Public Participation Meeting
SEBEWAING FLOOD CONTROL PROJECT

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Dam & Levee Safety Program Manager

Detroit District

June 23rd , 2010

US Army Corps of Engineers

BUILDING STRONG®

AGENDA

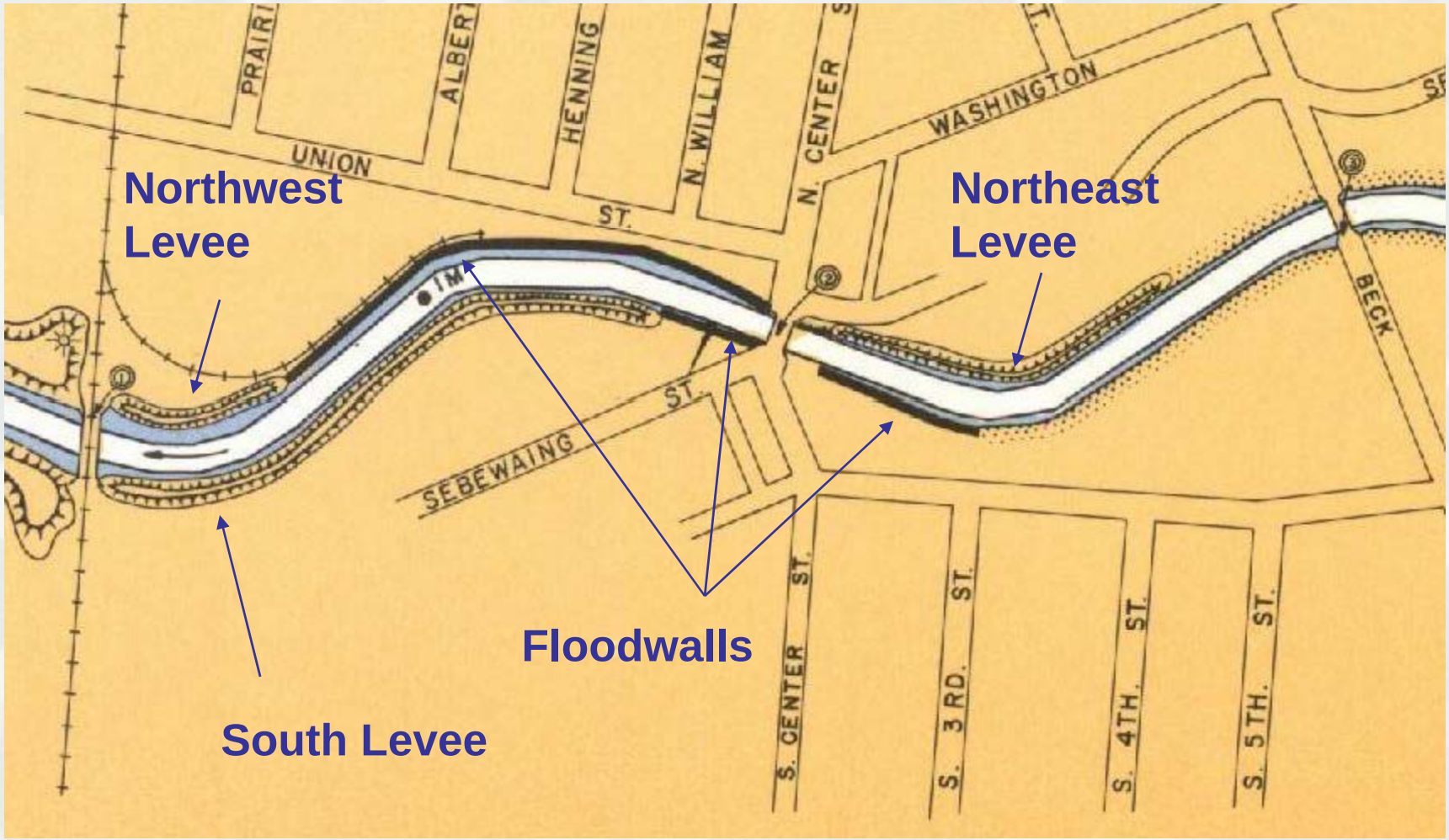
- Meeting Purpose
- Current Project Conditions
- Rationale for Changes
- Construction Alternatives
- Phase I work
- Phase II work

MEETING PURPOSE

- To inform the community of current and future reconstruction plans for Sebewaing Flood Control Project
- To inform the community of future maintenance activities on the Sebewaing Flood Control Project.
- Solicit public comments and concerns prior to finalizing the plan.

PROJECT OVERVIEW

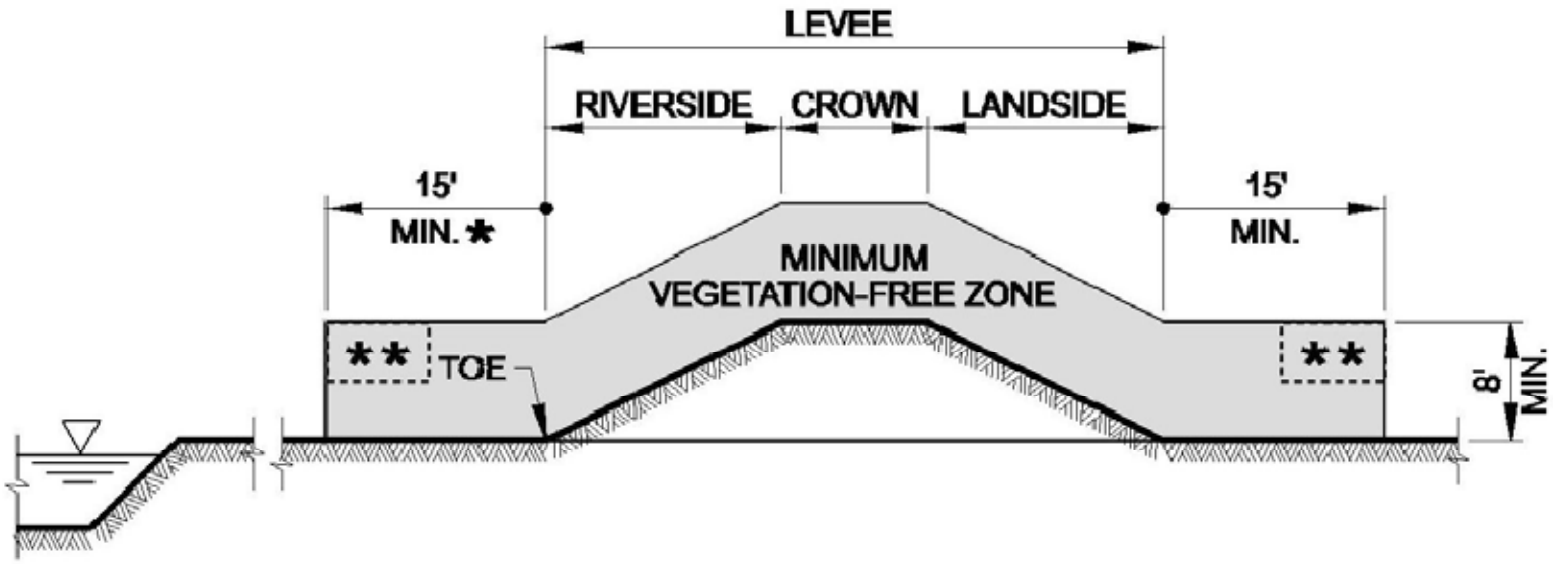
- Construction completed in 1948.
- Provides protection for a 7,500 cfs flow (0.2% chance flood).
- Protection includes earthen levees and flood walls.
- The Corps is responsible for maintenance.


Northwest Levee
Northeast Levee
Floodwalls
South Levee
UNION ST.
WASHINGTON
SEBEWAING ST.
N. CENTER
N. WILLIAM
HENNING
S. CENTER ST.
S. 3RD. ST.
S. 4TH. ST.
S. 5TH. ST.
BECK

VEGETATION CONTROL

- Trees and other woody vegetation, such as shrubs and vines, can create both structural and seepage instabilities, prevent adequate inspection, and create obstacles to maintenance and flood-fighting/ flood-control activities.
- Vegetation control is not a new requirement.

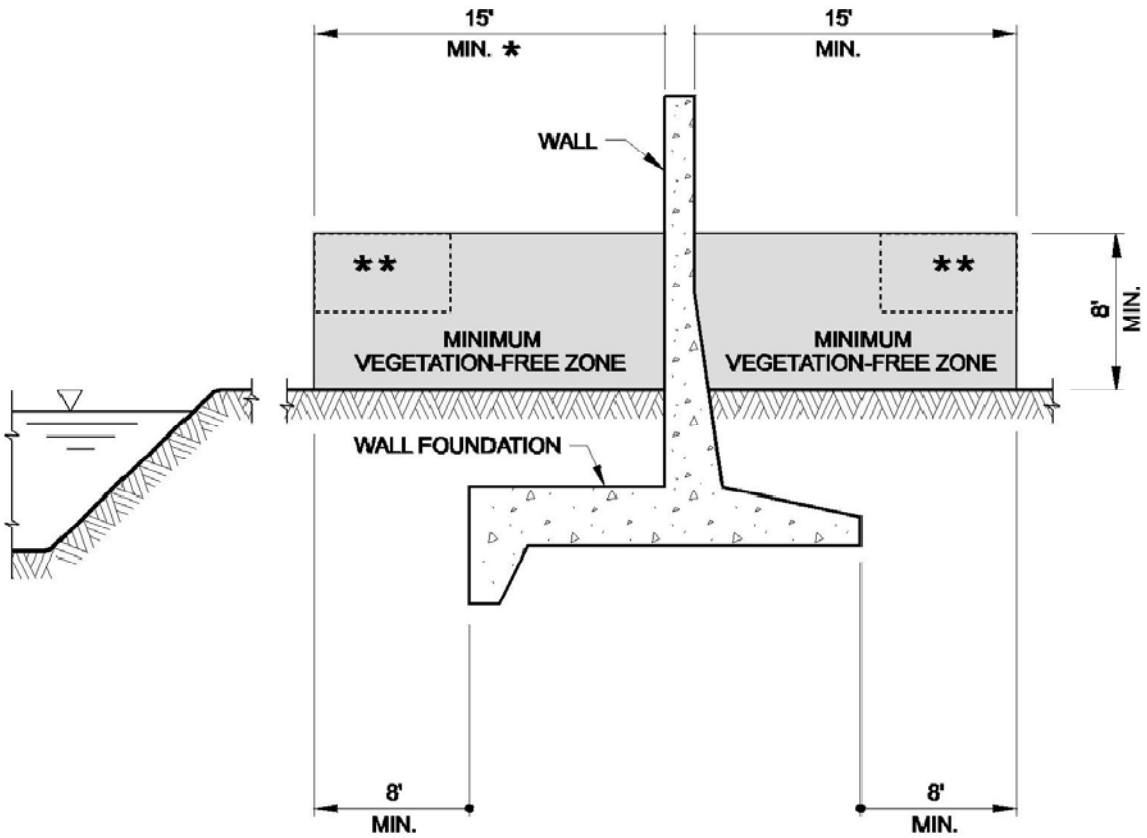
Skagit River
Cottonwood Root wad
08/21/2004



* 15' OR DISTANCE TO EDGE OF NORMAL WATER SURFACE, IF LESS

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

▽ NORMAL WATER SURFACE



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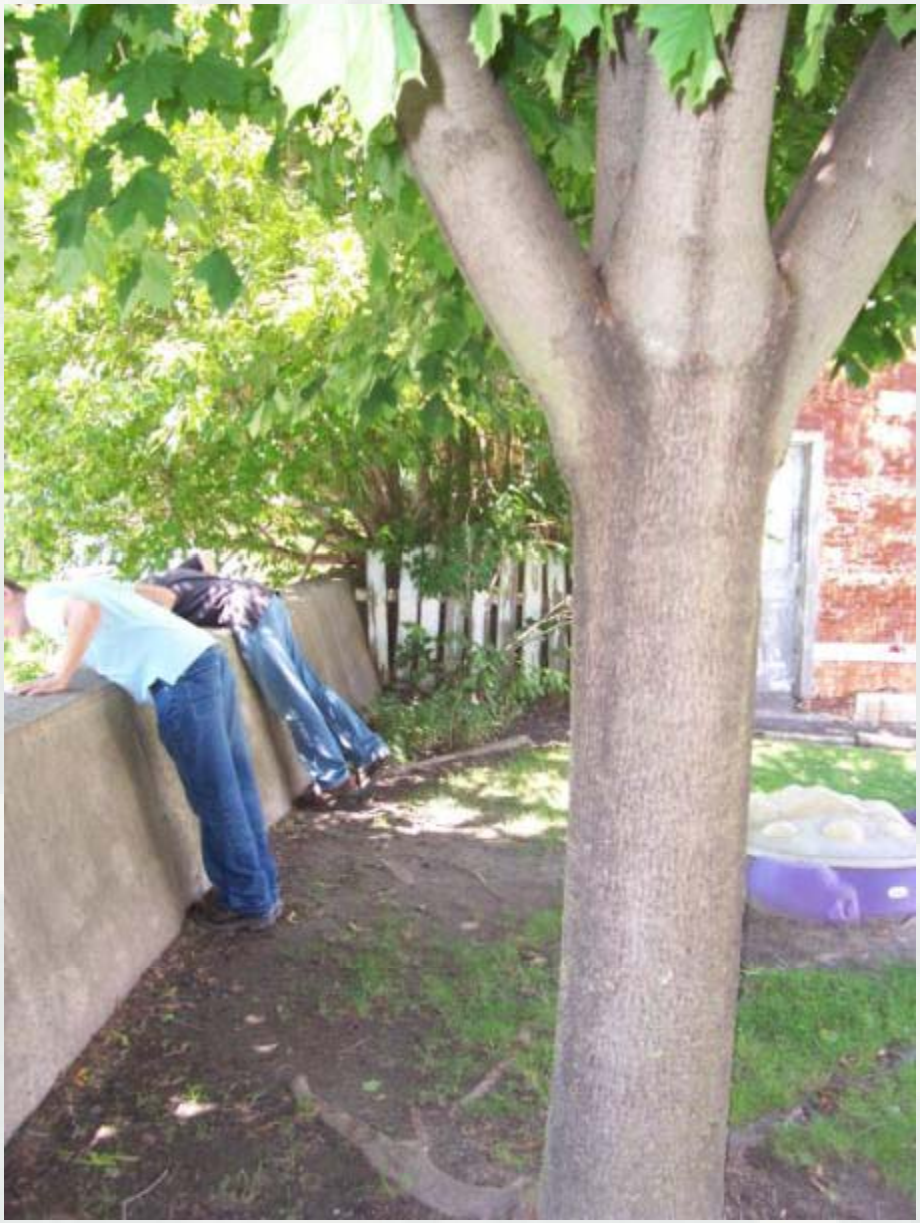
▽ NORMAL WATER SURFACE

EXAMPLE: well maintained levee

CURRENT PROJECT CONDITIONS

11 2:35PM



FY10 Maintenance Plan

Previous Plan	Current Plan
Reconstruct all of northeast dike & Portion of South Dike.	Reconstruct all of the northeast dike, with Armorflex protection.

Rationale for Changes

- Original stone sizing under designed for ice conditions
- Cost of additional protection does not allow funds to address both north & south levees.
- Real Estate not an issue on the north levee.
- Additional time needed for analysis and design of south bank protection.

North Levee Alternatives Explored

- Steel Sheet Piling
- Rip Rap Embankment
- Armorflex Embankment

Selected Alternative

Armorflex slope protection was the least costly alternative that still met design criteria.

Armorflex - Placement

Example of vegetated Armorflex

Armorflex – Ice conditions

10’ of ice on river in Albany, N.Y.

Armorflex – Ice conditions

10’ of ice on river in Albany, N.Y.

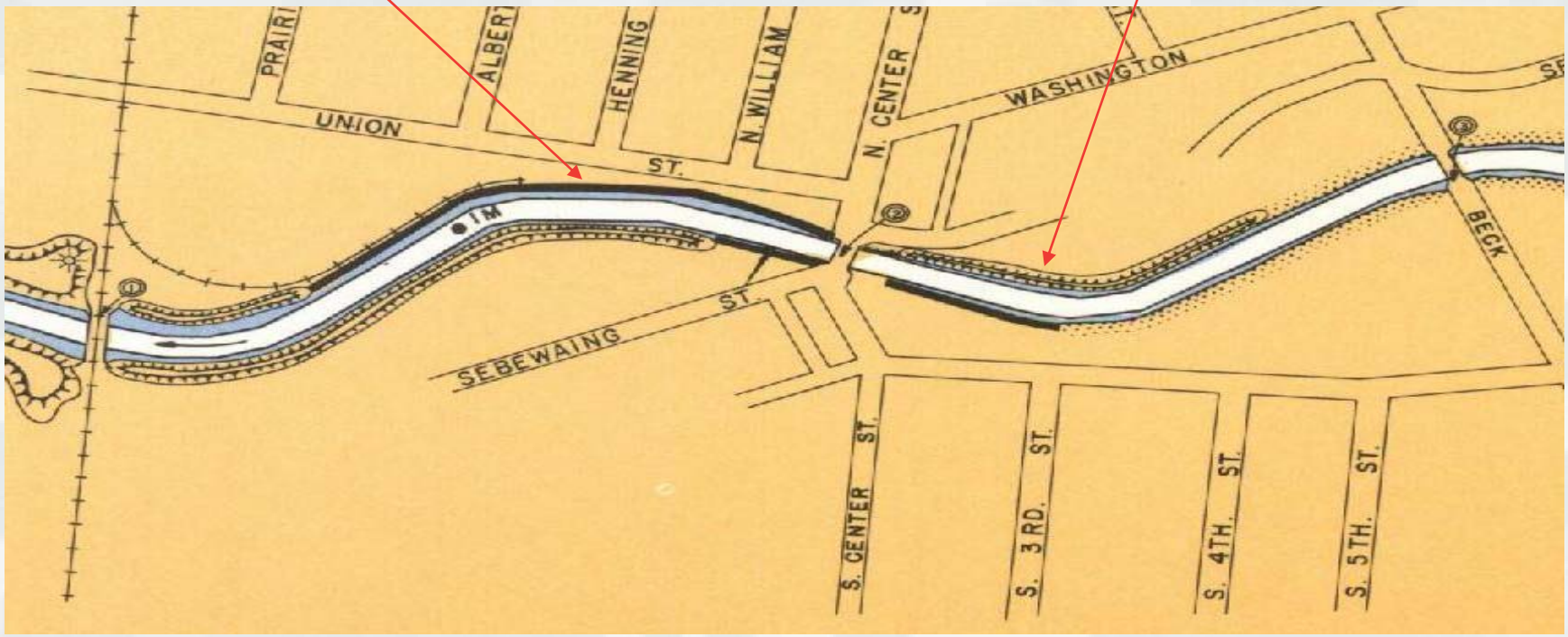
Armorflex did not experience any significant damage.

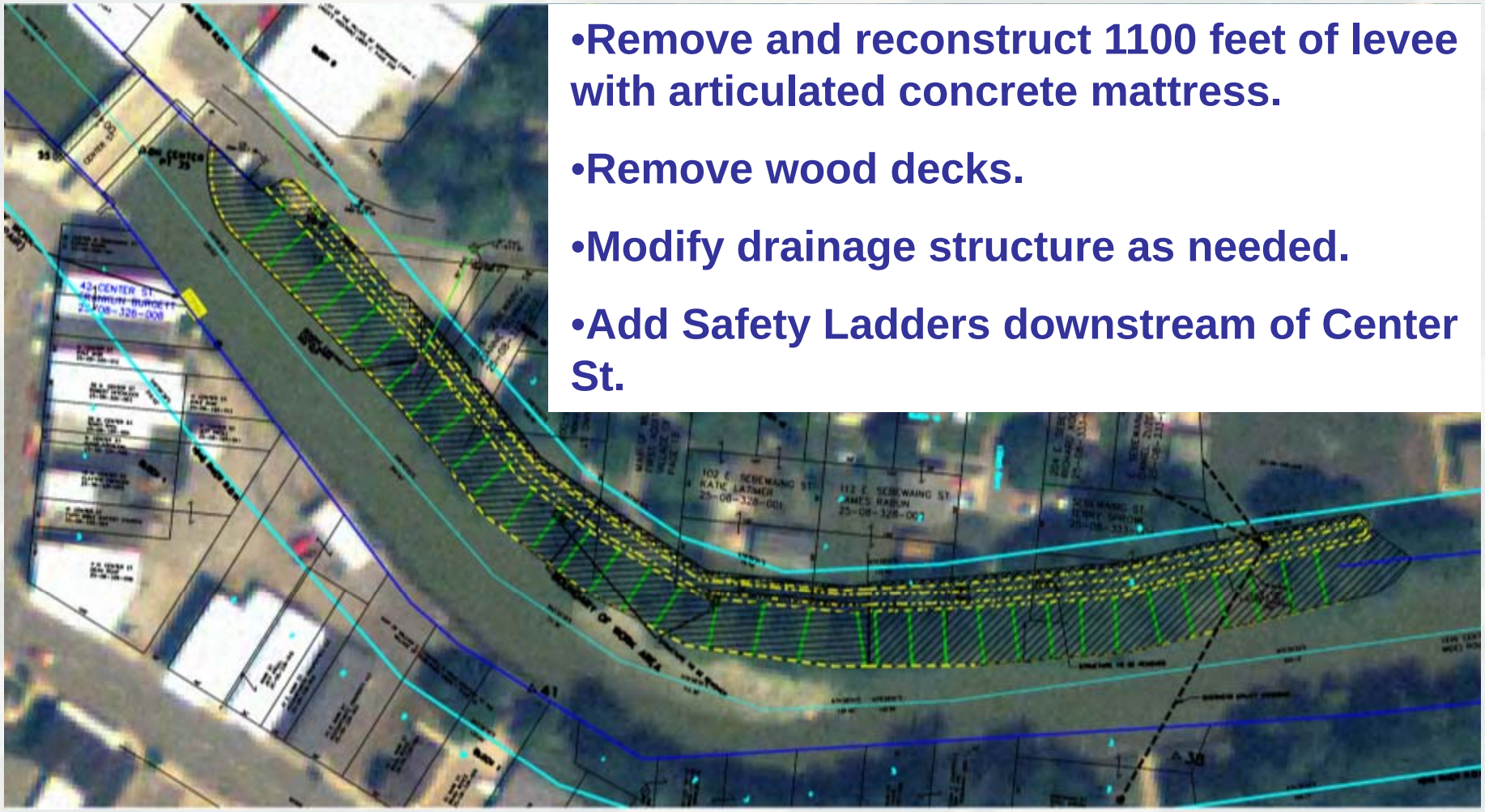
PHASE I WORK:

FY10 North Levee Reconstruction

Install Safety Ladders in Steel Sheet Pile Wall

Reconstruct North Levee

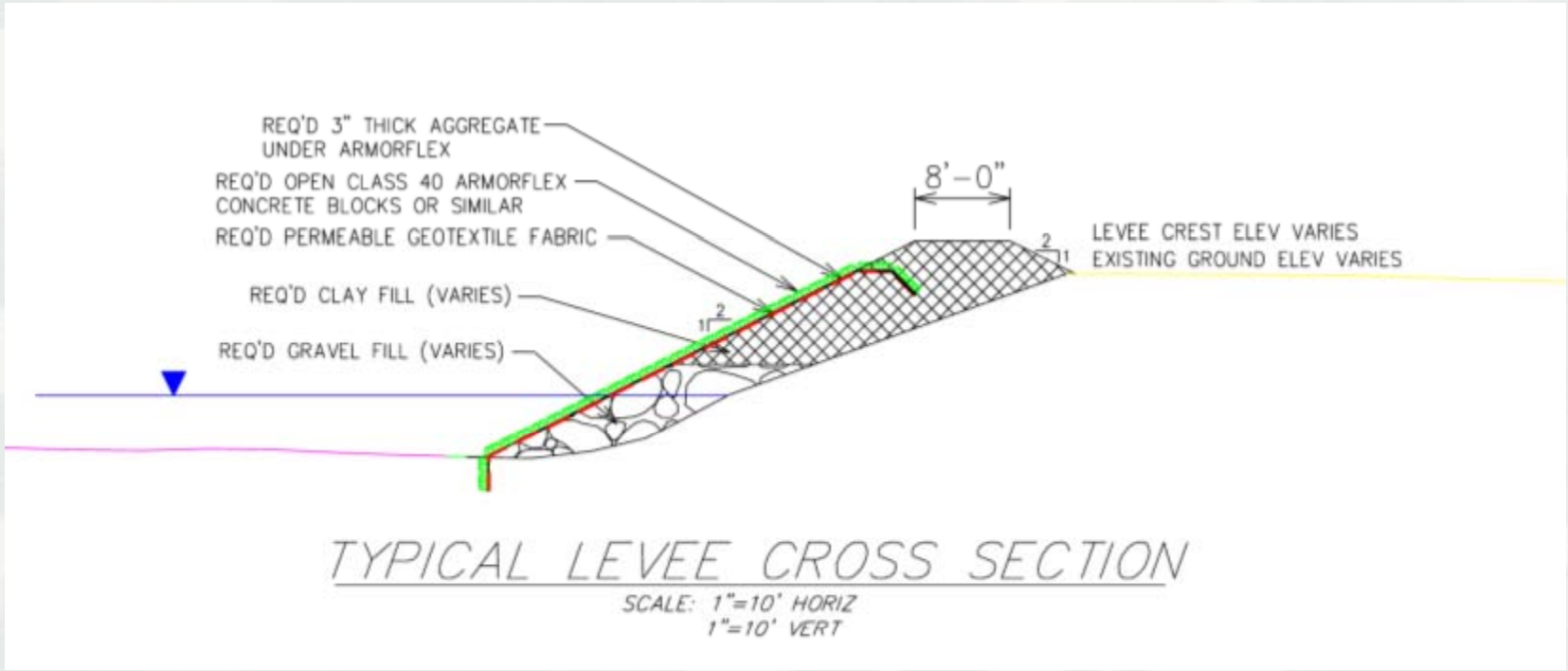




- **Remove and reconstruct 1100 feet of levee with articulated concrete mattress.**
- **Remove wood decks.**
- **Modify drainage structure as needed.**
- **Add Safety Ladders downstream of Center St.**

North Levee Reconstruction

Phase I Proposed Cross Section



Safety Egress Ladders

Phase I Timeline

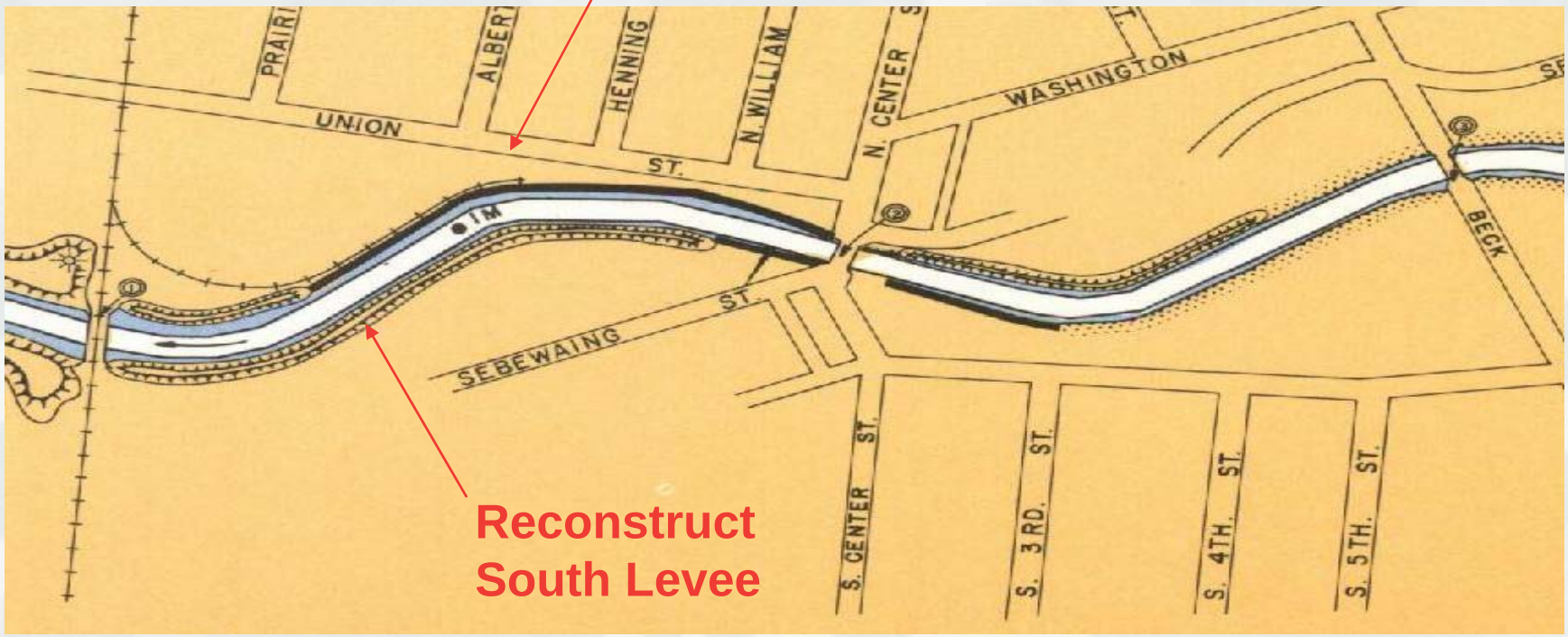
- An optimistic timeline could have construction beginning early-September.
- Construction may span two construction seasons.
- Regular meetings will be held with a bi-powers board during construction.
- Website will be updated to reflect schedules when available – www.lre.usace.army.mil

PHASE II WORK:

- Rehabilitation of South Levee

- Remaining Vegetation Removal on North Side of River, within 15’ of concrete floodwalls and west levee. (This work may be included in Phase I if excess funds are available.)

Remaining Vegetation Removal



Reconstruct South Levee

PHASE II TIMELINE:

- Design to be completed by May 2011
- Phase II construction has not been funded yet.
- Funding has been routinely requested. However, the Corps' maintenance funding is limited and projects compete for these funds annually on a national level.
- 2012 is the earliest funding is anticipated.

South Levee Reconstruction Alternatives

- Steel Sheet Piling
- Rip Rap Embankment
- Armorflex Embankment

Factors being considered in Design

- Overall cost of the project, to include real estate and maintenance costs for a 50 year design life.

- Homeowner's requests for alterations are being considered. Any additional costs above the government selected alternative will be the responsibility of the local sponsor.

Factors being considered in Design

The Corps of Engineers will develop alternatives that work within the existing real estate boundaries.

However, if the cost of working within the existing real estate limits is significantly higher than the cost of obtaining additional land, we will pursue obtaining additional real estate.

Existing Steel Sheet Pile Walls

- Existing walls installed by others being analyzed to determine if they meet USACE criteria.
- If the walls meet USACE criteria, the existing walls may be incorporated into the final design.
- If the walls do not meet USACE criteria, the design will incorporate additional measures needed.

Public Participation Meeting
SEBEWAING WATERSHED

Calvin Creech, P.E.

Hydraulic Engineer

Detroit District

June 23rd , 2010

US Army Corps of Engineers

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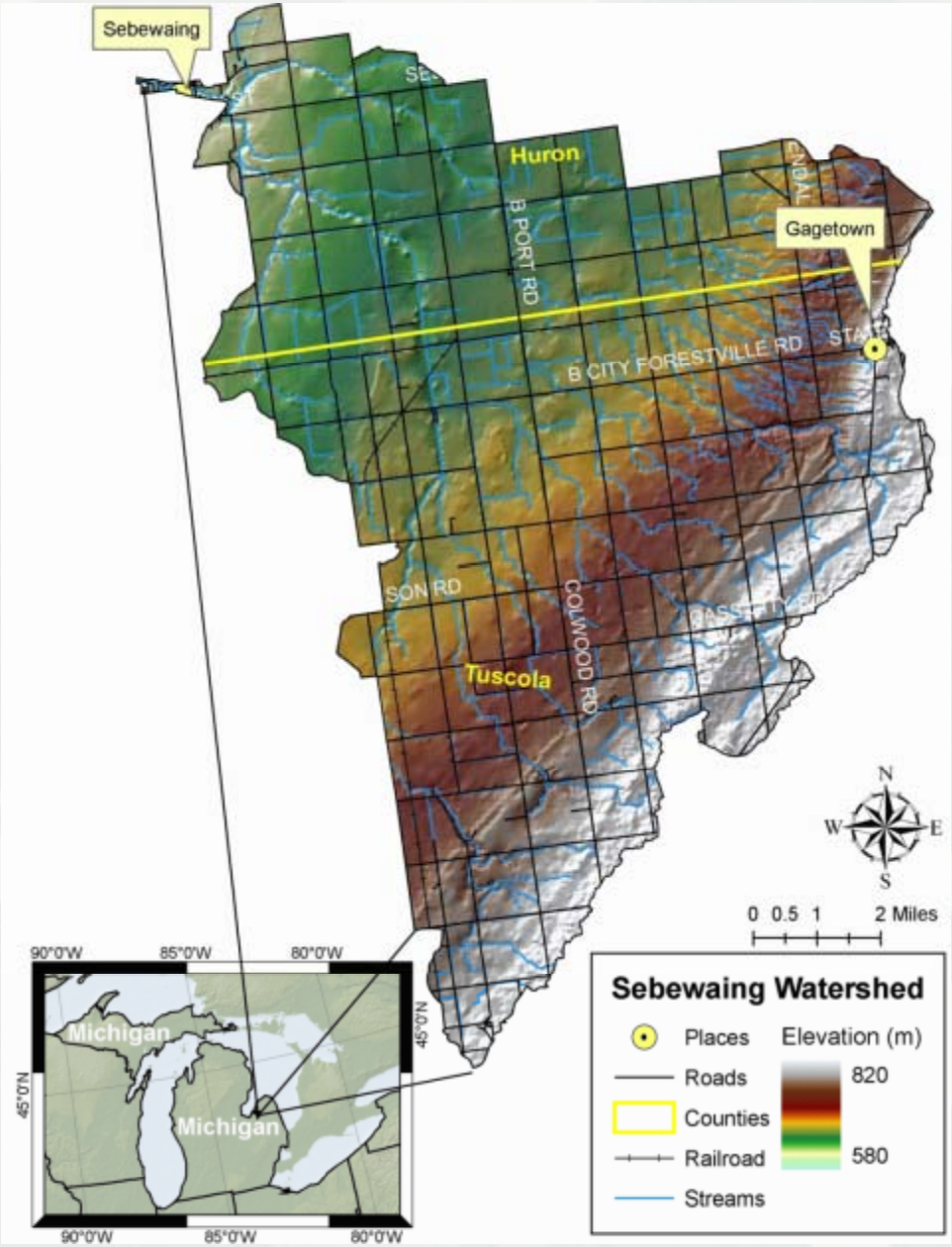
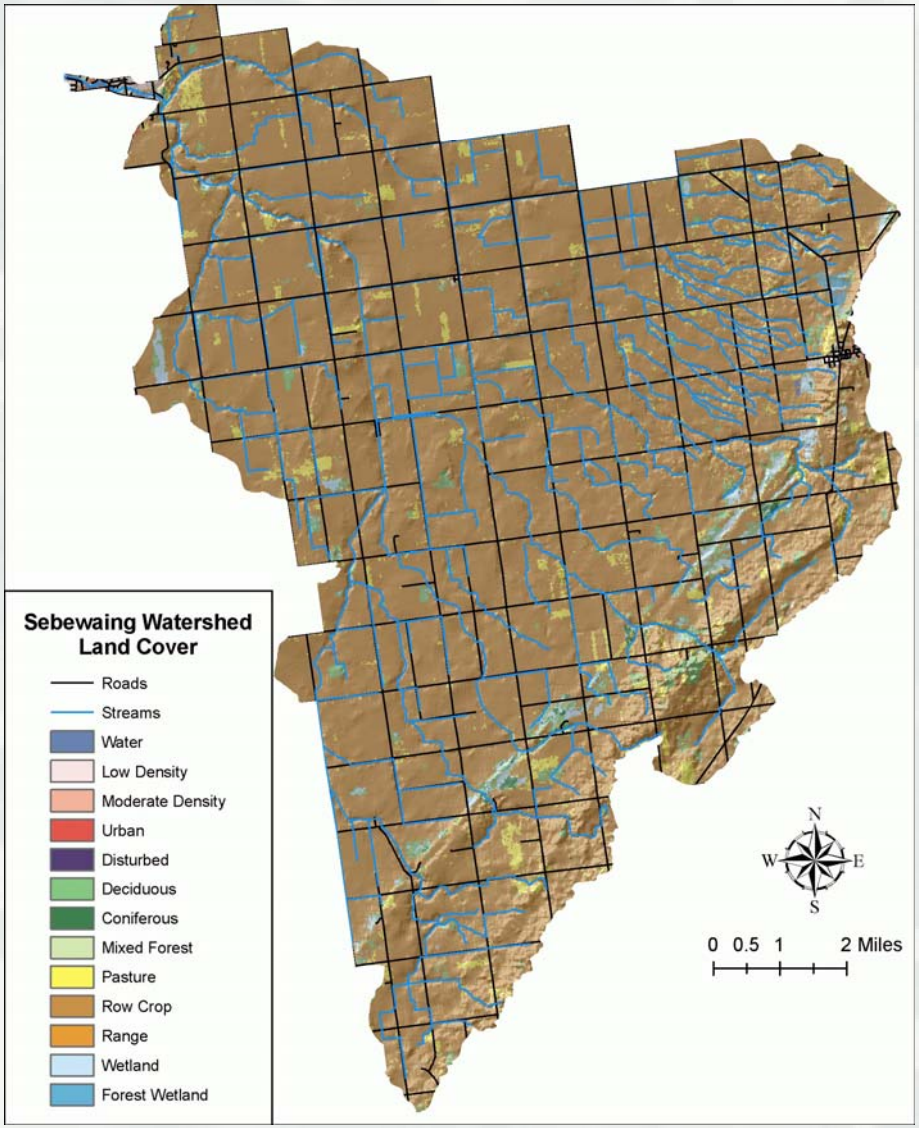
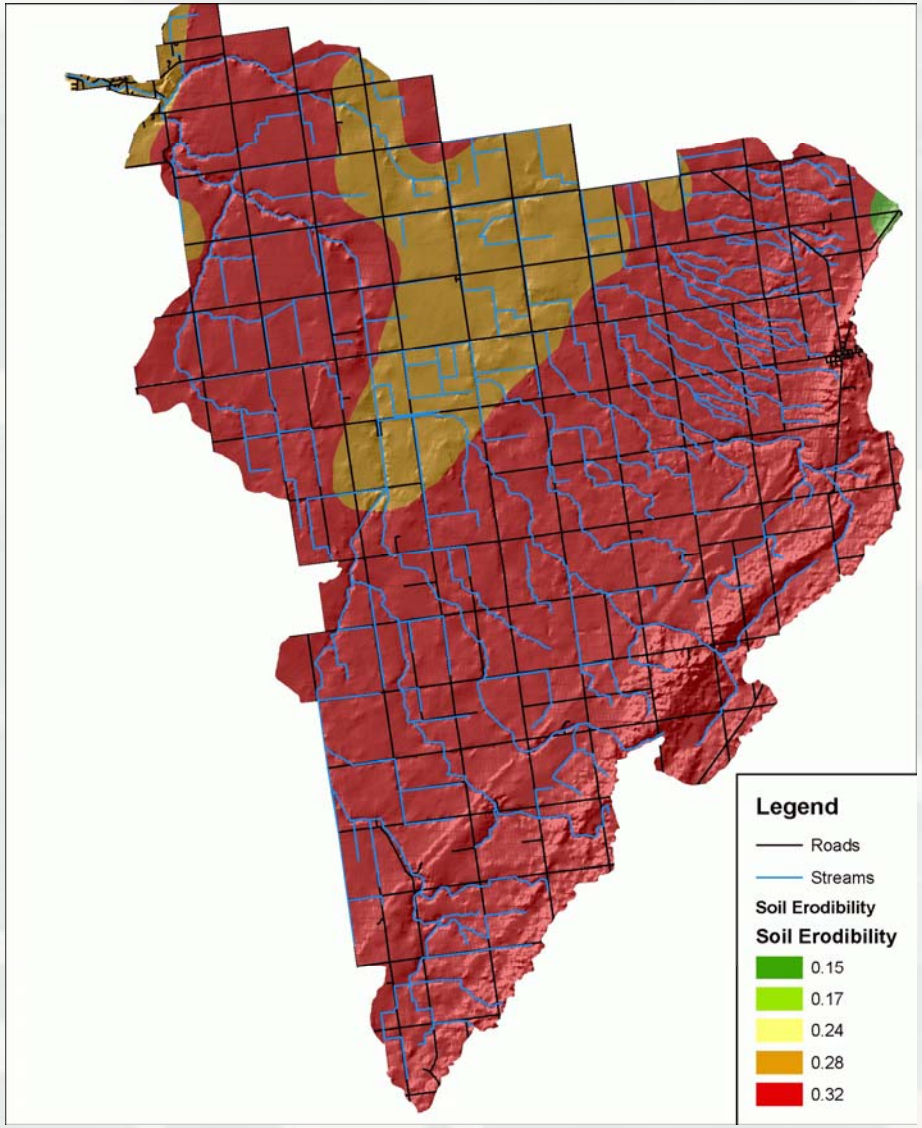
Watershed Conditions

- 66,000-acre watershed
- Landuse is largely agricultural (over 95%)
- Watershed is very flat
- Soils are highly erodible

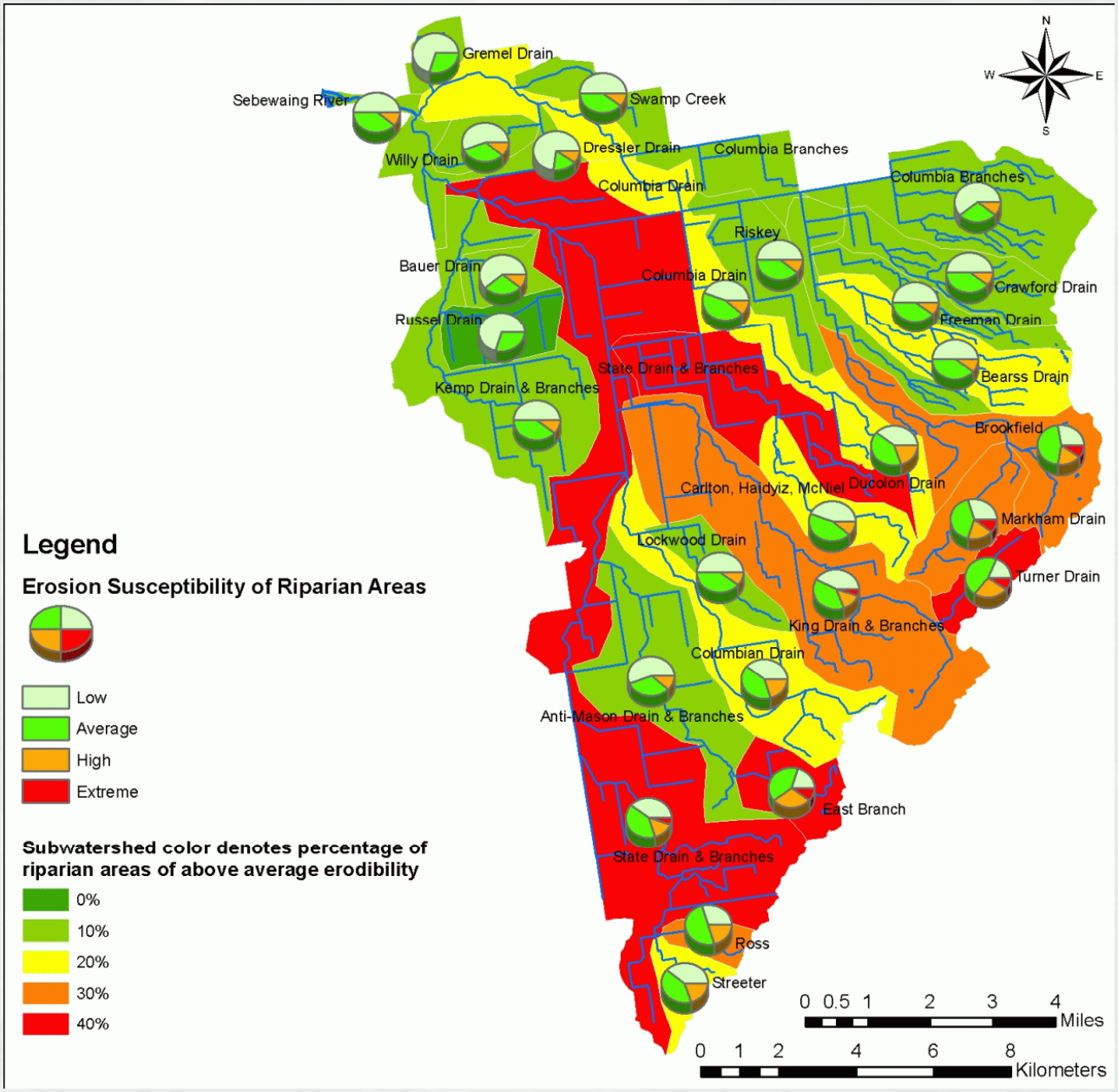

Sebewaing
Huron
Gagetown
B PORT RD
B CITY FORESTVILLE RD
SON RD
COLWOOD RD
Tuscola
N
S
W
E
0 0.5 1 2 Miles
Sebewaing Watershed
Places
Roads
Counties
Railroad
Streams
Elevation (m)
820
580
90°0'W
85°0'W
80°0'W
45°0'N
Michigan
Michigan

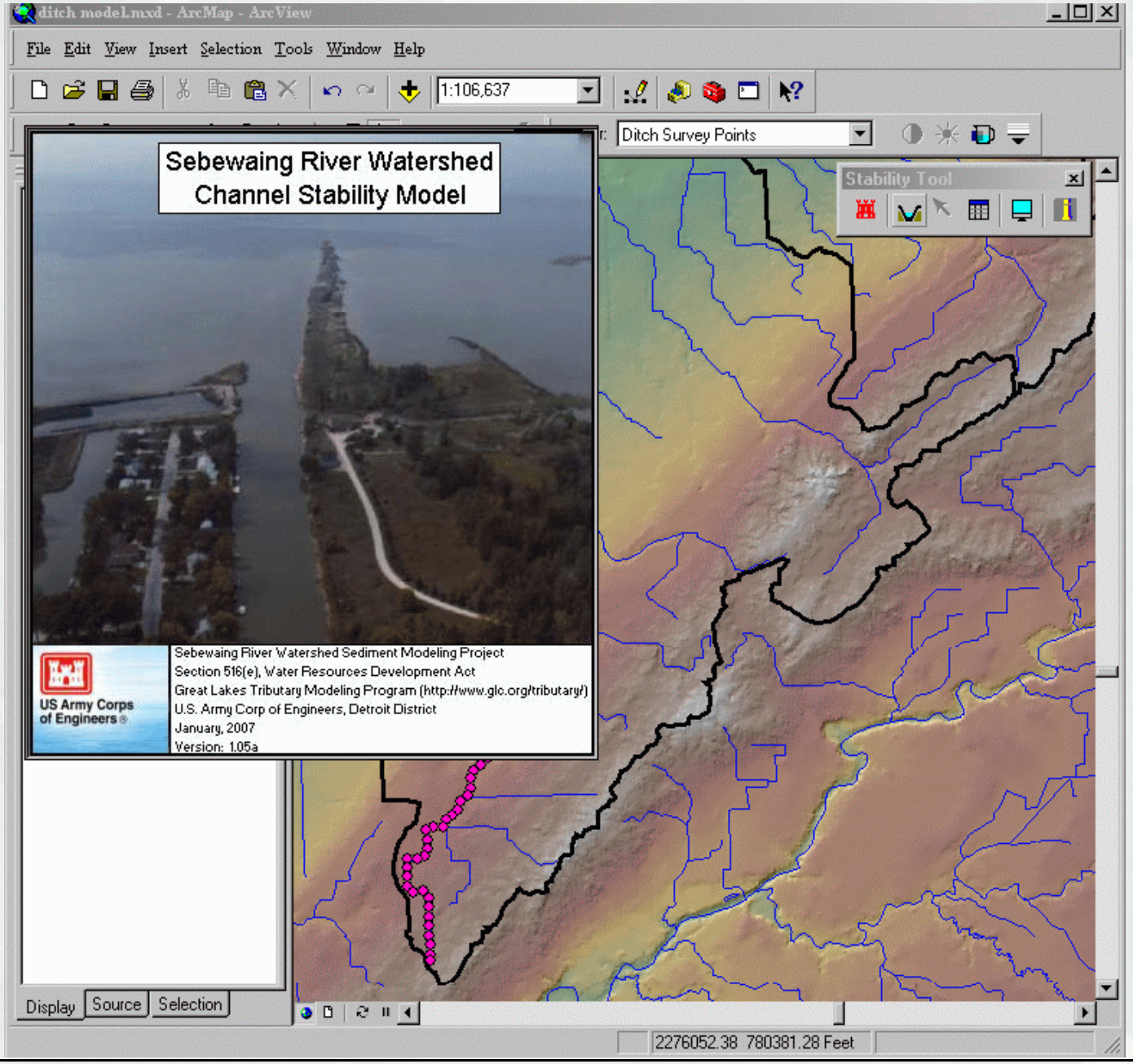

Sebewaing Watershed
Land Cover
Roads
Streams
Water
Low Density
Moderate Density
Urban
Disturbed
Deciduous
Coniferous
Mixed Forest
Pasture
Row Crop
Range
Wetland
Forest Wetland
N
W
E
S
0 0.5 1 2 Miles


Legend
Roads
Streams
Soil Erodibility
Soil Erodibility
0.15
0.17
0.24
0.28
0.32

Previous USACE Watershed Study

- Sebewaing River Sediment Transport Modeling Study, December 2007
- Investigated the sediment sources of the watershed (agricultural runoff and bank erosion)
- Prioritized areas for riparian (vegetative) buffers around agricultural drains
- Developed a drain stability tool to be used to design drain clean-outs such that future erosion is reduced


Gremel Drain
Sebewaing River
Swamp Creek
Willy Drain
Dressler Drain
Columbia Branches
Columbia Drain
Columbia Branches
Riskey
Bauer Drain
Columbia Drain
Crawford Drain
Russel Drain
Freeman Drain
State Drain & Branches
Bearss Drain
Kemp Drain & Branches
Brookfield
Carlton, Haidyiz, McNiel
Ducolon Drain
Markham Drain
Lockwood Drain
Turner Drain
King Drain & Branches
Columbian Drain
Anti-Mason Drain & Branches
East Branch
State Drain & Branches
Ross
Streeter
N
W
E
S
0 0.5 1 2 3 4 Miles
0 1 2 4 6 8 Kilometers
Legend
Erosion Susceptibility of Riparian Areas
Low
Average
High
Extreme
Subwatershed color denotes percentage of riparian areas of above average erodibility
0%
10%
20%
30%
40%



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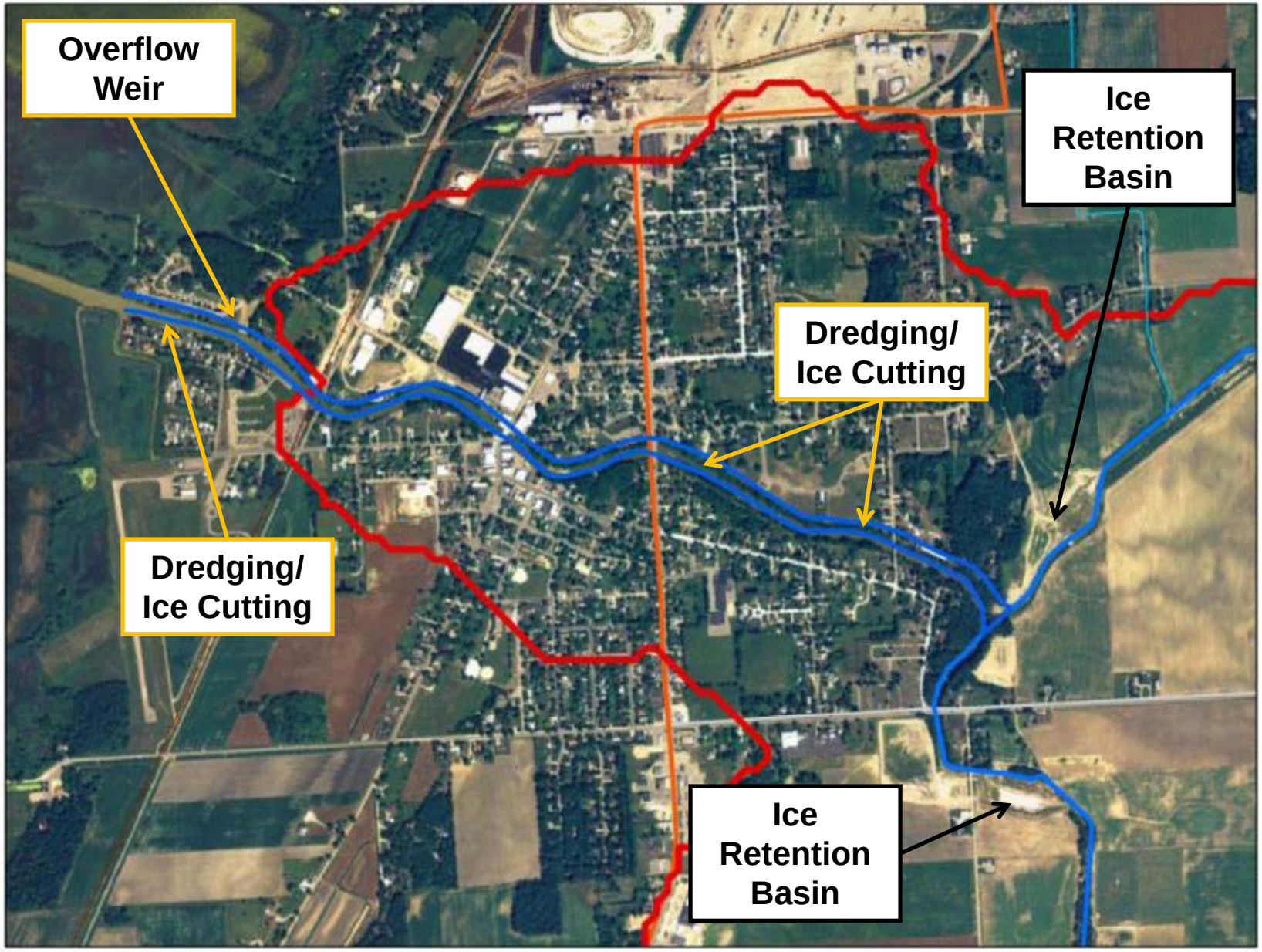
Ice Flooding Model

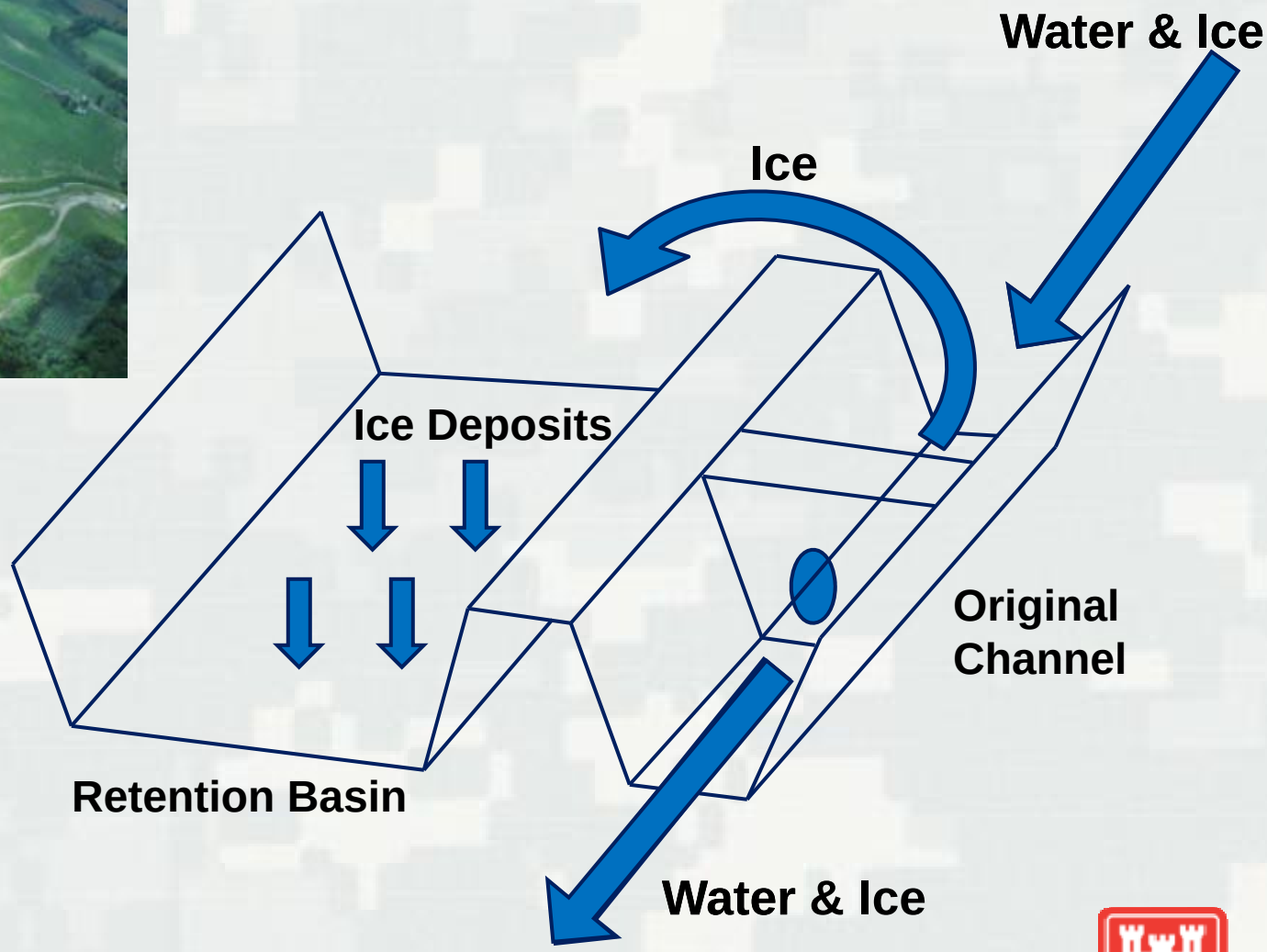
- Levees originally were designed to control floods for a 7,500 flowrate
- USACE developed a numerical model to calculate the effects of ice
- Proposed levees are designed to protect the floods that include both a high flowrate and ice jams

Additional Recent Engineering Projects

- Ice retention basins have been built near the outlet of the two major drains upstream of the Village of Sebewaing
- Overflow weir has been constructed downstream of the railroad bridge
- Sediment dredging has been completed on the main channel
- Ice cutting each year prior to spring melt


Overflow Weir
Ice Retention Basin
Dredging/ Ice Cutting
Dredging/ Ice Cutting
Ice Retention Basin

Ice & Sediment Retention Basins



Ice Control Recommendations for Future Phases

- Cold Regions Research and Engineering Lab (CRREL) developing a scope of work to address ice concerns for future phases
- Site investigation by CRREL and Detroit District conducted in May, 2010

CRREL Recommendations

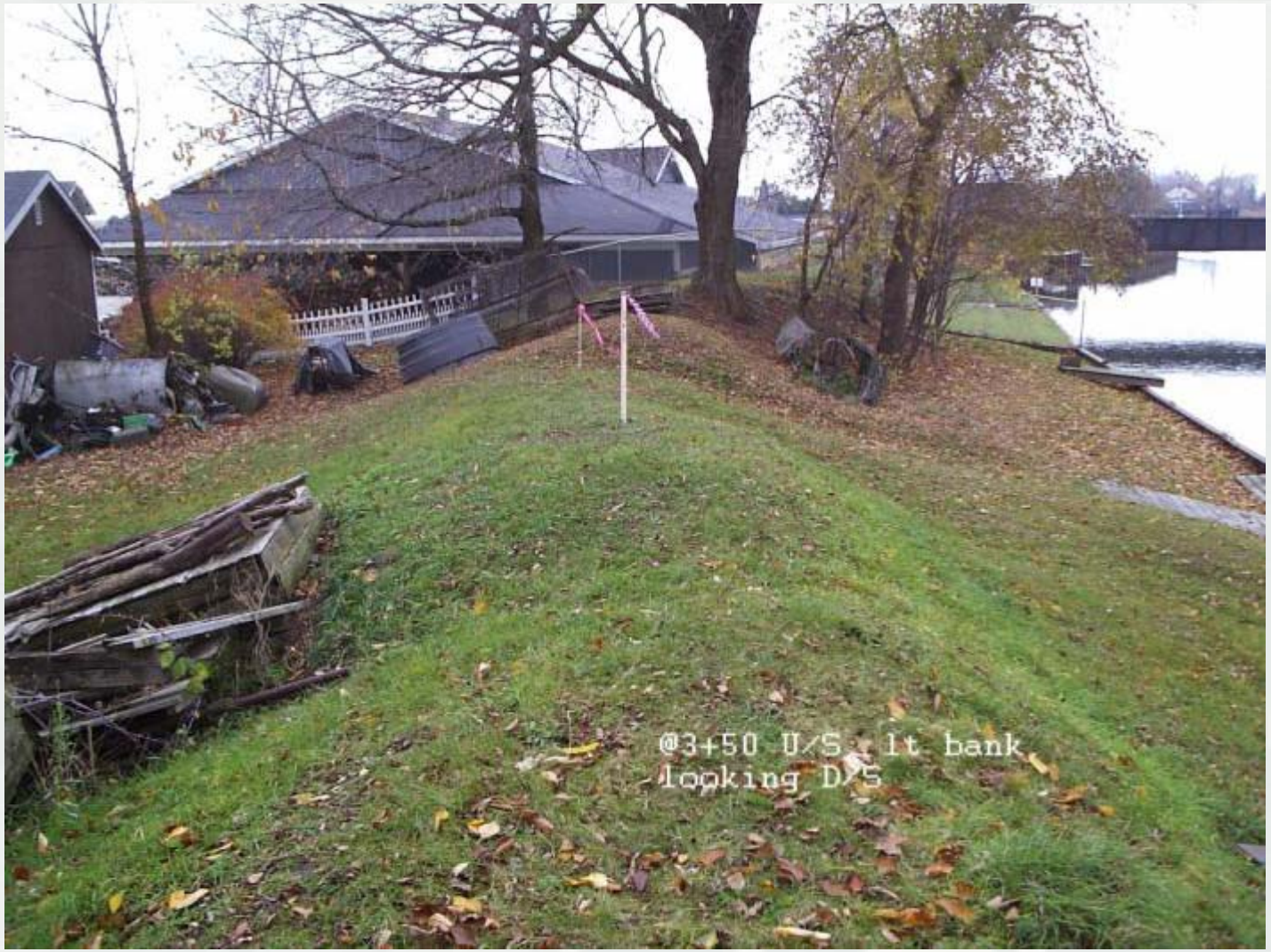
- Develop an ice data management system to better predict ice jam flooding potential
- Recommended retrofits to ice retention basins to prevent scour
- Additional piers or ice traps in strategic areas to capture ice floes upstream of the Village Limits

USACE Study Authorities

- Section 205 Flood Damage Reduction: Extend limits of flood control project. Cost shared with local sponsor 50/50.

- Section 216 Review of Completed Projects: Evaluate issues with existing flood control projects. Recon Phase as Federal cost, Feasibility Phase cost shared w/ local sponsor 50/50.

QUESTIONS?


@3+50 U/S lt bank
looking D/S