

Sewage Overflows in the Detroit River



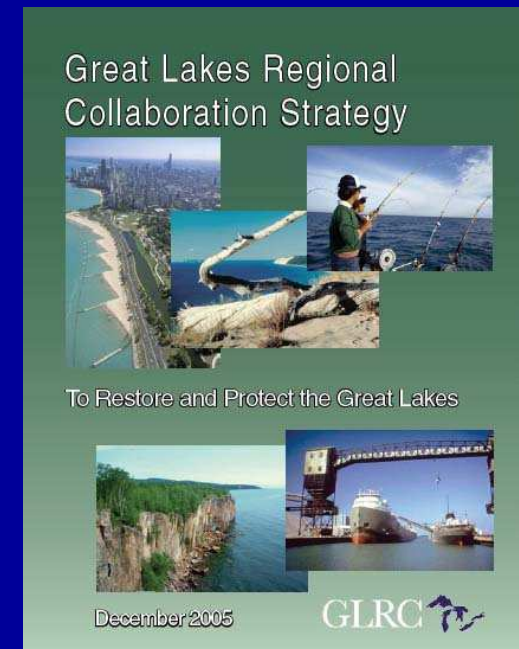
Photo Credit: Bob Burns, Detroit Riverkeeper

Great Lakes Regional Collaboration

- In May of 2004, President Bush issued an Executive Order
 - Recognized Great Lakes as a “national treasure”
 - Created Federal Great Lakes Interagency Task Force
 - Directed EPA Administrator to convene a “regional collaboration of national significance for the Great Lakes”
 - Charged to develop national restoration and protection action plan for Great Lakes
 - All 8 states, mayors, federal agencies
 - » Over 1500 people involved
 - One year
 - Signed December 12, 2005

Great Lakes Regional Collaboration Strategy

- **End sewage overflows and improve beach health**
- Prevent introduction and manage existing invasive species
- Clean up toxic hotspots and our Areas of Concern
- Reduce inputs of new toxins and persistent chemicals
- Reduce polluted run-off
- Protect and restore key habitat across the basin, including at least 500,000 acres of coastal wetlands
- Invest in sustainable development
- Monitor progress

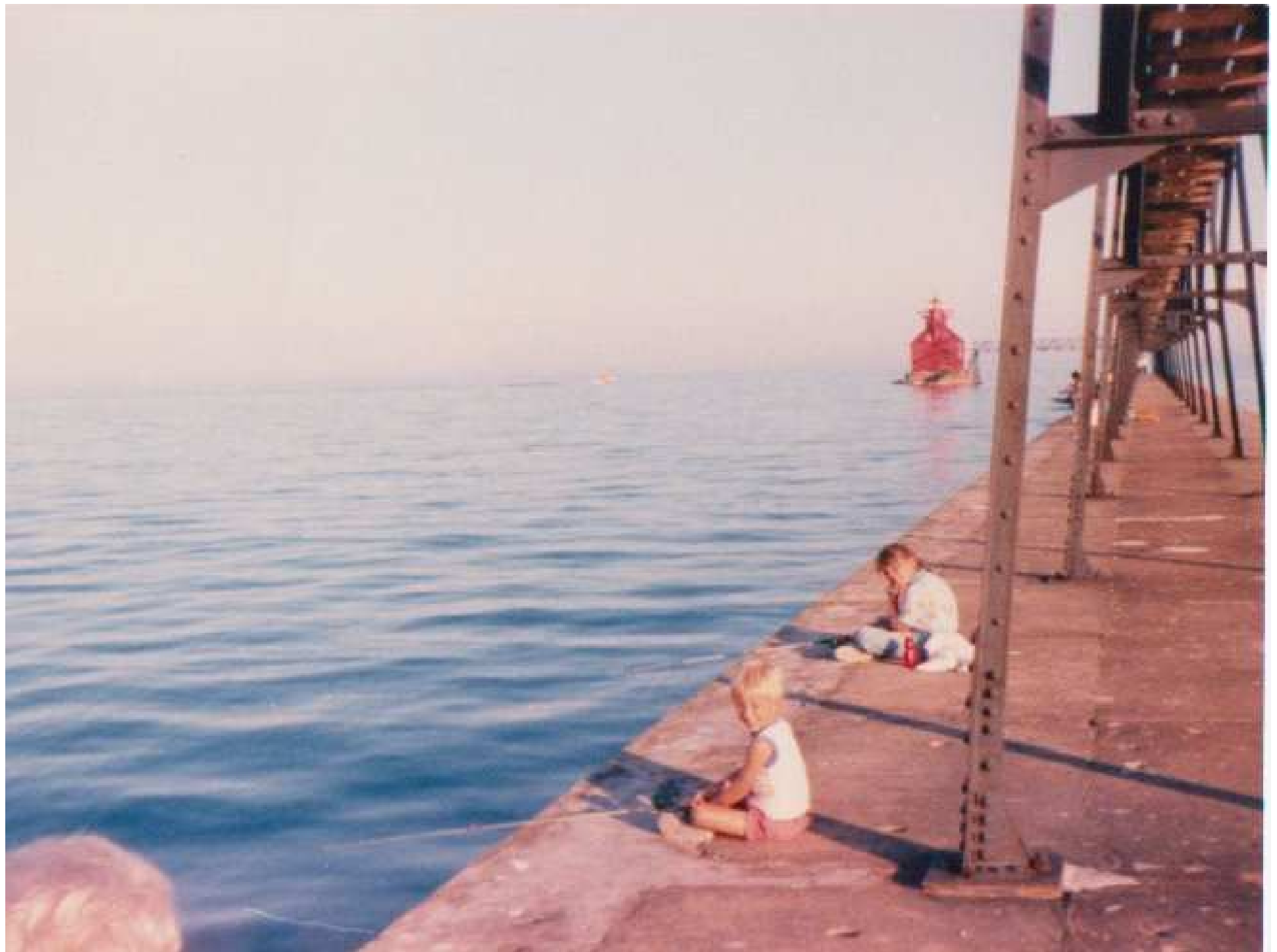


Sewage Overflows

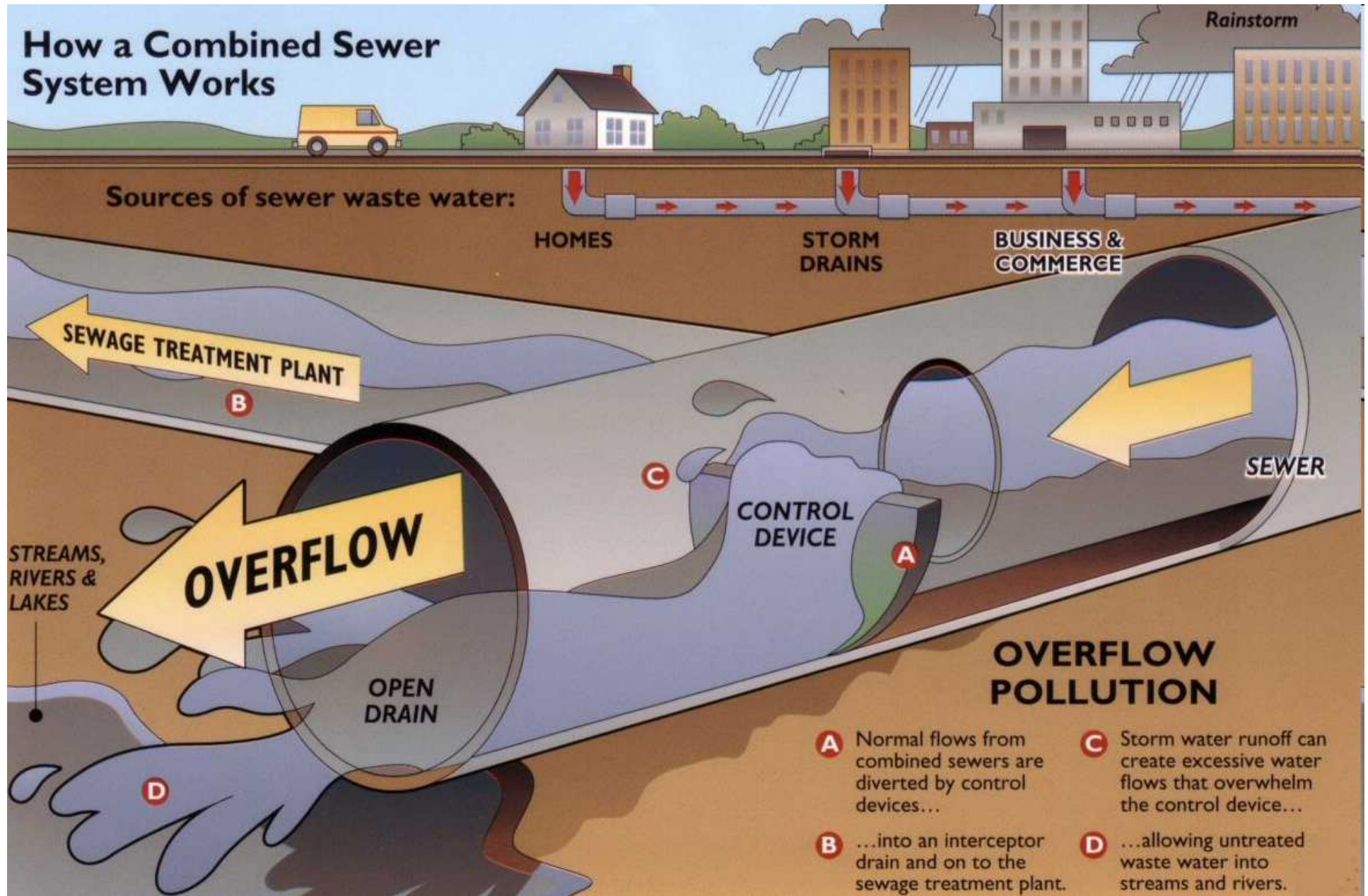


In 2006, cities dumped over 23 billion gallons of raw sewage into the Great Lakes.

Lake Michigan



How a Combined Sewer System Works



Source: Moundsville, West Virginia

CSOs

- **CSO = combined sewage overflow**
- **CSO outfalls contain a combination of:**
 - storm water
 - partially or wholly untreated sewage
 - industrial pretreated waste
- **CSO discharges can cause:**
 - a reduction of oxygen levels in surrounding waters harming aquatic organisms
 - increase levels of phosphorus promoting harmful algae blooms
 - cause a concentration of toxic chemical and metal levels increasing the bioaccumulation effects and increase harmful E. coli bacteria levels causing beach closings

Clean Water Act

- Congress passed the Clean Water Act (1972)
 - Launched major regulatory effort to control pollution from industrial and municipal sources
- One of the largest single sources of pollution to the Detroit River
 - Effluent discharged from 78 combined sewer outfalls are found along the Detroit and Rouge Rivers
- CSO outfalls are part of the Detroit Water and Sewerage Department (DWSD) sanitary system
 - One of the largest single site waste treatment plants in the world
 - Covers an area of approximately 946 square miles
 - Services 76 communities containing nearly 3 million people
 - Takes wastewater from over 10,000 commercial and over 350 significant industrial users

CSO Facilities

- DWSD currently operates and maintains seven CSO facilities
- Four of these are retention basins, which allow heavy storm flows to be temporarily stored



Hubbell – Southfield CSO Basin



7 Mile CSO Basin

CSOs

- **Detroit's three remaining CSO facilities are screening and disinfection facilities (St. Aubin, Lieb, and Baby Creek)**
 - Used only during high flow events
 - Their designs provide for 10 minutes of disinfection contact time
- **These three CSO facilities do not have any temporary storage capacity, but disinfect, screen, and separate solids from the storm water flow**
 - Solids are transported to an offsite location for disposal
 - Remaining screened flow is disinfected and released to the river


An aerial photograph showing the Detroit Wastewater Treatment Plant on the left, with its various industrial structures and pipes. The plant is situated along a river. To the right of the plant, the river widens, and a large, dark, circular area of water is visible, possibly a lagoon or a large tank. The water in the foreground is a murky, brownish-green color, while the water further out is a lighter, more natural blue-green. The sky is overcast, and the overall scene is industrial and somewhat somber.

Photo Credit: Bob Burns, Detroit Riverkeeper

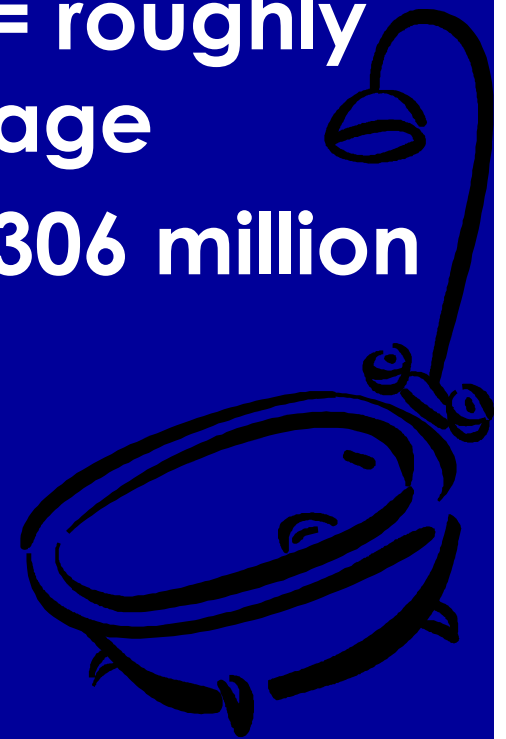
2008 CSO Data for Detroit Wastewater Treatment Plant

In 2008, the following was released in the Detroit and Rouge Rivers

- 3.4 billion gallons of diluted raw sewage**
- 30 billion gallons of partially treated sewage**

How much is that?

- 1 bathtub = 50 gallons of water
- 33.4 billion gallons / 50 gallons = roughly 668,000,000 full bathtubs of sewage
- U.S. population = Approaching 306 million





CSO Impact on Lake Erie

Source: Michigan Sea Grant

Impact on Coastal Health: Lake Erie

- Pollutes out water with:
 - Disease-causing microorganisms called pathogens
 - Pathogens lead to beach closures
 - 124 closings in Michigan (2006 data from NRDC report)
 - 629 closings in Ohio (2006 data from NRDC report)
 - Excess nutrients
 - Kills aquatic life
 - Creates algae that can suffocate fisheries
 - Heavy metals
 - Other toxins

Overview of CSO Problem

- As reported in the 2007 MDEQ CSO and SSO Report:

- 12 of the original 78 CSO outfalls have received some type of control measures to date
- 24 more being addressed in current or planned projects to be completed by 2013
- 42 more to be addressed in the future

How do we fix this problem?

- Build CSO retention and disinfection facilities, control tunnels, and increase treatment capacities and processing at the DWSD treatment plant
- Use green infrastructure
- Engage citizens

Build CSO Facilities: It's expensive!!!

- Providing public water and treating sewage is the second highest category of local government spending next to public education
- According to the US Council of Mayors, more than \$82 billion was spent in 2005 on water and sewer services and infrastructure by cities
 - This investment protects public health, supports local and metropolitan economies, and protects ecosystems
- Unfortunately, financial assistance for these projects continues to decrease from low-interest loans through the Clean Water State Revolving Fund and federal grants

Build CSO Facilities: Southeast Michigan

- **Southeast Michigan Council of Governments (SEMCOG) report, “Investments in Reducing Combined Sewer Overflows Pays Dividends”**
 - Indicates approximately \$2.4 billion is being invested in Southeast Michigan to reduce CSOs
 - When the report was written in September 2008, over \$1 billion of the projects were complete
 - Remaining commitments are in various stages of design or construction

Build CSO Facilities: Create Jobs

- U.S. Conference of Mayors Water Council prepared report, “Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy”
 - \$1 of water and sewer infrastructure investment increases GDP in the long-term by \$6.35
 - Adding one new job in the local public water and sewer sector creates 3.68 jobs in the national economy to support that job
- National Construction Alliance report
 - Every \$1 billion invested in water infrastructure results in 47,000 jobs in the United States

Build CSO Facilities: Need Government Support

- Level of spending for sewers need to at least **DOUBLE** over the next 30 years
- Federal commitments must be long-term and continual
- Sewage infrastructure merits levels proportional to transportation infrastructure

Thinking Outside the Pipe: Green Infrastructure

- Restores, recycles, and extends natural and built regional infrastructure
- Highly effective for stormwater runoff reduction and pollutant removal
- Saves money compared to conventional infrastructure
- Delivers multiple community benefits along with stormwater management

Thinking Outside the Pipe: Green Infrastructure

- **Low-Impact Development Manual**
 - Created by SEMCOG and MI DEQ
 - MI Great Lakes Plan plans to implement where possible statewide

Thinking Outside the Pipe: Green Infrastructure

- **Green Roofs**
 - consists of vegetation and soil, planted over a waterproofing membrane



Source: Don Carpenter, Lawrence Technological University

Thinking Outside the Pipe: Green Infrastructure

- **Bioretention/Rain Gardens**
 - Natural or excavated depression backfilled with engineered fill media designed to capture, filter, and store storm water

Thinking Outside the Pipe: Green Infrastructure

- **Bioswale**
 - Long narrow channel, planted with a variety of trees, shrubs, and grasses over permeable soils
 - Stormwater runoff from impervious surfaces is directed through the swale to filter pollutants and promote infiltration



Source: Don Carpenter, Lawrence Technological University

Thinking Outside the Pipe: Green Infrastructure

- **Porous Pavement**
 - Pavement (concrete or asphalt) consisting of traditional structural materials with regularly interspersed void areas that allow drainage

Thinking Outside the Pipe: Green Infrastructure

- **Stormwater Treatment Wetlands**
 - Wetland systems that are designed to maximize the removal of pollutants from stormwater runoff through settling and both uptake and filtering vegetation
 - Constructed stormwater wetlands temporarily store runoff in relatively shallow pools that support conditions suitable for the growth of wetland plants



Source: Don Carpenter, Lawrence Technological University

Thinking Outside the Pipe: Green Infrastructure

- **Naturalized Detention**
 - Stormwater control facilities that are planted with native vegetation rather than maintained as lawn to improve water quality



Source: Don Carpenter, Lawrence Technological University

Thinking Outside the Pipe: Green Infrastructure

- **Creates jobs**
 - Design
 - Landscaping
 - And many more!!!

Citizen Involvement

**Conserve water by
installing water
efficient
hardware/appliances**

- Install a 1.6 gallon low-flow toilet
- Install low-flow showerheads
- Purchase a front-loading washing machine



Sue Norman and Craig Ressler (Caledonia, MI)

Photo Credit: Advance Newspapers

Citizen Involvement

**Work with your
municipal leaders
to create a
community-wide
water conservation
program in your
city or town**



Citizen Involvement

Install a rain barrel



Citizen Involvement

Build a rain garden



Citizen Involvement

Encourage your city to install green rooftops and use permeable surfaces



Citizen Involvement

Use non-toxic cleaning products



Citizen Involvement

**Carefully dispose of
oil, paint, solvents, and other products**



Citizen Involvement

Reduce use of pesticides and fertilizers



Peter and Anne Bray (Birmingham, MI)

Photo Credit: Italia Millan

Citizen Involvement

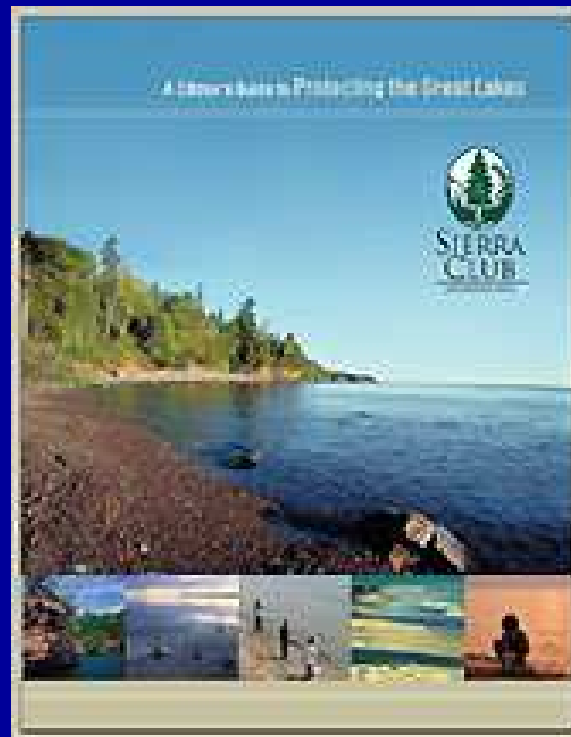
Don't put yard waste in streets



Citizen Involvement

Tell your friends!!!

“A Citizen’s Guide to Protecting the Great Lakes”



Citizen Involvement

Educate Local, State, and Federal Public Officials



Together, we will protect our Great Lakes!



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