

Development of Transboundary Water Quality Management Plans

Overview of International Management Plans for Water Quality

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Examples of US-Mexico International agreements :

- Colorado River Salinity;
- Quality of New River as flows from Mexico to USA;
- Nuevo Laredo treated waste water into Rio Grande/Rio Bravo

International agreements should be formed to: :

- Recognize the need for WQ management and commit to action;
- Harmonize use designations and level of WQ standards and criteria;
- Plan actions to improve water quality to meet use designations; and
- Implement measures to improve and sustain water quality.

Elements of Management Plan

- establish a Watershed Management Committee. This group could be composed of the members that initiated transboundary water quality negotiations during the initial recognition of a need for action. Alternately, a separate committee could be formed and could consist of technical representatives of the affected entities (agencies, consumers), appropriate non-governmental organizations (NGOs), and other stakeholders.
- evaluate current water quality in the transboundary water body under consideration. Ideally, a central database of water quality measurements (e.g., dissolved oxygen concentrations) would be established using data from all relevant Parties.

Elements of Management Plan

- identify each nation's current water use designation, or desired use if a Party has yet to designate water uses, as well as associated water quality criteria to meet those uses. A database of the uses along the water segment could be developed to facilitate harmonization of the different uses and water quality criteria.
- assess whether the current water quality supports each riparian Party's use designation.
- negotiate harmonized use designations and associated water quality

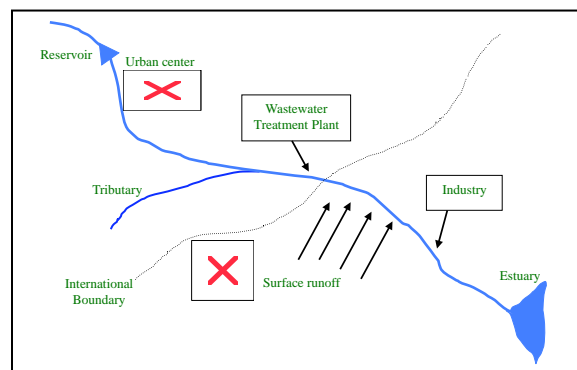
Elements of Management Plan

- negotiate harmonized use designations and associated water quality goals for the water body under consideration. The Watershed Management Committee should evaluate if the current water quality is satisfactory for each riparian Party's desired uses.
- document the list of harmonized use designations and water quality goals.
- establish appropriate procedures to review and revise those criteria to meet future needs.

Aspects of Implementation

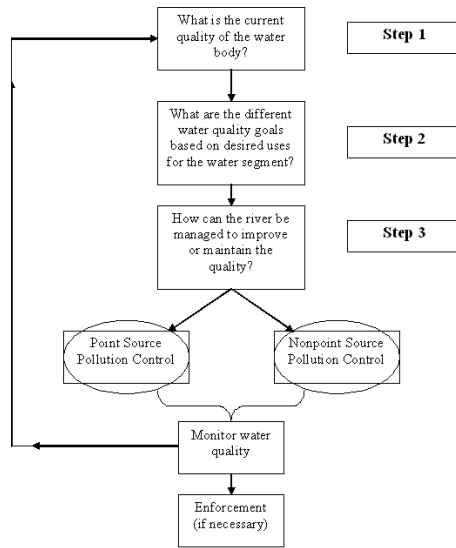
- establishment of a plan for construction and operation of any works required to meet the harmonized water quality goals. The international team or Committee or Council should identify the Parties responsible for construction and operation of the works.
- implementation of strategies for routine monitoring (to ensure water quality goals are being met in order to identify enforcement measures. An enforcement plan should be in place for instances of non-compliance and each riparian state should agree to team(s) responsible for enforcement.
- evaluation of current water quality in the transboundary water body under consideration. Ideally, a central database of water quality measurements (e.g., dissolved oxygen concentrations) would be established using data from all relevant Parties.

Figure 1. Conceptual diagram of a transboundary water body.



Source: Carolyn Gerwe, The University of Texas at Austin

Figure 2. Flowchart of a possible approach to binational water quality cooperation.



Source: Carolyn Gerwe

GUIDELINES FOR THE DEVELOPMENT OF TRANSBOUNDARY WATER QUALITY STANDARDS AND CRITERIA



Purpose :

- To provide guidelines that countries may follow in establishing border international water quality standards and criteria

Table A-1. Effluent Standards for the Nuevo Laredo Treatment Plant

Water Quality Parameter	Adopted Criteria	Mexican standards
Dissolved Oxygen (DO)	≥ 2.0 mg/L	4.0 mg/L
pH	Between 6.0 and 9.0	
Fecal Coliform Bateria	30-day average value of 200 colonies/100 mL	
Suspended Solids	30-day average value of 20 mg/L	30-day average value of 75 mg/L
Biochemical Oxygen Demand (BOD ₅)	30-day average of 20 mg/L	30-day average of 75 mg/L

Costs associated with water quality management

- Allocation of costs between the parties;
- Costs of planning, studies, design, construction and operation;
- Monitoring.

Some examples of beneficial uses

- (1) agricultural supply,
- (2) areas of special biological significance
- (3) cold freshwater habitat
- (4) ocean, commercial, and sport fishing
- (5) estuarine habitat
- (6) freshwater replenishment,

Some examples of beneficial uses:

- (7) groundwater recharge
- (8) industrial service supply
- (9) marine habitat
- (10) navigation
- (11) industrial process supply
- (12) power

Some examples of beneficial uses:

- (13) preservation of rare and endangered species
- (14) municipal and domestic supply
- (15) contact and non-contact recreation
- (16) shellfish harvesting
- (17) fish spawning
- (18) warm freshwater habitat
- (19) wildlife habitat.

Need for exemptions and special cases

- Prolonged droughts
- Major storm events
- Major spills
- Reductions or inadequacy of water supplies

Factors affecting water quality standards

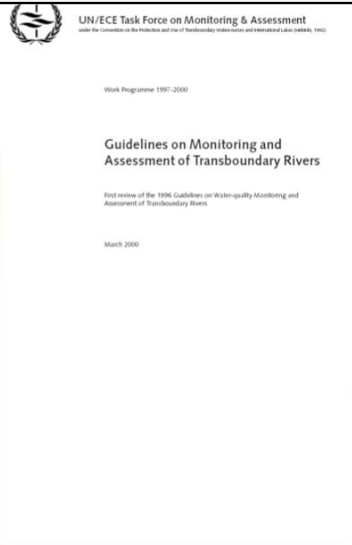
- Domestic regulations
- Designated uses
- Water quality regulatory constraints and relative importance
- Examples: Regulating water quality parameters or the contaminants themselves; important cultural or traditional constraints

Consistent understanding of terms

- Need for glossaries
- Consistent definitions even in translation
- Some special terms:
 1. Maximum contaminant level
 2. Maximum contaminant level goal
 3. Public health goal
 4. Regulatory action level
 5. Criterion maximum concentration
 6. Lowest observed effects level
 7. No observed effects level
 8. No observed adverse effect level

Meeting with Mexican Colleagues





Guidelines on Monitoring and Assessment of Transboundary Rivers

UN Economic Commission for Europe Website

- www.unece.org/env/water/publications/documents

UNECE Publications Water

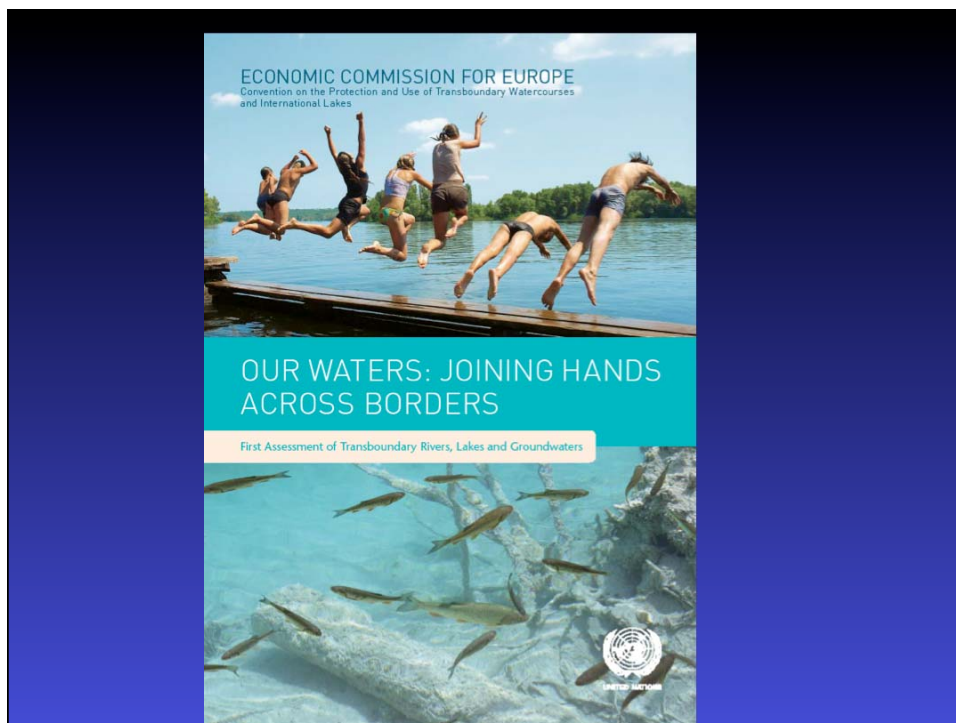
- **The Protocol on Water and Health: making a difference for a healthy environment**
(Forthcoming)
- **The Water Convention ... at your service**
ECE/CEP/NONE/2009/2 – February 2009
- **Our Waters: Joining Hands Across Borders**
First Assessment of Transboundary Rivers, Lakes and Groundwaters
ECE/MP.WAT/25 – Sales # E.07.II.E.19 – ISBN 978-92-1-116972-0 – US\$ 55 – E (R forthcoming)
Also available at: <http://www.unece.org/env/water/publications/pub76.htm>
- **Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management**
ECE/MP.WAT/22 – Sales # E07.II.E.12 – ISBN 978-92-1-116965-2 – US\$ 15 – E,R (F forthcoming)
Also available at: <http://www.unece.org/env/water/publications/pub74.htm>
- **Legal Basis for Cooperation in the Protection and Use of Transboundary Waters**
ECE/MP.WAT/21 – Sales # 06.II.E.14 – ISBN 92-1-116949-6 – R (E forthcoming)
Also available at:
http://www.unece.org/env/water/documents/ECE_WAT_21_Russian%20final_online.pdf
- **Strategies for monitoring and assessment of transboundary rivers, lakes and groundwaters**

UNECE cont.

- **Strategies for monitoring and assessment of transboundary rivers, lakes and groundwaters**
ECE/MP.WAT/20 – Sales # E.06.II.E.15 – ISBN 92-1-116951-8 – US\$ 10 – E, R
Also available at: <http://www.unece.org/env/water/publications/pub74.htm>
- **Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes**
ECE/MP.WAT/17 – January 2007 – E/F/R/German
- **Nature for Water: Payment for ecosystems services**
ECE/EHLM/NONE/2006/6 – March 2006
Also available at: http://www.unece.org/env/water/meetings/payment_ecosystems/brochure.pdf
- **Nature for Water – Protecting water-related ecosystems for sustainable development**
April 2005
Also available at: http://www.unece.org/env/water/meetings/ecosystem/Brochure_final.pdf
- **The 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes – What is it, why it matters?**
A booklet for all who care about and work for clean water
April 2004 – E,F,R, Arabic, Chinese, Spanish

UNECE cont.

- **Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters**
ECE/MP.WAT/11 & ECE/CP.TEIA/9 – August 2004 – E/F/R
- **Convention on the Protection and Use of Transboundary Watercourses and International Lakes**
ECE/ENHS/NONE/94/1 - special edition - E/F/R
- *Water Series*
- **# 5 Dam safety in Central Asia: Capacity-Building and Regional Cooperation**
ECE/MP.WAT/26 - Sales # R.07.II.E.10 - ISBN 978-92-1-416027-4 - R (E forthcoming)
- **# 4 Transboundary Water Cooperation: Trends in the Newly Independent States**
ECE/MP.WAT/16 – Sales # 06.II.E.8 – ISBN 92-1-116942-9 – R (E forthcoming)
Also available at:
http://www.unece.org/env/water/meetings/ecosystem/Brochure_final.pdf#3 **Protection of Transboundary Waters - Guidance for Policy- and Decision-making**
ECE/CEP/11 - Sales # E.96.II.E.25 - ISBN 92-1-116658-6 - US\$ 18 - E,F,R
Also available at:
<http://www.unece.org/env/water/publications/documents/wbtp414-1998.pdf#2> **Protection and Sustainable Use of Waters**
ECE/CEP/10 - Sales # E.95.II.E.14 - ISBN 92-1-116627-6 - US\$ 24 - E,F,R



International Joint Commission

- **MISSION STATEMENT**

The International Joint Commission prevents and resolves disputes between the United States of America and Canada under the *1909 Boundary Waters Treaty* and pursues the common good of both countries as an independent and objective advisor to the two governments.

- In particular, the Commission rules upon applications for approval of projects affecting boundary or transboundary waters and may regulate the operation of these projects; it assists the two countries in the protection of the transboundary environment, including the implementation of the *Great Lakes Water Quality Agreement* and the improvement of transboundary air quality; and it alerts the governments to emerging issues along the boundary that may give rise to bilateral disputes.

The screenshot displays the official website of the Great Lakes Commission. At the top, there is a navigation bar with links for 'ABOUT US', 'ANNOUNCEMENTS', 'CALENDAR', 'PROGRAMS', and 'PUBLICATIONS'. The main header features the organization's logo and name in both English and French, along with a search bar. Below the header is a horizontal menu with categories such as 'Featured Issues', 'Policy and Advocacy', 'Communications and Education', 'Air / Water Quality', 'Water Use', 'Economy and Transportation', 'Land and Soil Management', and 'Data and Monitoring'. A large featured image shows a lighthouse on a rocky shore with the caption 'Photo: Lake Superior, Grand Marais, MI'. The main content area is divided into several sections: 'Upcoming events' (listing the GLDS Annual Meeting), 'Recent publications' (listing various reports and newsletters), 'Commission news' (with three news items), and 'Commission E-newsletter' (with a link to News Briefs). At the bottom, contact information for the Great Lakes Commission is provided, including the address, phone, and fax numbers. There are also links for 'Staff directory', 'Site map', and 'Last updated' information. Logos for 'GLIN PARTNER' and 'Adobe Acrobat Reader' are visible in the footer.

Great Lakes Commission

- **Introduction**
The Great Lakes Commission is an interstate compact agency that promotes the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the Great Lakes basin and St. Lawrence River. Its members include the eight Great Lakes states with associate member status for the Canadian provinces of Ontario and Québec. Each jurisdiction appoints a delegation of three to five members comprised of senior agency officials, legislators and/or appointees of the governor or premier.
- The Commission was established by joint legislative action of the Great Lakes states in 1955 (the Great Lakes Basin Compact) and granted congressional consent in 1968. A Declaration of Partnership (PDF) established associate membership for the provinces in 1999.

Border Environment Cooperation Commission

- The **Border Environment Cooperation Commission** works to preserve, protect and enhance human health and the environment of the U.S. - Mexico border region, by strengthening cooperation among interested parties and supporting sustainable projects through a transparent binational process in close coordination with the North American Development Bank, federal, state and local agencies, the private sector, and civil society.



Border 2012

- U.S.-Mexico Environmental Program (Border 2012) is a collaboration between the United States and Mexico to improve the environment and protect the health of the nearly 12 million people living along the border. The bi-national program focuses on cleaning the air, providing safe drinking water, reducing the risk of exposure to hazardous waste, and ensuring emergency preparedness along the U.S.-Mexico border.
- Border 2012 is a results-oriented program that takes a “bottom-up” approach to addressing the environmental and public health needs of the border region. Issues and projects are identified and implemented at the local level. The program encourages stakeholder involvement through a variety of opportunities



Border 2012 Map



Other Partners

- BECC – Border Environmental Cooperation Commission
COCEF – Comisión de Cooperación Ecológica Fronteriza
- CCDS – Consejo Consultivo para Desarrollo Sustentable
(Mexico's Consulting Council for Sustainable Development)
- CEC – North American Commission for Environmental Cooperation
CCA – Comisión para la Cooperación Ambiental de América del Norte
- CONAGUA – Comisión Nacional del Agua
(Mexico's National Water Commission)
- GNEB – Good Neighbor Environmental Board
- IBWC – International Boundary and Water Commission
CILA – Comisión Internacional de Límites y Aguas
- HHS – U.S. Department of Health and Human Services
- NADB – North American Development Bank
BANDAN – Banco para el Desarrollo de América del Norte
- NAEPC – Native American Environmental Protection Coalition
- PROFEPA – Procuraduría Federal de Protección al Ambiente
(Mexico's Federal Attorney General for Environmental Protection)
- SCERP – Southwest Center for Environmental Research and Policy
- SEMARNAT – Secretaría de Medio Ambiente y Recursos Naturales
- SS – Secretaría de Salud (Mexico's Secretariat of Health)

State Partners

- ADEQ - Arizona Dept. of Environmental Quality
Lead: Edna Mendoza (Mendoza.Edna@azdeq.gov)
- CALEPA - California Environmental Protection Agency
Lead: Ricardo Martinez (rmartinez@calepa.ca.gov)
Alejandro Rodarte (arodarte@calepa.ca.gov)
- NMED - New Mexico Environment Department
Lead: Gedi Cibas (gedi.cibas@state.nm.us)
- TCEQ - Texas Commission on Environmental Quality
Lead: Diana Borjas (DBORJA@tceq.state.tx.us)
Steve Niemeyer (sniemeye@tceq.state.tx.us)

Additional Reference Sites

- <http://www.ibwc.gov/>
- <http://www.ijc.org/>
- <http://www.glc.org/>
- <http://cec.org>
- <http://www.cocef.org/>
- <http://www.epa.gov/usmexicoborder/>

Oregon State
UNIVERSITY
College of Science



PROGRAM IN WATER CONFLICT MANAGEMENT AND TRANSFORMATION
www.transboundarywaters.orst.edu

INSTITUTE FOR
WATER AND
WATERSHEDS

The Program in Water Conflict Management and Transformation (PWCMT)

The program is aimed at supporting water conflict prevention and resolution in Oregon, across the United States and internationally through a four-fold approach:

- (1) [The Certificate in Water Conflict Management and Transformation;](#)
- (2) [The Transboundary Freshwater Dispute Database;](#)
- (3) [The Universities Partnership for Transboundary Waters; and](#)
- (4) [Collaborative Facilitations and Skills-Building Workshops.](#)

This Program is being designed to fill the niche as a broader, more integrative approach that explicitly integrates human, policy, and scientific dimensions of water resources within the framework of governance and sustainability, and focuses training and research on all facets of water conflict transformation. The PWCMT serves as a training, resource and information hub for students, citizens, officials, and business leaders in Oregon, across the United States and internationally, facilitating dialogue on critical water issues across diverse values and perspectives.

[Learn more](#) about the Program in Water Conflict Management and Transformation.

Collaborating Partners

[Home](#) | [About Us](#) | [Certificate](#) | [Data](#) | [Research](#) | [Publications](#) | [Links](#) | [Contact Us](#)



- **The Transboundary Freshwater Dispute Database (TFDD)** is used to aid in the assessment of the process of water conflict prevention and resolution, over the years we have developed this Transboundary Freshwater Dispute Database, a project of the Oregon State University Department of Geosciences, in collaboration with the Northwest Alliance for Computational Science and Engineering.
- **The TFDD is comprised of several components**
- **TABULAR**
 - Middle East Water Collection - NEW
The Middle East Water Collection provides access to roughly 9000 items on the subjects of politics and water in the Middle East. Oregon State University is privileged to be selected to host Dr. Nalf's comprehensive life's work in our Library.
 - International Freshwater Treaties Database - New Treaties added
A searchable database of nearly 450 international, freshwater-related agreements, covering the years 1820 to 2007.
 - International Water Event Database - New Events added
A searchable database documenting historical international water relations from 1948 to 2005.
 - International River Basin Register (updated August 2002):
This register lists the world's international river basins, delineated by continent.
 - U.S Interstate Freshwater Compacts Database
A searchable compilation of 39 US interstate compacts.
 - Water Conflict and Cooperation Bibliography - Update in progress
A searchable database of publications concerning water conflict and cooperation, with a focus on international freshwater resources



- **Annotated Bibliographies - Coming soon!**
This is a literature resource of references and publications related to national and international river basins.
- **SPATIAL**
- Transboundary Freshwater Spatial Database - New Basins and maps added
Biophysical, socioeconomic, and geopolitical data relating to the world's international river basins are accessible and searchable through spatial and tabular formats.
- Atlas of International Freshwater Agreements:
Contains an historical overview of international river basin management; a detailed listing of more than 400 international freshwater agreements; and a collection of thematic maps.
-



New Publication



- **Environmental and Water Resources Institute**
- **American Society of Civil Engineers**
- **Standard 33-09**
- **Comprehensive Transboundary Water Quality Management Agreement with Guidelines for Development of a Management Plan, Standards and Criteria**
- **Coming Spring 2009**