resulted in a GIS-based planning tool for municipalities to project non-point source (NPS) pollution from new and existing land uses, and then target BMPs to those land uses. The project never received funds. NJWSA also provided a letter of support to South Branch Watershed Association for their grant proposal to develop a computer-based "virtual tour" of NPS problems and solutions in the South Branch watershed and then develop NPS action plans for five municipalities.

Organizing to complete tasks

When planning for the Raritan project first began, a loose committee met to develop a grant proposal. Once funding was received, the group broke into three groups: the funded Project Team, the full Work Group, the Executive Committee and the Characterization and Assessment committee. With time, more groups were formed, as need was felt. For example, the group formed an *Action-Now group*, charged with planning immediate watershed restoration activities when slow planning and start-up led to frustration. The group formed the *Education and Outreach Committee* when they felt that public education wasn't being adequately addressed through other committees. Also, hiring committees for staff and consultants were periodically created.

The group discussed the structures available to them often throughout the first months. Agreement was reached on a flexible, results-oriented structure for stakeholder involvement. For example, the Executive Committee oversaw the full project and met monthly. Quarterly meetings of the full Work Group were anticipated to discuss results, make mid-course corrections and plan next steps. Also, the Watershed Characterization and Assessment Committee focused on the details of the report development process and met frequently. However, only a few full Work Group meetings were held, because stakeholders expressed their views that the Executive

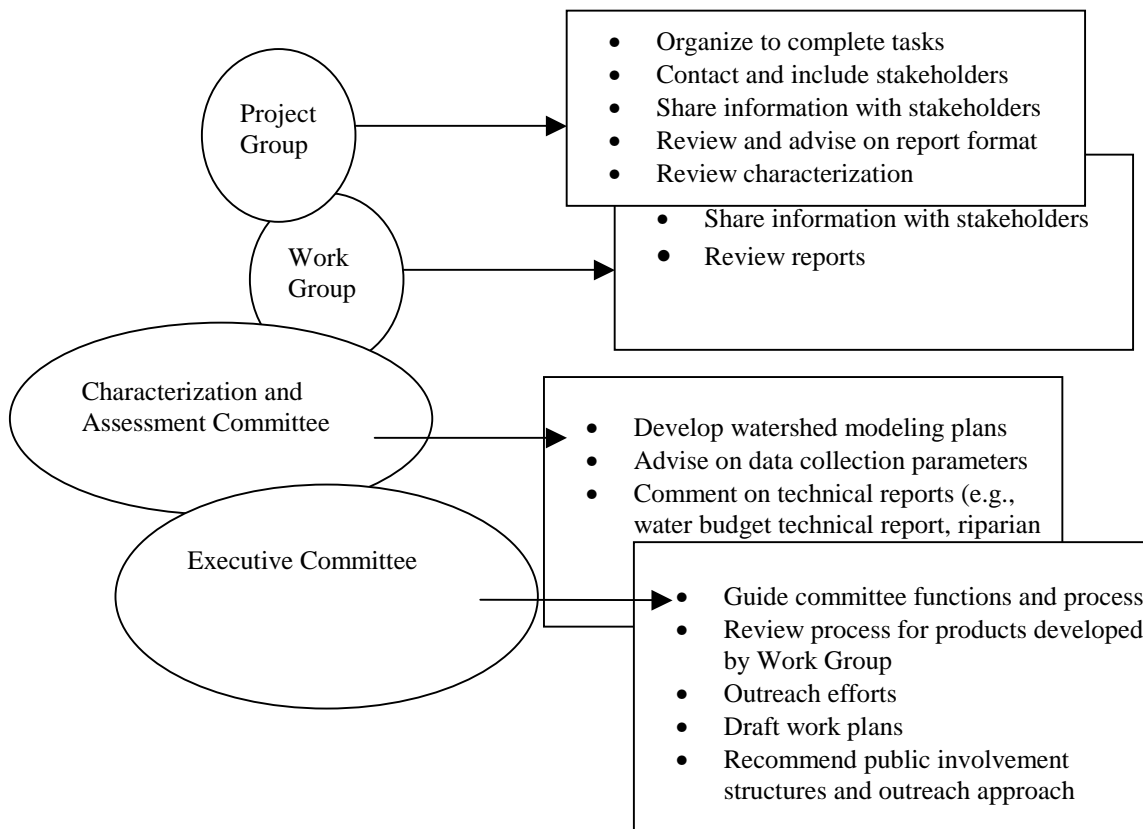
Committee and Characterization Committee were doing what was needed and additional meetings would be counterproductive.

Just over one year into Phase I of the project, partners began to plan for the second phase. Phase 2 intends to develop the plans for the Watershed Management Area Plans of the Upper Raritan, Lower Raritan and Millstone Watershed Management Areas. A Phase 2 agreement was negotiated early on in Phase I so that organizations could plan for the future. NJDEP needed to allocate resources from the Corporate Business Tax to this process, as well as plan for staff. Each of the other organizations wanted some certainty about the future of the initiative for their program and staff planning.

There were two major concerns about moving forward on Phase 2 among the Work Group members:

- Uncertainty regarding the level of effort needed to develop the plan;
- Uncertainty regarding the scope, cost and stakeholder issues associated with development of the Total Maximum Daily Loads (TMDLs).

Figure 1: Phase One Committees



Leading the initiative and agreeing on jobs

The NJWSA has led the initiative in the Raritan from the beginning. Individuals and groups trust NJWSA because it is not a political branch with vested interest in one outcome. Trust in the leading organization, project members suggest, may be key to ongoing watershed management success in this basin.

The group originally planned to conduct 15 months worth of work, with the end goal of developing the characterisation and assessment report (as well as public participation structures). Phase I took much longer than this, for a variety of reasons. The project planners underestimated by far the time needed to pull together the enormous amount of data. Further, accessing data took time and effort. For example, NJDEP's land use/land cover data was slow to arrive and when it did, there were many problems with data quality.

Lessons learned

Individual dedication makes for success.

The Project Team lacked funding for over two years of planning and meeting. However, a team of people continuously met over this period of time, reaching out to others and writing proposals for funding. Without the dedication of this team of people, the Raritan Project would likely have drowned. In particular, people cite the dedication and perseverance of one key leader from the NJWSA who convened meetings, provided refreshments and lunches, and guided the group towards the end goal of attaining funds for watershed management.

Structures for participation changed over time.

Over the course of the project, different groups formed and dissolved according to need. For example, a small hiring committee was formed to write job descriptions for employees, to advertise the positions and to interview prospective staff. The life of this committee was short-lived. The Project Team, or core-planning group, has remained constant. However, members from the Work Group have spun off into other committees, such as the Action-Now group or the Education and Outreach Committee.

Structures for participation were flexible. The group didn't spend a lot of time early on discussing the best structures; they got down to work and then periodically evaluated whether existing structures were working. When they found flaws with current structures, they altered them or formed new groups. Flexibility of planning structures was a key to Phase I success.

Funding is critical to planning and engagement.

It is unlikely that these groups would have continued to meet had it not been for the prospect of funding. Further the group came together at a critical juncture in New Jersey environmental planning, just as environmental regulation was being adapted to be more community-based.

Learn from other efforts, avoid re-inventing the wheel where possible (but invent where needed).

The Raritan group has already developed a paper and electronic trail summarizing methodologies, workgroups, and structures for planning. They encourage other partners to view the site, attend meetings and freely use materials. Adapting Raritan watershed materials may help other groups save time and effort. For example, the Raritan team encourages other watershed initiatives to adapt the already existing website for other groups. Two watershed management areas have already adapted the Raritan website for their own use.

The group is more than a sum of its parts.

The group as a whole was stronger because of the diverse skills brought together. Working together on this project spawned new ideas and projects and partners cited greater success in attaining funding because of these partnerships.

The agency as a partner.

NJDEP has gone a long ways towards encouraging collaborative watershed planning by putting in place staff and funding to encourage citizen led planning. Initiatives such as the Raritan point to the state's ability to let planning initiatives float on their own.

The agency tends to protect turf between watersheds and not encourage inter-watershed learning. Other watershed initiatives are floundering without solid guidance and may drown if lessons learned are not drawn over from other watershed groups. NJDEP gives out mixed messages – sometimes calling organizations involved in watershed management planning "partners" and sometimes acting as "boss." At one meeting between the state and subcontractors, agency staff sat up front in an auditorium and told subcontractors about the agency's changing priorities. Though the agency rhetoric points to partnerships, the agency's actions do not always mirror this hope. The agency needs to encourage and support innovation and cross-watershed learning.

Views about NJDEP staff involvement have been mixed. From the outset, evaluation results have pointed to concerns about NJDEP's commitment to the process, their provision of timely and high quality data and changing political priorities. The planning process is seen as important and viable, and yet there are many concerns about whether the watershed management plan will be truly successful in the long run or even adopted by NJDEP.

[\[http://www.raritanbasin.org/evaluation.html\]](http://www.raritanbasin.org/evaluation.html)

Plan more up front time for data gathering.

Phase II, according to project partners, may have been triggered too soon. Everyone underestimated how much time it would take to get a final version

of the characterization and assessment report as well as how poor data quality would slow the process of developing the report.

Communication

Communication amongst a range of groups with different structures, agendas and staff time committed to the job was a challenge the Raritan group addressed early on in the project.

Meeting periodically with a purpose

The Work Group decided to meet only when there was a clear-cut agenda and need, which helped to reduce meeting fatigue. At the same time, Phase I meetings were flexible and fun. People were energized and enthusiastic to participate.

Keeping in touch electronically but assessing capabilities

The group decided early on to use email, faxing and mailing to communicate about meetings and meeting results. This was burdensome albeit necessary. Later on in Phase I, minute meetings were posted on the website so as not to overload project participants. Early on, email access was a problem for several organizations. For example, at NJRCD and SBWA, the only Internet access was through one computer. Further, SBMWA had delivery problems through its new system. In the first year of the project, NJWSA had only one entry point/address, but had a functional local area network (LAN) so e-mail did get to the target. The group discussed trying to get funding to improve the non-profit's capacity, but didn't go through with a proposal. With time, NJWSA got individual e-mail addresses and access, as did others. What began as a significant technical issue eventually faded.

The team conducted an assessment of the computer capacities of each group, a necessary and telling step. The overview of two different organizations in 1998 below illustrates the varying computer capacities of organizations. The assessment helped the group to effectively plan how to work together over the coming months.

NJDEP

- Computer Hardware - Work stations, PCs. Can do CD-WR
- Office Software - MS Office 97 Professional
- GIS Software - ArcInfo, ArcView (both current versions)

- Printers - large variety of plotters and printers
- Digitizing - digitizing tables
- Webpage - extensive, connected with NJ State system.
- Watershed program web site under development

SBWA

- Computer Hardware - Pentium II-400, 5 other PCs
- Office Software - MS Office 97 Professional
- GIS Software - ArcView 3.1 (interns use primarily)
- Printers - no color printer
- Digitizing - none
- Web page - under development

Making decisions

Decisions were often made collaboratively at meetings. While meetings were chaired by NJWSA, each Work Group member was given the opportunity to report on activities and provide input in a number of ways, either directly in meetings or indirectly in evaluation summaries. For example, the Work Group made decisions on:

- Technical reports – data to be gathered, parameters to be covered, and format for reports
- Progress and content of characterization and assessment report
- Group progress and process
- Inclusion of new stakeholders
- Budget issues
- Dissemination of information (email, website, etc.)

Communication through issue papers

Issue papers helped to focus discussion and centre attention. NJWSA staff drafted papers on highly technical subjects and asked Work Group members to review them in advance of meetings. Issue papers included:

- Riparian Zones – a paper defining riparian zones from an environmental, ecological and human health perspective.
http://www.raritanbasin.org/Phase_1/Characterization/Jun30_IP.PDF

- Impervious Surfaces – a paper defining various methods of estimating impervious surfaces.
http://www.raritanbasin.org/Phase_1/Characterization/Aug11_IP.PDF
- Assessment of Water Quality in the Raritan River Basin
http://www.raritanbasin.org/Phase_1/Characterization/Sep15_IP.PDF
- Public Participation Structures: a paper describing options for Involving the public through committees and non-committee formats
[http://www.raritanbasin.org/Documents.htm#Public Involvement Reports](http://www.raritanbasin.org/Documents.htm#Public_Involvement_Reports)
- Report formats – a paper summarizing structure, detail and format for characterization and assessment reports.
http://www.raritanbasin.org/Phase_1/Characterization/Oct13_IP.PDF

The in depth review of these topics helped participants to come up to speed on a complex technical subject before a meeting.

Communicating outside of the group

Early on the group initiated a discussion on how to maintain communication links with groups uninvolved in the initiative and with the public. It was decided that a variety of strategies should be used, such as word-of-mouth, the website, action now events, presentations, short reports and longer more technical reports.

The group decided to use question and answer topics for designing short reports and fact sheets for the public. The idea was to select a variety of questions that are often posed by local officials or the public about the Raritan Basin and its watersheds. The group discussed at length the many trade-offs between different presentation formats.

<http://www.raritanbasin.org/education.htm#>

Fact sheets were developed on the following areas:

- Setting of the Raritan Basin
- Riparian Areas
- Impervious Surfaces
- Critical Habitats
- Water Budget
- Water Availability
- New Jersey Water Supply Authority

Settling on report formats

The group settled on a variety of formats and presentation modes for differentiated audiences. The group discussed the pros and cons of modes such as the oversized coffee table book and small booklets, among others. After this discussion, the group made a number of recommendations for the report format.

Bringing new partners in

Groups have always been and continue to be missing from the Raritan project. In a 2002 survey of participants in Phase II, respondents were about evenly split between those who felt that all interests were present and those who felt that some or many interests were missing. Most frequently identified as missing were: municipal representatives, especially those who are elected and appointed officials rather than staff; developers; agriculture; and business/industry; and academia.

Partners in another north Jersey initiative report that more stakeholders, especially mayors, have become more involved because of a constant change in meeting locations. "We change locations constantly among municipalities, 8-10 mayors regularly come because we ask for their buildings."

Lessons Learned

Clear (and multiple) goals and funding for each Project Team member may help get things done.

The group communicated about and agreed on project goals early on in the process. These goals constantly changed, but evaluation helped keep track of them. Funding for outreach and communication was critical. The group's diversity and flexibility showed that multiple priorities and goals were not mutually exclusive.

Organization of group and process can take time.

The group changed its structure over time, adding committees and changing them constantly as needed. They also reached out to new partners constantly, but emphasized that this process takes time. Three factors led to the success of meetings and outreach, according to some group members:

- Meetings were fun.
- New partners were always invited and welcome to join the initiative.
- Meeting locations were often changed.

Simplify technical issues early on using fact sheets and issue papers.

People came up to speed on technical issues through fact sheets and issue papers that were made available prior to critical decision making points.

Role of science and data

Setting priorities for data gathering

Collaborative decisions were made to determine what questions would be asked and what data would be gathered. At times, the process of prioritizing the group needs and interests was unwieldy and difficult. For example, a recent effort to prioritize interests and concerns was too technical according to some, or as one stakeholder admitted, "90 percent of it went over my head." However, as mentioned previously, issues papers helped people come up to speed on a topic so they could engage in discussion.

One major focus of the technical assessment was on surface water quality, including an assessment of point versus non-point source pollutant loads, and a significant percentage of total project resources went to this effort. Based on discussions supported by an Issues paper, the Characterization and Assessment Committee decided to collect data on the following water quality parameters.

- Biological oxygen demand
- Ammonia and organic nitrogen
- Nitrate and nitrite
- Total organic carbon
- Total phosphorus

- Total dissolved solids
- Total suspended solids
- Dissolved chloride (conservative parameter for quality assurance of the mass balance model)

Technical team drew on experts but included many

The Characterization and Assessment Committee, which essentially served as a scientific peer review team, included a number of technical experts. When needed, the committee drew in additional expertise from the local university. The committee needed to make a variety of decisions about how data would be collected, including what data to collect, at what scale and in which format.

Many classic water quality parameters were included in the list of data to gather, such as total organic content, total dissolved sediment and total suspended solids. Very little data was available on pesticides – so the team relied on partners to collect this information. The committee noted confusion over parameters (for the point source and non-point source assessment) versus the broader water quality database early on. However, a continual process of committee orientation to the science of water quality and quantity helped to bring members up to speed.

The Raritan Basin area is the largest Basin in the state, so data collection for the entire watershed had to be broken into component parts. A number of ideas emerged, but eventually the Executive Committee agreed to plan for management at the watershed area level (three areas are included in the basin) but gather data at the subwatershed level (136 covering the basin). A set of special projects were devised to allow planning at the subwatershed scale to test this approach. The Executive Committee suggested that a clear methodology was necessary, so a feasible workload with good chances of success was designed. The team decided to support existing and projected impairments for protecting “at risk” subwatersheds.

The group went through a process of anticipating priority pollutants before the data emerged. The group expected different problems to emerge in subwatersheds. For example, people thought key pollutants would be from non-point sources and that the highest values would be found in the basin for numerous pollutants. In the Stony Brook in Mercer and Hunterdon counties, agricultural and lawn pesticides were anticipated to be the worst sources of pollution. This exercise, anticipating the worst pollutants, provided an early entry point for people to think about how to respond to the major problems in watershed areas.

Many discussions were held about who would be relied on to provide data—in fact this was an element for discussion in a needs and resources assessment conducted by Rutgers University. Each data source had limitations and strengths—for example, Elizabethtown Water Company

promised to be a major source of ambient data, but staff had to transform significant amounts of data to electronic formats in order to use the data.

Some sources of data proved to be tricky to get. For example, NJDEP's Land Use Land Coverage data was promised to the team for December of 1999, but did not arrive in digital format until well into 2000.

The technical reports worked.

When the seven technical characterisation reports were finally released, the work teams managed to pull out eleven major issue areas for future work, based on the scientific data collected. Even though the process of coming to agreement on what was studied and how to study took a long time, project partners feel that this process prepared everyone well to understand, use and agree on future issue areas based on the data.

The legislated needs of the government may not align with those of citizen groups, however points of convergence can be found.

State priorities have been focused on policy development (i.e., development of Total Maximum Daily Loads as required by the Clean Water Act), but other Raritan group members have not echoed this goal. Data priorities varied among the group. The Work Group's top three priorities were chemical water quality data, aquatic biological monitoring and build-out analysis while those of uninvolved stakeholders from the basin were chemical water quality data, stormwater and flooding data, and information on farmland uses. Points of convergence on key needs were found with time.

Lessons Learned

Data emerges from many sources, but time and energy are required to access them.

The project team drew on many sources of data, identified through a needs and resources assessment. However, large amounts of staff time were needed to locate data, draw them together and ensure data compatibility. A 1999 Needs and Resources Assessment drew out many sources of data, including for example the Monmouth County health department, non-profits, water companies, sewage authorities, private companies, the NJ Office of State Planning, among many others.

<http://www.rci.rutgers.edu/~cecomm/involve2.html#rsvp>

The legislated needs of the government may not align with those of citizen groups, however points of convergence can be found.

While state priorities were clearly focused on policy development (i.e., development of TMDLs as required by the Clean Water Act), this end goal was clearly not that for members of the Raritan team. In fact, data priorities varied widely among the group. Points of convergence on top needs were found with time.

Agree on data purpose before the study is done.

The group saw it as vital to agree on the purpose and questions for study before starting to collect data. Many people suggested that it was very important to agree ahead of time on why and what they are studying.

Start with decisions on easy topics early on.

Project participants discussed the format for the report long before there was agreement on data needs and questions. This provided an early opportunity to make solid decisions on clear-cut issues, even when there was no data in house to review.

Provide data earlier.

The Raritan team was delayed enormously by slow attainment of data and poor quality data. Participants felt a major need was dissemination of data to partners and stakeholders so that they could make informed decisions quickly.

Education and outreach

Phase 1 wasn't ever conceived as the right time to conduct in-depth education and outreach of the general public. From the outset the group agreed that they would include partners, but hold off on including the broader public until there was a story to tell.

Dedicate staff people to education and outreach.

Late in the day in Phase I, the group began to see the need for more education and outreach to be done and so a committee was born. Each organization put forward one person who was to devote time to the area of education and outreach although there were no dedicated education and outreach personnel at NJWSA. Although NJDEP promised staff, they were unable to commit full-time staff to the initiative. This was particularly important because staff on the project didn't have time to talk to new audiences, and, as one NJWSA person suggested, "we needed to talk to people who didn't want to talk to us."

Targeting audiences helped reach the mark.

Education and outreach was a targeted activity, for example to certain key audiences such as municipal officials, builders and farmers. Essential to reaching out to these groups was the need to have one of their usual points of contact within the Raritan Project. So for example, NJRC&DC was identified

as the best outreach partner for the agricultural community. Likewise, a leader in the Builders' Association was identified as the most trusted person to communicate to other builders. While points of contact were identified, levers were also discussed. For example, the EPA stormwater standards www.epa.gov/water were seen to be a useful lever to engage and motivate municipal officials to act on watershed management. Similarly, a key lever for builders is the knowledge that local constraints on water supply might be forthcoming with watershed management policy.

Burnout avoided by including most interested in Phase I.

In Phase I, the group decided to include the most interested people until the characterization was completed. Once there was a story to tell, more diverse audiences would be contacted. The group also decided to include participants at the scale that was appropriate to their interests. For example, while builders and developers tend to get involved at the local level, only one representative joined in at the basin level during Phase I largely because this planning can tend to be quite abstract.

Some groups just hard to reach.

The Raritan Project reports, after months of outreach in Phase II, that some audiences are simply hard to reach. Many urban communities are still uninvolved due to the lack of contact with these areas by current team members. Only two members of the building community are involved.

Evaluation

A self-reflective process

From the beginning, the Project Team agreed that they had a need to track their own progress—and adapt project strategy and organization based on ongoing feedback from project participants. To this end, the Rutgers University Center for Environmental Communication (CEC) worked with the Work Group to develop a system of evaluating project meetings. CEC researchers developed evaluation forms for each meeting that were distributed to attendees. They then compiled the resulting data, summarized it and analyzed the results for the Work Group.

Evaluation format

Evaluations consisted of a series of both closed- and open-ended questions, some of which were consistent from meeting to meeting and others that

reflected specific meeting agenda items. Annual summaries of the evaluation results, along with NJWSA staff responses, were then compiled.

<http://www.raritanbasin.org/minutes.htm>

Technology transfer

CEC played a unique role in the evaluation process. Rather than permanently assuming responsibility for preparing and analyzing evaluations for each meeting, CEC planned from the beginning of the project to “phase out” by the end of the project’s first year. CEC researchers trained Project Team members to design, administer, and evaluate meeting evaluations.

NJWSA staff now design their own evaluations and periodically administer them. For example, the Raritan website hosts an on-line survey that included 23 multiple-choice questions, some of which had an open-ended component. The survey focused on:

- Level of participant involvement
- Comfort level with project progress rate
- Quality of staff support
- Level of available project resources
- Goals and objectives of process
- Likelihood of watershed plan completion and adoption
- Potential reasons for project failure

Lessons Learned

A dynamic process that raises ‘red flags’.

The Work Group’s goal for the evaluation process was to make changes in response to evaluation feedback. The group’s assessment of its changes in strategy, organizational structure and communication methods in response to evaluation feedback were detailed in two reports:

Evaluations of 1999 Project Meetings: Summary

[/http://www.raritanbasin.org/Documents/1999%20Evaluation%20Results%20Public%20Report.pdf](http://www.raritanbasin.org/Documents/1999%20Evaluation%20Results%20Public%20Report.pdf) /

Evaluations of 2000 Project Meetings: Summary

[/http://www.raritanbasin.org/Documents/2000%20Evaluation%20Results%20Public%20Report.pdf](http://www.raritanbasin.org/Documents/2000%20Evaluation%20Results%20Public%20Report.pdf) /

For example, the reports show that meeting agendas became more narrowly focused after some group members made comments such as “Try to have less to discussion per meeting. Many topics require in depth discussion

that gets cut off due to time constraints.” In addition, comments about the difficulty of the technical issues discussed resulted in a decision by the Work Group to send out detailed “Issues Papers” prior to each meeting.

Consistency without exhaustion.

Including some of the same questions on each meeting evaluation can help to track the group’s progress and spot trends. For example, tracking the answers to the question, “Was the information at this meeting useful to you?” may reveal whether meetings improved or declined over time. However, group members may tire of answering the same questions at every meeting. Assessing evaluation questions carefully to determine which are most useful may avoid this dilemma.

Question evolution.

It may be important to adapt evaluation questions over the course of the project in order to keep them meaningful. For example, the question, “Do you understand your role in the project better after this meeting?” may lose its significance after a certain number of meetings—many participants would presumably understand their role well by then and would answer in the negative. This can lead to the erroneous interpretation that participants understood their roles less and less well as the project progressed.

Specific vs. general information.

In addition to tracking general project trends, evaluation questions can be used to elicit specific information on various topics. For example, when the Raritan Project Team wanted feedback on their new website, it was simpler and more efficient for the group to modify their standard evaluation form to include questions specifically about the website, rather than to administer an entirely different survey. Another advantage to incorporating these kinds of specific questions into the standard evaluation is that most meeting attendees are probably already familiar with the evaluation format and thus less likely misinterpret the questions.

Evaluation is also communication.

The Raritan group found that it was important to include open-ended questions and allow for “additional comments” on each evaluation. This serves a dual purpose. First, it allows the group to provide feedback on issues that either may not have been included on the formal meeting agenda or were omitted from the evaluation form. Second, it provides an important channel of communication for those project participants who are reluctant for any reason to raise certain issues verbally during the meeting.

Quick turn around.

Evaluation summaries and analyses may lose their context and impact if not completed and distributed to the group in a timely way. In addition to completing each summary within a week of each meeting, the Raritan group used email to distribute the summaries quickly. In addition, the group found it useful to begin each evaluation summary with an “executive summary” so that participants were able to understand the main points from each meeting without reading through the entire document. The widespread use of email and web-based communication was valuable and effective for the group, but may result in “information overload.” The group recognized participants’ time limitations in making this information easily accessible.

Verbal summary.

Even though Work Group members got a written summary of each meeting, verbal summaries were also given at the beginning of the next meeting. This practice was introduced after some Work Group members commented that private review of the meeting evaluations didn’t lead to action. Group discussion of issues raised in evaluations allowed the group to make decisions about how to address problems publicly.

The buck stops here.

Although input from others can be valuable, it may be most efficient to assign one person or small group of people to compile, analyze and distribute evaluation results. CEC taught one member of the Raritan Project Team how to create and analyze evaluations, and continued to review her work for several months after she had assumed responsibility for the process.

While evaluation methods were discussed, it was also necessary to touch base informally through phone calls or after meetings with people involved in the watershed project. This could serve to identify why some members:

- Talk a lot
- Don't talk a lot
- Are heavily involved
- Are more distanced

Conclusions

Watershed management in New Jersey has taken a collaborative turn, particularly in the Raritan watershed. Since 1996, citizens have been working together to understand the quality and quantity of water in the basin. They

have done this together, with the support of funds from the New Jersey Department of Environmental Protection. Their story is an important one because they represent one of many collaborating groups beginning to take responsibility for water quality and quantity at a watershed level. Their hope, in commissioning this report, is that their story can serve to inform other watershed initiatives. Key lessons learned from this initiative include the following:

- Individual dedication makes for success. Strong leadership and personal commitment have led to success of early efforts.
- Flexible structures over time. The Raritan project has changed group structures many times, based on the results of evaluations with the group. In order to constantly attract new stakeholders, staff endeavoured to run fun meetings in locations throughout the watershed.
- Funding is critical to planning and engagement. Even though individual leaders have helped to make the process work, without funding it is unlikely that the group would have continued to work.
- Learn from others. Many watershed initiatives have been given the chance to float and new initiatives should learn from others before re-inventing already completed work.
- Use multiple communication channels. Communicating among group members and outsiders took the form of issue papers, emails, phone calls, meetings and websites. By using multiple channels, the Raritan group hoped to reach as diverse of an audience as possible.
- Simplify technical issues early on using fact sheets and issue papers. People came up to speed on technical issues through fact sheets and issue papers that were issued prior to critical decision making points.
- Data emerges from many sources, but time and energy are required to access them. Anticipating and planning to access the data required for characterizing and assessing a watershed takes time. The Raritan project underestimated how much time data collection and transformation would take.
- Evaluate process and product continuously. Social science evaluation methods were incorporated into the project by researchers. Evaluation allowed the group to raise red flags, identify needed changes to process and products, and allow issues to be raised privately.