Chapter 3

NRCS AGRICULTURAL SEDIMENT REDUCTION PROJECT

Toledo Harbor Sediment Reduction Overview

Sediment in the Toledo Harbor originates as erosion from the farm fields within the Maumee River Basin. The Maumee River drains more than 4.2 million acres in Ohio, Indiana, and Michigan. More than 75% of the acreage is cultivated cropland, the bulk of which is corn and soybeans. Even though the average per acre erosion rates in the watershed are low by national standards, the sediment load in the Maumee is extremely high by national standards due to the large watershed and the high percentage of the watershed that is intensively cultivated cropland.

Picture 2 Erosion on Flat Crop Fields in the Maumee River Watershed

The Waterville Gauge on the Maumee River at Waterville, Ohio, has measured **an average annual suspended sediment load of 1, 300,000 tons**. According to the 1993 NRCS Report "Erosion and Sedimentation Dynamics of the Maumee River Basin" approximately 33% of the sediment that passes the Waterville gauge is deposited in Toledo Harbor. This amount converts to cubic yards of dredging as follows:

1,300,00 (tons of sediment @ Waterville gauge)	x	.33 (ship channel trapping efficiency)	x	1.85	(conversion factor yards dredging per ton of sediment)	=	793,650 yards (yds. dredged)

This amount generally agrees with the average amounts reported dredged each year. In February 1989, the Corps of Engineers, in the "Environmental Assessment and Finding of No Significant Impact- Operations and Maintenance for Toledo Harbor, Lucas County, Ohio," reported that 780,000 cubic yards of sediment are dredged from the ship channel annually. More recently the Corps has reported that dredge amounts average 850,000 cubic yards annually (Sohngen et. al.).

The Toledo Ship Channel consists of two components: a river channel and a lake channel. Of the 850,000 yards dredged annually, approximately 47 percent or 400,000 yards is dredged from the river channel with the remainder being dredged from the lake channel (Sohngen et. al.).

Much remains to be learned about the sediment dynamics of the harbor. It is commonly accepted that the need to dredge can never be fully eliminated. However, source reduction is expected to have significant beneficial effects in reducing dredging amounts, cost and/or dredging frequencies. The following information supports this premise:

* The amount of sediment (in tons) which passes the Waterville gauge annually is roughly equivalent to the amount dredged in cubic yards. If the incoming sediment is reduced, over time either dredging will be reduced or the harbor will get deeper.

* The river miles sediment represents almost half the annual dredging. The source of the river miles is more logically would be incoming river sediment rather than lake effect storm generated sediment.

* The river miles section of the ship channel is the most costly sediment to dredge.

* The sediment in the river miles section is the most contaminated and must be confined. Reducing dredging of the river miles section will reduce environmental disturbances and extend the life of the CDF facilities, thereby reducing dredging costs.

Soil Conservation Goals

The LTMS Study Team assigned a goal of reducing dredging attributed to agricultural sources by 130,000 cubic yards annually as compared to the 1992 baseline condition. This represents a 15% reduction in dredging. (Long-Term Management Study, Phase III Report, U.S. Army COE).

The goals of the NRCS Soil Conservation Plan in the Phase III Report were as follows:

1. Utilize a field delivery structure that was capable of creating public awareness of the dredging problem and accelerating sediment reduction activities by landowners in the watershed.

2. Increase the acreage of corn and soybeans grown under conservation tillage in the watershed to 75% of the watershed.

3. Increasing the acreage of filter strips and sod waterways in the watershed.

4. Develop pilot projects which use constructed or restored wetlands as sediment traps.

5. Quantify the beneficial changes in the watershed over time including changes in conservation tillage and gross erosion changes for the watershed.

The original Soil Conservation Plan relied almost entirely on conservation tillage (item 2) as the primary means to achieve the sediment reduction goal. At the time the proposal was prepared it was felt that filter strips would not be effective in achieving the goal because of the lack of a program with economic incentives that would convince farmers to install filter strips in them in numbers sufficient enough to make a difference.

Funding

As part of the Phase III report NRCS prepared a proposal to implement a sediment reduction program in the watershed over a 6 year time period (Erosion and Sediment Dynamics of Toledo Harbor, NRCS, 1993). The full cost for the 6 year proposal at that time included $1.5 million for technical assistance (personnel) and $8 million for financial assistance (incentive payments) to landowners and county sediment reduction committees. The proposal also included a need for an additional $7 million to capitalize a long term maintenance fund for the project for a total project cost of $16.5 million.

The study team proposed redirecting of dredging funds as an innovative idea for funding the Soil Conservation Plan. The rational of the team was that:

* Dredging funds represent a user fee on the shipping industry which would benefit from reducing the dredging and keeping the harbor open.

* Utilizing dredging funds to prevent sediment pollution and reducing dredging would be more environmentally sound than removing sediment from the harbor after it got there.

* It would be more cost effective to keep sediment out of the harbor than to dredge it after it got there.

* Solving the sediment problem in the harbor will require reducing erosion levels within the watershed below the target levels of traditionally funded agricultural soil conservation programs.