APPENDIX A

NAVIGATION STUDY PRESENTATION

Good evening, I'm Gary Loss. I am the Project Manager for the Upper Mississippi River and Illinois Waterway System Navigation study. We appreciate all of you taking time to come hear about the study and share with us your comments.

In addition to myself, we have several other members from the Corps of Engineers study team here to help answer your questions.

Also tonight I would like to recognize the following individuals who served as Governors Liaison Committee Representatives

- Iowa - Jim Hall, DOT
- Illinois - Don Vonnahme, DNR
- Minnesota - Steve Johnson, DNR (Acting)
- Missouri - Stephen Mahfood, DNR
- Wisconsin - Chris Spooner - Policy Advisor

Tonight we are here to present several alternatives to you and to get your feedback.

This presentation has been prepared to provide background information. We want to share what we have learned in the past six years of this study. I'm going to try in the next 30 minutes or so to summarize what we have accomplished with the $50 + million study. We will be showing findings that are representative of volumes of work that has been completed.We will also be sharing what the next steps are following this set of public workshops.

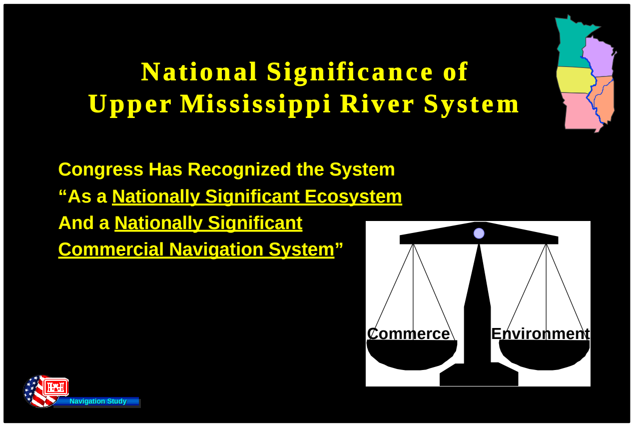
Following my presentation, we will ask you to share your questions, concerns, and give us feedback on the study.

Tonight’s workshop is just one of 7 we are hosting to gather input on the various alternative plans.

The geographic area of this study covers approximately 1,200 river miles, with 37 lock and dam sites in 5 states. The study includes the entire Upper Mississippi River from Minneapolis to the mouth of the Ohio River and the Illinois Waterway from Chicago to the Mississippi River.

The study was initiated in response to changed conditions on the navigation system since the project was constructed in the 1930's. The locks on the system were originally designed for tows up to 600 feet long.

Since then, typical tows have doubled in length and traffic volumes have multiplied several times. Delays due to increased congestion at the locks have resulted in significant increases in shipping costs.



Besides evaluating the need for commercial navigation improvements, the potential for impacts to the environment is also being carefully considered.

Maintaining a balance between commerce and the environment is especially important on the Upper Mississippi River and Illinois Waterway System. Congress has designated the system both a nationally significant ecosystem and commercial navigation system.

We have obtained forecasts of future system traffic through an independent contractor. These forecasts show potential growth from the current 80 million tons per year to 155 million tons by the year 2050. **

Engineering efforts have identified a wide range of potential measures to address system delays and traffic demand. Over 100 different improvement options were identified for possible implementation. These ranged from new or extended locks to less costly items such as adding mooring facilities. **

Environmental study efforts have compiled existing data, collected new information, and developed new analysis tools. This information will be used in assessing impacts at potential construction sites and looking at the overall effects of increased traffic on the entire system. **

Coordination efforts have resulted in numerous meetings with the study area states, resource agencies, various interests, and the public in identifying issues of concern, gathering additional data, and arriving at possible solutions. **

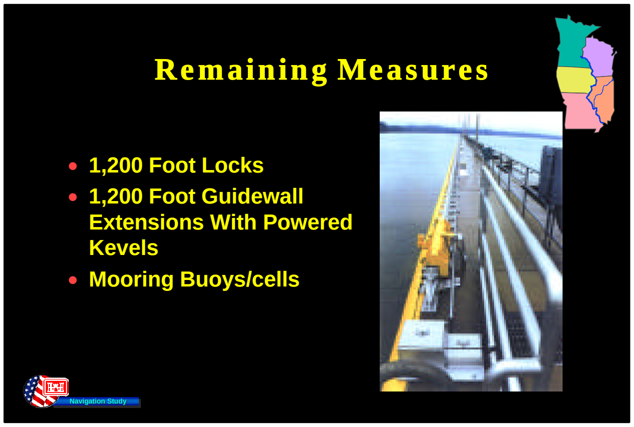
This study is the first system navigation study ever undertaken by the Corps of Engineers. The broad scope of the study has produced a number of benefits and presented some major challenges. **

The system environmental analysis has added to the body of knowledge of how various fish species use the main channel. New tools have been developed to assess the impacts of commercial traffic on the river system's aquatic life. **

As a result of our economic analysis we have developed new tools that consider the complexity and importance of the economies of the region. These efforts have allowed us to make significant advances in how we evaluate economic benefits. **

Engineering efforts have sought to incorporate innovative construction techniques and new approaches to significantly lower costs and delays to navigation during construction. **

Finally, meetings like this give evidence of the interest and concern many people have for this river and its many uses and roles. **



The study started in 1993 with first identifying all the possible measures. This effort was done in combination with the States and other Federal Agencies. We also met with groups representing commercial, environmental, and recreational interests.

Due to the large number of alternatives a screening process was used to narrow the range of possible measures. We ended with the measures that are the most complete, effective, efficient, and acceptable.

The three measures shown here remain. I will now describe each of these in greater detail.

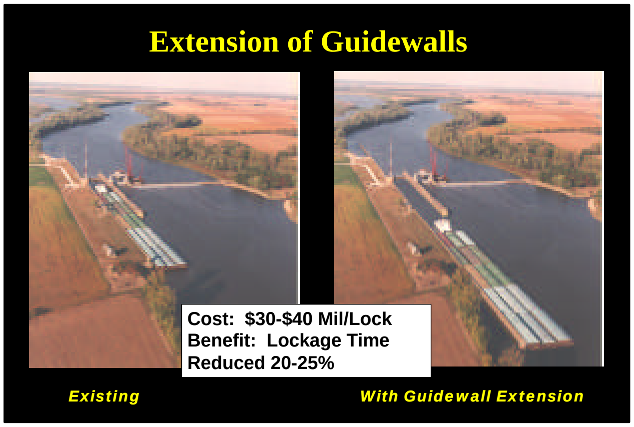
We looked at options to extend the existing lock or to construct new locks. The lowest cost lock option on the Mississippi River is the extension of the existing 600 foot lock to 1,200 feet, as shown here at lock 20. A computer revised photo is on the right.

In order to minimize costs and disruption to navigation traffic the lock extension utilizes innovative construction techniques and maximizes reuse of the existing structure. This results in a design with first costs in the $95-$125 million range. This estimate includes the cost to rehab portions of the exisitng lock. For example, work on the gates and mechanical and electrical equipment would be accomplished when we do the lock extension.

As shown here, we see the existing condition where longer tows must go through the time consuming double lockage process. With a 1200' lock extension, this 15-barge tow can lock through in a single step. This reduces the lockage time from an average of approximately 100 minutes to 55 minutes, cutting lockage times nearly in half.

Due to conflicts with traffic during construction a 1200 foot lock at Peoria and LaGrange may best be accomplished with a new lock next to the existing lock. The Illinois River's 12 month shipping season gives us special challenges for construction that we don't have on the Upper Miss.

Disadvantages of building larger locks include the construction impacts to a larger area. There will be higher traffic levels and

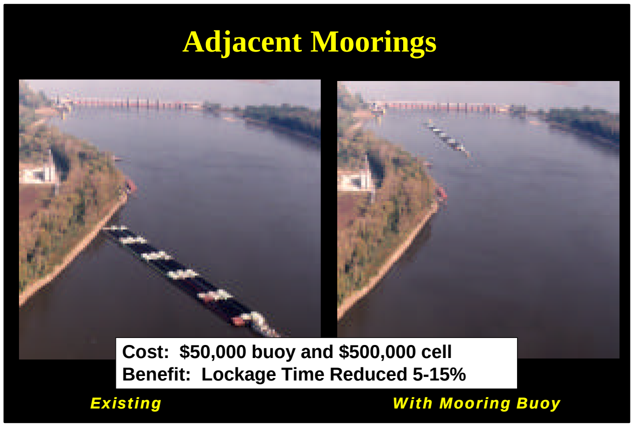


Guidewalls allow the tows to line up with the lock. Here the 1200 foot tows are disconnected and put back together. Typically the guidewalls are only 600 feet long.

Extending guidewalls to 1,200 feet in combination with a powered kevel provides the potential to reduce double lockage times by 20-25 minutes. This is done without increasing the length of the 600 foot lock.

Shown here is the LaGrange Lock on the Illinois River. The photo on the left shows a 1200 foot tow in the 600 foot lock with 600 foot long guidewall. The photo on the right has been modified to illustrate a 1200' guidewall extension. Note that by extending the guidewalls to 1,200 feet the first cut can be taken further from the chamber. This allows the towboat and remaining barges to move all the way out of the lock so the next tow traveling in the same direction can use the lock sooner.The powered kevel on top of the guidewall pulls the unpowered first cut of barges from the chamber out along the extended wall.

Guidewall extensions will have relatively lower site and system environmental impacts than construction of 1,200' locks.



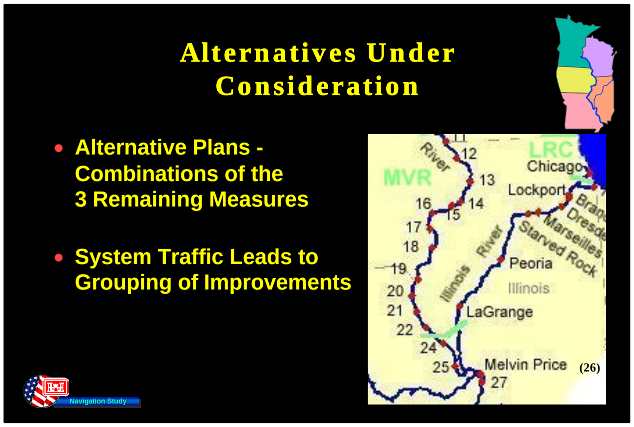
Adjacent mooring facilities were identified for sites where tows could wait closer to the lock than they currently do. Two types of moorings are under consideration.

Mooring cell - is a solid circular sheet pile structure roughly 30-40 feet in diameter sitting on the river bottom.

Mooring buoys - are floating devices anchored to the river bottom that also provide a tie off for tows.

The costs of $50,000 for the buoy and $500,000 for the cell are quite low compared to the other measures. However, there are only limited sites where they will help. These mooring facilities can save a tow 7-13 minutes in approaching the lock.

These facilities will often be environmentally neutral or even beneficial. They can provide tows a formal waiting area, helping to keep them from waiting in more ecologically sensitive areas (such as mussel beds or along banks).



In the next several slides, I will show the details of each alternative we are currently considering. These alternatives are made up of various combinations of the three measures we just discussed.

Tonight we will be covering the same alternatives presented in the June Study Newsletter. These alternatives include the no action alternative and various groupings of the remaining measures. In addition, we will provide more information regarding each plans' effects on traffic levels, lock delays, the environment, and the impact on the economy of the region.

You will soon realize many of the improvements focus on the downstream lock sites. Traffic is generally greater on the downstream end of the system. Much of the traffic on the system is export grain. Grain enters the system from multiple terminals, much on its way to New Orleans, resulting in increased tonnage at the lower locks. Likewise upbound shipments are primarily coal, fertilizers, and petroleum. We should note that lock 19 already has a 1,200 foot lock, while locks 26 and 27 have both a 1,200 foot and a 600 foot chamber, at each site. Lock 25 is the first lock with a 600 foot chamber and is also the most downstream lock on the Mississippi above the confluence with the Illinois River.

As we work thru the several alternatives I will be sharing a lot of information on each. Please recognize the findings I am sharing with you tonight are only a sampling of the data we have analyzed over the past 6 years. There are volumes and volumes of information available. We have selected representative pools and dates to give you some idea of the information that is available. Since we are in ____________tonight you will probably be especially interested in the information we provide for pool ___. Also please note that improvements made at any site do have some impacts on the entire river system. For example, if we build 1,200' locks at the downstream sites. Traffic will increase on the entire river with corresponding impacts to congestion and delay.

St. Louis Pool 25 Quincy Pool 21
Bettendorf Pool 15

Peoria Peoria Pool La Crosse Pool 8

Matrix of Alternatives

(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
No Action	-	-	-	-	-
A Mooring Buoys/Cells (Locks 12,18,20,22,24)	2004	$700	$200	$1,800	$1,600
B 1200' Guidewalls (Locks 20-25) and Mooring Buoys/Cells (Locks 12,18,20,22,24)	2008	$190,000	$24,800	$37,700	$12,900
C 1200' Locks (20-25)	2013	$542,000	$46,900	$54,600	$7,700
D 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18)	2013	$705,000	$63,000	$74,900	$11,900
E 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18) Mooring Buoys/Cells (Locks 12,18,20,22,24)	2013	$706,000	$63,200	$78,500	$15,300
F 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18, Peoria, LaGrange) Mooring Buoys/Cells (Locks 12,18,20,22,24)	2013	$765,000	$68,800	$84,100	$15,300
G 1200' Locks (14-18 and 20-25)	2017	$1,077,000	$83,700	$91,200	$7,500
H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

This slide illustrates the no action alternative and eight other alternative plans. All plans are unique and have different combination of measures, locations, and timing of implementation. You have this matrix in the handout for this evening.

Matrix of Alternatives
(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
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H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

For sake of tracking, we have assigned a letter to each alternative. I will describe in greater detail the proposed work for each of these alternatives in the following slides.

Matrix of Alternatives

(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
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H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

For these examples the date in place represents the first year the complete alternative would be ready for use, considering the time required to complete design and construction.

Matrix of Alternatives
(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
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Other columns include the total and an annualized cost of making these improvements. The total cost is like the sticker price of a new car, while the annual cost is the associated annual payment spread over 50 years.

Matrix of Alternatives

(Costs in $1,000s)

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Next the annualized benefits in terms of transportation cost savings are shown. These savings are primarily associated with delay reductions, but also include the benefits of providing additional waterway shipments.

Matrix of Alternatives
(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
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H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

Finally the annual net benefits are shown. This column is obtained by subtracting the annual cost from the annual benefits.

Matrix of Alternatives
(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
No Action	-	-	-	-	-
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H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

Let's take a quick look at the measures included in each of the alternatives before we look at each in greater detail.

First is the No Action Alternative - which results in no change in costs or benefits

Alternative A: Mooring buoys or cells would be built at Locks 12, 18, 20, 22, and 24.

Alternative B: adds 1,200' guidewall extensions to the mooring facilities

Alternative C: calls for 5 1200' locks at 20-25

Alternative D: Adds 1200' guidewalls at Locks 14-18

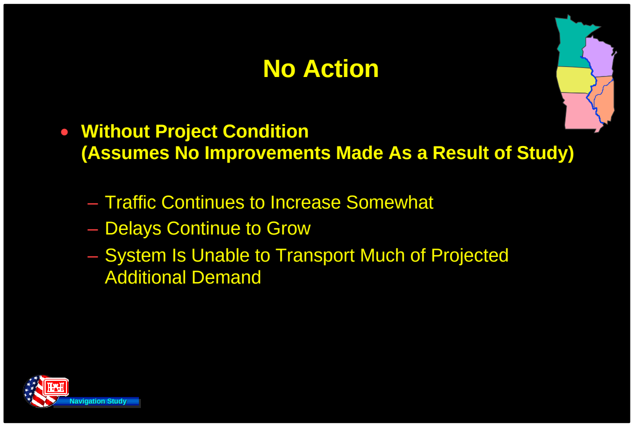
Alternative E: Adds mooring buoys and cells to the locks and guidewalls

Alternative F: Adds 1200' guidewalls at Peoria and LaGrange

Alternative G: We would construct 1200' locks at 10 sites from Lock 14 to 25.

Alternative H: We would construct 1200' locks at 20-25 and at Peoria and LaGrange, and construct guidewall extensions at Locks 14-18.

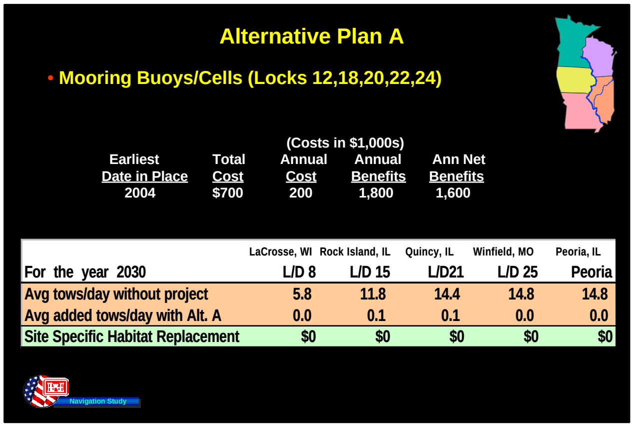
Now we will look in greater detail at each plan, including the affects it has on traffic, and site specific environmental costs. These alternatives are also in the handout you received for tonight's meeting.



An alternative we must always start with is the No Action alternative, sometimes called the Without Project Condition. This alternative projects what will happen on the system if no improvements are made as a result of the study. This alternative then serves as the basis for comparison with all other alternatives.

Obviously if we do nothing as a result of this study there would be no additional expenditures or benefits.

It is important to note that even if no improvements are made, future demand for the system will cause traffic to grow somewhat,. However, this growth will be limited and will not accommodate very much of the projected increase in demand for the system due to increasing congestion and delay. At the most congested locks, estimates show the potential for the delay to double between 2000-2030 if no improvements are made. For example average delays would increase by 9 hours at lock 22 for the average tow.



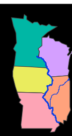
We will be using this format to look more closely at each of the alternative plans. The white text re-states the date in place and cost information from the matrix we just looked at. This alternative has relatively low costs and benefits, since we are simply constructing mooring facilities at five lock sites.

We have selected representative locks 8, 15, 21, 25, on the Mississippi River and Peoria Lock on the Illinois Waterway to portray some of the effects of each of the alternatives. All data shown is for a representative year 2030. We selected 2030, since it demonstrates the relative effects several years after improvements have been completed. In the first line we see an estimate of how many tows/day there will be in 2030 without any improvements being implemented. The next line shows the additional tows/day that come with implementing this alternative. In this case very small changes in traffic are anticipated.

Finally on the bottom row we show site specific habitat replacement costs. In this case there are no site specific costs shown since the proposed mooring facilities are not located at any of the representative sites.

Alternative Plan B

- 1,200' Guidewalls (Locks 20 - 25)
- Mooring Buoys/Cells (Locks 12,18,20,22,24)



(Costs in $1,000s)

Earliest Date in Place	Total Cost	Annual Cost	Annual Benefits	Ann Net Benefits
2008	$190,000	24,800	37,700	12,900

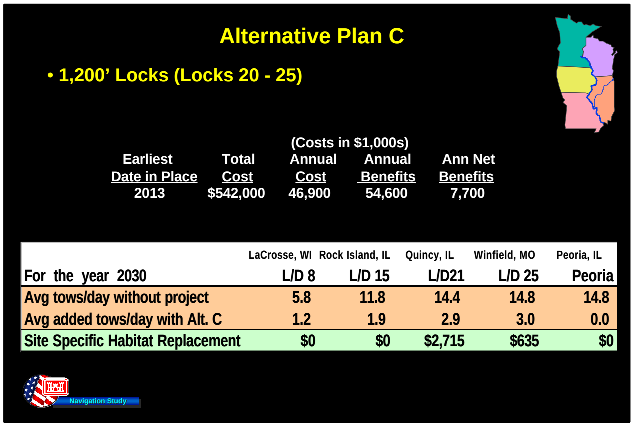
For the year 2030	LaCrosse, WI L/D 8	Rock Island, IL L/D 15	Quincy, IL L/D21	Winfield, MO L/D 25	Peoria, IL Peoria
Avg tows/day without project	5.8	11.8	14.4	14.8	14.8
Avg added tows/day with Alt. B	0.8	1.4	1.8	1.9	0.0
Site Specific Habitat Replacement	$0	$0	$925	$560	$0

Navigation Study

For Alternative B, we add 1200 foot guidewall extensions with powered kevels at 5 sites to the mooring buoys and cells we just looked at in Alternative A. Both costs and benefits increase substantially. Annual net benefits have increased from $1.6 to $12.9 million annually.

We see that for most locks on the Upper Mississippi River an increase of 1 to 2 boats per day can be anticipated.

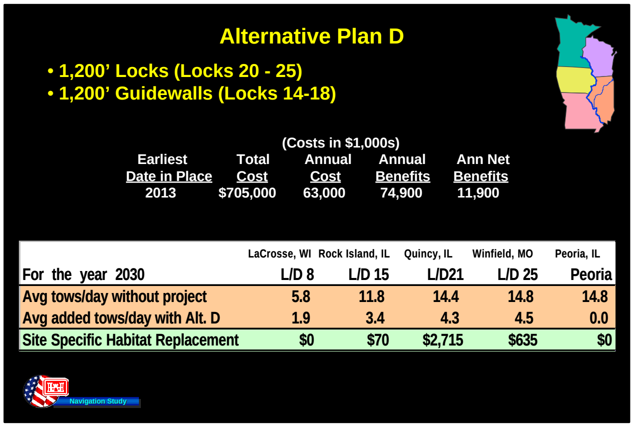
Finally Site Specific Habitat Replacement Costs are anticipated at the sites where the guidewall extensions would be built. These costs are associated with replacing habitat impacted as a result of actual construction at the specific sites. These environmental costs have been included in the overall costs above.



Alternative C is the first alternative we looked at with 1200’ lock extensions. In this case we estimate that design and construction times for 5 1200 foot locks at locks 20 through 25 will take 12 years to complete. Total costs increase to $542 million dollars, while net benefits are $7.7 million per year.

We see an increase in the traffic. Particularily at the sites with new locks, roughly 3 additional tows/day.

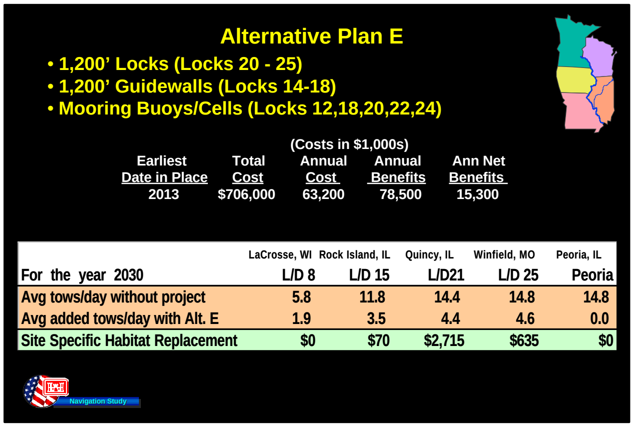
Somewhat greater Site Specific Habitat Replacement Costs are anticipated. This is due to the larger footprint impact of the lock extension compared to the guidewall extensions in Alternative B.



Alternative D has 1200 foot locks constructed at Locks 20-25. Plus 1200' guidewall extensions at Locks 14-18. This will significantly help reduce the delays that will occur at Locks 14-18 if we only built 1200 foot locks at Locks 20-25. With concurrent construction the design and construction time can be completed in 2013. Total costs are higher, but the end result is higher net benefits of $11.9 million.

We again see some relatively large increases in traffic. From nearly 2 additional tows/day at lock 8 to 4.5 tows/day at lock 25.

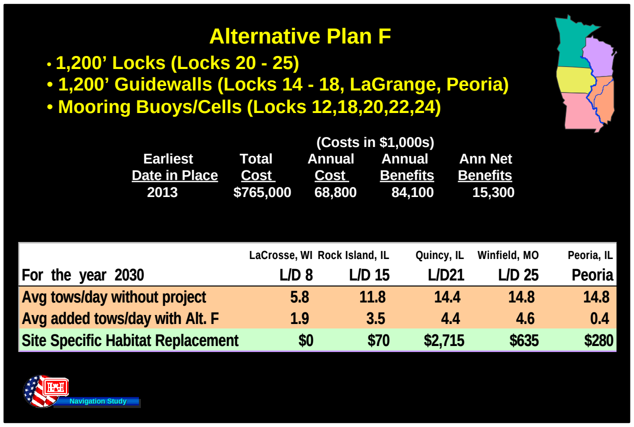
Additional Site Specific Habitat Replacement Costs are anticipated, due to the fact that this option includes construction of guidewalls at 5 additional sites.



Alternative E takes the same 5 locks and 5 guidewall extensions we just looked at and adds 5 mooring buoys and cells. Construction time remains the same and total costs only increase slightly. However, the addition of these mooring facilities increases annual net benefits by $3.4M to $15.3M.

While the moorings only modestly increase system traffic levels over Alternative D, reductions in delay at the improved sites and resulting additional movements increase overall system benefits.

The Site Specific Habitat Replacement Costs remain unchanged from Alternative D.



For the year 2030	LaCrosse, WI L/D 8	Rock Island, IL L/D 15	Quincy, IL L/D21	Winfield, MO L/D 25	Peoria, IL Peoria
Avg tows/day without project	5.8	11.8	14.4	14.8	14.8
Avg added tows/day with Alt. F	1.9	3.5	4.4	4.6	0.4
Site Specific Habitat Replacement	$0	$70	$2,715	$635	$280

Alternative F takes the same 5 locks, 5 guidewalls, and 5 mooring buoys and cells shown in Alternative E and <u>adds guidewall extensions to the Peoria and LaGrange Locks on the Illinois Waterway</u>. Construction time remains the same. While total costs increase by roughly $60 million, additional benefits offset the additional costs resulting in the same annual net benefits as Alternative E.

Traffic on the Upper Mississippi River remains unchanged from alternative E. The addition of the guidewalls at Peoria and LaGrange will increase traffic on the Illinois Waterway, 0.4 tows/day at Peoria. Please recall that the Illinois Waterway operates year round while the Upper Mississippi has a season of approximately 9 months.

Additional Site Specific Habitat Replacement Costs are anticipated for Peoria and LaGrange related to construction site impacts.

Alternative Plan G

• 1,200' Locks (Locks 14-18 and 20-25)

(Costs in $1,000s)

Earliest Date in Place	Total Cost	Annual Cost	Annual Benefits	Ann Net Benefits
2017	$1,077,000	83,700	91,200	7,500

For the year 2030	LaCrosse, WI L/D 8	Rock Island, IL L/D 15	Quincy, IL L/D21	Winfield, MO L/D 25	Peoria, IL Peoria
Avg tows/day without project	5.8	11.8	14.4	14.8	14.8
Avg added tows/day with Alt. G	2.8	4.8	5.5	5.6	0.0
Site Specific Habitat Replacement	$0	$600	$2,715	$635	$0

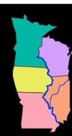
Alternative G shows the anticipated affects if we built Lock extensions on the Upper Mississippi River at the 10 lock sites from Lock 14 to 25. Total costs would exceed $1 billion. Construction would be not be completed until 2017. Despite a considerable increase in benefits over some of the previous options, annual net benefits are only $7.5 million.

This alternative results in the largest increases in Upper Mississippi River traffic. Roughly 5 to 5.5 tows/day up to lock 15.

The Site Specific Habitat Replacement Costs increase for those sites which would have a lock extension.

Alternative Plan H

- 1,200’ Locks (Locks 20 - 25, Peoria, LaGrange)
- 1,200’ Guidewalls (Locks 14-18)



(Costs in $1,000s)

Earliest Date in Place	Total Cost	Annual Cost	Annual Benefits	Ann Net Benefits
2015	$1,066,000	89,500	93,300	3,800

	LaCrosse, WI	Rock Island, IL	Quincy, IL	Winfield, MO	Peoria, IL
For the year 2030	L/D 8	L/D 15	L/D21	L/D 25	Peoria
Avg tows/day without project	5.8	11.8	14.4	14.8	14.8
Avg added tows/day with Alt. H	1.9	3.4	4.3	4.5	0.5
Site Specific Habitat Replacement	$0	$70	$2,715	$635	$645

Navigation Study

Alternative H differs from Alternative D with its 5 1200 foot locks and 5 1200 foot guidewalls. Since Peoria and LaGrange Locks on the Illinois Waterway would also receive 1,200 foot locks. In contrast with Mississippi River sites, providing a 1,200 foot lock at Peoria and LaGrange may best be done by building a new lock.

Design and construction would be completed in 2015. This level of improvement would again push total costs over $1 billion. However, annual net benefits drop to $3.8 million annually. Since Peoria and LaGrange operate in open pass for a major part of the year, more efficient locks will only provide benefits for the part of the year when the boats must use the lock.

In this case we again see that traffic on the Upper Mississippi River remains relatively unchanged. The main change is that the additions of the locks at Peoria and LaGrange result in an increase in Illinois Waterway traffic of 1/2 tow/day at Peoria Lock.

Additional Site Specific Environmental Costs are anticipated at Peoria and LaGrange related to the greater construction site impacts associated with new locks.

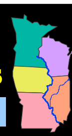
Matrix of Alternatives
(Costs in $1,000s)

Alternative Plan	Date in Place	Total Costs	Annual Costs	Annual Benefits	Annual Net Benefits
No Action	-	-	-	-	-
A Mooring Buoys/Cells (Locks 12,18,20,22,24)	2004	$700	$200	$1,800	$1,600
B 1200' Guidewalls (Locks 20-25) and Mooring Buoys/Cells (Locks 12,18,20,22,24)	2008	$190,000	$24,800	$37,700	$12,900
C 1200' Locks (20-25)	2013	$542,000	$46,900	$54,600	$7,700
D 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18)	2013	$705,000	$63,000	$74,900	$11,900
E 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18) Mooring Buoys/Cells (Locks 12,18,20,22,24)	2013	$706,000	$63,200	$78,500	$15,300
F 1200' Locks (20-25) and 1200' Guidewalls (Locks 14-18, Peoria, LaGrange) Mooring Buoys/Cells (Locks 12,18,20,22,24)	2013	$765,000	$68,800	$84,100	$15,300
G 1200' Locks (14-18 and 20-25)	2017	$1,077,000	$83,700	$91,200	$7,500
H 1200' Locks (20-25, Peoria, LaGrange) and 1200' Guidewalls (Locks 14-18)	2015	$1,066,000	$89,500	$93,300	$3,800

Here is the overall summary slide again, so you can compare the alternatives. These displays will also be available for your use in the breakout rooms.

NOTE: Leave on for 15 seconds or so.

Regional Economic Analysis

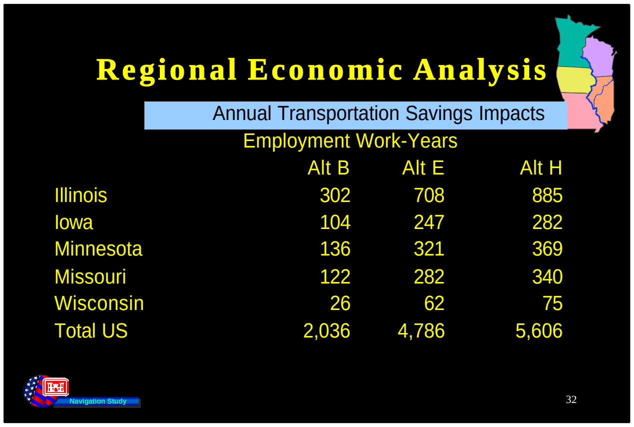


Total Construction Impacts			
Employment Work-Years	Alt B	Alt E	Alt H
Illinois	1,319	4,897	7,310
Iowa	59	1,213	1,266
Minnesota	70	336	408
Missouri	1,256	3,698	3,783
Wisconsin	105	412	540
Total US	5,163	19,282	24,240

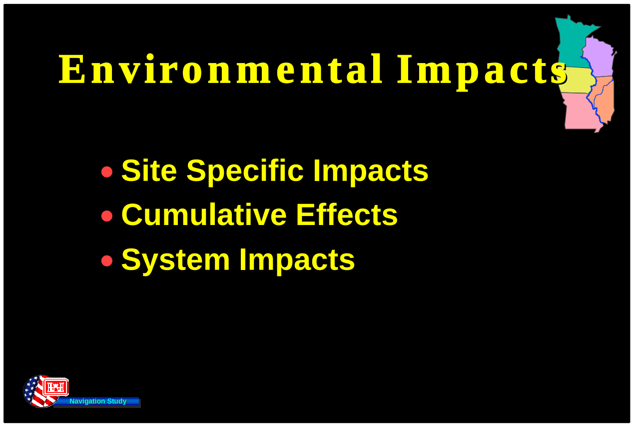
Navigation Study

Our study has identified benefits to the economy of the nation. The regional economic analysis summarized here has focused on the construction benefits of various alternative plans in the five study states and the entire country.

This slide shows the short term increases in employment related to the construction of the improvements. In other words, the numbers shown represent how many jobs measured in work years would be created as a result of building the improvements, providing the materials, etc.



In addition to the one-time benefits directly associated with construction, this table shows just the increased employment related to transportation savings. In other words, how many additional jobs would be created each year on the average as a result of having additional low cost water based transportation available and lower delay costs. Corresponding changes in income and output of goods and services for each state are expected.



Almost one-half of the study resources have been dedicated to examining the effects these proposed alternatives have on environmental resources and historic properties.

These studies have assessed potential impacts at both the site-specific and system levels. In addition, we have looked at the potential cumulative effects of various actions out into the future. The findings of these studies will comprise the system Environmental Impact Statement (EIS), which accompanies the draft feasibility report. The EIS will be programmatic in nature, meaning it will allow for continued monitoring and re-evaluation of environmental impacts. It will address mitigation requirements and describe additional data collection that is necessary.

Site-specific environmental studies examined potential ‘footprint’ impacts, or those changes that would occur due to a specific construction activity at the lock and dam sites.

Examples would be impacts to borrow locations, mussel beds, and loss of various habitats.

Site Specific Impacts of Lock Extensions (Costs in $1,000s)

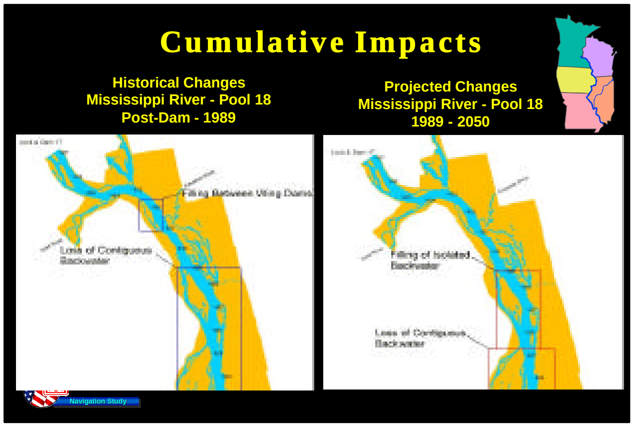
Habitat Impacts	Lock 21	Lock 25	Peoria
Bottomland Forest	$2,500 – $5,400	$285	$505
Main Channel Border	$70	$350	$140

Resource Impacts	Lock 21	Lock 25	Peoria
Mussels	Potential beds right bank upsteam and downstream	Mussel bed is avoidable	No known concentration
Threatened and Endangered Species	Bald eagle, Indiana Bat	Potentially avoid impacts	Indiana Bat, Decurrent false aster

Navigation Study

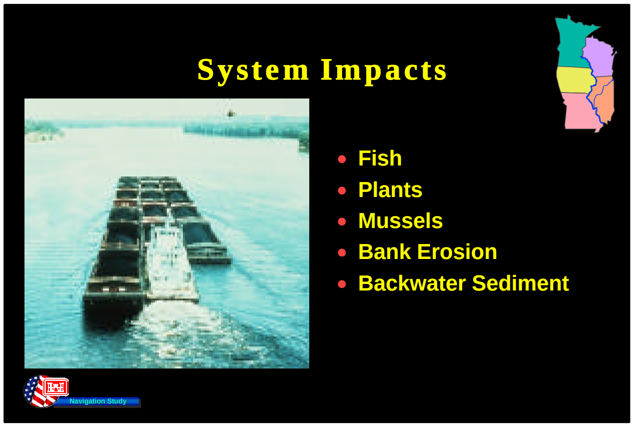
Several habitats and resources of concern were evaluated in detail at the lower lock and dam sites. This chart illustrates estimated resource impacts and habitat replacement costs at three sites for a potential lock extension.

I should note here that detailed sampling data gathered in some of the lower pools was extrapolated for other upstream reaches of the river.



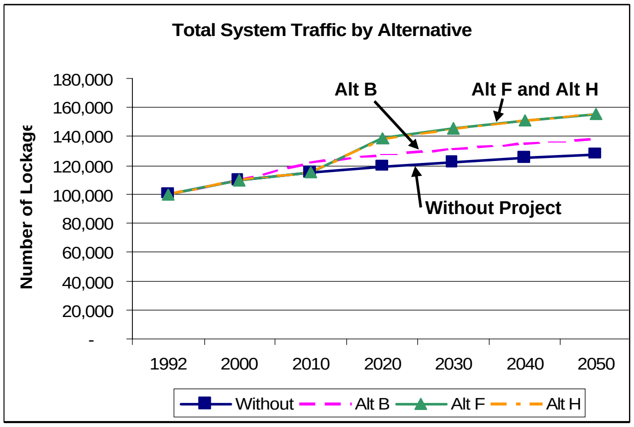
We also conducted an assessment of cumulative impacts on the Upper Mississippi and Illinois system. A team with extensive expertise in geomorphology, hydraulics, and ecology compiled a large amount of historic information on the rivers. The cumulative study describes how the system has changed over time and predicts the future direction of the system and its habitats. These cumulative impact studies provide in part a context for the system environmental impacts

One small example, shown here on the left for the upper half of Pool 18, compares historic changes since the dam was constructed in the 1930's. This is compared with predictions in the processes of sediment effects for the future in the map on the right. Other factors evaluated included island formation, wind-wave erosion, and delta formation.



While the site-specific studies considered effects only in the immediate vicinity of a lock site, system environmental impact studies are evaluating system-wide effects due to incremental traffic increases. The system assessment looks at what is happening to the environment in each pool as towboats transit the area. The analysis determines the physical forces created by passing tows, and how these forces affect fish, plants, mussels, bank erosion and backwater sedimentation.

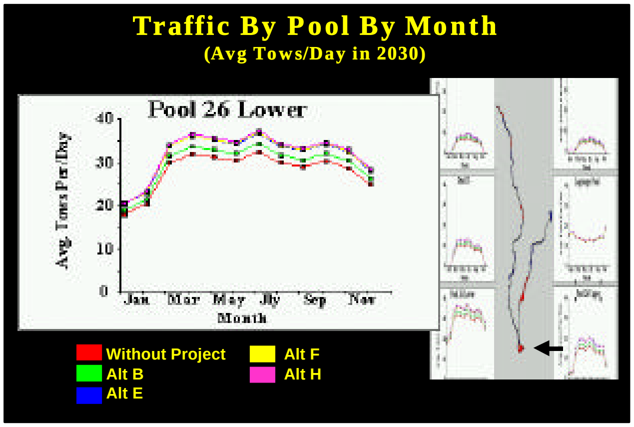
During the next few months we will complete the system model runs for the various alternatives. This information will be used as we address the significance of the impacts and determine appropriate avoid, minimize, and mitigation strategies.



Traffic increases are the key component for evaluating system environmental impacts. This chart illustrates how traffic levels could grow on the entire system for various alternatives over 50 years.

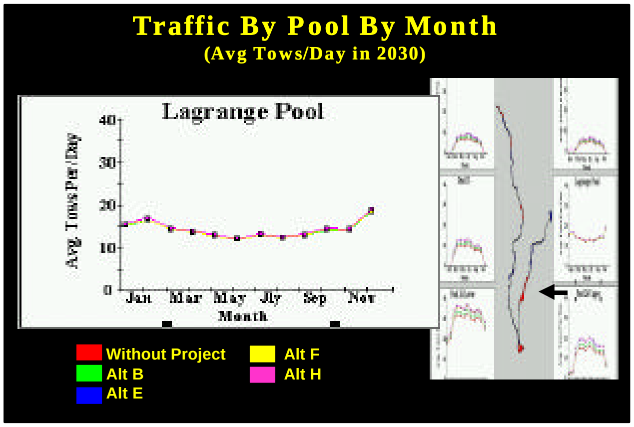
You can see how traffic increases more dramatically as we move from the without project condition (bottom line) to the alternatives which involve large scale measures (top lines). These are the same alternatives which I discussed earlier.

Recall Alternative B had just mooring facilities and 5 guidewall extensions. The other alternatives with larger locks all have similar increases in total traffic (about 20,000 additional lockages in the year 2030).



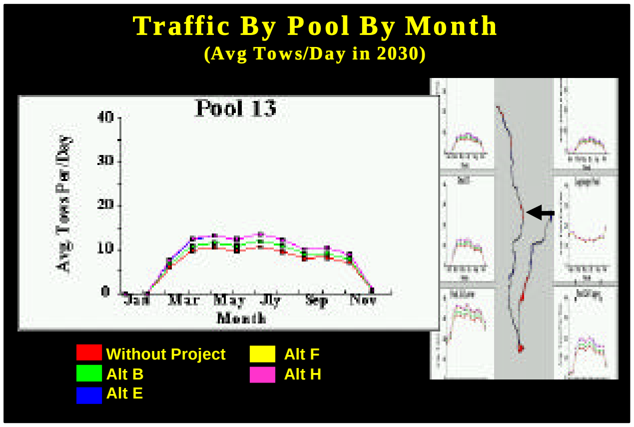
We also examined the relative traffic levels on various parts of the system in number of tows per day occurring in each month.

Here we are looking at the level of traffic in lower pool 26. This shows the combined traffic coming from both the Illinois Waterway and Upper Mississippi River. In this area of the river we currently have traffic levels of about 30 or more tows per day. With implementation of the various alternatives we see some increases in traffic of roughly 5 to 15% in this reach.



Traffic for LaGrange Pool which is the most downstream reach of the Illinois River does not vary much by month and in fact peaks in December. This is due to the fact that the Illinois River typically has less ice and remains open year round.

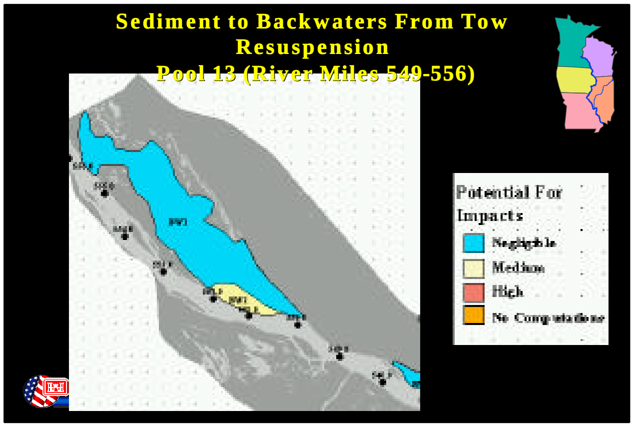
Due to traffic being spread over more months and the fact that open pass conditions exist 40-50 percent of the time, there is not much difference between the without project traffic levels and the various alternatives, even those which include new guidewalls or locks for Peoria and LaGrange such as shown in Alternative H. However, improvements would help to relieve congestion and delay associated with the traffic using the system.



As we look at traffic further up the Mississippi River, such as in pool 13 we can see the winter closure from mid-December to mid-March. We also see that current traffic levels are around 10 tows per day, and that the increase in number of tows per day is less than it would be for sites further downstream.

Similar information is being developed for all pools to assist in evaluating the potential system effects of any increases in traffic. For example, we are looking at how traffic levels at various times of the year coincide with periods of fish spawning and plant growth.

I spoke a few moments ago about how the system studies have determined the physical forces due to tows. These determinations were made in numerous laboratory studies which used both numerical and physical models. This picture shows the physical effects flume constructed especially for our study at the Corps' Waterways Experiment Station. This 1/25 scale model allowed researchers to simulate a wide variety of flows and tow configurations, many more than could be done in the 'real world'. Forces generated by tows were determined in the lab. The model results agreed well with actual field measurements which had been collected on the Illinois and Mississippi Rivers.

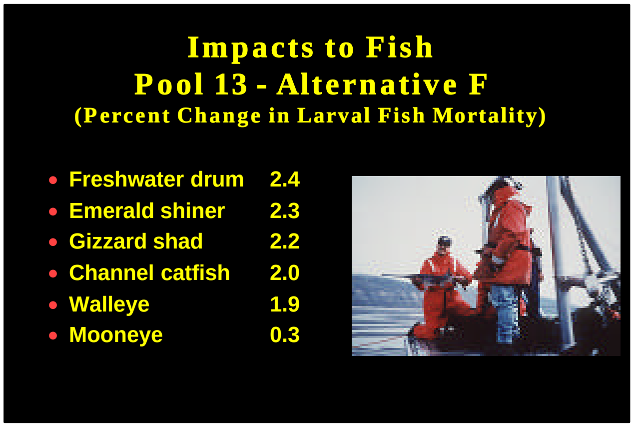


To determine how increased tow traffic might affect sediment resuspension, existing sediment data and additional sampling were used to map the sediment types on the system.

This information is important to assess plant impacts and the potential for sediment movement into backwaters. This map is an example for part of Pool 13. The colored areas represent various backwater areas and their relative susceptibility to tow induced sedimentation. The light gray areas are the Mississippi River and other isolated water bodies.

Relatively few backwaters along the Mississippi River were identified as being of concern due to tow impacts. This is due in part to the presence of heavier sediments (such as - sand). These heavier sediments are not easily transportable due to resuspension. In contrast portions of the Illinois Waterway are generally more susceptible due to large areas with fine sediments. In this slide for Pool 13 on the Mississippi we see that the backwater area with some potential for tow impacts is located closer to the sailing line and likely has more readily transported sediments nearby.

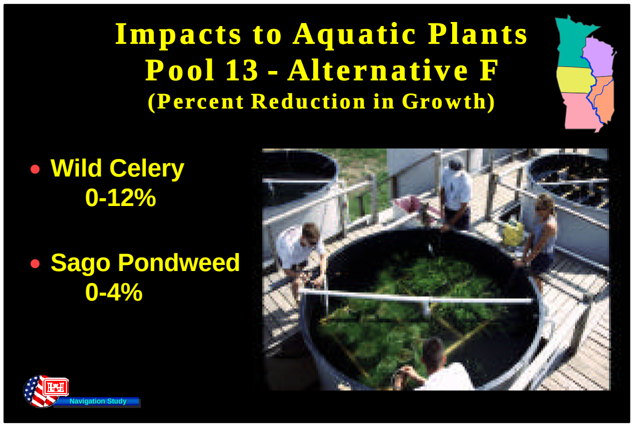
Tow effects are just one of many factors causing sedimentation. Floods and sediment from tributaries also influence sediment buildup in the backwaters.



The fish impact studies looked both at direct impacts (such as fish being killed by the tow or its propeller) and indirect effects such as the loss of spawning or overwintering habitat due to changes in velocity and sediment resuspension.

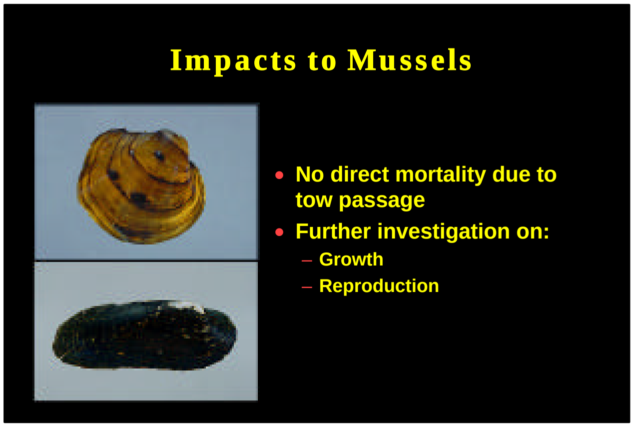
The primary area of investigation dealt with entrainment of larval fish and how this in turn affects adult fish populations. We had a significant effort to compile existing data and collect field data necessary to apply impact models so that we could determine larval fish mortality and equivalent adult fish loss. This slide gives an example of estimated percentage increases in larval mortality for 6 of the 30 fish species which were studied. While showing the greatest relative impacts, freshwater drum, emerald shiner, and gizzard shad are also among the most common species on the system.

Both direct and indirect effects were also assessed for aquatic plants. Direct effects include breakage or uprooting due to waves, while indirectly, plant growth could be impaired by increases in suspended sediment. The forces necessary to damage plants were determined in the lab using the wave flume shown here, and then compared to those forces generated by tows. Results thus far indicate that physical damage to aquatic plants caused by tows is very low.



Indirect impacts on plants result when increased sediment reduces the light available to plants and thus reduces their growth or reproduction. Our studies looked at all areas which could potentially support aquatic plants, based on depth and velocity criteria, in Pools 4-13. We found submersed aquatic plants generally do not occur below Pool 13.

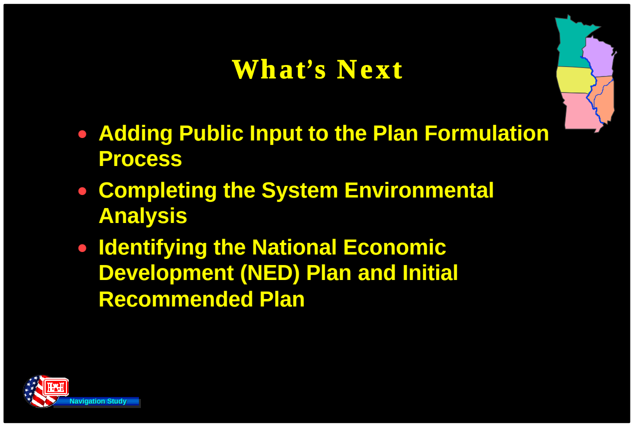
The photo shows laboratory studies on which sediment levels would adversely affect plants. Actual plant bed locations were then assessed based on the amount of sediment which they could be exposed to from passing vessels. The results shown here indicate a range of decreased plant production for Pool 13 and alternative F. The larger numbers are for locations most impacted by tows, however most locations will have no impact. The studies have shown that effects on reproduction associated with commercial navigation traffic appear to be very minor.



Our initial studies found that direct impacts to mussels from tow passage were not lethal.

Further study efforts are assessing potential indirect effects on mussel growth and reproduction due to sediment resuspension,and focusing on known mussel beds on the river system.

Hopefully these slides give you some idea of the vast amount of environmental information that we have obtained and are currently analyzing. Once we have determined the impacts to the environment caused by the alternatives we will be determining appropriate avoid, minimize, and mitigation strategies. This collaborative effort will be done in conjunction with state and Federal natural resource agencies. All the information, including the cost of mitigation measures for both site specific and system impacts will be included in the Draft Feasibility Report and System EIS. Public review and input is welcome throughout the process and certainly during the formal review period in the summer of 2000.

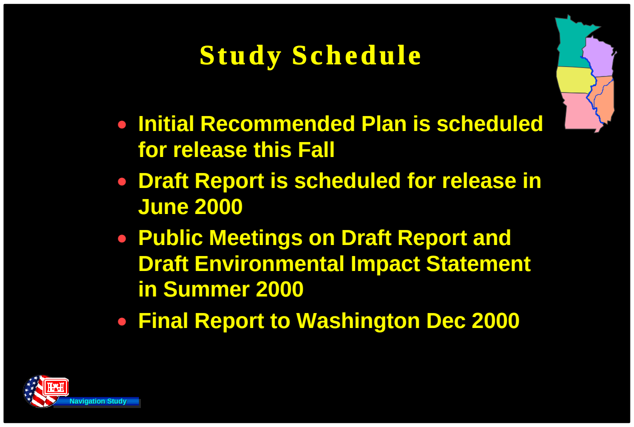


Where do we go from here?

The study is in the process of evaluating alternative plans. Your input tonight is a vital part of that process.

In addition, once the system environmental evaluations have been completed on the various alternatives we will have a more clear understanding of environmental impacts. This will allow us to identify the National Economic Development or (NED) Plan, which is the alternative plan that maximizes net benefits to the nation consistent with protecting the environment.

We will then also identify an "Initial" Recommended Plan based on information from the study area states, information you provide this evening, and the overall study analysis. This initial recommended plan will be used to prepare the draft Feasibility report and EIS, and will be designated the Recommended Plan unless changed during the final study phases.

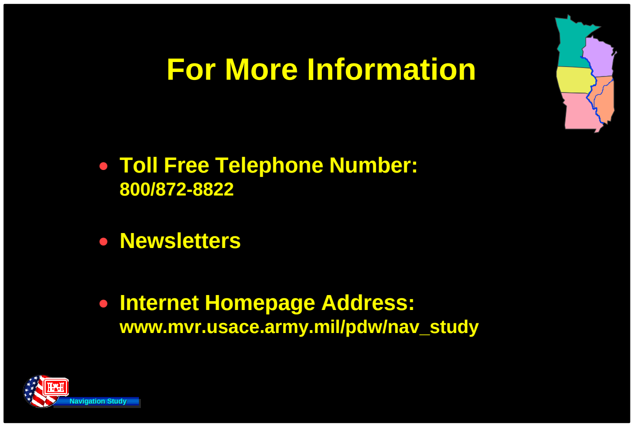


The remaining steps in this study include:

Identifying and releasing the “Initial” Recommended Plan this fall.

We will then coordinate this plan with the U.S. Fish and Wildlife Service and develop the draft Feasibility Report and Environmental Impact Statement (EIS). This effort is anticipated to be complete in June 2000. At that time we will release the draft Feasibility Report and EIS for Public and Agency review.

Following Public hearings in the Summer of 2000 we will make any final changes to the report. We will submit the report to Corps Headquarters in Washington D.C. in December 2000 for subsequent processing to Congress for authorization.



If you would like additional information on the study please call the toll free telephone number, sign up for our newsletter, or check our homepage which also provides back up reports for the information we have presented this evening.

The plans we have presented tonight are the best alternatives we have identified to date to address transportation needs in the next 50 years. In the next part of this workshop, you will be asked to give your thoughts and comments on these alternatives.

That concludes the first part of the workshop. At this time I will turn the meeting back over to Mr. Bill Weidman.