1.b. Sampling Stations and Methods

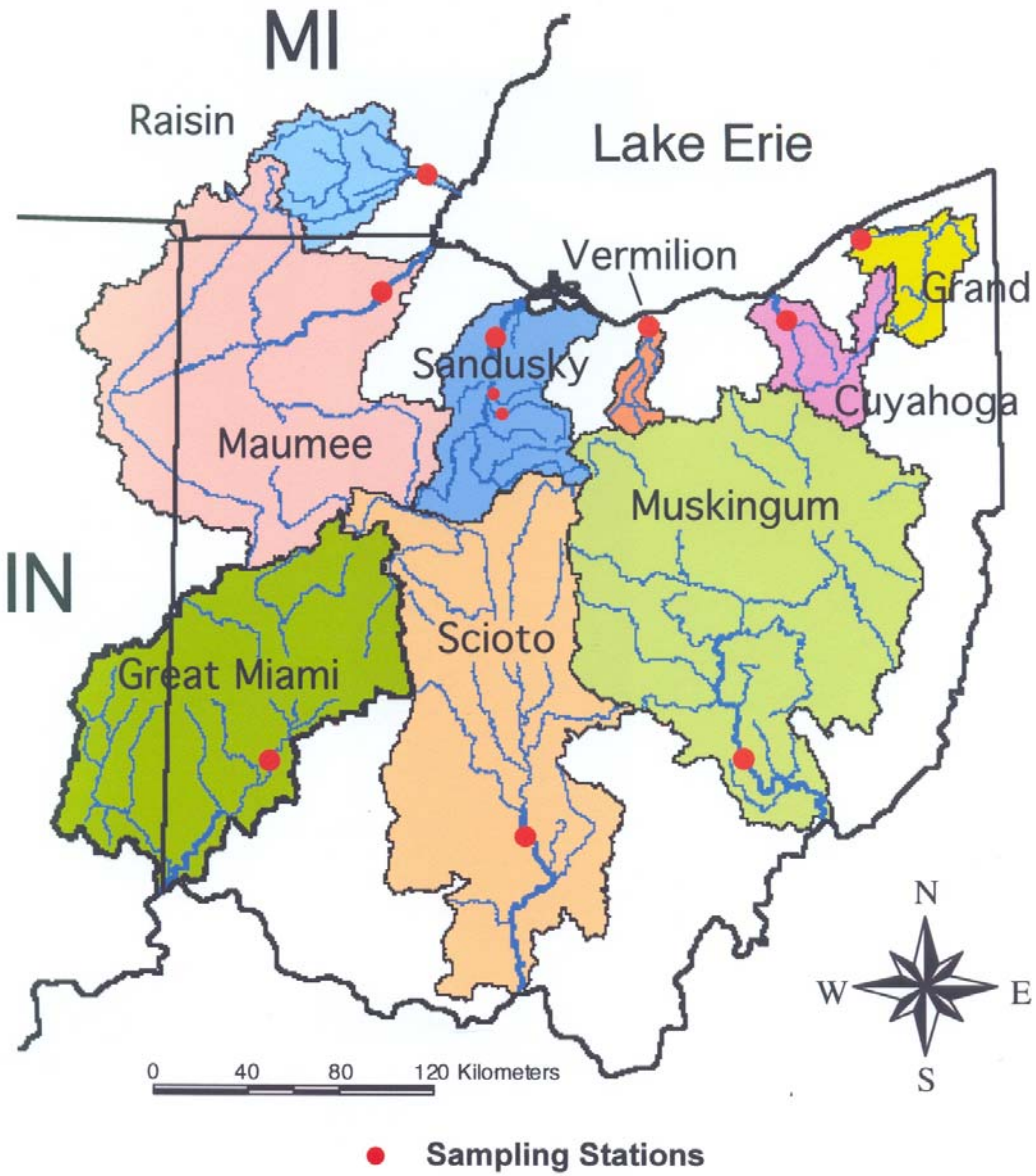
The 2005 Water Year Sampling Program

Sampling is currently underway at the 11 stations shown on the adjacent map.

The monitoring program for the Maumee, Sandusky, Cuyahoga, Grand, Great Miami, Scioto, and Muskingum rivers is supported by the Ohio Department of Natural Resources, Division of Soil and Water Conservation. The program on the Vermilion River is supported as part of the USDA's Lake Erie CREP (Conservation Reserve Enhancement Program). The Michigan Department of Environmental Quality supports the sampling program on the River Raisin.

There are two smaller watershed stations in the Sandusky River Watershed. Rock Creek, the more northerly of the two stations, is currently the focus of a USDA CEAP (Conservation Effects Assessment Project) Grant to the Heidelberg Water Quality Laboratory. That grant supports the Rock Creek Monitoring Program. The Honey Creek station is supported by miscellaneous grants to the Water Quality Laboratory.

The Water Quality Laboratory operates a pesticide monitoring program that is "piggybacked " on the nutrient and sediment monitoring program. The pesticide monitoring program has been supported primarily by annual grants from pesticide manufacturers. Currently the Syngenta Corporation and Bayer Agrichemicals provide the bulk of that support.



Slightly more that 50% of the land area in Ohio is upstream from one of the sampling stations in the Ohio Tributary Monitoring Program.

Sampling Station Information

For each sampling station, the adjacent table lists the USGS Station Number, the drainage area, and the watershed land use.

River	Drainage Area above Station (sq.mi.)	Land use above station, by percent*			
		Agri-culture**	Urban	Wooded	Other***
River Raisin at Monroe, MI USGS 04176500	1,042	79.0	2.3	14.0	4.7
Maumee R. at Waterville USGS 04193500	6,330	89.9	1.2	7.3	1.6
Sandusky R. near Fremont USGS 04198000	1,253	84.1	0.9	13.0	2.0
Rock Creek at Tiffin USGS 04197170	34.6	82.0	0.9	16.1	1.0
Honey Creek at Melmore USGS 04197100	149	85.6	0.6	12.5	1.3
Vermilion R. at Mill Hollow USGS 04199500	262	71.4	0.7	25.9	2.0
Cuyahoga R. at Independence USGS 04208000	708	30.4	9.6	50.1	9.9
Grand R. at Painesville USGS 04212100	686	40.0	0.9	45.2	13.1
Muskingum R. at McConnelsville USGS 03150000	7,420	52.0	1.7	43.4	2.9
Scioto R. at Chillicothe USGS 03231500	3,854	80.2	4.6	12.9	2.3
Great Miami R. below Miamisburg USGS 03271601	2,685	82.1	4.7	10.3	2.9

* Source: ODNR Division of Real Estate and Land Management. River Raisin land use from USGS, Lake Erie NAV

** Includes open urban/suburban areas such as lawns

*** Includes shrub/scrub lands, open water, non-forested wetlands, barren ground

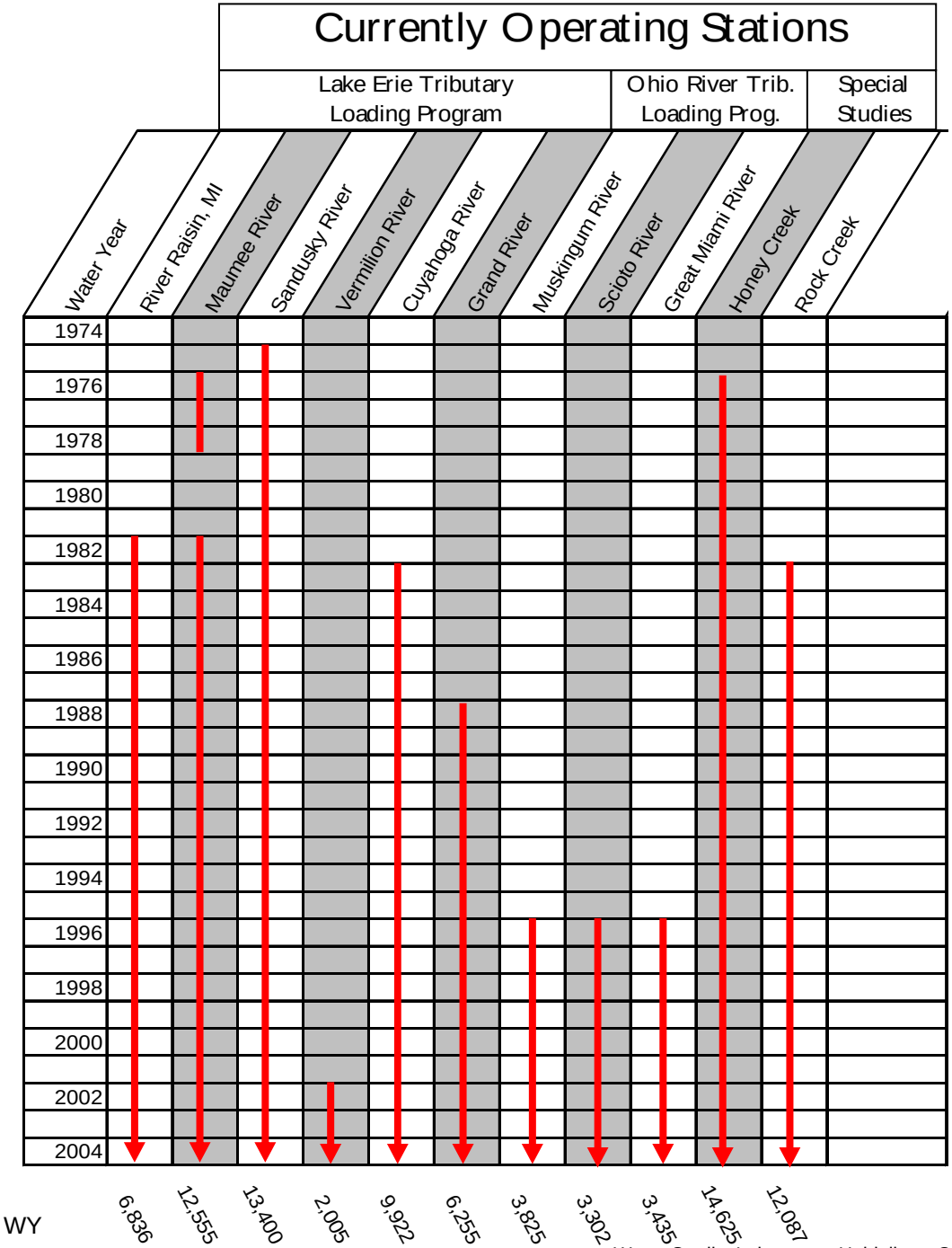
Sampling History at the Current Stations

The tributary loading program was started in 1974 to help determine the sources of phosphorus that had been identified as a major cause of water quality degradation in Lake Erie. The program indicated that control of municipal and industrial sources of phosphorus would be inadequate to restore Lake Erie and that nonpoint sources, such as agriculture, would have to be addressed. The program has subsequently been used to help design agricultural pollution abatement programs and evaluate their effectiveness.

The usefulness of the tributary loading data in supporting the assessment of agricultural pollution issues led to the program's expansion in 1996 to three major Ohio tributaries to the Ohio River.

Since its inception in 1974, many organizations have provided support for our tributary monitoring program. These include the Ohio Department of Natural Resources; the Army Corps of Engineers; the Great Lakes Program Office of the U.S. EPA; the Athen's (GA) Research Laboratory of the U.S. EPA; the Toledo Metropolitan Area Council of Governments; the U.S. Soil Conservation Service; the Ohio Lake Erie Protection Fund; the cities of Tiffin, Upper Sandusky and Bucyrus; the Rockefeller Foundation; and the Proctor and Gamble Corporation.

More than 88,000 samples have been collected through the 2004 Water Year at the currently operating sampling stations.



Number of samples analyzed at each station through the 2004 WY

Some of the USGS Sampling Stations with WQL Automatic Samplers

The Rock Creek USGS stream gage on the Heidelberg Campus across from the WQL labs in Gillmor Science Hall

The Maumee sampling station at the Bowling Green Water Treatment Plant intake.

The Honey Creek station at Melmore

The Sandusky River sampling station at Tindall Bridge near Fremont

Sample Collection

At weekly intervals new bases are taken to the sampling stations and the bases from the previous week are returned to the Water Quality Laboratory for analysis. WQL staff change the bases for the NW Ohio Stations while local observers change the bases at more distant sites and ship the samples at weekly intervals to the WQL.

Rock Creek

Submersible pumps in the streams provide a continuous supply of water for the sampling wells in the sampling stations.

Sandusky River

ISCO refrigerated samplers are used to collect three samples each day at all of the stations except the Muskingum and Raisin rivers. At those two rivers, local observers collect one sample per day. The samplers pump water from the sampling wells.

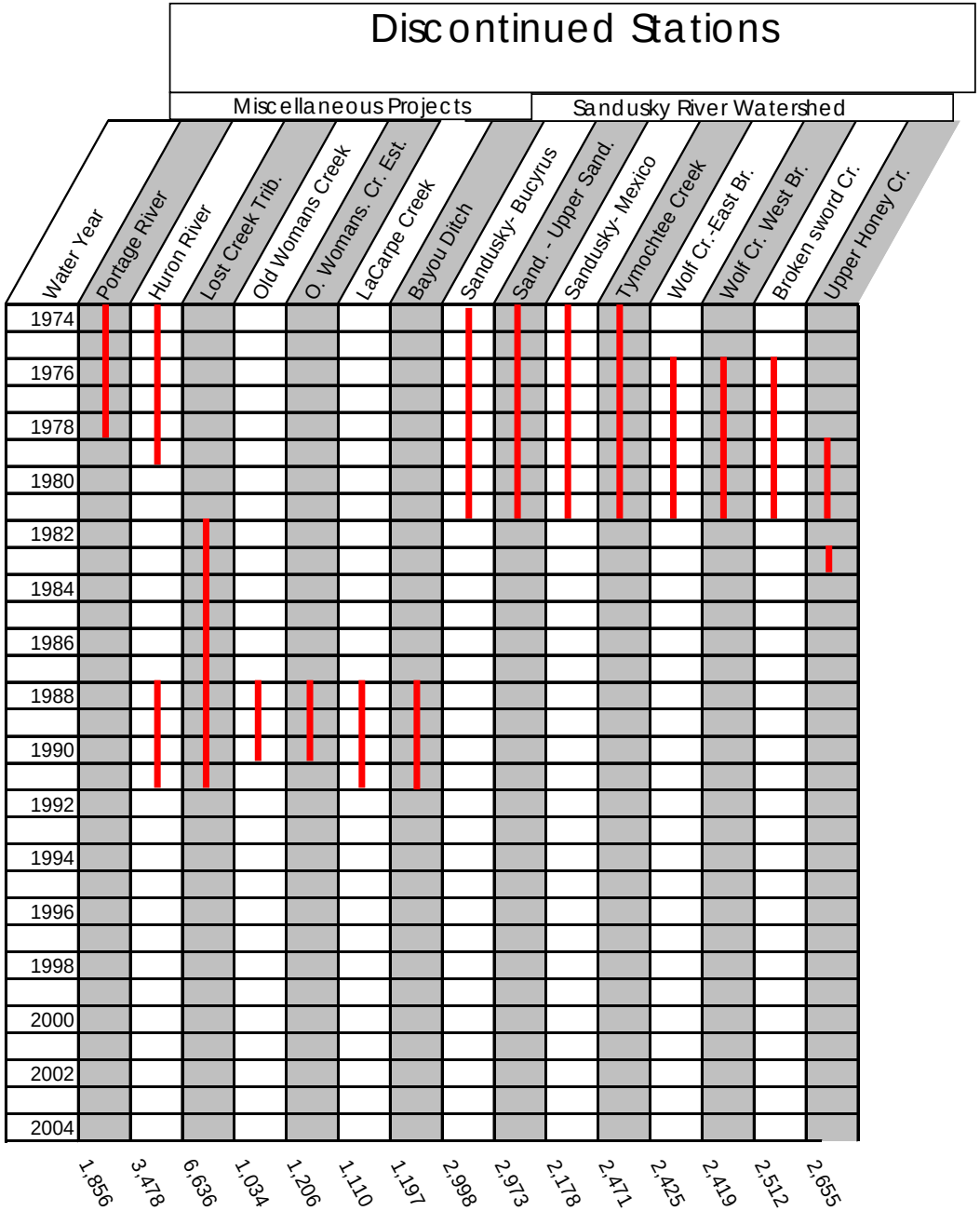
ISCO refrigerated samplers containing glass bottles are used to collect three samples per day from the Maumee, Sandusky, Honey Creek and Rock Creek stations during the April through August period. At other stations, two samples per week are collected for pesticide analysis by local observers during this time period.

Early Sampling Stations in the WQL Tributary Loading Program

The WQL has conducted sampling programs on several other streams and rivers in the Lake Erie Basin. Data and reports for these studies are available by request to the WQL.

The same sampling and analytical methods were used for these studies as described for the current studies.

The detailed network in the Sandusky River Watershed was used by the Army Corps of Engineers to develop models for phosphorus transport in river systems.



Number of samples analyzed at each station through the 2004 WY