

# BMPs & Management Measures Structural & Nonstructural

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2011 National Tribal Water Quality Conference

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# Definitions

- What are *Best Management Practices*? (BMPs)
- Either **physical or cultural controls** working individually or as a group, **appropriate to the source, location, and area climate for the pollutant to be controlled**. These are a basis for estimating the effectiveness, costs, and economic impacts of achieving the management measures

# Definitions

- What are *Management Measures*?
- Economically achievable actions to control the addition of pollutants to our waters, which provide the greatest degree of pollutant reduction through the application of the best available NPS controls

# Know Your Water Quality Goals



# Types of BMPs

- Structural

- Moving earth
- Planting things
- Construction

- Non-structural

- Institutional changes
- Ordinance development
- Watershed planning
- Inventories

# Approaches in selecting BMPs

- Control pollutants at the source
  - Stormwater infiltration
- Provide treatment for special wastes
  - Manure management/containment
- Prevent stream and river bank erosion
  - Preserve/replace vegetation
- Redesign developed areas
  - Keep runoff on site

# How to Select BMPs and MMs

Select Management Measures by category of pollution (agriculture, forestry)

Select BMPs by the source of pollution, site conditions and climate factors (rain gardens, native plants, fencing)

# Think about a Treatment Train

- Source controls
- Site controls
- Neighborhood controls
- Regional controls



# What it takes to get a BMP implemented

- Technical information  
what is the problem  
you are trying to solve
- Partnerships – look at what is  
being used in your area
- Clear understanding of the  
outcome desired





**Do you see an opportunity for BMPs?**

How would you go about choosing the BMPs?

Who would do the implementation?

What climate assumptions would you make?

# Non-Structural

## Chapter 48

### Water Resources Ordinance

Kanekalunyuhs Olihwake

the matters of the different kinds of waters

48.1-1 Purpose and Policy

48.2-1 Authority

48.3-1 Definitions

48.4-1 Powers and Duties

48.5-1 Review

48.6-1 Reporting

48.3-7. "Non-point Source" means a land management activity which contributes to runoff, seepage or percolation which adversely affects or threatens the quality of waters of the Reservation and which is not a point source as defined in Section 3-10.

48.6-5. Oneida Environmental Fund established. The Oneida Environmental Fund is hereby established. Any and all monies collected pursuant to this Ordinance shall be deposited in the Oneida Environmental Fund. This fund shall be used by the Tribe to defray the expense of administering this Ordinance, and to fund pilot projects and provide pollution control and prevention grants to persons at the discretion of the Department, and subject to the availability of funds.

Adopted - BC-5-08-96-B

# Conservation Plan

Partnership NRCS and Bay Mills Indian Community

This plan is a dynamic and nonbinding document produced to help preserve and protect the natural resources on the Bay Mills Indian Community (BMIC) tribal lands for present and future generations. BMIC is located in Michigan's Upper Peninsula,....

The main objectives for this plan include the protection of surface and ground water quality, a reduction in stream bank and soil erosion, and the enhancement of existing wildlife habitat....

Once installed, all practices should be periodically inspected and maintained, as needed, according to the operation and maintenance plan, provided and approved by NRCS. All operation and maintenance will be the responsibility of the tribe. It is recommended that the plan be reviewed and updated as practices are implemented and the management objectives change. Please contact NRCS for help when updating your plan.

13th Annual

# LAKEFEST

June 20, 2009

Downtown Lac du Flambeau

Saturday, 10a.m. to 3p.m.

*"Water is life within the sacred circle."*



Educational Displays

Free Hot Dogs, Popcorn & Soda

Games & Activities

Live Entertainment

Canoe Races with prizes.

## Raffles

- For a \$1,000 Gander Mountain Gift card.
- Two tickets and two-night hotel stay for Green Bay Packers Season Opener vs. Chicago Bears.
- Patio Set with Grill.
- Plus hourly raffles.



Another  
Non –  
Structural  
Example

# Structural BMPs











# Septic replacement



# Before and After



**Burnsville Raingardens**

**Designed  
by: Barr Engineering**

# More BMPs



- ▶ Maps, Imagery, and Data, & Analysis
- ▶ Nutrient & Pest Management
- ▶ Range and Pasture
- ▶ Social Sciences
- ▶ Soils
- ▶ Water Resources

- ▶ Find a Service Center
- ▶ States and Regions
- ▶ Centers

Guides are automated as data bases, computer programs, and other electronic-based materials such as those included in these web based pages.

## What is in eFOTG?

### Section I – General References

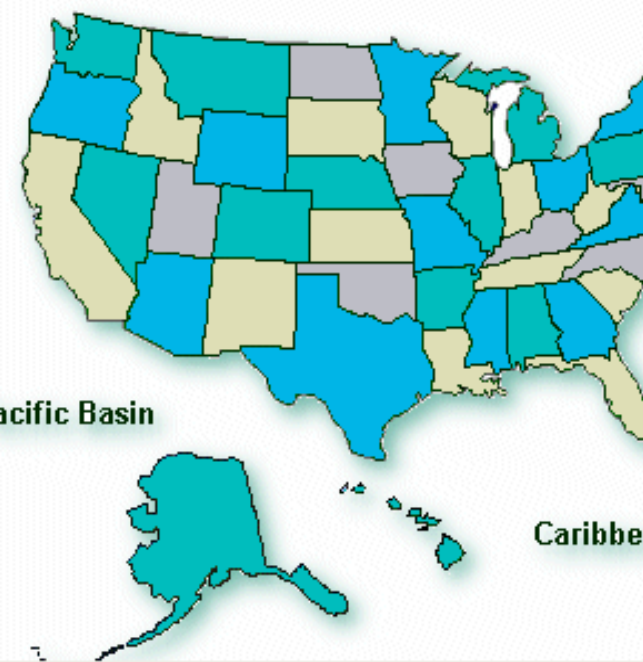
In this section you will find general state maps, descriptions of Major Land Resource Areas, watershed information, and links to NRCS reference manuals and handbooks. Section I contains links to researchers, universities, and agencies we work. Section I also contains conservation practice costs, agricultural laws and regulations, cultural resources, and information about protected plant and animal species.

### Section II – Soil and Site Information

In this section you will find detailed information about soil, water, air, plant, and animal resources. NRCS Soil Surveys, Hydric Soils Interpretations, Ecological Site Descriptions, Forage Suitability Groups, Cropland Production Tables, Wildlife Habitat Evaluation Guides,

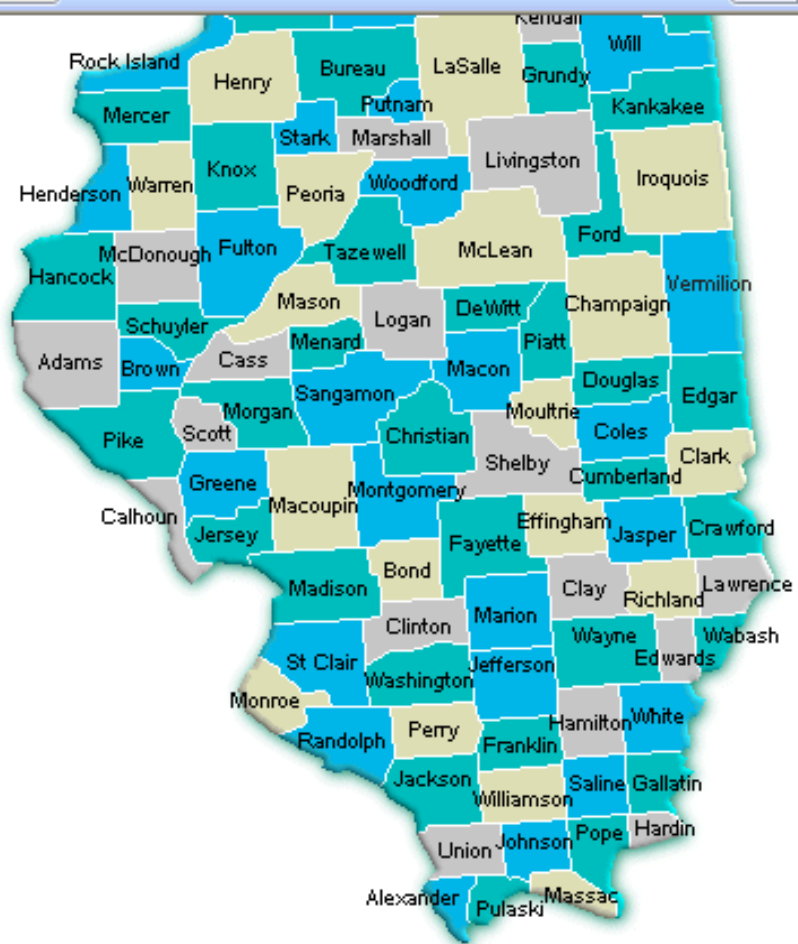
## Access eFOTG

eFOTG State Locator — Click on



Pacific Basin

Caribbe



to the left.

- To select a different state, click [here](#).

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD  
WATER AND SEDIMENT CONTROL BASIN  
(No.)  
CODE 638**

**NRCS, Illinois March 2008**

- Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office or visit the electronic Field Office Technical Guide.

- **DEFINITION**

- An earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin.

- **PURPOSES**

- A water and sediment control basin may be established to:
  - Improve farmability of sloping land
  - Reduce watercourse and gully erosion
  - Trap sediment
  - Reduce peak rate of flow at downstream locations
  - Improve downstream water quality



TABLE 1. Agricultural Practices

| PRACTICE<br>(NRCS Practice<br>Code)<br><br>(ADDITIONAL SOURCES<br>OF INFORMATION) | TARGETED<br>POLLUTANTS<br><br>B bacteria<br>F floatables<br>N nutrients<br>DO dissolved oxygen<br>H hydrocarbons<br>TP temperature<br>T toxics<br>S sediment | MECHANISM                  |                      |                           |             |                           |            |                   |                         |                       |            |              |
|---|--|----------------------------|----------------------|---------------------------|-------------|---------------------------|------------|-------------------|-------------------------|-----------------------|------------|--------------|
|   |  | SOURCE CONTROL             |                      |                           |             |                           |            | TREATMENT CONTROL |                         |                       |            |              |
|   |  | Managerial/<br>Operational | Good<br>Housekeeping | Collection/<br>Conveyance | Containment | Reduction/<br>Elimination | Protection | Stabilization     | Biological<br>Treatment | Chemical<br>Treatment | Filtration | Infiltration |
| <b>NONIRRIGATED CROPLAND</b>  |  |                            |                      |                           |             |                           |            |                   |                         |                       |            |              |
| Alley Cropping (311)  | N, S   |                            |                      |                           |             |                           | ✓          |                   |                         |                       | ✓          |              |
| Contour Buffer Strips (332)   | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         | ✓                     |            |              |
| Conservation Cover ((327)   | N, S   |                            |                      |                           |             | ✓                         | ✓          |                   |                         |                       |            |              |
| Conservation Crop<br>Rotation (328)   | N, S   |                            |                      |                           | ✓           |                           |            |                   |                         |                       |            |              |
| Contour Farming (330)   | N, S   |                            |                      |                           | ✓           |                           |            |                   |                         |                       |            |              |
| Cover and Green Manure<br>Crop (340)  | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |
| Critical Area Planting (342)  | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |
| Deep Tillage (324)  | N, S   |                            |                      |                           |             |                           |            |                   |                         |                       |            |              |
| Field Border (386)  | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |
| Field Windbreak (380)   | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |
| Filter Strip (393)  | N, S   |                            |                      |                           |             |                           |            |                   |                         | ✓                     |            |              |
| Grassed Waterway (412)  | N, S   |                            |                      |                           |             |                           | ✓          |                   |                         |                       |            |              |
| Mulching (484)  | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |
| PAM Erosion Control (450)   | N, S   |                            |                      |                           |             | ✓                         | ✓          |                   | ✓                       |                       |            |              |
| Pasture and Hayland<br>Planting (512)   | N, S   | ✓                          |                      |                           |             |                           |            |                   |                         |                       |            |              |
| Residue Management<br>(329)   | N, S   |                            |                      |                           |             | ✓                         |            |                   |                         |                       |            |              |

# EPA and Management Measures/BMPs

<http://www.epa.gov/owow/nps/pubs.html>

**National Management Measures to Control Nonpoint  
Source Pollution from**

**Agriculture**

**Forestry**

**Hydromodification**

**Marinas and Recreational Boating**

**Urban Areas**

**AND**

**To Protect and Restore Wetlands and Riparian Areas for  
the Abatement of Nonpoint Source Pollution**

**Guidance Specifying Management Measures for Sources of  
Nonpoint Pollution in Coastal Waters**

# National Menu of Stormwater Best Management Practices

- The National Menu of Best Management Practices for Stormwater Phase II was first released in October 2000. EPA has renamed, reorganized, updated, and enhanced the features of the website.
- Urban Management Measures Guidance- The National Management Measures to Control Nonpoint Source Pollution from Urban Areas helps municipalities and citizens in urban areas protect waterbodies from polluted runoff resulting from everyday activities. These scientifically sound techniques are the best practices known today. The guidance helps municipalities implement their Phase II stormwater permit programs, and states implement their nonpoint source control programs.
- Page <http://www.epa.gov/npdes/stormwater/menuofbmps>

# International BMP Database

www.bmpdatabase.org



**INTERNATIONAL  
STORMWATER BMP  
DATABASE**  
www.bmpdatabase.org

[Site Map](#) [Contacts](#) [Policies](#) [Disclaimer](#)

|                         |             |                                  |                             |  |                                  |                                 |                       |
|-------------------------|-------------|----------------------------------|-----------------------------|--|----------------------------------|---------------------------------|-----------------------|
| <b>Project Sponsors</b> | <b>Home</b> | <b>BMP Performance Summaries</b> | <b>Retrieve BMP Studies</b> | <b>Research Tools/ Master Database</b> ▾ | <b>Data Entry Spreadsheets</b> ▾ | <b>Monitoring/ Evaluation</b> ▾ | <b>Publications</b> ▾ |
|-------------------------|-------------|----------------------------------|-----------------------------|--|----------------------------------|---------------------------------|-----------------------|

**Project Team**

Welcome to the International Stormwater Best Management Practices (BMP) Database project website, which features a database of over 300 BMP studies, performance analysis results, tools for use in BMP performance studies, monitoring guidance and other study-related publications. The overall purpose of the project is to provide scientifically sound information to improve the design, selection and performance of BMPs. Continued population of the database and assessment of its data will ultimately lead to a better understanding of factors influencing BMP performance and help to promote improvements in BMP design, selection and implementation.

The project, which began in 1996 under a cooperative agreement between the [American Society of Civil Engineers \(ASCE\)](#) and the [U.S. Environmental Protection Agency \(USEPA\)](#), now has support and funding from a broad coalition of partners including the [Water Environment Research Foundation \(WERF\)](#), [ASCE Environmental and Water Resources Institute \(EWRI\)](#), [USEPA](#), [Federal Highway Administration \(FHWA\)](#) and the [American Public Works Association \(APWA\)](#). [Wright Water Engineers, Inc.](#) and [Geosyntec Consultants](#) are the entities maintaining and operating the database clearinghouse and web page, answering questions, conducting analyses of newly submitted BMP data, conducting updated performance evaluations of the overall data set, disseminating project findings, and expanding the database to include other approaches such as Low Impact Development techniques. The database itself is downloadable to any individual or organization that would like to conduct its own assessments.

**What's New**

2007 Data Analysis Report released in October 2007

Website revised with new, ease-to-use performance summary information

Master Database exceeds 300 BMP studies with access to a new bibliography

Florida Department of Environmental Protection BMP Database Integrated into International Stormwater BMP Database--searchable online

**What Type of User Are You?** Let us help you enter our website to find the level of detail you need:

|  |   |  |   |   |
|--|---|--|---|---|
| <p><b>Low-Intensity</b></p> <p>Get Basic Performance Summary Information for BMPs</p> <p>Typical Users:<br/>Public officials, casual users, those seeking quick/fast answers</p> | <p><b>Mid-Intensity</b></p> <p>Get Detailed Statistical Analysis for Individual BMPs</p> <p>Typical Users:<br/>Consultants, Public Works Staff, Designers</p> | <p><b>Researcher</b></p> <p>Download the Master Database to Conduct Independent Research</p> <p>Typical Users:<br/>University Professors</p> | <p><b>Data Provider</b></p> <p>Obtain Data Entry Spreadsheets</p> <p>Typical Users:<br/>Public agencies, consulting firms, university researchers</p> | <p><b>New to BMP Monitoring</b></p> <p>Obtain Monitoring Guidance</p> <p>Typical Users:<br/>Public agencies, consulting firms, university researchers</p> |
|--|---|--|---|---|

# Targeting Best Management Practices

- Until you have quantitative knowledge of:
  - a) The nature and source of the WQ problem
  - b) Your water-quality based goals
  - c) The BMPs most effective at solving your impairments specific to your location....

**YOU'RE NOT READY TO IMPLEMENT BMPS**

# Thank you

