

Building capacity of the Baltic States to meet the EU Water Framework Directive through watershed demonstration projects

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Abstract The Ohio River Valley Water Sanitation Commission (ORSANCO), in cooperation with the United States EPA, is completing its role in assisting the Baltic Countries of Estonia, Latvia, Lithuania and Kaliningrad Oblast, Russia with watershed management capacity building demonstration projects under the Great Lakes/Baltic Sea Partnership Program. The Countries of Estonia, Latvia and Lithuania view the skills gained through this program as important to their objective of complying with the European Union's Water Framework Directive and thus facilitating accession into the European Union. The program also addressed Kaliningrad's desire to work cooperatively with their neighboring countries concerning shared waters. Three watershed demonstration projects were designed and implemented, two of which involved joint country efforts: Parnu River (Estonia) modeling for nutrients and bacteria survey; river basin assessment and management planning for the Lielupe Basin (Latvia and Lithuania); and data base development and cooperative water quality survey and analysis for the Sesupe River (Lithuania and Kaliningrad). The benefits of the projects include enhancing the country's technical skills and the forging of relationships, without which achieving effective watershed management will be difficult to achieve.

Keywords Baltic countries; demonstration projects; EU Framework Directive; Kaliningrad; transboundary; watersheds

Background

In December of 2000, the European Commission issued its Water Framework Directive that requires the EU member countries to approach management of surface waters on a catchment basis (European Union, 2000). For countries aspiring to become members of the EU, including the countries of Estonia, Latvia and Lithuania, it is recognized that watershed management capacity building is needed to satisfy the Framework's mandates on an international level. In addition, the Kaliningrad Oblast of Russia desires to achieve more effective watershed management and forge closer cooperation with their neighboring countries where watersheds are shared.

Given the similarity of the environmental issues and challenges associated with the Great Lakes and the Baltic Sea, representatives of the United States and Canada, Estonia, Finland, Latvia, Lithuania, Russia and Sweden entered into a program of mutual cooperation in November 1998. That program, referred to as the Great Lakes/Baltic Sea Partnership (GL/BS P), provides for mutual improvement of the water quality of the Great Lakes and Baltic Sea by sharing information, expertise and management approaches. Specifically, the GL/BS P comprises two components; an exchange Fellowship Program that provides US funded 6-month exchanges of water management

professionals for in-depth studies, and a Watershed Management Capacity Building Program, which makes possible on-the-ground demonstration projects to build international cooperation.

The Ohio River Valley Water Sanitation Commission (ORSANCO), an interstate compact water pollution control agency created to abate interstate water pollution in the Ohio Valley region of the USA, was requested by the US Environmental Protection Agency (EPA) to assist in the implementation of the GL/BS P. Created in 1948, ORSANCO has long standing experience in implementation of catchment management approaches and programs involving multiple jurisdictions. Through a grant agreement with USEPA, ORSANCO worked with the countries of Estonia, Lithuania, Latvia and the Kaliningrad in their implementation of catchment management capacity building demonstration projects. ORSANCO also actively participated in the Fellowship program by hosting a 6-month Fellow.

Project selection criteria

As an initial step, representatives of Estonia, Lithuania, Latvia (the “Baltic Countries”), Kaliningrad, USEPA and ORSANCO identified appropriate criteria on which to evaluate possible demonstration/capacity building projects. The criteria agreed upon were as follows:

Ongoing/planned cooperative projects

The existence of ongoing/planned projects may provide a foundation for a watershed project. Watersheds where such projects exist should be given preferential consideration.

Hot spots

Over 100 “hot spots” in the Baltic region have been identified by the Helsinki Commission (Helsinki Commission, 1998). It is desirable to focus geographically on these areas.

Workable scale

Program funding constraints and anticipated costs for a watershed management project necessitates projects of a modest scope.

Transferability

As lessons learned from one project should be applied to other locations with minimal cost and effort, projects should not be so unique as to preclude transferability.

Diverse problems

To further promote the objective of transferability and maximize the knowledge that is gained, it is preferable to select a watershed impacted by a diverse array of pollutant sources and environmental problems.

Watersheds selected and project descriptions

Shown on Figure 1 are the three watersheds selected for demonstration projects; the River Parnu (Estonia), The River Lielupe (Lithuania and Latvia) and the River Sesupe (Lithuania and Kaliningrad).

River Parnu

Description. The River Parnu Watershed is a moderately sized river system located entirely within Estonia. It is the site of ongoing international projects focused on agriculture and has been designated by Estonia as a selected watershed pursuant to the European Union



Figure 1 Location of participating countries and River Basins selected for demonstration projects under the Great Lakes/Baltic Sea Partnership

Framework. It has been identified as having “hot spots” and is a major source of pollution of Parnu Bay. Specific concerns include nutrient impacts on Parnu bay and the Baltic Sea, nutrient levels in the Parnu River and the need to protect a nearby high quality resort beach from bacteria sources.

Project. The project for this watershed involves the development and implementation of a water quality model to evaluate Parnu River dissolved oxygen levels and Parnu Bay (Baltic Sea) nutrient reduction scenarios and a study of wet weather impacts on Parnu Beach. The QUAL2 model, version 3.21, was used. Specific project tasks included the following.

Nutrients

- Model setup (criteria, objectives, required data, scale).
- Collection and analysis of supporting database.
- Preliminary simulation modeling (hydrological, point and non-point sources, transport and transformation).
- Field investigations (confirming parameters, seasonal variation, calibration).
- Analysis and results interpretation (different scenarios, management strategies, future model use and development).

Bacteria

- Identification of sources (permanent, episodic – ex. combined sewer overflows).
- Measurements (point sources, combined sewer overflows in extreme conditions, Parnu Beach).

ORSANCO’s assistance with respect to the model included providing the QUAL2 model software and associated training on its setup, calibration procedures and use. Regarding the bacteria component of the project, a wet and dry weather survey was

conducted. ORSANCO's assistance included consultation on survey design, field collection protocols and laboratory quality assurance. The project schedule requires completion of a draft report by July 2002.

River Lielupe

Description. The Lielupe watershed flows from Lithuania into Latvia and discharges at the environmentally sensitive area of Jurmala on the Baltic Sea coast. Although of moderate size, the watershed suffers from a diverse array of pollutant sources including municipal, industrial and agricultural. Watershed management for this basin will be addressed under an international agreement between the two countries and they have in place an informal arrangement to share monitoring data. In addition, this basin is the site of several international cooperative efforts involving Sweden, Finland and the United States.

Project. Given the current movement of the countries toward international cooperation and the various individual projects in the region, this project served to evaluate the state-of-the-art international cooperation regarding river basin management (The EU Water Framework Directive) and possibilities to achieve it, to determine the environmental status, problems and additional information needs, and develop a joint report on steps toward transboundary watershed management.

Specific tasks to accomplish the objectives are as follow.

- Respective country's critical analysis of a PHARE sponsored study of the Lielupe Watershed (BCEOM French Engineering Consultants *et al.*, 2000). That report was commissioned to assess the status of the conditions in the basin and provide information to facilitate the development of an action plan that would achieve sustained water resources management.
- Respective country development of a joint proposal for appropriate environmental indicators.
- Joint workshop on indicators and development of joint basin management and prioritization of actions.
- Implementation of specific projects/studies necessary for additional data gathering and management and establishment of technical/management approaches and outreach efforts.
- Publication of a joint report proposing a framework for watershed management on an international level.
- Development of terms of reference including specific project proposals, budget and possible funding sources.
- Presentation of the above framework to ministries of the environment and local/regional stakeholders.

The cooperating countries have developed a joint report that includes an overview of the main environmental problems in the basin, goals to be achieved, decision making framework and role of stakeholders, water quality, natural and human factors, and how to implement the action plan (Latvia – Lithuania, 2001). Figure 2 shows the structural scheme envisioned for Lielupe Watershed management.

A key objective of this project was for the cooperating countries to work together throughout the process. This has been achieved and a first meeting to review the report with the stakeholders in the basin was organized in April 2002.

River Sesupe

Description. The River Sesupe forms a portion of the border between Lithuania and Kaliningrad (see Figure 1). The Sesupe is a tributary to the River Nemanus, which

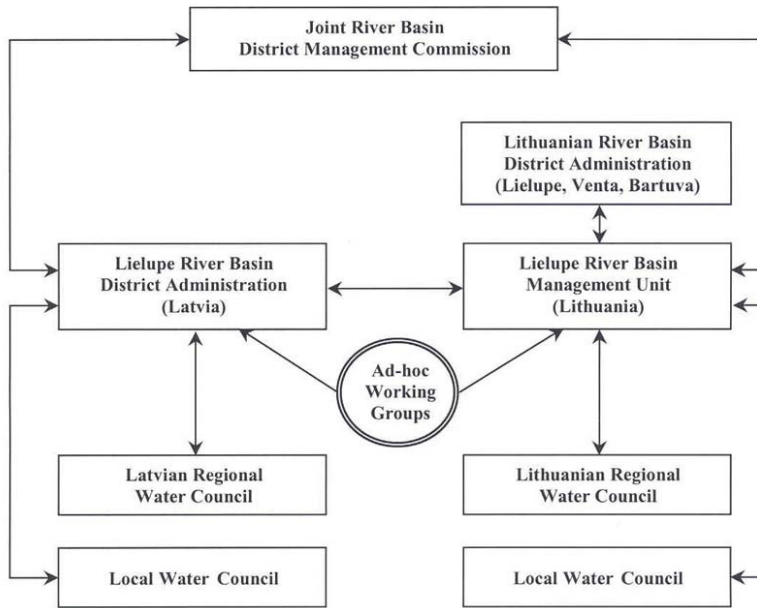


Figure 2 Proposed structure for watershed management of the Lielupe River Basin

discharges to the Baltic Sea at the Coronian Lagoon. The Sesupe Basin is not highly developed. Key water quality problems, as indicated by available data, are depressed summertime dissolved oxygen and elevated concentrations of nitrogen and phosphorus.

Project. This project addressed the need for the cooperating countries to work more closely in aspects of joint environmental data generation, assessment and management. Accordingly, the following project tasks were agreed upon.

- Development of a joint (compatible) Geographic Information System (GIS) that permits the combining/integration of historical data generated by the respective countries.
- Design and execution of a joint country field survey; survey to include collection of physical parameters and split samples for analysis by each country's laboratory and comparison of results to evaluate data comparability.
- Evaluate available conditions for future modeling and preliminary set up (software).
- Identify future priorities for cooperation.
- Identify gaps in watershed management and terms of reference for future implementation of management approaches (Vinceviciene *et al.*, 2002).

Through this project, Kaliningrad was provided with state-of-the-art in situ monitoring equipment as well as GIS hardware and software. The joint field survey was conducted in September 2000 with the partial results shown in Table 1. In general, the data show areas of good agreement between the measurements recorded and parameters needing follow-up by the respective countries.

Special aspects of the demonstration projects program

There were several overarching aspects of the program to be noted.

Role and contributions of the Institute of Environmental Engineering (APINI), Kaunas University of Technology

APINI's contribution to the overall program effort was in connection with its contractual services to PHARE for the development of an assessment of the Lielupe Basin. As noted in

Table 1 Selected comparative data from Joint Country Survey of Sesupe River
Lithuania – Kaliningrad

Parameter	Kaliningrad		Lithuania*	
	Hydrolab	Laboratory	JRC Laboratory	Mrijampo Lab.
pH	8.35	8.49	8.40	8.30
Cond. ($\mu\text{S}/\text{m}$)	623	480	647	–
DO (mg/l)	12.15	12.06	12.0	12.0
BOD ₇ (mg/l)		3.8	1.20	1.81
NH ₄ -N (mg/l)	0.05	0.07	0.023	0.02
PO ₄ (mg/l)		0.2	0.163	0.16
Zn ($\mu\text{g}/\text{l}$)		31	7.4	
Cd ($\mu\text{g}/\text{l}$)		0.56	0.00	
Cr ($\mu\text{g}/\text{l}$)		15.0	0.92	

* Data from Lithuanian laboratories specified as “right, middle, left.” Data shown is middle

the Lielupe Basin demonstration project, the participating countries reviewed that report. In addition, APINI reported on the Sesupe River Basin characterization, data analysis and modeling. It is anticipated that APINI will continue to play an important technical supporting role as the Baltic countries continue their efforts toward employing river basin management approaches in the region.

Joint country workshop in the United States

As part of the general capacity building process, representatives of the Baltic countries and Kaliningrad visited the United States in May 2000. Over the course of a two-week period, the representatives were the guests of USEPA, Chicago regional office, and ORSANCO. The agenda for the Chicago workshop included such topics as wetlands, combined sewer overflow control, GIS, watershed management and water quality standards and monitoring. In Cincinnati the participants received briefings on ORSANCO’s programs, met with local watershed organizations, took field tours and visited area research facilities.

Finally, the participants traveled to Lexington, Kentucky to observe an ORSANCO meeting of Commissioners.

Project workshops

Throughout the project workshops were held in the Baltic region. In addition to the initial November 1998 workshop, additional meetings were held in different locations in October 1999, March and May of 2000 and a final workshop in May 2002. These workshops served to discuss problems and issues relative to the execution of the projects, assure the proper support for project support funding and help build mutual confidence and friendship between cooperating staff.

In the final workshop, the country representatives delivered presentations on status summaries of the projects and discussions were held on future capacity development needs. To assure broad input, particularly with respect to future efforts, and to learn of other projects in the region, thus putting this program into context, country representatives from Poland and Belarus as well as representatives from Russian and Romanian non-governmental organizations and TACIS participated.

Major accomplishments, problems encountered, future directions

The demonstration projects were highly successful, primarily because individual designs were as determined by the Baltics/Kaliningrad country representatives. In addition, and most importantly, through the several workshops held throughout the projects,

key interpersonal relationships were made; relationships which will be vital to the future success of cooperative watershed management.

Overarching specific accomplishments were:

- Parnu Project – First river modeling undertaken by Estonia. First wet weather survey of sewer overflow impacts.
- Lielupe Project – Process and infrastructure identified to support international river basin management.
- Sesupe Project – First international joint monitoring survey between Lithuania and Kaliningrad.

Major challenges included:

- Cultural differences and historical mistrust (manifested in hesitations to share information).
- Lack of baseline information, conflicts in water quality criteria, incompatibility of respective country equipment, differences in monitoring approaches.
- Difficulty of country representatives to make commitments.
- Delays in the flow of support funding and ability to provide on-site assistance (particularly US participants).
- Overcoming differences in language and terms, lack of institutional understanding (particularly US participants).

For the future, the Baltic countries, at the final project workshop, received presentations on, and have agreed on the need to direct attention to, building capacity of local non-governmental organizations and stakeholder groups to become involved with watershed management. Possibilities include capacity building regarding development of volunteer monitoring programs and decision making at the local level. Training on local decision-making can be effectively administered through the development of a local sub-watershed action plan.

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