

APPENDIX

GIS DATA SOURCES

1. **7.5-Minute Quadrangle Index (24,000-scale)** – Ohio Department of Transportation, 2005
2. **8-Digit Hydrologic Unit Code (HUC) Lake Erie Watershed** – Ohio Department of Natural Resources (ODNR), Office of Coastal Management, 2012. Compiled from Indiana Watershed Boundaries (U.S. Geological Survey, 2002); Michigan Watershed Boundaries (Michigan Department of Environmental Quality, 1998); New York Watershed Boundaries (U.S. Geological Survey and the Natural Resources Conservation Service (NRCS), various dates); Ohio Watershed Boundaries (U.S. Geological Survey, NRCS, ODNR and the Ohio Environmental Protection Agency, various dates); and Pennsylvania Watershed Boundaries (derived from the National Hydrography Dataset (NHD)).
3. **10-Digit HUC Lake Erie Watershed** – Natural Resources Conservation Service, 2008
4. **2-Digit HUC Lake Erie Watershed** – Natural Resources Conservation Service, 2008
5. **15-Minute Quadrangle Index (62,500-scale)** – Ohio Department of Transportation, 2005
6. **Abandoned Underground Mines** – Ohio Department of Natural Resources, Division of Geological Survey, 2011
7. **Active Railroads** – Ohio Department of Natural Resources, Office of Coastal Management, 2012; Modified from Ohio Department of Transportation, 2007
8. **Aids to Navigation, including Beacons, Lights and Buoys** – National Oceanic and Atmospheric Administration, Office of Coast Survey; NOAA Electronic Nautical Chart data (Approach and Harbour), 2016
9. **Airports** – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Modified from Ohio Department of Transportation, 2007
10. **Aquatic Invasive Species** – Ohio Department of Natural Resources, Office of Coastal Management, 2018 (shaded hexagonal bins); Based on National Oceanic and Atmospheric Administration, Great Lakes Aquatic Nonindigenous Species Information System, 2018
11. **Aquifer Net Recharge** – Derived from the Statewide Aquifer Mapping Program (SAMP), Ohio Department of Natural Resources, Division of Water, 2000
12. **Areas of Concern Boundaries (International)** – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Includes data from U.S. Environmental Protection Agency (2016), Environment Canada (2016), International Joint Commission (2016), Ohio Environmental Protection Agency (2016) and the Maumee River Remedial Action Plan (2010)
13. **Areas of Concern Boundaries (Ohio)** – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Includes data from U.S. Environmental Protection Agency (2016; Ashtabula and Cuyahoga river AOCs), Ohio Environmental Protection Agency (2016; Black River AOC) and the Maumee River Remedial Action Plan (2010; Maumee River AOC)
14. **Bedrock Geology** – Ohio Department of Natural Resources, Division of Geological Survey, 2004, 2006
15. **Bedrock Topography** – Ohio Department of Natural Resources, Division of Geological Survey, 2004
16. **Black Swamp Land Conservancy Protected Lands** – Black Swamp Land Conservancy, 2016
17. **Bluff Classification** – Ohio Department of Natural Resources, Office of Coastal Management, 2018
18. **Canals** – Ohio Department of Natural Resources, Division of Real Estate and Land Management, unknown date. Milan Canal, Pennsylvania & Ohio Canal and Wabash & Erie Canal added by Ohio Department of Natural Resources, Office of Coastal Management, 2017
19. **Conservation and Recreation Lands (CARL)** – Ducks Unlimited, Inc., Great Lakes/Atlantic Regional Office, 2013
20. **County Boundaries** – Ohio Department of Natural Resources, Office of Coastal Management, 2015; Modified from Ohio Department of Transportation, 2007
21. **County Metro Park and Park District Facility Boundaries** – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Includes data from Cleveland Metroparks (2015); Lake Metroparks (2011, 2013); Metroparks Toledo (2009, 2016); Summit Metro Parks (2016); and the Statewide Parcels database (compiled by Ohio Department of Natural Resources, Office of Information Technology, 2014)
22. **Covered Bridges** – Ashtabula County GIS Department, 2017 and Ohio Department of Natural Resources, Office of Coastal Management, 2007, 2018
23. **Cultural Points of Interest** – Ohio Department of Transportation, 2007 and Ohio Department of Natural Resources, Office of Coastal Management, various years
24. **Dams** – Ohio Department of Natural Resources, Division of Water Resources, 2018
25. **Depth to Water Table** – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”
26. **Digital Elevation Model (30-meter resolution)** – Ohio Department of Natural Resources, Division of Geological Survey, 2004
27. **Disposal Areas** – National Oceanic and Atmospheric Administration (NOAA), Office of Coast Survey; NOAA Electronic Nautical Chart data (Approach and Harbour), 2016
28. **Disturbed Reclamation Land (Surface Affected Areas in Mineral Industries map)** – Ohio Department of Natural Resources, Division of Mineral Resources Management, 2013
29. **Dominant Soil Order** – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”
30. **Drainage Class** – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”

31. **Drift Thickness** – Ohio Department of Natural Resources, Division of Geological Survey, 2004
32. **Ecological Regions (Omernik Ecoregions, Level III and Level IV)** – U.S. Environmental Protection Agency, 2012
33. **Fairways/Navigable Waterways** – Ohio Department of Natural Resources, Office of Coastal Management, 2007; Digitized from NOAA Navigation Charts
34. **Faults** – Ohio Department of Natural Resources, Division of Geological Survey, 2006
35. **Ferry Routes** – Ohio Department of Natural Resources, Office of Coastal Management, 2004-2008
36. **Glacial (Quaternary) Geology** – Ohio Department of Natural Resources, Division of Geological Survey, 1999, 2004
37. **Groundwater Pollution Potential** – Ohio Department of Natural Resources, Division of Real Estate and Land Management and Ohio Department of Natural Resources, Division of Water Resources, various dates by county: Ashland (2009), Ashtabula (2013), Cuyahoga (1994), Erie (1991), Fulton (2012), Geauga (2013), Hancock (2011), Henry (2011), Huron (2011), Lake (2013), Lorain (1998), Lucas (2010), Mahoning (2003), Medina (2011), Ottawa (1994), Portage (1995), Putnam (2006), Sandusky (2012), Seneca (2011), Summit (1994) and Trumbull (2010); Combined dataset completed by Ohio Department of Natural Resources, Office of Coastal Management, 2016
38. **Groundwater Resources** – Ohio Department of Natural Resources, Division of Water, various dates by county: Ashtabula (1994), Cuyahoga (1991), Erie (1994), Geauga (1986), Henry (1990), Huron (1992), Lake (1994), Lorain (1997), Lucas (1991), Mahoning (1979), Medina (1981), Ottawa (1994), Portage (1980), Putnam (1995), Sandusky (1994), Summit (2000) and Trumbull (2000); Combined dataset, including general illustrations for Ashland, Fulton, Hancock and Seneca counties completed by Ohio Department of Natural Resources, Office of Coastal Management, 2016
39. **Fish Habitat** – Ohio Department of Natural Resources, Division of Wildlife, 2008
40. **Glacial Aquifer Settings** – Derived from the Statewide Aquifer Mapping Program (SAMP), Ohio Department of Natural Resources, Division of Water, 2000
41. **Great Lakes** – Great Lakes Commission, 2000; Vignette effect by Ohio Department of Natural Resources, Office of Coastal Management, 2016
42. **Great Lakes Watershed Boundaries** – U.S. portion from U.S. Geological Survey Hydrologic Unit Maps; Canadian portion from Canada Land Inventory Level-I Watershed Maps, 1998
43. **Highly Erodible Soils** – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”
44. **Historic Quarry Areas** – Ohio Department of Natural Resources, Division of Geological Survey, 2006
45. **Hydric Classification** – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”
46. **Hydrography (from Digital Line Graph)** – U.S. Geological Survey, various dates
47. **Hydrography (from National Hydrography Dataset)** – U.S. Geological Survey, 2014
48. **Hydrologic Soil Groups (map service)** – Map service from National Resources Conservation Service, 2016
49. **Important Bird Areas** – National Audubon Society, 2015. Lake Erie Central Basin IBA added by Ohio Department of Natural Resources, Office of Coastal Management, 2017
50. **Inland Source Water Protection Areas** – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, 2017
51. **Inner Management Zones** – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, 2017
52. **Karst Features, including Sinkholes, etc.** – Ohio Department of Natural Resources, Division of Geological Survey, 2017
53. **Karst Geology, including Probable Karst Areas** – Ohio Department of Natural Resources, Division of Geological Survey, 2005
54. **Lakebed Substrates** – Various sources, including Ohio Sea Grant, 1999, Ohio Department of Natural Resources, Division of Geological Survey, 2004, and Lake Erie Committee – Habitat Task Group, Great Lakes Fishery Commission, date unknown
55. **Lake Erie** – National Oceanic and Atmospheric Administration, 2004
56. **Lake Erie Bathymetric Contours** – National Oceanic and Atmospheric Administration, 2004
57. **Lake Erie Bathymetry** – National Oceanic and Atmospheric Administration, 2004
58. **Lake Erie Environmental Zones** – Natural Resources Research Institute and Lake Erie Millennium Network, 2011. Modified by Ohio Department of Natural Resources, Office of Coastal Management, 2016
59. **Lake Erie Public Access** – Ohio Department of Natural Resources, Office of Coastal Management, 2015-2018
60. **Lake Erie Shoreline** – Ohio portion: Ohio Department of Natural Resources, Office of Coastal Management, 2011; Outside Ohio: National Oceanic and Atmospheric Administration, 2004; Vignette effect by Ohio Department of Natural Resources, 2010 and modified by Ohio Department of Natural Resources, Office of Coastal Management, 2016; Historic vignette effect (Lake Erie Shipwrecks map) by Ohio Department of Natural Resources, Office of Coastal Management, 2017
61. **Lake Erie Watershed Boundary** – Ohio Department of Natural Resources, Office of Coastal Management, 2012
62. **Lake Maumee Approximate Shoreline** – Ohio Department of Natural Resources, Office of Coastal Management, 2016

GIS DATA SOURCES

63. Land Cover (2010), from the Coastal Change Analysis Program (C-CAP) – U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Coastal Services Center, 2013
64. Lighthouses – Ohio Department of Natural Resources, Office of Coastal Management, 2006
65. Local Unconsolidated Aquifer Names – Derived from the Statewide Aquifer Mapping Program (SAMP), Ohio Department of Natural Resources, Division of Water, 2000
66. Military Practice Area Boundaries – National Oceanic and Atmospheric Administration (NOAA), Office of Coast Survey; NOAA Electronic Nautical Chart data (Approach and Harbour), 2016
67. Motorized Boating Access Facilities – Ohio Department of Natural Resources, Division of Parks and Watercraft, 2017
68. Municipal Boundaries – Ohio Department of Natural Resources, Office of Coastal Management, 2015; Modified from Ohio Department of Transportation (2007) and Lucas County Auditor's Office (2016)
69. National Wetlands Inventory (NWI) – U.S. Fish and Wildlife Service, 2014
70. Native American Trails (including River Portages) – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Based on Frank Wilcox's Ohio Indian Trails, 1970
71. Native American Villages – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Based on Frank Wilcox's *Ohio Indian Trails*, 1970
72. National Data Buoy Center Stations – Ohio Department of Natural Resources, Office of Coastal Management, 2014
73. Natural Springs and Waterfalls (from National Hydrography Dataset) – U.S. Geological Survey, 2014
74. Navigation Dangers and Wrecks, including Caution Areas, Obstructions, Underwater/Awash Rocks, Wrecks – National Oceanic and Atmospheric Administration (NOAA), Office of Coast Survey; NOAA Electronic Nautical Chart data (Approach and Harbour), 2016
75. NOAA National Ocean Service Stations – Ohio Department of Natural Resources, Office of Coastal Management, 2014
76. ODNR Lands Boundaries (State Fish Hatcheries, State Forests, State Nature Preserves, State Parks, State Wildlife Areas, Wildlife Production Areas) – Ohio Department of Natural Resources, 2014
77. Ohio Clean Marinas – Ohio Department of Natural Resources, Office of Coastal Management, 2017
78. Ohio's Designated Coastal Area – Ohio Department of Natural Resources, Office of Coastal Management, 2004, 2006
79. Oil and Gas Fields – Ohio Department of Natural Resources, Division of Geological Survey, 2005
80. Original Land Subdivision Public Land Survey System (PLSS) Townships – Ohio Department of Natural Resources, 2012
81. Original Land Subdivision Survey Townships – Ohio State University: Center for Mapping; U.S. Geological Survey: National Mapping Division; Ohio Environmental Protection Agency; Ohio Department of Natural Resources, Division of Geological Survey, 2005
82. Original (Pre-Settlement) Vegetation – Ohio Biological Survey, 1966; Digitized by Ohio Department of Natural Resources, Division of Real Estate and Land Management, 2000
83. Paddling Access – Ohio Department of Natural Resources, Division of Parks and Watercraft, 2017
84. Paddling Hazards – Ohio Department of Natural Resources, Division of Parks and Watercraft, 2017
85. PLSS First Divisions – Ohio Department of Natural Resources, 2012
86. Potentiometric Surfaces – Ohio Department of Natural Resources, Division of Water Resources, 2016
87. Potentiometric Surface Flow Directions – Ohio Department of Natural Resources, Division of Water Resources, 2016
88. Primary Lithology of Glacial Deposits – Derived from the Statewide Aquifer Mapping Program (SAMP), Ohio Department of Natural Resources, Division of Water, 2000
89. Prime Farmland – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: "Soils"
90. Protected Lands – Various sources, including Ohio Department of Natural Resources (various dates), Ducks Unlimited, Inc. (see Conservation and Recreation Lands), Black Swamp Land Conservancy (see Black Swamp Land Conservancy Protected Lands) and Western Reserve Land Conservancy (see Western Reserve Land Conservancy Protected Lands), et al.
91. Reefs and Shoals – Ohio Department of Natural Resources, Office of Coastal Management, 2006
92. River Miles – Ohio Department of Natural Resources, Office of Coastal Management, 2013
93. Roads and Highways – Ohio Department of Transportation, various years
94. Security Zones – Ohio Department of Natural Resources, Office of Coastal Management, 2017
95. Scenic Byways and Driving Tours – Ohio Department of Natural Resources, Office of Coastal Management, 2009, 2018
96. Shipping Lanes – Ohio Department of Natural Resources, Office of Coastal Management, 2008; Digitized from NOAA Navigation Charts
97. Shipwrecks – Ohio History Connection, State Historic Preservation Office, 2017 and Ohio Sea Grant, 2007

98. Soils, including Depth to Water Table, Dominant Soil Order, Drainage Class, Highly Erodible Soils, Hydric Classification, Prime Farmland, Soils by Parent Material, derived from the Soil Survey Geographic Database (SSURGO) – Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010
99. Soils by Parent Material – Derived from the Soil Survey Geographic Database (SSURGO), Natural Resources Conservation Service, National Cartography and Geospatial Center, 2010. See also: “Soils”
100. Sole Source Aquifers – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, 2017 and U.S. Environmental Protection Agency, 2017
101. Source Water Protection Areas, groundwater – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, 2017
102. Source Water Protection Areas, Lake Erie – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, 2017
103. State Boundaries – Esri, 2002
104. Submerged Cables – National Oceanic and Atmospheric Administration (NOAA), Office of Coast Survey; NOAA Electronic Nautical Chart data (Approach and Harbour), 2016
105. Surface Industrial Minerals Mine Operations (Industrial Mining Operations in Mineral Industries map) – Ohio Department of Natural Resources, Division of Mineral Resources Management, 2013
106. Survey System Lines – Ohio Department of Natural Resources, 2012
107. Township Boundaries – Ohio Department of Natural Resources, Office of Coastal Management, 2015; Modified from Ohio Department of Transportation (2007) and Lucas County Auditor’s Office (2016)
108. Township Lines in Lake (Lucas and Ottawa counties) – Ohio Department of Natural Resources, Office of Coastal Management, 2016
109. Trails – Ohio Department of Natural Resources, Office of Coastal Management, 2015; Includes data from Chagrin Valley Engineering, Ltd. (2015); Cleveland Metroparks (2015); Lake Metroparks (2015); Metroparks Toledo (2015); National Park Service (2015); Northeast Ohio Areawide Coordinating Agency (2015); Summit Metro Parks (2016); and Toledo Metropolitan Area Council of Governments (2015)
110. Underground Railroad Trails and Active Communities – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Based on Wilbur H. Siebert’s *The Mysteries of Ohio’s Underground Railroads*, 1951
111. U.S. Census Tracts (2010) – U.S. Census Bureau, 2010 Census
112. Underground Industrial Minerals Mining Extent (Underground Industrial Mining in Mineral Industries map) – Ohio Department of Natural Resources, Division of Mineral Resources Management, 2013
113. Uppermost Aquifer Media – Derived from Groundwater Pollution Potential dataset(s). See “Groundwater Pollution Potential”
114. Uppermost Hydro-Stratigraphic Formations – Ohio Department of Natural Resources, Division of Water, various dates
115. Walleye Sport Harvest – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Based on Ohio Department of Natural Resources, Division of Wildlife, 2014-2015
116. Water Withdrawal Amounts (2014) – Ohio Department of Natural Resources, Division of Water Resources, 2016
117. Wave Information Stations – Ohio Department of Natural Resources, Office of Coastal Management, 2014; Based on U.S. Army Corps of Engineers, Wave Information Studies
118. Western Reserve Land Conservancy Protected Lands – Western Reserve Land Conservancy, 2016
119. Yellow Perch Sport Harvest – Ohio Department of Natural Resources, Office of Coastal Management, 2016; Based on Ohio Department of Natural Resources, Division of Wildlife, 2014-2015
120. Yields of the Uppermost Bedrock Formations – Ohio Department of Natural Resources, Division of Water, various dates

OUT-OF-STATE GIS DATA SOURCES

121. 10-Digit HUC and 12-Digit HUC Watershed Boundaries (Indiana, Michigan, Pennsylvania) – Downloaded from U.S. Department of Agriculture, Geospatial Data Gateway, 2015
122. Indiana County Boundaries – Indiana Geological Survey, 2002
123. Michigan County Boundaries – Michigan Geographic Framework, Center for Shared Solutions and Technology Partnerships, 2014
124. New York County Boundaries – New York State GIS Program Office, 2013
125. Pennsylvania County Boundaries – Esri, 2002
126. Pennsylvania Inland Lakes (Warmwater/Coolwater Species Fisheries) – Pennsylvania Fish and Boat Commission, 2009
127. Secondary Watershed Boundaries (Ontario) – Ontario Ministry of Natural Resources and Forestry, 2010; Downloaded from Land Information Ontario, 2014
128. Tertiary Watershed Boundaries (Ontario) – Ontario Ministry of Natural Resources and Forestry, 2010; Downloaded from Land Information Ontario, 2014

GIS DATA SOURCES AND TEXT REFERENCES

EXPANDED GEOLOGY MAP DATA SOURCES

1. Shaded elevation data used to create the Topography and Landforms map (see page 208) from: Powers, D.M., Laine, J.F., Pavey, R.R., 2002 (revised 2003), Shaded elevation map of Ohio: Ohio Department of Natural Resources (ODNR), Division of Geological Survey Map MG-1, scale 1:500,000, 1 map and 1 GIS file, modified from: National Elevation Dataset, U.S. Geological Survey, EROS Data Center, 1999, 4 GIS data files.*
2. Data used to create the Bedrock Geology map (see page 210) from: Slucher, E.R., (principal compiler), Swinford, E.M., Larsen, and others, with GIS production and cartography by Powers, D.M., 2006, Bedrock geologic map of Ohio: ODNR Division of Geological Survey Map BG-1, version 6.0, scale 1:500,000, 1 map and GIS files. Bedrock topography data from: ODNR Division of Geological Survey, 2003, Bedrock topography map of Ohio: ODNR Division of Geological Survey Map BG-3, map layout scale 500,000, 1 map and GIS files.
3. Data used to create the Glacial Geology map (see page 212) from: Pavey, R.R., Goldthwait, R.P., Brockman, C.S., Hull, D.N., Swinford, E.M., and Van Horn, R.G., 1999, Quaternary geology of Ohio: ODNR Division of Geological Survey Map M-2, scale 1:500,000, 1 map and GIS files captured at 1:250,000-scale.
4. Data used to create the Drift Thickness map (see page 214) from: Powers, D.M., and Swinford, E.M., 2004, Shaded drift-thickness of Ohio: ODNR Division of Geological Survey Map SG-3, map layout scale 1:500,000, 1 map and GIS files.
5. Data used to create the Karst Geology map (see page 216) from: Pavey, R.R., Hull, D.N., Brockman, C.S., Schumacher, G.A., Stith, D.A., Swinford, E.M., Sole, T.L., Vorbau, K.E., Kallini, K.D., Evans, E.E., Slucher, E.R., and Van Horn, R.G., 1999 (revised 2002), Known and probable karst in Ohio: ODNR Division of Geological Survey Map EG-1, scale 1:500,000, 1 map and GIS files.
6. Data used to create the Oil and Gas Fields map (see page 218) from: Riley, R.A., Baranoski, M.T., and Wickstrom, L.H., 2004, Oil and gas fields map of Ohio: ODNR Division of Geological Survey Map PG-1, scale 1:500,000, 1 map and GIS files.

* Used in many maps to show topographic relief

TEXT REFERENCES (BY CHAPTER)

Chapter 1 – General Reference

1. National Oceanic and Atmospheric Administration. "NOAA's State of the Coast: National Coastal Population Report, Population Trends from 1970 to 2020." March 2013.
2. ---. National Ocean Service. What percentage of the American population lives near the coast? oceanservice.noaa.gov/facts/population.html.
3. ---. Office for Coastal Management. coast.noaa.gov.
4. Population Education. What is a Cartogram? www.populationeducation.org/content/what-cartogram.
5. State of Ohio. Department of Natural Resources. Division of Geological Survey. Educational Leaflet No. 16: Ohio Topographic Maps. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Education/el16.pdf. Revised 2016.
6. ---. Department of Natural Resources. Office of Coastal Management. Designated Coastal Management Area. coastal.ohiodnr.gov/dcma.
7. ---. Department of Natural Resources. Office of Coastal Management. Ohio Coastal Management Program. coastal.ohiodnr.gov/ocmp.
8. ---. Development Services Agency. County Profiles, 2016 Annual Edition (Ashtabula County, Cuyahoga County, Erie County, Lake County, Lorain County, Lucas County, Ottawa County and Sandusky County). development.ohio.gov/reports/reports_countytrends_map.htm.
9. United States. Census Bureau. www.census.gov.
10. ---. Census Bureau. Center for Economic Studies, Longitudinal Employer-Household Dynamics. 2014. lehd.ces.census.gov.
11. ---. Census Bureau. Geographic Terms and Concepts – Census Tract. www.census.gov/geo/reference/gtc/gtc_ct.html.
12. ---. Geological Survey. The National Map. US Topo: Maps for America. nationalmap.gov/ustopo.

Chapter 2 – Lake Erie Watershed

1. Chicago Line Cruises. "The Story Behind the Chicago River Reversal." www.chicagoline.com/blog/chicago-river-reversal.
2. CrookedRiverChronicles. Dams on the Cuyahoga: Past and Present. crookedriverchronicles.com/dams.html.

3. Downing, Bob. "Cuyahoga River is still evolving after two dams came down in Cuyahoga Falls." Akron Beacon Journal, 4 Jan. 2014. www.ohio.com/akron/news/cuyahoga-river-is-still-evolving-after-two-dams-came-down-in-cuyahoga-falls.
4. ---. "Dam removal begins in Cuyahoga Falls." Akron Beacon Journal, 30 Jul. 2013. ohio.com/akron/news/dam-removal-begins-in-cuyahoga-falls.
5. Encyclopædia Britannica, www.britannica.com.
6. Encyclopedia of Chicago. www.encyclopedia.chicagohistory.org.
7. Environment Canada. "Great Lakes Areas of Concern." www.ec.gc.ca/raps-pas.
8. Great Lakes Commission. "About Great Lakes Areas of Concern (AOCs)." glc.org/projects/habitat/aoc.
9. Great Lakes Information Network. www.great-lakes.net/lakes/ref/lakefact.html.
10. ---. "Water Pollution in the Great Lakes." www.great-lakes.net/teach/pollution/water/water2.html.
11. International Joint Commission. Annex 1—Areas of Concern. www.ijc.org/en/_/Annexe_1_Areas_of_Concern.
12. Jones, D. Mark. Ohio Department of Natural Resources, Division of Geological Survey. Lake Erie Water Levels. geosurvey.ohiodnr.gov/lake-erie-geology/water-levels.
13. Lake Erie Waterkeeper. www.lakeeriewaterkeeper.org.
14. National Oceanic and Atmospheric Administration. National Geophysical Data Center. ngdc.noaa.gov.
15. ---. National Geophysical Data Center. ngdc.noaa.gov.
16. ---. National Geophysical Data Center. "Lake Erie and Lake St. Clair Geomorphology." www.ngdc.noaa.gov/mgg/greatlakes/lakeerie_cdrom/html/e_gmorph.htm and www.ngdc.noaa.gov/mgg/greatlakes/lakeerie_cdrom/startglb.htm.
17. ---. National Geophysical Data Center. "Lake-Floor Geomorphology of Lake Erie." www.ngdc.noaa.gov/mgg/greatlakes/erie/RP3/lakefloorgeomorphologyoflakeerie.pdf.
18. ---. National Ocean Service. Lake Level Viewer. coast.noaa.gov/llv.
19. ---. National Ocean Service. "What is Bathymetry?" oceanservice.noaa.gov/facts/bathymetry.html.
20. ---. Office for Coastal Management. C-CAP Land Cover and Change. coast.noaa.gov/digitalcoast/data/ccapregional.html.
21. ---. Office for Coastal Management. Coastal Change Analysis Program (C-CAP) Land Cover Classifications. coast.noaa.gov/digitalcoast/training/ccap-land-cover-classifications.html.
22. Ohio State University. Ohio Sea Grant College Program. Explore the Lake Erie Islands: A Guide to Nature and History along the Lake Erie Coastal Ohio Trail.
23. State of Ohio. Environmental Protection Agency. Division of Surface Water. Fact Sheet: Lowhead Dam Removal. www.epa.ohio.gov/portals/47/media/olentangy_2010/lowhead_dam_removal.pdf. October 2013.
24. ---. Ohio Department of Natural Resources. Division of Soil and Water Resources. Best Management Practices Guidebook for Dams: Best Management Practices to Improve Surface Water Quality and Instream and Riparian Habitat at Dams. coastal.ohiodnr.gov/portals/soilwater/pdf/dam/BMPGuidebookDams.pdf. date unknown.
25. ---. Ohio Department of Natural Resources. Division of Soil and Water Resources. Fact Sheet 94-29: Dam Safety: Classification of Structures. water.ohiodnr.gov/portals/soilwater/pdf/dam/factsheets/fctsht29.pdf. May 2013.
26. ---. Ohio Department of Natural Resources. Division of Water. Gazetteer of Ohio Streams, Second Edition (Water Inventory Report 29), 2001.
27. ---. Ohio Department of Natural Resources. Division of Water Resources. Ohio Dam Safety Program. water.ohiodnr.gov/safety/dam-safety.
28. ---. Ohio Department of Natural Resources. ODNR List of Ohio Dam Removals. www.batchgeo.com/map/fce5d1833b25ae7b3ba33946d4315b9e.
29. United States. Department of Agriculture. Natural Resources Conservation Service. "Watersheds, Hydrologic Units, Hydrologic Unit Codes, Watershed Approach, and Rapid Watershed Assessments." 18 June 2007. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042207.pdf.
30. ---. Environmental Protection Agency. www.epa.gov/greatlakes/lake-erie.
31. ---. Environmental Protection Agency. "Beneficial Use Impairments- What are Beneficial Use Impairments (BUIs)?" www.epa.gov/great-lakes-aocs/beneficial-use-impairments.
32. ---. Environmental Protection Agency. Wetlands Protection and Restoration. www.epa.gov/wetlands.
33. ---. Geological Survey. www.usgs.gov.
34. ---. Geological Survey. "Hydrography (National Hydrography Dataset)." nhd.usgs.gov.
35. ---. Geological Survey. "The Lake Superior Iron Ranges: Geology and Mining." [mn.water.usgs.gov/projects/tesnar/2011/Presentations/CannonIron ranges.pdf](http://mn.water.usgs.gov/projects/tesnar/2011/Presentations/CannonIron%20ranges.pdf).
36. ---. Geological Survey. "Largest Rivers in the United States." pubs.usgs.gov/of/1987/ofr87-242.
37. ---. Geological Survey. "What is a Watershed?" water.usgs.gov/edu/watershed.html.
38. Water Education Foundation. What's an acre-foot? www.watereducation.org/general-information/whats-acre-foot.
39. Wikipedia. www.wikipedia.com.

TEXT REFERENCES

Chapter 3 – History

1. Bickham, Troy. "What did the Treaty of Ghent do? A look at the end of the War of 1812." Oxford University Press, 24 Dec. 2014. blog.oup.com/2014/12/treaty-of-ghent-war-1812.
2. Blake, Erica. "Vanished shipwreck's secret revealed, Sunken vessel swallowed up by Lake Erie muck." Toledo Blade, 19 Mar. 2012. www.toledoblade.com/State/2012/03/19/Vanished-shipwreck-s-secret-revealed.html.
3. Case Western Reserve University. Encyclopedia of Cleveland History. Connecticut Land Co. case.edu/ech/articles/c/connecticut-land-co.
4. ---. Encyclopedia of Cleveland History. Explorations. case.edu/ech/articles/e/explorations.
5. Cleveland Underwater Explorers, Inc. www.clueshipwrecks.org.
6. Dailey, John E., LS. "Ohio Lands and Survey Systems." The American Surveyor. Winter 2004. www.oldfortsteuben.com/admin/data/files/TheAmericanSurveyor_FabricOfSurveyingOhio_December2004.pdf.
7. Deitch, Linda. "Many Ohio counties, towns linked to American Indian words, phrases." Columbus Dispatch, 19 Nov. 2008. www.dispatch.com/article/20081119/LIFESTYLE/311199650.
8. Erie County, Ohio. Erie County History. History of the Firelands. www.eriecounty.oh.gov/resources/kids-resources/erie-county-history/the-firelands.
9. Fort Meigs. www.fortmeigs.org.
10. Great Lakes Shipwreck Museum. www.shipwreckmuseum.com.
11. Hemenway, Eric. Summer 1795: The Treaty of Greenville creates an uneasy peace. United States. Department of the Interior. National Park Service. www.nps.gov/articles/a-long-legacy.htm.
12. Herdendorf, C.E. Biological Report 85(7.9): The Ecology of the Coastal Marshes of Western Lake Erie: A Community Profile. February 1987. www.nwrc.usgs.gov/techrpt/85-7-9.pdf.
13. Herr, Fred, J. Ohio Archæological and Historical Publications, Volume XXI. 1912.
14. Hickman, Kennedy. "Northwest Indian War: Battle of Fallen Timbers." ThoughtCo., 1 Oct. 2015. www.thoughtco.com/northwest-indian-war-battle-of-fallen-timbers-2360787.
15. HistoryNet. War of 1812. www.historynet.com/war-of-1812.
16. Hudson Library and Historical Society. Underground Railroad Sites in Hudson, Ohio. www.hudsonlibrary.org/historical-society/underground-railroad-sites-in-hudson-ohio.
17. Knepper, George W. The Official Ohio Lands Book. 2002. ohioauditor.gov/publications/OhioLandsBook.pdf.
18. Lorain Public Library. The Underground Railroad: The Lorain County Connection. lorainpubliclibrary.org/research/local-research/local-history-resources/underground-railroad.
19. Maritime Archaeological Survey Team (MAST). www.ohiomast.org.
20. Maritime History of Great Lakes. History of the Great Lakes. www.maritimehistoryofthegreatlakes.ca/documents/hgl/default.asp?ID=c006.
21. McCain, Dan. A Boy's Encounter with the Derelict Canal. Wabash & Erie Canal Association. www.wabashanderiecanal.org/history-of-the-canal.
22. Metroparks Toledo. Pearson. metroparkstoledo.com/explore-your-parks/pearson.
23. Michigan State University. The French and Indian War. geo.msu.edu/extra/geogmich/frenchindian_war.html.
24. ---. French Explorers. geo.msu.edu/extra/geogmich/french_explorers.html.
25. Milan Area. The Milan Canal. milanarea.com/milancanal.htm.
26. Millberg, Stacy. "Pilgrimage recalls county's Underground Railroad stops." Star Beacon, 8 Oct. 2006.
27. Nasspecial, Shannon, M. "Lake Erie shipwrecks, well-preserved by fresh water, are favorites among divers." Pittsburgh Post-Gazette, 3 Oct. 2010. www.post-gazette.com/sports/outdoors/2010/10/03/Lake-Erie-shipwrecks-well-preserved-by-fresh-water-are-favorites-among-divers/stories/201010030307.
28. National Museum of the Great Lakes. www.inlandseas.org.
29. Oak Openings Green Ribbon Initiative. oakopenings.org.
30. Ohio & Erie Canalway. www.ohioanderiecanalway.com.
31. Ohio Historical Society. Historic American Indian Tribes of Ohio, 1654-1843. Date unknown.
32. Ohio History Connection. www.ohiohistory.org.
33. ---. Ohio History Central. American Indians. www.ohiohistorycentral.org/w/Native_Americans.
34. ---. Ohio History Central. Battle of Lake Erie. www.ohiohistorycentral.org/w/Battle_of_Lake_Erie.
35. ---. Ohio History Central. Black Swamp. www.ohiohistorycentral.org/w/Black_Swamp.
36. ---. Ohio History Central. Connecticut Western Reserve. www.ohiohistorycentral.org/w/Connecticut_Western_Reserve.
37. ---. Ohio History Central. Erie Canal. www.ohiohistorycentral.org/w/Erie_Canal.
38. ---. Ohio History Central. Firelands. www.ohiohistorycentral.org/w/Firelands.
39. ---. Ohio History Central. Fort Meigs. www.ohiohistorycentral.org/w/Fort_Meigs.
40. ---. Ohio History Central. Fur Trade. www.ohiohistorycentral.org/w/Fur_Trade.
41. ---. Ohio History Central. Fort Stephenson. www.ohiohistorycentral.org/w/Fort_Stephenson.
42. ---. Ohio History Central. Toledo War. www.ohiohistorycentral.org/w/Toledo_War?rec=562.

43. ---. Ohio History Central. Treaty of Greenville (1795). [www.ohiohistorycentral.org/w/Treaty_of_Greenville_\(1795\)](http://www.ohiohistorycentral.org/w/Treaty_of_Greenville_(1795)).
44. ---. Ohio History Central. Upper Sandusky, Ohio. www.ohiohistorycentral.org/w/Upper_Sandusky,_Ohio.
45. ---. Ohio History Central. War of 1812. www.ohiohistorycentral.org/w/War_of_1812.
46. ---. Ohio History Central. Wyandot Indians. www.ohiohistorycentral.org/w/Wyandot_Indians.
47. ---. Ohio Shipwreck Inventory. www.ohiohistory.org/preserve/state-historic-preservation-office/hpsurvey/ohio-shipwreck-inventory.
48. Ohio State University. Ohio Sea Grant College Program. Shipwrecks & Maritime Tales of the Lake Erie Coastal Ohio Trail. www.ohioshipwrecks.org.
49. Oklahoma Historical Society. Removal of American Indian Tribes to Oklahoma. www.okhistory.org/research/airemoval.
50. Rails and Trails Transportation History Sources. Indian Trails and Towns in Ohio. www.railsandtrails.com/Maps/OhioArch1914/trails.htm.
51. Schneider, Andrew. A Brief History of the Miami & Erie Canal at Cincinnati. 2010. homepages.uc.edu/~maynarjb/362/Canal/Schneider_2010_History_of_the_Miami_and_Erie_Canal_in_Cincinnati.pdf.
52. Sherman, C.E. Original Ohio Land Subdivisions, Volume III of the Final Report, Ohio Cooperative Topographic Survey. Ohio Department of Natural Resources, Division of Geological Survey, Columbus, Ohio, 1925. Reprinted 2005.
53. State Land Claims. www.landofthebrave.info/state-land-claims.htm.
54. State of Ohio. Department of Natural Resources. Division of State Parks and Watercraft. Portage Lakes State Park. parks.ohiodnr.gov/portagelakes.
55. Tanner, Helen H. Atlas of Great Lakes Indian History. University of Oklahoma Press, Norman, OK, 1987.
56. Touring Ohio. Brief History of the Ohio Country. www.touringohio.com/history.html.
57. ---. The Feeder Lakes... today's great water attractions. www.touringohio.com/history/feeder-lakes.html.
58. ---. Ohio and the War of 1812. www.touringohio.com/history/1812-war-2.html.
59. ---. The Treaty of Ghent is finalized. www.touringohio.com/history/treaty-of-ghent-part2.html.
60. ---. Underground Railroad in Ohio. www.touringohio.com/history/ohio-underground-railroad.html.
61. United States. Department of the Interior. National Park Service. Aboard the Underground Railroad: A National Register Travel Itinerary. www.nps.gov/nr/travel/underground.
62. ---. Department of the Interior. National Park Service. Perry's Victory and International Peace Memorial. The Battle of Lake Erie, War of 1812. www.nps.gov/pevi/learn/historyculture/battle_erie_detail.htm.
63. ---. Geological Survey. The National Map Small Scale. Public Land Survey System (PLSS). nationalmap.gov/small_scale/a_plss.html#two.
64. United States History. Wabash and Erie Canal. www.u-s-history.com/pages/h2565.html.
65. ---. Western Land Claims. www.u-s-history.com/pages/h1160.html.
66. Unknown author. "Clearer Water Reveals Sunken Ships." New York Times, 26 Sep. 1999. www.nytimes.com/1999/09/26/us/clearer-water-reveals-sunken-ships.html?mcubz=3.
67. Wikipedia. www.wikipedia.com.
68. Wilcox, Frank. Ohio Indian Trails, Third Edition. Kent State University Press, 1970.

Chapter 4 –Transportation and Shipping

1. Buettner, Michael G. By the Numbers/A Chronology of the Federal Highways in Ohio. The Ohio Lincoln Highway League. www.lincolnhighwayoh.com/articles/8-articles/28-by-the-numbers.
2. Case Western Reserve University. Encyclopedia of Cleveland History. Cleveland, Painesville & Eastern. case.edu/ech/articles/c/cleveland-painesville--eastern.
3. ---. Encyclopedia of Cleveland History. Toll Roads. case.edu/ech/articles/t/toll-roads.
4. ---. Encyclopedia of Cleveland History. Walk-in-the-Water. case.edu/ech/articles/w/walk-in-the-water.
5. Cleveland State University. Michael Schwartz Library. The Cleveland Memory Project. History of the Iron Ore Trade. www.clevelandmemory.org/glihc/oretrade.html.
6. Conneaut Ohio History & Genealogy. History of Ashtabula Co., Ohio: Conneaut Township. www.conneautohio.us/Ashtaco_ConneautHistory_xviii.htm.
7. Curbstone Corporation. Macadam Roads. curbstone.com/iblog/31-macadam-roads.
8. Gindy, Gayleen. Sylvania: Lucas County, Ohio: From Footpaths to Expressways and Beyond, Volume Two. AuthorHouse, 2012.
9. Great Lakes Information Network. Great Lakes Ports & Shipping. www.great-lakes.net/teach/business/ship.
10. Gregory, W.M. and Guitteau, W.B. History and Geography of Ohio. Ginn, 1922.
11. Harper, Glenn and Smith, Doug. A Traveler's Guide to the Historic National Road in Ohio: The Road That Helped Build America. An All-American Road National Scenic Byway, Fourth Edition. Ohio National Road Association, Inc., 2010. ohionationalroad.org/TravelersGuide/TravelersGuide.pdf.

TEXT REFERENCES

12. Intrepid Historical Services. Transportation: An Overview of Early Historic Transportation Systems in Ohio. www.horizonview.net/~ihs/Transportation/Transp-HistOverview.html.
13. Interstate-Guide. www.interstate-guide.com.
14. Lake Shore Rail Maps. www.lakeshorerailmaps.com.
15. Lighthousefriends.com. www.lighthousefriends.com.
16. Longfellow, Rickie. Highway History: Back in Time, Plank Roads. U.S. Department of Transportation. Federal Highway Administration. www.fhwa.dot.gov/infrastructure/back0508.cfm.
17. Lupold, H.F. and Haddad, G. Ohio's Western Reserve: A Regional Reader. Kent State University Press, 1988.
18. Mad River & NKP Railroad Museum. The Mad River and Lake Erie Railroad. www.madrivermuseum.org/mr&lerr.html.
19. McNamara, Robert. "The National Road, America's First Major Highway: A Road From Maryland to Ohio Helped America Move Westward." ThoughtCo., 2017. www.thoughtco.com/the-national-road-1774053.
20. Minnesota Historical Society. Lake Superior Shipwrecks: History and Development of Great Lakes Water Craft. www.mnhs.org/places/nationalregister/shipwrecks/mpdf/mpdf2.php.
21. ---. Lake Superior Shipwrecks: Onoko. www.mnhs.org/places/nationalregister/shipwrecks/onoko/onoko.php.
22. National Oceanic and Atmospheric Administration. National Ocean Service. What is a nautical chart? oceanservice.noaa.gov/facts/nautical_chart.html.
23. National Oceanic and Atmospheric Administration. Office of Coast Survey. Find Nautical Charts. www.nauticalcharts.noaa.gov.
24. Niagara's Welland Canal. www.niagarawellandcanal.com.
25. Ohio History Connection. www.ohiohistory.org.
26. ---. Ohio Memory. All Aboard! Ohio Railroad History. www.ohiohistoryhost.org/ohiomemory/archives/3405.
27. ---. Ohio Memory. Transportation in Ohio. www.ohiohistoryhost.org/ohiomemory/wp-content/uploads/2014/12/TopicEssay_Transportation.pdf.
28. ---. Ohio History Central. Automobiles. www.ohiohistorycentral.org/w/Automobiles.
29. ---. Ohio History Central. Enabling Act of 1802. www.ohiohistorycentral.org/w/Enabling_Act_of_1802.
30. ---. Ohio History Central. Panic of 1837. www.ohiohistorycentral.org/w/Panic_of_1837.
31. ---. Ohio History Central. Railroads. www.ohiohistorycentral.org/w/Railroads.
32. Ohio National Road Association. www.ohionationalroad.org.
33. Orris, Sue. History of the Dock Road Arcola Creek Area, Madison Township, Ohio. Madison Historical Society. August 1980. www.madison-library.info/wp-content/uploads/2016/09/History-of-the-Dock-Road.pdf?x80724.
34. Reese, Matt. "SB 1 passes Senate." Ohio's Country Journal, February 2015. ocj.com/2015/02/sb-1-passes-senate.
35. Sandusky History. The Columbus & Sandusky Pike. sanduskyhistory.blogspot.com/2007/07/columbus-sandusky-pike.html.
36. Smith, Robert. "Port of Cleveland seals deal to bring container shipping to the Great Lakes." The Cleveland Plain Dealer, November 2013. www.cleveland.com/business/index.ssf/2013/11/port_of_cleveland_seals_a_deal.html.
37. State of Ohio. Development Services Agency. Economic Overview, June 2017. development.ohio.gov/files/research/E1000.pdf.
38. ---. Environmental Protection Agency. Lake Erie Dredged Material Program. epa.ohio.gov/dir/dredge.
39. ---. Department of Transportation. Office of Technical Services. Division of Planning. ODOT Facts Book 2017.
40. ---. Department of Transportation. Office of Aviation. Ohio Airports Economic Impact Study: Technical Report, October 2014. www.dot.state.oh.us/Divisions/Operations/Aviation/OhioAirportsFocusStudy/OhioAirportsEconomicImpactStudy/Forms/AllItems.aspx.
41. ---. Department of Transportation. Office of Aviation. Ohio Airports Focus Study: Executive Summary, 2014. www.dot.state.oh.us/Divisions/Operations/Aviation/OhioAirportsFocusStudy/OhioAirportsEconomicImpactStudy/Forms/AllItems.aspx.
42. ---. Department of Transportation. Ohio Statewide Freight Study. Final Report. November 2013.
43. ---. Public Utilities Commission. Railroad consumer information. www.puco.ohio.gov/information-by-industry/railroad-consumer-information.
44. ---. Public Utilities Commission. Railroad industry information. www.puco.ohio.gov/information-by-industry/railroad-industry-information.
45. Touring Ohio. National Road. touringohio.com/history/national-road.html.
46. United States. Army Corps of Engineers. Dredging on the Great Lakes. [www.lre.usace.army.mil/Portals/69/docs/Navigation/GreatLakesDredging/Introduction to Dredging Methods on the Great Lakes.pdf](http://www.lre.usace.army.mil/Portals/69/docs/Navigation/GreatLakesDredging/Introduction_to_Dredging_Methods_on_the_Great_Lakes.pdf).
47. ---. Army Corps of Engineers. Great Lakes Navigation System. www.lre.usace.army.mil/Missions/Great-Lakes-Navigation and www.lre.usace.army.mil/Portals/69/docs/Navigation/GrtLaksNavSysBro_REV_11_Feb_2013.pdf.
48. ---. Army Corps of Engineers. Navigation Data Center. www.navigationdatacenter.us/wcsc/wcsc.htm.

49. ---. Army Corps of Engineers. Waterborne Commerce of the United States: Part 3—Waterways and Harbors Great Lakes (IWR-WCUS-15-3), 2015. www.navigationdatacenter.us/wcsc/pdf/wcusgl15.pdf.
50. ---. Coast Guard. Great Lakes Light List, Volume VII (COMDTPUB P16502.7), 2017. www.navcen.uscg.gov/pdf/lightLists/LightList_V7.pdf.
51. ---. Department of the Interior. National Park Service. Ohio and Erie Canal National Heritage Center. www.nps.gov/nr/travel/ohioeriecanal/transportation.htm.
52. ---. Department of Transportation. New FHWA Report Reveals States with the Busiest Highways (FHWA 35-13). www.transportation.gov/briefing-room/new-fhwa-report-reveals-states-busiest-highways.
53. ---. Department of Transportation. Office of Highway Policy Information. Highway Statistics 2013. www.fhwa.dot.gov/policyinformation/statistics/2013/hm60.cfm.
54. University of North Carolina at Chapel Hill. Lighthouses of the United States: Ohio. www.unc.edu/~rowlett/lighthouse/oh.htm.
55. Welland Public Library. Canal History. www.welland.library.on.ca/digital/history.htm.
56. Wikipedia. www.wikipedia.com.
10. Lorain County Metro Parks. North Coast Inland Trail. www.metroparks.cc/north_coast_inland_trail.php.
11. National Audubon Society. Birding in Ohio. www.audubon.org/news/birding-ohio.
12. National Marine Manufacturers Association. 2014 Recreational Boating Statistical Abstract. 2015.
13. ---. Economic Significance of Recreational Boating in Ohio. 2015.
14. Ohio & Erie Canalway. The Towpath Trail. www.ohioanderiecanalway.com/Main/Pages/The_Towpath_Trail_56.aspx.
15. Ohio Ornithological Society. www.ohiobirds.org.
16. Ohio State University. Ohio Sea Grant College Program. Lake Erie Islands Water Trails Brochure. ohioseagrant.osu.edu/products/1nk1g/lake-erie-islands-water-trails-brochure.
17. ---. Ohio Sea Grant College Program. Ohio Clean Programs. ohioseagrant.osu.edu/clean.
18. Sandusky County Park District. North Coast Inland Trail. www.lovemyparks.com/parks/north_coast_inland_trail.
19. State of Ohio. Department of Natural Resources. Division of Parks and Recreation. 2013 Ohio Statewide Comprehensive Outdoor Recreation Plan (SCORP). 2013. parks.ohiodnr.gov/Portals/parks/PDFs/stay_informed/SCORP/2013_SCORP.pdf.
20. ---. Department of Natural Resources. Division of Parks and Watercraft. Boating Statistics. watercraft.ohiodnr.gov/statistics.
21. ---. Department of Natural Resources. Division of Parks and Watercraft. Lake Erie Boating. watercraft.ohiodnr.gov/registrationagents.
22. ---. Department of Natural Resources. Division of Parks and Watercraft. Ohio Water Trails Program. watercraft.ohiodnr.gov/watertrails.
23. ---. Department of Natural Resources. Division of Parks and Watercraft. Ohio State Parks. parks.ohiodnr.gov.
24. ---. Department of Natural Resources. Division of Parks and Watercraft. Ohio's Scenic Rivers Program. watercraft.ohiodnr.gov/scenicrivers.
25. ---. Department of Natural Resources. Division of Parks and Watercraft. Rivers & Streams, Where to Paddle. watercraft.ohiodnr.gov/where-to-boat/rivers-streams.
26. ---. Department of Natural Resources. Division of Parks and Watercraft. Where to Register—Find an Agent. watercraft.ohiodnr.gov/lakeerie.
27. ---. Department of Natural Resources. Division of Watercraft. 2012 Annual Report. watercraft.ohiodnr.gov/Portals/watercraft/pdfs/reports/12WCAnnualReport.pdf. 2012.
28. ---. Department of Natural Resources. Division of Watercraft. Map: Ohio Boating Areas. June 2012.

Chapter 5 – Outdoor Recreation

1. American Cycling Association. Adventure Cycling Route Network. www.adventurecycling.org/routes-and-maps/adventure-cycling-route-network.
2. ---. National Corridor Plan. www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/national-corridor-plan.
3. Biggest Week in American Birding, The. www.biggestweekinamericanbirding.com.
4. Buckeye Trail Association. www.buckeyetrail.org.
5. Cho, Janet. "Recreational boating industry is sailing toward record growth by 2015 as it powers out of recession lows." The Plain Dealer, 28 July 2014.
6. Erie Metroparks. East Sandusky Bay Water Trail brochure. watercraft.ohiodnr.gov/Portals/watercraft/pdfs/maps/wteastsanduskybay.pdf.
7. Firelands Rails to Trails, Inc. www.firelandsrailstotrails.org.
8. Great Lakes Clean Marina Network. Project Number C/CC-18 | MICHU-17-101: Case Study—Ohio Clean Marinas Program. www.miseagrant.umich.edu/great-lakes-clean-marina/files/2017/02/17-101-OSG-GL-Clean-Marina-Case-Study.pdf. 2017.
9. Great Lakes Commission. Great Lakes Restoration at work in Ohio. lakeerie.ohio.gov/Portals/0/GLRI/Ohio_GLRI_State_Factsheet_2014_final_Feb2028.pdf. March 2014.

TEXT REFERENCES

29. ---. Department of Natural Resources. Division of Wildlife. Fishing Lake Erie. wildlife.ohiodnr.gov/fishing/fishing-lake-erie.
30. ---. Department of Natural Resources. Division of Wildlife. Lake Erie Birding Trail. lakeeriebirding.ohiodnr.gov.
31. ---. Department of Natural Resources. Division of Wildlife. Lake Erie Fisheries Update. 2017. (PowerPoint presentation).
32. ---. Department of Natural Resources. Office of Coastal Management. Ohio's Lake Erie Public Access Guidebook, Coast Edition, 2014. (coastal.ohiodnr.gov/gocoast).
33. ---. Department of Natural Resources. Office of Coastal Management. Ohio's Lake Erie Public Access Guidebook, Rivers Edition, 2013. (coastal.ohiodnr.gov/gorivers).
34. The Nature Conservancy. Conservation Gateway. Recreational Boating Map. www.conservationgateway.org/ConservationByGeography/NorthAmerica/wholesystems/greatlakes/coasts/wle/Pages/Recreational-Boating.aspx.
35. Vermilion-Lorain Water Trail brochure. watercraft.ohiodnr.gov/Portals/watercraft/pdfs/maps/wtverm-lorain.pdf. 2009.
36. Wabash Cannonball Trail. Welcome to the Wabash Cannonball Trail. www.wabashcannonballtrail.org.
37. Wikipedia. www.wikipedia.com.
9. ---. Museum Preserves. List of Museum Natural Areas. www.cmnh.org/c-r/natural-areas-program/museum-natural-areas.
10. ---. Museum Preserves. List of Museum Natural Areas. Natural Areas. Preserving unique natural areas for science, education and enjoyment. www.cmnh.org/c-r/natural-areas-program.
11. ---. Museum Preserves. Mentor Marsh. www.cmnh.org/mentor-marsh.
12. Coastal Resilience. Western Lake Erie. coastalresilience.org/project/western-lake-erie.
13. Dietz, T. and Bidwell, D. Climate Change in the Great Lakes Region: Navigating an Uncertain Future. MSU Press, 2011.
14. DifferenceBtw.com. Difference between Food Chain and Food Web. www.differencebtw.com/difference-between-food-chain-and-food-web. May 2015.
15. Ducks Unlimited. Great Lakes/Atlantic Regional Office. Updating the National Wetlands Inventory (NWI) for the Great Lakes (Wisconsin, Illinois, Indiana, Michigan, and Ohio): Project Workplan. www.ducks.org/media/Conservation/GLARO/_documents/_library/_gis/NWI_Workplan.pdf. 15 October 2008.
16. Edsall, T.A. and Charlton, M.N. United States. Environmental Protection Agency. Nearshore Waters of the Great Lakes. archive.epa.gov/solec/web/pdf/nearshore_waters_of_the_great_lakes.pdf. December 1997.
17. Erie MetroParks. eriemetroparks.org.
18. GreatLakesEnvironmentalAssessmentandMappingProject(GLEAM). Hypoxia. greatlakesmapping.org/great_lake_stressors/6/hypoxia.
19. Herdendorf, C.E., Klarer, D.M. and Herdendorf, R.C. The Ecology of Old Woman Creek, Ohio: An Estuarine and Watershed Profile, Second Edition. 2006. www.coast.noaa.gov/data/docs/nerrs/Reserves_OWC_SiteProfile.pdf.
20. Holden Arboretum. www.holdenarb.org.
21. International Society of Limnology. What is Limnology? limnology.org/what-is-limnology.
22. Johnson, L.B., Mackey, S.D., Hollenhorst, T., Ciborowski, J.J.H., Button, D.T. and Gauthier, R. An Integrated Habitat Classification and Map of the Lake Erie Basin: Building Expertise and Cooperation (PowerPoint presentation). www.lemn.org/LEMN2008_files/Presentations/Mackey%20LEMN%202008%20Wed%20130.pdf.
23. Lake Access. Understanding Lakes. Lake Zones. www.lakeaccess.org/ecology/lakeecologyprim9.html.
24. Lake Erie Allegheny Partnership. A Legacy of Living Places. www.leapbio.org/resources/a-legacy-of-living-places.
25. Lake Metroparks. www.lakemetroparks.com.
26. Lorain County Metro Parks. www.metroparks.cc.

Chapter 6 – Ecosystem and Habitat

1. Act For Libraries. Zones Found in Freshwater Lakes. www.actforlibraries.org/zones-found-in-freshwater-lakes.
2. Albert, D.A., Wilcox, D.A., Ingram, J.W. and Thompson, T.A. Hydrogeomorphic Classification for the Great Lakes Coastal Wetlands. Journal of Great Lakes Research, Volume 31, Issue 1: 129-146. 2005.
3. Allinger, L. and Reavie, E. "Research Summary: Lake Erie's Ecological History as Recorded by Phytoplankton." Lake Scientist, 15 January 2014.
4. BirdLife International. www.birdlife.org.
5. Black Swamp Conservancy. www.blackswamp.org.
6. ---. 2017 Annual Report. 2017.
7. Cleveland Metroparks. clevelandmetroparks.com.
8. Cleveland Museum of Natural History. Kelleys Island Preserves. www.cmnh.org/kelleys-island.

27. Mackey, S.D. "Great Lakes Nearshore and Coastal Systems." In: U.S. National Climate Assessment Midwest Technical Input Report. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators. Available from the Great Lakes Integrated Sciences and Assessments (GLISA) Center. greatlakesresilience.org/sites/default/files/library_reference_2012_GLISA_CoastalSectorMidWestTechnicalInputReportNationalClimateAssessment.pdf. 2012.
28. Metroparks Toledo. metroparkstoledo.com.
29. National Oceanic and Atmospheric Administration, Great Lakes Aquatic Nonindigenous Species Information System, www.glerl.noaa.gov/res/Programs/glansis/glansis.html.
30. ---. Office for Coastal Management. Old Woman Creek National Estuarine Research Reserve. coast.noaa.gov/nerrs/reserves/old-woman-creek.html and coast.noaa.gov/data/docs/nerrs/Handout-Old-Woman-Creek.pdf (reserve handout).
31. Nelli, Fabio. "Hexagonal Binning – a new method of visualization for data analysis." Meccanismo Complesso. 14 January 2014.
32. New Hampshire Public Broadcasting System. Nature Works. Bogs, Fens and Pocosins. www.nhptv.org/natureworks/nwep7f.htm.
33. National Audubon Society. Bird Conservation. Important Bird Areas. Criteria Overview. web4.audubon.org/bird/iba/criteria.html.
34. ---. Bird Conservation. Important Bird Areas. Global and Continental Important Bird Areas. web4.audubon.org/bird/iba/prioritizedibas.htm.
35. ---. Bird Conservation. Important Bird Areas. What is an Important Bird Area? web4.audubon.org/bird/iba/iba_intro.html.
36. Oak Openings Green Ribbon Initiative. Why the Oak Openings? www.oakopenings.org/about/history.
37. Ohio State University. Ohio Sea Grant College Program. FS-1501: Aquatic Invasive Species in the Great Lakes. ohioseagrant.osu.edu/products/6bdd5. March 2015.
38. ---. Ohio Sea Grant College Program. "The Top 10 Aquatic Invasive Species in Lake Erie," educational display OHSU-DIS-011, 2009.
39. Pennsylvania Land Trust Association. What Is a Land Trust? conservationtools.org/guides/150-what-is-a-land-trust.
40. Sandusky County Park District. www.lovemyparks.com/parks.
41. Smith, Nate. "Binning: An Alternative to Point Maps." Points of Interest (official Mapbox blog). 24 May 2012.
42. State of Ohio. Department of Natural Resources. Division of Natural Areas and Preserves. Conneaut Swamp State Nature Preserve. naturepreserves.ohiodnr.gov/conneautswamp.
43. ---. Department of Natural Resources. Division of Natural Areas and Preserves. Mentor Marsh State Nature Preserve. naturepreserves.ohiodnr.gov/mentormarsh.
44. ---. Department of Natural Resources. Division of Wildlife. Lake Erie Fisheries Units, Fairport and Sandusky. Federal Aid in Fish Restoration Project F-69-P: Ohio's Lake Erie Fisheries 2016, Annual status report. 2017.
45. ---. Department of Natural Resources. Division of Wildlife. Old Woman Creek National Estuarine Research Reserve. Technical Bulletin No. 3.: How is Fish Habitat Affected? Lake Erie's Dead Zone. wildlife.ohiodnr.gov/portals/wildlife/pdfs/public_areas/OWC_TechBull3.pdf. July 2015.
46. ---. Department of Natural Resources. Division of Wildlife. Publication 276 (R404): Lake Erie Fishing Guide. 2004.
47. ---. Department of Natural Resources. Division of Wildlife. Species Guide Index. wildlife.ohiodnr.gov/species-and-habitats/species-guide-index/fish.
48. ---. Department of Natural Resources. Invasive Species in Ohio. ohiodnr.gov/invasivespecies.
49. ---. Department of Natural Resources. Office of Real Estate & Land Management. Land Inventory Summary 2017. realestate.ohiodnr.gov/Portals/realestate/pdfs/LandInventoryFY2017Report8.22.2017.pdf. June 2017.
50. The Nature Conservancy. www.nature.org.
51. ---. Western Lake Erie Coastal Conservation Vision Project. Walleye Lake Habitat. www.conservationgateway.org/ConservationByGeography/NorthAmerica/wholesystems/greatlakes/coasts/wle/Documents/WalleyeLakeHabitat.pdf.
52. ---. Ohio. Places We Protect. www.nature.org/ourinitiatives/regions/northamerica/unitedstates/ohio/placesweprotect/ohio-places-we-protect-column-1.xml.
53. United States. Environmental Protection Agency. Ecoregions. www.epa.gov/ecoresearch/ecoregions.
54. ---. Environmental Protection Agency. The Effects: Dead Zones and Harmful Algal Blooms. www.epa.gov/nutrientpollution/effects-dead-zones-and-harmful-algal-blooms.
55. ---. Environmental Protection Agency. Office of Water. Office of Wetlands, Oceans and Watersheds (4502T). EPA 843-F-01-002c: Functions and Values of Wetlands. March 2002.
56. ---. Environmental Protection Agency. Water Quality. www.epa.gov/greatlakes/water-quality.
57. ---. Environmental Protection Agency. What is a Wetland? www.epa.gov/wetlands/what-wetland.
58. ---. Environmental Protection Agency. Why are wetlands so important? www.epa.gov/wetlands/why-are-wetlands-important.
59. ---. Fish and Wildlife Service. Mapper Legend. www.fws.gov/wetlands/data/Mapper-Wetlands-Legend.html.
60. ---. Fish and Wildlife Service. National Wetlands Inventory. NWI Program Overview. www.fws.gov/wetlands/nwi/overview.html.

TEXT REFERENCES

61. Western Reserve Land Conservancy. www.wrlandconservancy.org.
62. ---. Annual Report, July 1, 2015 – June 30, 2016. www.wrlandconservancy.org/wp-content/uploads/2016/12/2016WRLC_AnnualReport_Updated_Web.pdf. 2016.
63. Wikipedia. www.wikipedia.com.
64. Woods, A.J., Omernik, J.M., Brockman, C.S., Gerber, T.D., Hosteter, W.D. and Azevedo, S.H. Ecoregions of Indiana and Ohio. newftp.epa.gov/EPADDataCommons/ORD/Ecoregions/in/ohin_front.pdf.

Chapter 7 – Coastal Processes

1. Beletsky, D., Saylor, J.H., and Schwab, D.J. Mean Circulation in the Great Lakes. *Journal of Great Lakes Research*, Volume 25, Issue 1. www.sciencedirect.com/science/article/pii/S0380133099707185. 1999.
2. Bolsenga, S. J. and Herdendorf, C.E. *Lake Erie and Lake St. Clair Handbook*. Wayne State University Press, 1993.
3. Cross, W., Morang, A., Frey, A., Mohr, M., Chader, S., and Forgette, C. United States. Army Corps of Engineers. Engineer Research and Development Center, Coastal Hydraulics Laboratory. ERDC/CHL TR-16-15: Regional Sediment Management (RSM) Program. Historical Sediment Budget (1860s to Present) for the United States Shoreline of Lake Erie. August 2016.
4. Fuller, J.A. and Foster, D.S. Ohio Department of Natural Resources, Division of Geological Survey. Sidescan Sonar Differentiation of Ohio's Nearshore (Lake Erie) Surficial Sediments (Map LE-1), Scale 1:633,000. 1998.
5. Great Lakes Fishery Commission. Report of the Lake Erie Habitat Task Group. www.glfc.org/pubs/lake_committees/erie/HTG_docs/annual_reports/HTG_AnnualReport2016.pdf. 2016.
6. Great Lakes Integrated Sciences + Assessments. Lake-effect Snow in the Great Lakes Region. glisa.umich.edu/climate/lake-effect-snow-great-lakes-region
7. Holcomb, T.L., Warren, J.S., Taylor, L.A., Reid, D.F., and Herdendorf, C.E. Lakefloor Geomorphology of Western Lake Erie. *Journal of Great Lakes Research*, Volume 23, Issue 2, pages 190-201. www.glerl.noaa.gov/pubs/fulltext/1997/19970031.pdf. 1997.
8. Hubertz, J.M., Driver, D.B., and Reinhard, R.D. United States. Army Corps of Engineers. Coastal Engineering Research Center. WIS Report 22: Wave Information Studies of US Coastlines. Hindcast Wave Information for the Great Lakes: Lake Erie. October 1991.
9. International Association for Great Lakes Research. Lake Gyres and Seiches. iaglr.org/jglr/release/32/32_4_764-775.php. December 2006.
10. Jones, D. Mark. Ohio Department of Natural Resources, Division of Geological Survey. Lake Erie Water Levels. geosurvey.ohiodnr.gov/lake-erie-geology/water-levels.
11. ---. National Geophysical Data Center. "Lake Erie and Lake St. Clair Geomorphology." www.ngdc.noaa.gov/mgg/greatlakes/lakeerie_cdrom/html/e_gmorph.htm and www.ngdc.noaa.gov/mgg/greatlakes/lakeerie_cdrom/startglb.htm.
12. Mitchell, Sandy. "What is Lake Effect Snow?" *tripsavvy*, 6 July 2017.
13. Morang, A. and Chader, S. United States. Army Corps of Engineers. Engineer Research and Development Center, Coastal Hydraulics Laboratory, National Shoreline Erosion Control Development and Demonstration Program (Section 227). ERDC/CHL TR-05011: Geology and Historical Evolution of Sheldon Marsh Nature Preserve, Lake Erie, Ohio. www.dtic.mil/dtic/tr/fulltext/u2/a438950.pdf. September 2005.
14. National Oceanic and Atmospheric Administration. National Ocean Service. Currents. oceanservice.noaa.gov/education/tutorial_currents/welcome.html.
15. ---. National Ocean Service. What is a seiche? oceanservice.noaa.gov/facts/seiche.html.
16. ---. National Ocean Service. What is a thermocline? oceanservice.noaa.gov/facts/thermocline.html.
17. ---. National Ocean Service. Center for Operational Oceanographic Products and Services. NOAA Technical Report NOS CO-OPS 38: Triaxys Directional Wave Buoy for Nearshore Wave Measurements – Test and Evaluation Plan. tidesandcurrents.noaa.gov/publications/techrpt38.pdf. January 2003.
18. ---. Office of Ocean and Coastal Resource Management and Ohio Department of Natural Resources, Division of Real Estate and Land Management. Combined Coastal Management Program and Draft Environmental Impact Statement for the State of Ohio, Volume 1. August 1996.
19. Ohio State University. Ohio Sea Grant College Program. FS-019: Lake Erie Shore Erosion. ohioseagrant.osu.edu/archive/documents/publications/FS/FS-019-2014_Lake_Erie_shore_erosion.pdf. February 2014.
20. ---. Ohio Sea Grant College Program. FS-020: Beaches Are Shore Protection. ohioseagrant.osu.edu/archive/documents/publications/FS/FS-020-2014_Beaches_are_shore_protection.pdf. February 2014.
21. ---. Ohio Sea Grant College Program. Guide Series OHSU-GS-7: Guide to Lake Erie Bluff Stabilization. ohioseagrant.osu.edu/archive/documents/publications/GS/GS-007_Guide_to_Lake_Erie_Bluff_Stab.pdf. January 1984.
22. Pope, Alexandria. "Hypnotic animated map tracks Great Lakes currents." *Canadian Geographic*, 10 December 2015.
23. Rabalais, Audrey. "Lake Erie has it backward, studies show." *Lake Scientist*, 23 April 2012.
24. State of Ohio. Department of Natural Resources. Division of Geological Survey. GeoFacts No. 19: Sand and Gravel. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof19.pdf. Revised August 2014.

25. ---. Department of Natural Resources. Division of Geological Survey. The Lake Erie Coastal Erosion Problem in Ohio: Coastal Erosion in Ohio. geosurvey.ohiodnr.gov/lake-erie-geology/erosion-and-research/erosion-problems.
26. ---. Department of Natural Resources. Office of Coastal Management. Coastal Design Manual, First Edition, 2011. (coastal.ohiodnr.gov/design).
27. ---. Department of Natural Resources. Office of Coastal Management. Lake Erie Shore Erosion Management Plan. (coastal.ohiodnr.gov/erosion).
28. United States. Army Corps of Engineers. Engineer Research and Development Center, Coastal Hydraulics Laboratory. Wave Information Studies. wis.usace.army.mil/.
29. ---. Federal Emergency Management Agency. Flood Insurance Study Number 39095CV001A: Flood Insurance Study, Volume 1 of 4. Lucas County, Ohio and Incorporated Areas. www.co.lucas.oh.us/DocumentCenter/View/45419. Revised August 2011
30. ---. Fish and Wildlife Service. Biological Report 85(7.9): The Ecology of the Coastal Marshes of Western Lake Erie: A Community Profile. www.nwrc.usgs.gov/techrpt/85-7-9.pdf. February 1987.
31. ---. Fish and Wildlife Service. Great Lakes Fish and Wildlife Restoration Act, Final Report. www.fws.gov/midwest/fisheries/GLFWRA/30181-8-G021.pdf. 2010.
32. Wikipedia. www.wikipedia.com.
9. Measurement Engineering Australia. What is Soil Texture? mea.com.au/soil-plants-climate/soil-moisture-monitoring/learning-centre/what-is-soil-texture.
10. Michigan State University. Institute for Water Research. RUSLE – Online Soil Erosion Assessment Tool. www.iwr.msu.edu/rusle.
11. National Geographic Society. www.nationalgeographic.org.
12. National Soil Erosion Research Laboratory. Soil Erosion and WEPP Technology. milford.nserl.purdue.edu/weppdocs/overview/intro.html.
13. Northern Rivers Catchment Management Authority. Soil Erosion Solutions – Fact Sheet 1: Types of erosion. www.dpi.nsw.gov.au/data/assets/pdf_file/0003/255153/fact-sheet-1-types-of-erosion.pdf.
14. Penn State University. Department of Ecosystem Science and Management. College of Agricultural Sciences. What is the Difference Between SSURGO and STATSGO soils data? ecosystems.psu.edu/research/labs/land-analysis/software/tutorials/using-digital-soils-data/what-are-all-these-tables-of-data/what-is-the-difference-between-ssurgo-and-statsgo-soils-data.
15. Plant & Soil Sciences eLibrary. passel.unl.edu.
16. Province of Ontario. Ministry of Agriculture, Food and Rural Affairs. Soil Erosion – Causes and Effects. www.omafra.gov.on.ca/english/engineer/facts/12-053.htm.
17. Soil Science Society of America. Physical Properties of Soil – Soil Texture. soils4teachers.org/physical-properties.
18. State of Ohio. Department of Agriculture. Revised Universal Soil Loss Equation (RUSLE). www.agri.ohio.gov/divs/SWC/docs/RUSLE_Erosion_Prediction.pdf.
19. ---. Department of Natural Resources. Division of Water Resources. About Ohio’s Soils. water.ohiodnr.gov/soil-conservation/about-ohios-soils#INT.
20. ---. Department of Natural Resources. Division of Water Resources. Ohio Soil Regions. water.ohiodnr.gov/portals/soilwater/pdf/soil/Soil_Regions_of_Ohio_brochure.pdf.
21. ---. Environmental Protection Agency. Division of Drinking and Ground Waters. Fact Sheet: Ground Water in Ohio. epa.ohio.gov/Portals/28/documents/gwqcp/gwfactsht.pdf. December, 2014.
22. United States. Department of Agriculture. Natural Resources Conservation Service. Conservation Compliance on Highly Erodible Land and Wetlands. www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/programs/?cid=nrcs144p2_027057.
23. ---. Department of Agriculture. Natural Resources Conservation Service. Highly Erodible Map Units. www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016637.
24. ---. Department of Agriculture. Natural Resources Conservation Service. Prime Farmland Definitions. www.nrcs.usda.gov/wps/portal/nrcs/detail/pr/soils/?cid=nrcs141p2_037285 and www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014052.

Chapter 8 – Soils

1. AgVerra. Soil Facts: Basic Information on Soil You Need to Know. agverra.com/blog/soil-facts.
2. Earth Online Media. The Physical Environment. Soil Profiles. www.earthonlinemedia.com/ebooks/tpe_3e/soil_systems/soil_development_profiles.html.
3. Esri. ArcGIS Online. Hydrologic Group – Dominant Condition. Map Service description. www.arcgis.com/home/item.html?id=5004587b2e0543bc96c944b1ab9bf2fd.
4. ---. ArcGIS Online. USA Soil Map Units 2011. Map Service description. www.arcgis.com/home/item.html?id=6344f3e4db8b446390fbc13eec9354e8.
5. ---. ArcGIS Resources. Soil Hydrology of the United States. resources.arcgis.com/en/communities/soils/02ms00000008000000.htm.
6. Franzmeier, D.P. and Kladvik, E.J. Drainage and Wet Soil Management: Wet Soils of Indiana (AY-301). Purdue University, June 2011.
7. Free Dictionary, The. encyclopedia2.thefreedictionary.com.
8. Institute for Wetland & Environmental Education & Research. Wetland Primer – What Is Hydrophytic Vegetation? www.wetlanded.com/Primer/HydrophyticVeg.html.

TEXT REFERENCES

25. ---. Department of Agriculture. Natural Resources Conservation Service. Soil Erosion – About the Data. www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/?cid=stelpdb1041925.
26. ---. Department of Agriculture. Natural Resources Conservation Service. Properties and Qualities. www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054223#44.
27. ---. Department of Agriculture. Natural Resources Conservation Service. Soil Survey Manual – Chapter Three. www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054253.
28. ---. Department of Agriculture. Natural Resources Conservation Service. Soil Survey Manual. www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054262.
29. ---. Department of Agriculture. Natural Resources Conservation Service. Water Table Determinations. www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053385.
30. ---. Department of Agriculture. Natural Resources Conservation Service. What are Soil Map Units and Web Soil Survey? (PowerPoint presentation). www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_025378.pdf.
31. ---. Environmental Protection Agency. EnviroAtlas. www.epa.gov/enviroatlas.
32. ---. Environmental Protection Agency. EnviroAtlas. Soils Drainage Class: Dominant Condition. enviroatlas.epa.gov/enviroatlas/DataFactSheets/pdf/Supplemental/SoilsDrainageClassDominantCondition.pdf.
33. ---. Geological Survey. ScienceBase-Catalog. www.sciencebase.gov.
34. ---. Geological Survey. USGSFAQs:GroundwaterandAquifers. www2.usgs.gov/faq/categories/9812/2579.
35. ---. Geological Survey. The USGS Water Science School. Groundwater depletion. water.usgs.gov/edu/gwdepletion.html.
36. Wecker, David. “Small Ohio town is famous for its celery.” *Deseret News*, 14 June 1988.
37. Wikipedia. www.wikipedia.com.
4. Karst Waters Institute. What is Karst? And Why is it Important? karstwaters.org/educational-resources/what-is-karst-and-why-is-it-important.
5. Kent, Ohio. Portage County, Since the Ice Age. www.kentohio.net/kent-alive/since-the-ice-age.
6. Ohio History Connection. Ohio History Central. Findlay Arch. www.ohiohistorycentral.org/w/Findlay_Arch.
7. ---. Ohio History Central. Bedrock Geology of Ohio. www.ohiohistorycentral.org/w/Bedrock_Geology_of_Ohio.
8. ---. Ohio History Central. Economic Mineral Resources. www.ohiohistorycentral.org/w/Economic_Mineral_Resources.
9. ---. Ohio History Central. Limestone Rocks. www.ohiohistorycentral.org/w/Limestone_Rocks.
10. ---. Ohio History Central. Ohio’s Physiographic Regions. www.ohiohistorycentral.org/w/Ohio’s_Physiographic_Regions.
11. Oil On My Shoes—Introduction to Petroleum Geology. Oil and Gas Traps. www.geomore.com/oil-and-gas-traps.
12. Seneca Caverns. www.senecacavernsohio.com.
13. State of Ohio. Department of Natural Resources. Division of Geological Survey. 2000 Report on Ohio Mineral Industries: With Directories of Reporting Coal and Industrial Mineral Operations. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Mineral_Industries_Reports/00minind.pdf. 2001.
14. ---. Department of Natural Resources. Division of Geological Survey. Bedrock Geology Map of Ohio (Map BG-1). Generalized page-size version with text, 2 p., Scale 1:2,000,000. 2006. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/BedrockGeology/BG-1_8.5x11.pdf.
15. ---. Department of Natural Resources. Division of Geological Survey. Educational Leaflet No. 20: Ohio’s Geological Walk Through Time. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Education/el20.pdf. 2013.
16. ---. Department of Natural Resources. Division of Geological Survey. GeoFacts No. 23: A Brief Summary of the Geologic History of Ohio. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof23.pdf. Revised June 2014.
17. ---. Department of Natural Resources. Division of Geological Survey. GeoFacts No. 25: High-Calcium Limestones in Ohio. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof25.pdf. February 2008.
18. ---. Department of Natural Resources. Division of Geological Survey. GeoFacts No. 11: Rocks & Minerals Mined in Ohio and Their Uses. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof11.pdf. Revised July 2014.
19. ---. Department of Natural Resources. Division of Geological Survey. GeoFacts No. 19: Sand and Gravel. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof19.pdf. Revised August 2014.

Chapter 9 – Geology

1. Bier, J.A. Landforms of Ohio. Ohio Department of Natural Resources, Division of Geological Survey. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/Landforms_withCitation.pdf. 1956, 1967 (reprinted).
2. Geology.com, Geoscience News and Information. Geologic Time Scale, A Time Line for the Geological Sciences. geology.com/time.htm.
3. Hansen, Michael C. “The History of Lake Erie.” Ohio Geology Newsletter, Ohio Department of Natural Resources, Division of Geological Survey. Fall 1989. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/newsletter/Fall89.pdf.

20. ---. Department of Natural Resources. Division of Geological Survey. Glacial Map of Ohio. Page-size map with text, 2 p., Scale 1:2,000,000. 2005. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Glacial/glacial.pdf.
21. ---. Department of Natural Resources. Division of Geological Survey. Ohio Karst Areas (Map EG-1). Generalized page-size version with text, 3 p., Scale 1:2,000,000. 1999 (rev. 2002, 2006). geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Karst/karstmap.pdf.
22. ---. Department of Natural Resources. Division of Geological Survey. Ohio Mineral Industries: Report Summaries. geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2015-salt.
23. ---. Department of Natural Resources. Division of Geological Survey. Oil and Gas Fields Map of Ohio (Map PG-1). Generalized page-size version with text, 2 p., Scale 1:2,000,000. 2004 (rev. 2014). geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/pg01.pdf.
24. ---. Department of Natural Resources. Division of Geological Survey. Physiographic Regions of Ohio. Page-size map with text, 2 p. April 1988. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/physio.pdf.
25. ---. Department of Natural Resources. Division of Geological Survey. Shaded Drift-Thickness Map of Ohio (Map SG-3). Generalized page-size version with text, 3 p., Scale 1:2,000,000. 2004. geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/sg3map.pdf.
26. Toledo Talk. Lake Maumee. toledotalk.com/cgi-bin/tt.pl/article/18996/Lake_Maumee.
27. Voelker, Don. "The Ohio Oil Boom: 1885-95." *Farm Collector*, December 2007. www.farmcollector.com/equipment/ohio-oil-boom-1885-95.
28. Weary, D.J., and Doctor, D.H. Karst in the United States: A digital map compilation and database: U.S. Geological Survey Open-File Report 2014-1156, 23 p., pubs.usgs.gov/of/2014/1156/pdf/of2014-1156.pdf. 2014.
29. Wikipedia. www.wikipedia.com.
5. ScienceDaily. Water resources. www.sciencedaily.com/terms/water_resources.htm.
6. State of Indiana. Department of Natural Resources. Potentiometric Surface Mapping (1:48,000) Overview. www.in.gov/dnr/water/7258.htm.
7. State of Minnesota. Department of Natural Resources. Division of Ecological & Water Resources – Water Resources. Surface-water watersheds vs. ground-water watersheds. www.dnr.state.mn.us/watersheds/surface_ground.html. May, 2015.
8. State of Ohio. Department of Natural Resources. Division of Water Resources. Fact Sheet 92-9: Evaluating Ground Water Pollution Potential in Ohio. water.ohiodnr.gov/portals/soilwater/pdf/wells/fctsht09.pdf. October, 2011.
9. ---. Department of Natural Resources. Division of Water Resources. Fact Sheet 12-68: Water Withdrawal Regulations for Oil and Gas Drilling. water.ohiodnr.gov/portals/soilwater/pdf/water_withdrawal/fctsht68.pdf. May, 2015.
10. ---. Department of Natural Resources. Division of Water Resources. Ground Water Pollution Potential Maps. water.ohiodnr.gov/maps/pollution-potential-maps.
11. ---. Department of Natural Resources. Division of Water Resources. Groundwater Resources Maps. water.ohiodnr.gov/maps/groundwater-resources-maps.
12. ---. Department of Natural Resources. Division of Water Resources. Hydrologic Atlas for Ohio. water.ohiodnr.gov/maps/hydrologic-atlas#PRE.
13. ---. Department of Natural Resources. Division of Water Resources. Ohio Water Withdrawal Statewide Map. water.ohiodnr.gov/maps/statewide-water-withdrawal-map.
14. ---. Department of Natural Resources. Division of Water Resources. Potentiometric Surface Maps. water.ohiodnr.gov/maps/potentiometric-surface-maps.
15. ---. Department of Natural Resources. Division of Water Resources. Statewide Aquifer Mapping Program. water.ohiodnr.gov/maps/statewide-aquifer-maps.
16. ---. Environmental Protection Agency. Division of Drinking and Ground Waters. Fact Sheet: Ground Water in Ohio. epa.ohio.gov/Portals/28/documents/gwqcp/gwfactsht.pdf. December, 2014.
17. ---. Environmental Protection Agency. Division of Drinking and Ground Waters. Fact Sheet: Major Aquifers and Ground Water Quality in Ohio. epa.ohio.gov/Portals/28/documents/gwqcp/FS_Final_Major_Aquifers_and_GWQ_11-2015.pdf. October, 2015.
18. ---. Environmental Protection Agency. Division of Drinking and Ground Waters. Source Water Assessment and Protection Program. epa.ohio.gov/ddagw/swap.aspx.
19. ---. Environmental Protection Agency. Division of Drinking and Ground Waters and Division of Surface Water. "Developing Source Water Protection Plans For Public Drinking Water Systems Using Inland Surface Waters." epa.ohio.gov/portals/28/documents/swap/swap_sw_protplan.pdf. October, 2009.

Chapter 10 – Water Resources

1. Aller, L. Lehr, J.H. and Petty, R., DRASTIC: A Standardized System to Evaluate Ground Water Pollution Potential Using Hydrogeologic Settings. National Well Water Association. rdn.bc.ca/cms/wpattachments/wpID3175atlID5999.pdf. Date unknown.
2. Alliance for the Great Lakes. Protecting Great Lakes Water. greatlakes.org/campaigns/protecting-great-lakes-water.
3. National Wildlife Federation. Great Lakes Water Resources Compact. www.nwf.org/What-We-Do/Protect-Habitat/Waters/Great-Lakes/Great-Lakes-Compact.aspx.
4. Oak Ridges Moraine Groundwater Program. Hydrostratigraphic Units. oakridgeswater.ca/program-elements/hydrogeologic-analysis/hydrostratigraphic.

TEXT REFERENCES AND ACKNOWLEDGEMENTS

20. The Nature Conservancy. Conservation Gateway. www.conservationgateway.org.
21. United States. Environmental Protection Agency. Contaminant Candidate List (CCL) and Regulatory Determination: Types of Drinking Water Contaminants. www.epa.gov/ccl/types-drinking-water-contaminants.
22. ---. Environmental Protection Agency. The Great Lakes: Lake Erie. www.epa.gov/greatlakes/lake-erie.
23. ---. Geological Survey. Groundwater. pubs.usgs.gov/gip/gw/gw_a.html.
24. ---. Geological Survey. USGS FAQs: Groundwater and Aquifers. www2.usgs.gov/faq/categories/9812/2579.
25. ---. Geological Survey. The USGS Water Science School. Precipitation: The Water Cycle. water.usgs.gov/edu/watercycleprecipitation.html.
26. ---. Geological Survey. The USGS Water Science School. Summary of the Water Cycle. water.usgs.gov/edu/watercyclesummary.html.
27. Warner, K.L., and Ayotte, J.D., 2014, The Quality of Our Nation's Waters — Water Quality in the Glacial Aquifer System, Northern United States, 1993–2009: U.S. Geological Survey Circular 1352, pubs.usgs.gov/circ/1352/pdf/circ1352.pdf.
28. Wikipedia. www.wikipedia.com.

PROJECT MANAGER:

Brian D. George, GISP – Ohio Department of Natural Resources, Office of Coastal Management

CARTOGRAPHER:

Brian D. George, GISP – Ohio Department of Natural Resources, Office of Coastal Management

AUTHOR:

Brian D. George, GISP – Ohio Department of Natural Resources, Office of Coastal Management

EDITORS AND MAP REVIEW:

Eric Anderson – Ohio Department of Natural Resources, Office of Coastal Management

Steve Holland – Ohio Department of Natural Resources, Office of Coastal Management

SUBJECT MATTER EXPERTS:

Aden, Douglas – Ohio Department of Natural Resources, Division of Geological Survey

Angle, Mike – Ohio Department of Natural Resources, Division of Geological Survey

Arbour, Tom – Ohio Department of Natural Resources, Division of Parks and Watercraft

Bader, Timothy – Ohio Department of Natural Resources, Division of Wildlife

Beck, Deborah – Ohio Department of Natural Resources, Office of Coastal Management

Blair, Cherie – Ohio Environmental Protection Agency, Division of Surface Water

Braig, Eugene – Ohio State University, Ohio Sea Grant College Program

Coe, Curtis – Ohio Department of Natural Resources, Division of Water Resources

Deller, John – Ohio Department of Natural Resources, Division of Wildlife

Gabriel, Tory – Ohio State University, Ohio Sea Grant College Program

Garrity, Lynn – Ohio Lake Erie Commission

Gorman, Ann Marie – Ohio Department of Natural Resources, Division of Wildlife

Hartman, Travis – Ohio Department of Natural Resources, Division of Wildlife

Hirsch, Mary Beth – Ohio History Connection, State Historic Preservation Office

Holland, Steve – Ohio Department of Natural Resources, Office of Coastal Management

Jones, D. Mark – Ohio Department of Natural Resources, Division of Geological Survey

Kannik, Mia – Ohio Department of Natural Resources, Division of Water Resources

Kennedy, Kendra – Ohio History Connection, State Historic Preservation Office

Knight, Carey – Ohio Department of Natural Resources, Division of Wildlife

Lantz, Aaron – Ohio Department of Natural Resources, Division of Oil & Gas Resources



Paper District Marina, Sandusky, Erie County

Leed, Douglas – Ohio Department of Natural Resources, Division of Parks and Watercraft
 Lopez, Frank – Ohio Department of Natural Resources, Division of Wildlife
 Lubberger, Barbara – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters
 McCormac, Jim – Ohio Department of Natural Resources, Division of Wildlife
 McFarland, Amanda – Ohio Department of Transportation
 Orlando, Sarah – Ohio State University, Ohio Sea Grant College Program
 Pansing, Linda – Ohio History Connection, State Historic Preservation Office
 Park, Jim – Ohio Department of Natural Resources, Office of Coastal Management
 Patzke, Jeffrey – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters
 Raab, Jim – Ohio Department of Natural Resources, Division of Water Resources
 Roar, Jenny – Ohio Department of Natural Resources, Division of Parks and Watercraft
 Schnell, Jarrod – Cleveland Metroparks
 Sheets, Heather – Ohio Department of Natural Resources, Division of Parks and Watercraft
 Smith, Craig – Ohio Environmental Protection Agency, Division of Drinking and Ground Waters
 Snyder, David – Ohio History Connection, State Historic Preservation Office
 Spahr, Paul – Ohio Department of Natural Resources, Division of Geological Survey
 Trapp, Jason – Ohio Department of Natural Resources, Office of Coastal Management
 Vandergoot, Christopher – Ohio Department of Natural Resources, Division of Wildlife
 Weimer, Eric – Ohio Department of Natural Resources, Division of Wildlife

THANKS TO:

Thanks to all partners, listed below, who provided valuable information, geospatial data, feedback and support throughout the development of the Atlas.

Allen, Lynn – Ohio Department of Administrative Services, General Services Division, State Printing
 Boehnlein, Paul – Western Reserve Land Conservancy
 Collier, Chris – Black Swamp Land Conservancy
 Dasher, Lance – Toledo Metropolitan Area Council of Governments
 Hampton, Matthew – Oregon Metro
 Mack, Tina – Lucas County Auditor's Office
 Mason, Lacey – Institute for Fisheries Research (Michigan Department of Natural Resources and the University of Michigan)
 Mather, Elizabeth – Lake Metroparks
 Mather, Stephen – Cleveland Metroparks
 Parsons, Nancy – Ohio History Connection, State Historic Preservation Office

Rutherford, Ed – National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory
 Sevenbergen, Tina – Ohio Department of Natural Resources, Office of Coastal Management
 Shaw, Christine – Ohio Department of Natural Resources, Office of Coastal Management
 Slattery, Linda – Ohio Environmental Protection Agency, Information Technology Services
 Smith, Kyle – Ohio History Connection, State Historic Preservation Office
 Sturtevant, Rochelle – National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory
 Sulak, Tami – Ashtabula County Auditor's Office
 Ziegler, Emily – Metroparks Toledo

All photos are from the Ohio Department of Natural Resources.



Sunset over Lake Erie, Erie County