Navigation

From the days of wooden wicket dams to today's modern technology, improving and maintaining the navigability of our nation's waterways has been a priority for the U.S. Army Corps of Engineers. The Pittsburgh District operates 23 locks & dams on the Allegheny, Monongahela & Ohio Rivers.

Locks & Dams

Allegheny River	Monongahela River	Ohio River
Lock & Dam 2, Allegheny River	Braddock Locks & Dam	Emsworth Locks & Dams
C.W. Bill Young Lock & Dam	Locks & Dam 3, Mon River	Dashields Locks & Dam
Lock & Dam 4, Allegheny River	Locks & Dam 4, Mon River	Montgomery Locks & Dam
Lock & Dam 5, Allegheny River	Maxwell Locks & Dam	New Cumberland Locks & Dam
Lock & Dam 6, Allegheny River	Grays Landing Lock & Dam	Pike Island Locks & Dam
Lock & Dam 7, Allegheny River	Point Marion Lock & Dam	Hannibal Locks & Dam

Lock & Dam 8, Allegheny River	Morgantown Lock & Dam	
Lock & Dam 9, Allegheny River	Hildebrand Lock & Dam	
	Opekiska Lock & Dam	

Map of Pittsburgh District Locks & Dams

Who Uses the Rivers?

Navigation systems across the United States and especially in this region significantly contributed to the growth and economic prosperity of our Nation. For centuries settlers in the upper Ohio River basin used the system of rivers in the Pittsburgh region to expand commerce and industrial enterprise. However, it was not until 1824 that Congress tasked the Corps of Engineers with improving navigation on the Ohio River. Dedicated in 1885, Davis Island Lock and Dam, was the first of 53 Ohio River locks and dams, built over a 44 year period, descending from Pittsburgh to Cairo, Illinois.

In 1893 the Corps opened a permanent office in Pittsburgh with the mission of improving navigation on the Allegheny and Monongahela Rivers. Today, Pittsburgh District's navigation system includes 23 locks and dams on the Allegheny, Monongahela and Ohio Rivers. In support of this system, the District also operates a major warehouse and repair facility located on Neville Island, housing a repair fleet responsible for major maintenance work on the locks and dams.

- Eight locks and dams on the Allegheny River provide 72 miles of slack-water navigation from the Point at Pittsburgh to above East Brady, Pennsylvania.
- Nine locks and dams on the Monongahela River maintain navigable waters for the entire 128.7 miles of the river from just above Fairmont, West Virginia to the Point at Pittsburgh.
- Six locks and dams on the Ohio River provide navigable waters from the Point at Pittsburgh for 127.2 miles of the river downstream to New Martinsville, West Virginia.

The three rivers that make up the Port of Pittsburgh are used to carry raw materials, bulk and manufactured goods for many industries in the region. The Port of Pittsburgh is the 2nd busiest inland port and the 17th busiest port of any kind in the nation.

Commercial navigation is important to the region's economy because river transport is an extremely economical method of transporting raw materials and bulk goods. Shipping costs for raw materials average .97 cents per ton mile by barge compared with 2.53 cents per ton mile by rail or 5.35 cents per ton mile by truck. The 41 million tons of cargo the Port of Pittsburgh ships and receives each year provides a significant annual benefit to the region. The primary cargo in the Port of Pittsburgh is coal but millions of tons of raw products including sand, gravel and iron ore; manufactured goods; petroleum and petroleum products as well as chemicals and related products traverse our waterways. Thousands of jobs depend on the reliable operation of these river supply lines.

Industries are not the only users of the river. The locks are open to any boat. Sometimes in the summer there are lines of pleasure boats waiting for lockages on busy weekends. Almost 30,000 recreational boats locked through the Pittsburgh District's locks in 2003 taking advantage of the improving water quality in the three rivers. Numerous excursion boats also use our locks as they cruise the rivers entertaining and educating area residents and tourists. These are only a small percentage of those who benefit from the Corps' navigation structures. Many people use the navigation pools as a lake for pleasure boating without ever using a lock and some do not realize that the miles of clear channel are created by the dams. Water sports are increasing in popularity and the water quality of the rivers has improved. Because of this, usage of the rivers will continue to grow. In many areas, gamefish are reappearing in the rivers and providing sport for large numbers of fishermen.

Why We Need Locks & Dams

Navigation structures are necessary to make inland waterways viable, year-round transportation corridors. Prior to the construction of the locks and dams in the region, some river depths were less than 12 inches at times during the year and would not support commercial or pleasure boat traffic.

The natural river beds are long, uneven downhill slopes with shallow areas and deep pools. Without improvement, the depth of the water in the river would vary with seasonal rainfall and the shallow areas of the river would obstruct navigation in dry periods.

The dams which the Corps has constructed create an "aquatic staircase" in the river and prevent the river from draining in dry weather, so navigation can go on year-round. Each step on the slope of the riverbed is a pool of water extending miles upstream, maintaining sufficient depth for boats and barges. The normal flow of the river runs through these pools and the excess flows over the dam into the next pool and on down the river. However, these dams do **not** provide flood protection.

The entire width of the river is not used for navigation, but there is a channel in which the water is maintained at a nine foot depth for commercial vessels. Congress mandated that the channel should be at least nine feet deep.

In order to maintain our navigation structures and provide an improved navigation system for the future, the Pittsburgh District maintains a comprehensive project maintenance program including major rehabilitation as well as new project design and construction. Under current rules, the waterways industry pays half the federal costs for construction of new navigation projects and major rehabilitation of existing projects through a mechanism known as the Inland Waterways Trust Fund. Diesel fuel tax levied on commercial users of the inland navigation system finance this fund.

How Locks & Dams Work

Each dam on a navigable river – such as the Allegheny, Monongahela or Ohio – has at least one lock chamber to enable river traffic to go safely from one pool level to the next. Locks provide navigation access through the dam complex, by which vessels are lifted or lowered from one pool to the next. The lock chamber is essentially a

concrete box fixed into the riverbed with two matching gates at each end that close at an angle directed upstream against the river flow. The gates can open or close only when the water level is the same on both sides. One set opens to let the watercraft enter and then closes to allow the water level in the chamber to be raised or lowered depending on the direction of travel. The other set of gates then opens to let the boat leave. Raising or lowering from one pool level to the next is called a "lift. The lift of the locks in the Pittsburgh District ranges from 8 to 22 feet depending on the length of the pool. Pool length varies from as short as 7 miles between locks up to 42 miles between locks.

The filling and emptying of the lock chamber is done by valves which control the flow of water through large, deep culverts in the lock walls. No pumping is necessary as the water flows through the culverts and into and out of the lock chamber entirely by gravity. The lock chamber never empties completely, but drops only as far as the pool level of the river downstream of the lock.

Locking Through

A must-have for the first-time boater and a great reference for the experienced boater, *Locking Through* is an illustrated pamphlet that provides basic guidelines and some key tips for all boaters on the proper way to lock through one of our navigation locks.

Navigation Notices

Notices to Navigation Interests, containing data on channel conditions, noteworthy activities that affect river traffic and location of dredges, are issued as occasions demand. To receive either electronic or printed copies of Pittsburgh District's notices interested parties should send a request to:

Chief, Regulatory Branch
U.S. Army Corps of Engineers, Pittsburgh District
2200 William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Navigation Charts

Navigation Charts are 8½" x 14" scaled color maps that indicate important navigation features of special interest. Features shown on the charts include channel sailing line, U.S. navigation lights, daymarks, arrival point marks for locks, normal pool elevations, mouth of tributary streams, location of bars, channel buoys, bridges, aerial and submarine crossings, docks, terminals, landings and navigation structures. No soundings are shown. A listing of small boat harbors, ramps, landings and commercial river terminals are included at the back of each navigation chart book.

Purchase Navigation Charts

Allegheny River, Great Kanawha River, Monongahela River and Ohio River Navigation Charts are available by:

- Internet from the U.S. Government Online Bookstore, by
- Calling the Government Printing Office toll-free at (866) 512-1800 or by
- Mail order with the Government Printing Office order form.

Payment can be made by check, money order, major credit card or Superintendent of Documents Deposit Account. When ordering Navigation Charts from the Online Bookstore, enter "navigation charts" in the *Search the U.S. Government Bookstore:* field and click on the *Submit* button. Click on the ***Add to Cart*** button below the publication title of your choice and follow the instructions provided to order your navigation charts.

Publication Title	Price	Stock No.
Allegheny River Navigation Charts: ***Pittsburgh, Pennsylvania to East Brady, Pennsylvania***	**$23**	**008-022-00334-7**
Great Kanawha River Navigation Charts: ***Mouth to Head of Navigation***	**$25**	**008-022-00336-3**
Monongahela River Navigation Charts: ***Pittsburgh, Pennsylvania to Fairmont, West Virginia***	**$29**	**008-022-00335-5**
Ohio River Navigation Charts: ***Cairo, Illinois to Foster, Kentucky***	**$51**	**008-022-00331-2**
Ohio River Navigation Charts: ***Foster, Kentucky to New Martinsville, West Virginia***	**$40**	**008-022-00329-1**
Ohio River Navigation Charts: ***New Martinsville, West Virginia to Pittsburgh, Pennsylvania***	**$28**	**008-022-00330-4**

The Corps of Engineers' Navigation Data Center, which is responsible for establishing and maintaining a variety of water transportation information systems, provides an Index to Navigation Charts by Corps District for information on navigation charts and related navigation information throughout the United States.

Download Navigation Charts

Navigation Charts for the Allegheny, Cumberland, Green, Great Kanawha, Monongahela, Ohio (New Martinsville, West Virginia to Pittsburgh, Pennsylvania; Cairo, Illinois to Foster, Kentucky) and Tennessee Rivers are available to download in Portable Document Format (PDF).

Allegheny River Navigation Charts

Pittsburgh, Pennsylvania to East Brady, Pennsylvania

Chart/ Sheet No.	Locality/Description
	Brief Index
A	General Notes
B – E	Regulations, Section 7 of River & Harbor Act 1917
F – G	Extracts from Section of the River & Harbor Act of 1899
H	U.S. Coast Guard Information
I	Characteristics of Lights & Notes
J	Aids to Navigation & Legend
K	Tabular Index to Navigation Charts
L	Map Index to Navigation Charts
	Emsworth Locks & Dams Pool
1	Pittsburgh, Herrs Island
2	Pittsburgh, Herrs Island, Girtys Run, Pine Creek
3	Six Mile Island
	Lock & Dam 2 Pool
3	Six Mile Island
4	Blawnox, Sycamore Island, Nine Mile Island, Verona, Oakmont
5	Twelve Mile Island, Fourteen Mile Island
	C.W. Bill Young Lock & Dam Pool
5	C.W. Bill Young Lock & Dam, Fourteen Mile Island
6	Springdale, New Kensington
7	New Kensington, Arnold, Tarentum, Bull Creek
8	Brackenridge, Natrona
	Lock & Dam 4 Pool
8	Lock & Dam 4, Jacks Island
9	Jacks Island

10	Buffalo Creek, Freeport, Kiskiminetas River
	Lock & Dam 5 Pool
10	Lock & Dam 5, Schenley
11	Murphys Island
	Lock & Dam 6 Pool
12	Lock & Dam 6, Nicholson Island
13	Ross Island, Crook Creek
14	Ford City, Cogleys Island
15	West Kittanning, Kittanning
	Lock & Dam 7 Pool
15	Kittanning, Lock & Dam 7
16	Mosgrove
	Lock & Dam 8 Pool
17	Lock & Dam 8, Templeton
18	Mahoning, Reesedale
	Lock & Dam 9 Pool
19	Lock & Dam 9
20	Redbank Creek, Wattersonville
21	East Brady, End of Navigation

1 – 3	Allegheny River Terminals
4 – 10	Allegheny River Small Boat Harbors, Ramps, Landings, etc.
	Allegheny River Mileage Chart

Monongahela River Navigation Charts

Pittsburgh, Pennsylvania to Fairmont, West Virginia

Chart/ Sheet No.	Locality/Description
	Brief Index
A	General Notes
B – E	Regulations, Section 7 of River & Harbor Act 1917
F – G	Extracts from Section of the River & Harbor Act of 1899
H	U.S. Coast Guard Information

		I	Characteristics of Lights & Notes
		J	Aids to Navigation & Legend
		K	Tabular Index to Navigation Charts
		L	Map Index to Navigation Charts
			Emsworth Locks & Dams Pool
		1	Pittsburgh
		2	
		3	Homestead, Braddock, Rankin
			Braddock Locks & Dam Pool
		4	Braddock Locks & Dam, Turtle Creek, Duquesne
		5	McKeesport, Youghiogheny River
		6	Clairton, Peters Creek
			Locks & Dam 3 Pool
		7	Locks & Dam 3, Elizabeth
		8	
		9	Monongahela
		10	
		11	Donora
			Locks & Dam 4 Pool
		12	Lock & Dam 4, Monessen, Charleroi
	13	13	Belle Vernon, Fayette City
		14	
		15	California
		16	Brownsville
			Maxwell Locks & Dam Pool
		17	Maxwell Locks & Dam
		18	Fredericktown
		19	Tenmile Creek
	20		
	21		
	22		
			Grays Landing Lock & Dam Pool
		23	Grays Landing Lock & Dam
		24	Greensboro, Dunkard Creek
		25	Cheat River, Point Marion
			Point Marion Lock & Dam Pool
		25	Point Marion Lock & Dam

26		
	27	Star City
	28	Deckers Creek, Morgantown
		Morgantown Lock & Dam Pool
	28	Morgantown Lock & Dam, Morgantown
		Hildebrand Lock & Dam Pool
	29	Hildebrand Lock & Dam
		Opekiska Lock & Dam Pool
	30	Opekiska Lock & Dam
31		
	32	Prickett Creek Small Boat Launching Area, Mile 120.7
	33	Buffalo Creek, Fairmont
	34	Tygart Valley River, West Fork River, End of Navigation
	1 – 10	Monongahela River Terminals
	11 – 19	Monongahela River Small Boat Harbors, Ramps, Landings, etc.
		Monongahela River Mileage Chart

Ohio River Navigation Charts

New Martinsville, West Virginia to Pittsburgh, Pennsylvania

Chart/ Sheet No.	Locality/Description
	The Lewis & Clark Bicentennial Commemoration (description of noted expedition sites)
	Brief Index
A	General Notes
B – E	Regulations, Section 7 of River & Harbor Act 1917
F – G	Extracts from Section of the River & Harbor Act of 1899
H	U.S. Coast Guard Information
I	Characteristics of Lights & Notes
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K	Tabular Index to Navigation Charts

L	Map Index to Navigation Charts
	Hannibal Locks & Dam Pool
187	New Martinsville, Hannibal, Hannibal Dam
188	Proctor Bar, Proctor, Roger Bar
189	Opossum Creek Bar, Sunfish Ripple, Clarington
190	Clines Bar
191	Woodlands, Fish Creek Island, Old Lock #14
192	Powhatan Point, Captina Island
193	Captina Island
194	Moundsville, Little Grave Creek Bar
195	Riley Run Bar
196	Old Lock #13, Boggs Island
197	Wheeling, Wheeling Island
198	Old Lock #12
	Pike Island Locks & Dam Pool
199	Pike Island Dam
200	Short Creek Small Boat Launching Area, Mile 81.3
201	
202	Old Lock #11, Buffalo Creek Small Boat Launching Area, Mile 74.7 Wellsburg
203	
204	Cross Creek Bar, Mingo Bar
205	Steubenville, Old Lock #10, Cables Eddy
206	Weirton, Brown Island
207	Toronto, Talbot Run Bar, Croxton Run Bar, New Cumberland, Old Lock #9
	New Cumberland Locks & Dam Pool
208	New Cumberland Dam
209	Cluster Island
210	Wellsville
211	J.F. Kennedy Park Small Boat Launching Area, Mile 46.2, Old Lock #8, East Liverpool
212	East Liverpool, Babbs Island, State Line, Mouth of Little Beaver Creek
213	Georgetown Island
214	Phillis Island
	Montgomery Locks & Dam Pool
215	Montgomery Dam
216	Beaver
217	Beaver, Mouth of Beaver River, Rochester, Monaca, Freedom
218	Aliquippa

219	**Ambridge**
	Dashields Locks & Dam Pool
220	**Dashields Dam**
221	**Sewickley, Coraopolis, Whites Towhead, Neville Island**
222	**Neville Island**
	Emsworth Locks & Dams Pool
223	**Emsworth Dams, Neville Island, Davis Island**
224	**Brunot Island, "Point", Pittsburgh**
1 – 14	**Ohio River Terminals**
15 – 21	**Ohio River Small Boat Harbors, Ramps, Landings, etc.**
	Ohio River Mileage Chart

Navigation Links

- Navigation Information Connection (NIC)
  - Navigation Data Center
  - Operations and Maintenance Business Information Link (OMBIL)
  - Great Lakes & Ohio River Division Navigation Reports
  - U.S. Army Corps of Engineers Education Center - Navigation

DID YOU KNOW ...

Pittsburgh District's 26,000 square miles include portions of western Pennsylvania, northern West Virginia, eastern Ohio, western Maryland and southwestern New York. Our jurisdiction includes more than 328 miles of navigable waterways, 23 navigation locks and dams, 16 multi-purpose flood control reservoirs, 42 local flood protection projects and other projects to protect and enhance the Nation's water resources, infrastructure and environment.

General Information: Pittsburgh District Public Affairs Office
Technical Point of Contact: lrp.webmaster@usace.army.mil

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