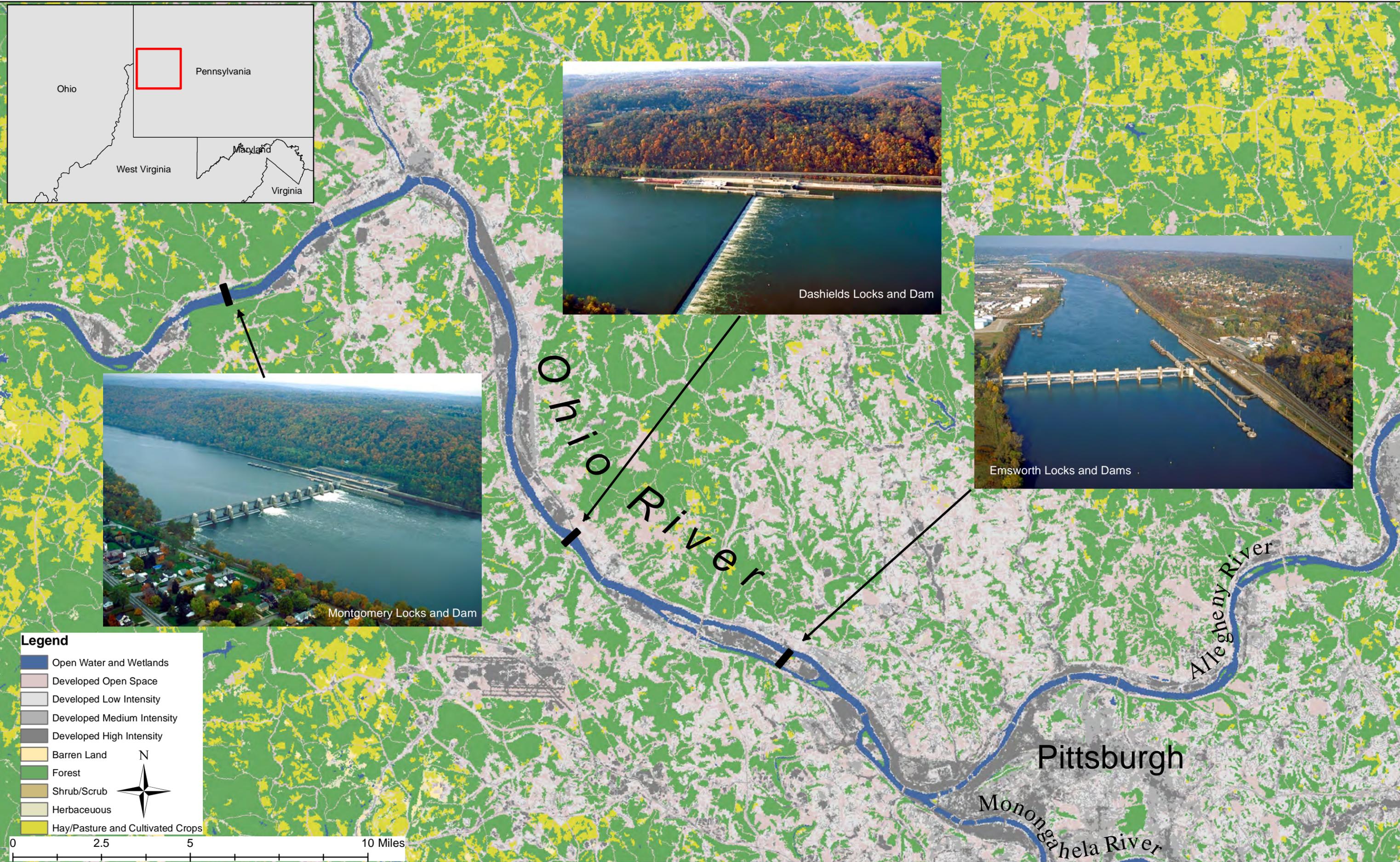


# Upper Ohio Navigation Study, Pennsylvania



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The **Upper Ohio Navigation Study** evaluates alternatives to provide safe, reliable, efficient, and sustainable navigation at Emsworth, Dashields, and Montgomery Locks and Dams at the head of the Ohio River.

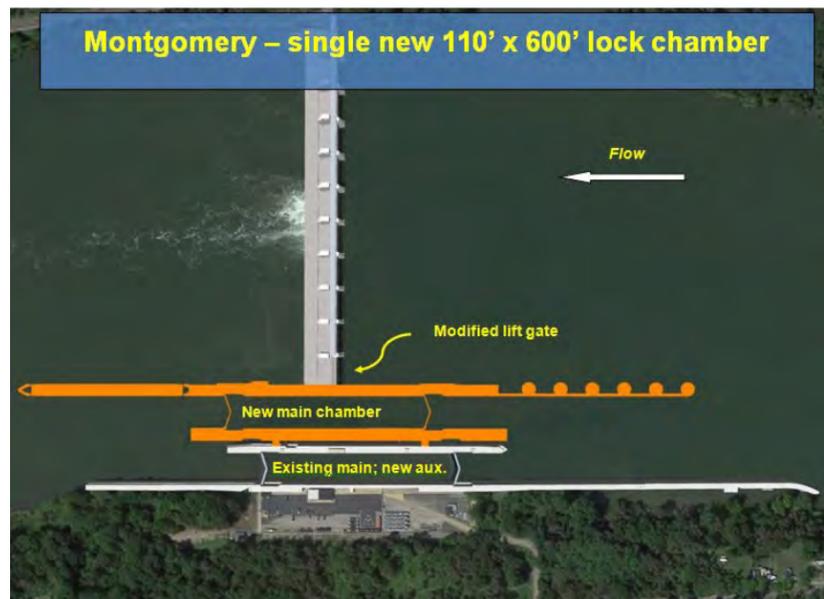
The Study also evaluates ecosystem restoration projects but makes no recommendation, lacking commitment from a non-federal cost share sponsor.

ALTERNATIVES - Final Array [Same application at Emsworth, Dashields, & Montgomery]				ACRONYM	Principles & Guidelines System of Accounts			
					NED	RED	EQ	OSE
No new chambers - Advance Maintenance				AMA				
Two new chambers new main:	110' x 600'	New auxiliary: 110' x 600'		LMA 1			■	■
One new chamber new main:	110' x	600'	Auxiliary = existing main Reactive Maintenance	LMA 7	■			
		800'		LMA 8				
		1200'		LMA 9		■	■	

AMA = Advanced Maintenance Alternative; LMA = Lock Modernization Alternative

The **Recommended Plan (LMA 7)** is the National Economic Development (**NED**) Plan that maximizes net economic benefits for commercial navigation.

Alternatives LMA 1 and LMA 9 rank higher in the other Principles and Guidelines Accounts, i.e., Regional Economic Development (**RED**), Environmental Quality (**EQ**), and Other Social Effects (**OSE**), but are not recommended over the NED Plan.



## Recommended project features at Montgomery, Dashields, and Emsworth

The **Recommended Plan** consists of a new main chamber constructed in the place of the existing, auxiliary chamber. The existing main chamber will continue to operate during the construction period, and will be retained as the future auxiliary chamber with reactive maintenance. The dams at each facility will be modified to accommodate the new wider locks.

### Recommended Plan - Mitigation requirements

- Aquatic impact mitigation: Three acres of fish habitat improvements.
- Terrestrial impact mitigation (temporary construction support areas): Revegetation.
- Historic properties mitigation (navigation facilities): Historic research & publication, Historic American Engineering Record documentation, and National Register of Historic Places nominations.

Total first project cost of the **Recommended Plan**:

\$2.32 Billion

- \$737 Million, Emsworth;
- \$801 Million, Dashields;
- \$782 Million, Montgomery.

October 2014 price level & 3.5% discount rate;  
Fully risk informed cost estimate

Benefit to Cost ratio is 2.6.