



Harbor Economic Impact Model (HEIM)



Presentation to

**Alaska Association of Harbormasters
and Port Administrators**

Mike Fisher



October 2004

Agenda

- **History of the Model**
- **HEIM Version 1.1**
- **Demonstration of Model**
- **Potential Future Improvements**
- **Where to Learn More**
- **Questions and Comments**

History of the Model



■ PURPOSE

Develop user-friendly computer model to:

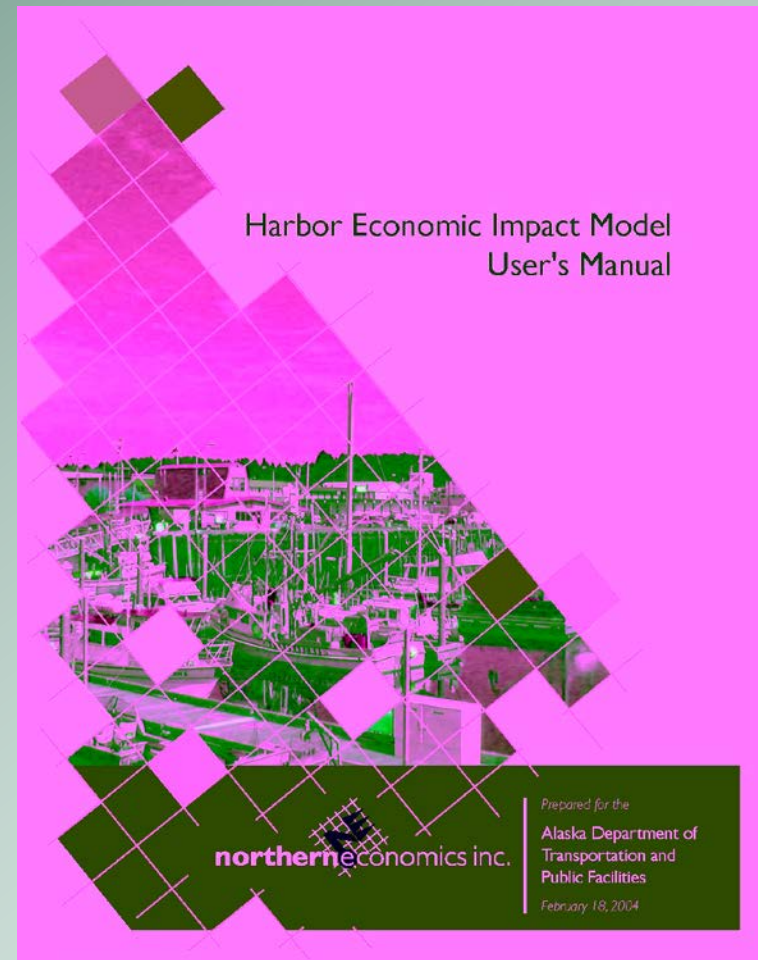
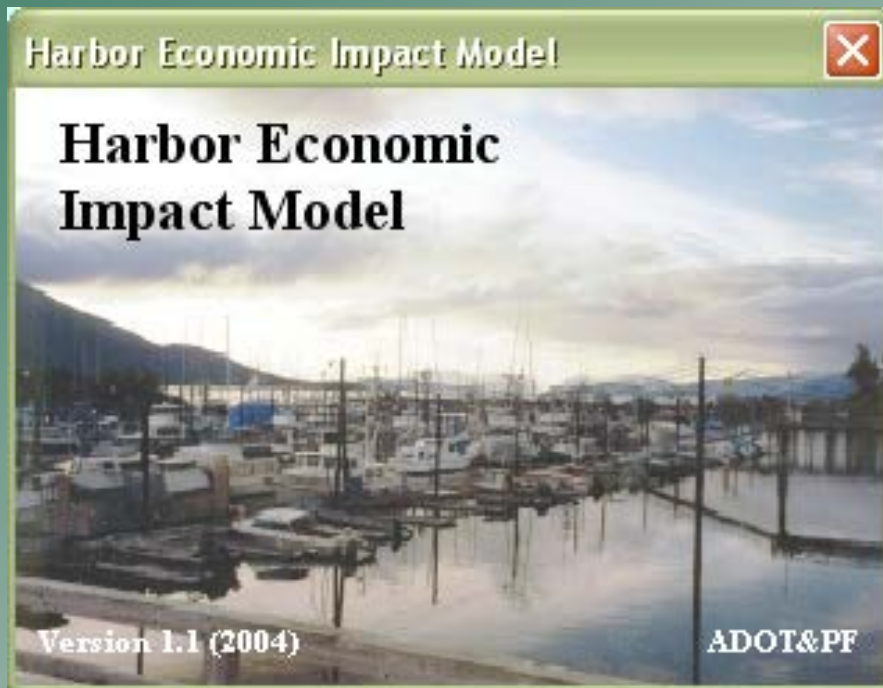
- Estimate benefits of harbor facilities to:
 - Local community
 - Region (Borough or Census Area)
 - State
- These benefits often not addressed by Army Corps of Engineers
- Without this information it is difficult to document benefits to decision-makers

History of the Model



- **Data collected from**
 - 8 harbors
 - 309 recreational vessels
 - 64 charter/tour/other vessels
 - 45 commercial fishing
 - 54 businesses
 - Reports by ACOE and DOT&PF
- **Inner harbor cost model from DOT&PF**
- **Beta model presented October 2003**
- **Final model completed March 2004**
- **Based in Microsoft Excel 2000**

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■ Basic use:

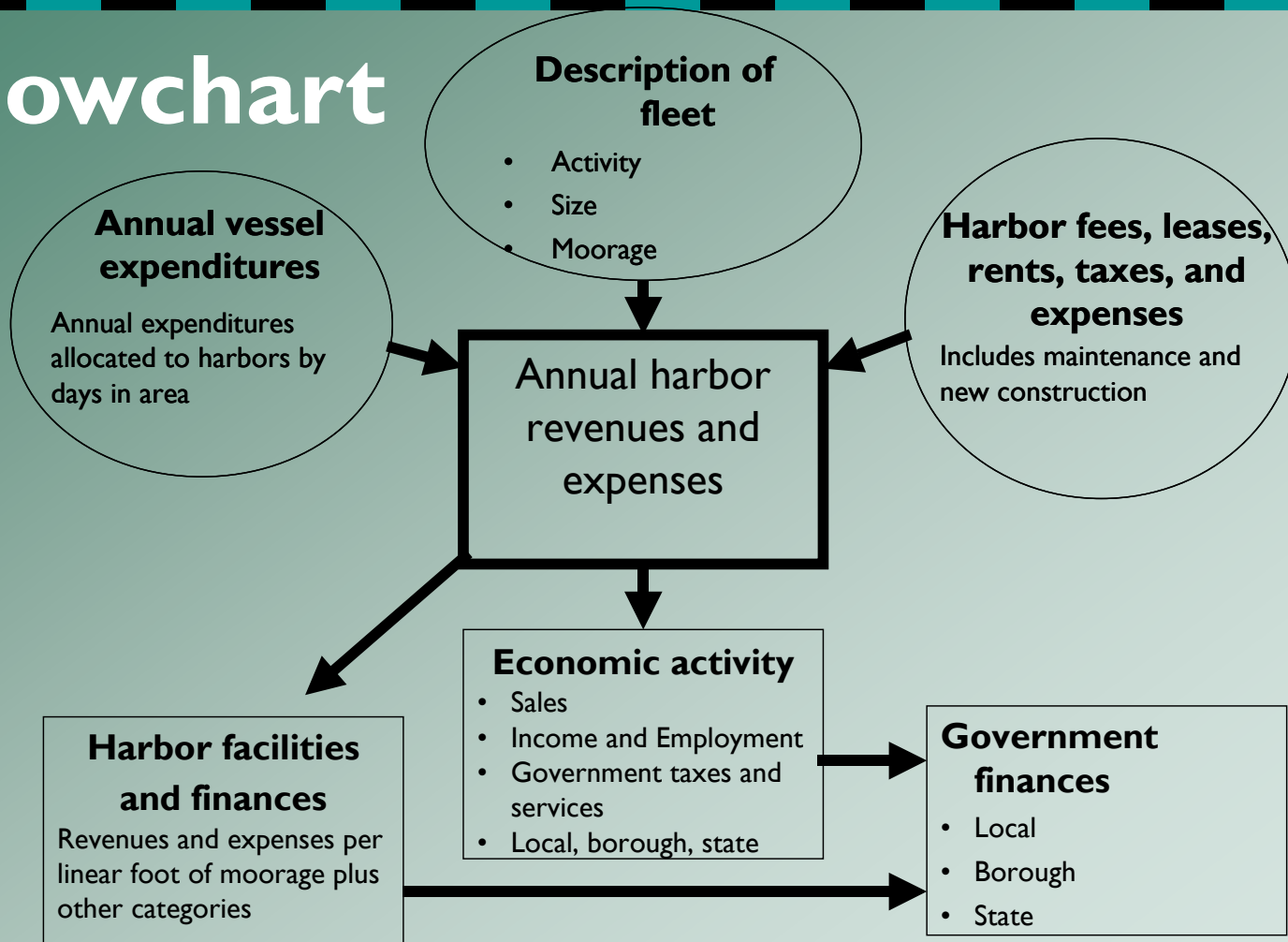
- Select your community
- Verify and enter harbor characteristics
- View impacts of harbor

■ Advanced uses:

- Determine impacts of changes in harbor

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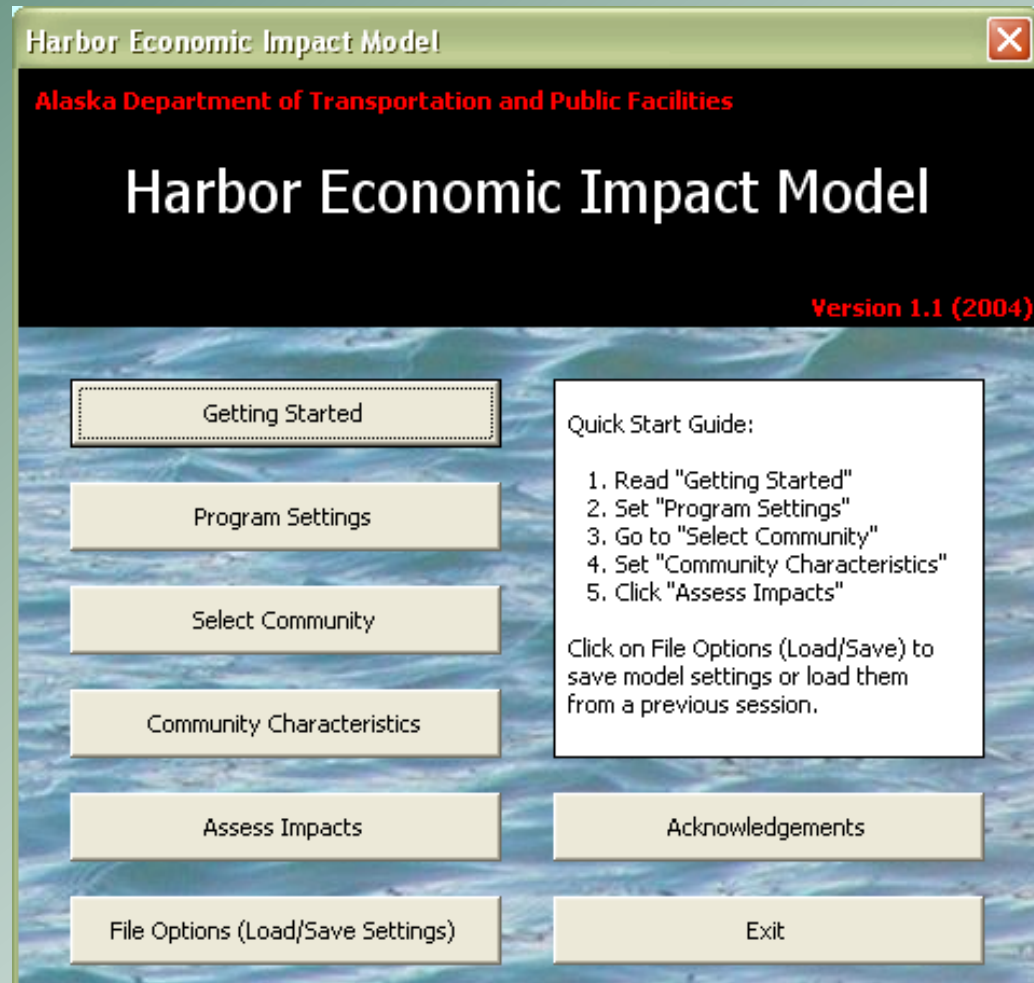
Flowchart



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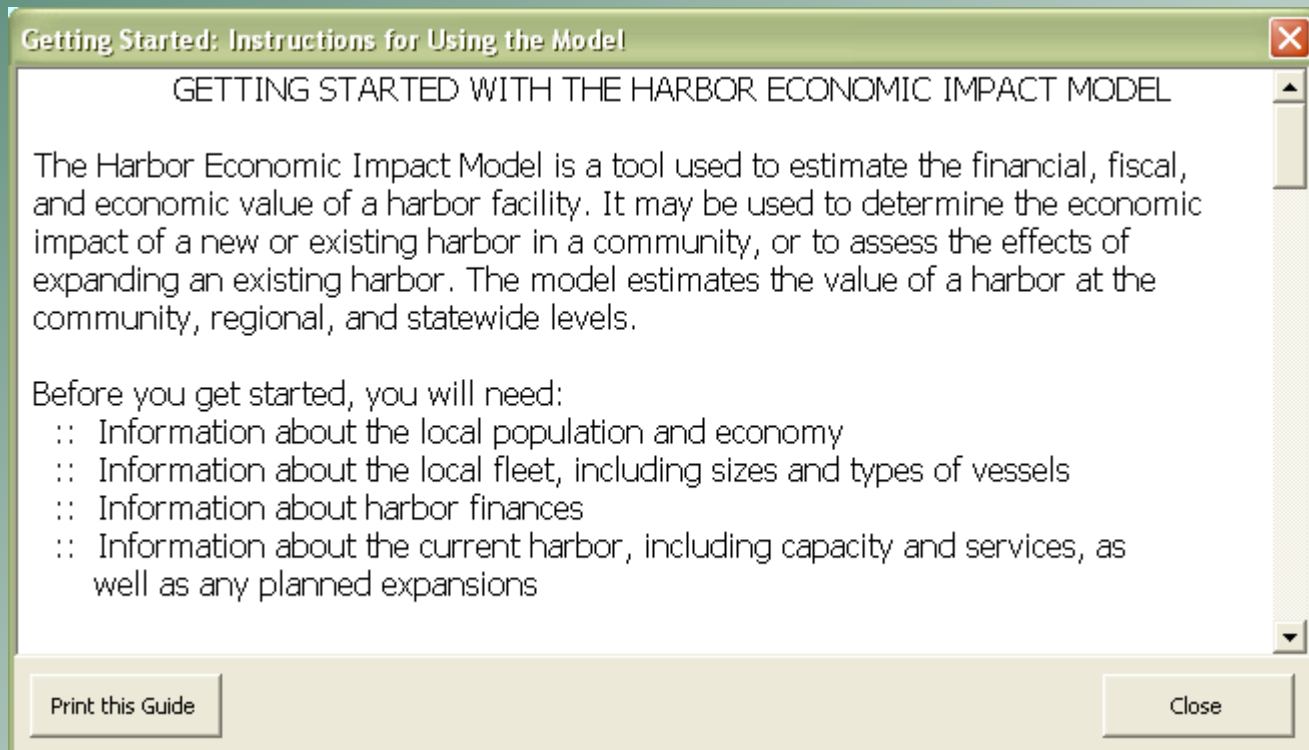
Main Menu



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Getting Started Guide



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Select Your Community

Community Selection

Please specify the community in which this harbor is located by selecting a community name below. This information is used to set up default tax rates and other characteristics for your community, and is also used to determine the harbor's impacts to your borough and the entire state.

If your community is not listed, please select the borough in which it is located or the nearest community of similar size. Please report missing communities to ADOT&PF.

Select your community from the following list:

- Adak
- Aleknagik
- Angeon
- Bethel
- Chenega Bay
- City & Borough of Juneau
- City & Borough of Sitka
- City & Borough of Yakutat
- Coffman Cove
- Cold Bay
- Cordova
- Craig
- Dillingham
- Edna Bay
- Elfin Cove
- Gustavus
- Haines

Select Community

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Verify Community Information

Verify Community Information ✕

Some characteristics of the community you have chosen are shown below. These values have been pulled from the best available sources. However, some of this information may no longer be correct. Please review the information shown below and make changes as necessary.

Community Characteristics	Value	Borough Characteristics	Value
Sales Tax Rate (%)	<input type="text" value="3"/>	Sales Tax Rate (%)	<input type="text" value="0"/>
Bed Tax Rate (%)	<input type="text" value="0"/>	Bed Tax Rate (%)	<input type="text" value="0"/>
Property Tax Mill Rate	<input type="text" value="0"/>	Property Tax Mill Rate	<input type="text" value="0"/>
Raw Fish Tax Rate (%)	<input type="text" value="0"/>	Raw Fish Tax (%)	<input type="text" value="0"/>
State Fish Tax Sharing	<input type="text" value="0"/>	State Fish Tax Sharing	<input type="text" value="0"/>

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Community Population

Community Characteristics (Step 1 of 11) ✕

Please verify your community's population and correct it if necessary.

Population of local community

Community Selected:
Adak

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Harbor Fees

Harbor Fees (Step 2 of 11) ✕

Harbor Fees

Item	Unit	Rate	Annual Collections	Item	Unit	Annual Collections
Moorage				Utilities not included in moorage		
Permanent	\$/linear foot/year	<input type="text" value="3"/>	<input type="text" value="100000"/>	Water & Sewer		<input type="text" value="5000"/>
	\$/square foot/year	<input type="text" value="0"/>	<input type="text" value="0"/>	Electricity		<input type="text" value="75000"/>
Transient	\$/linear foot/year	<input type="text" value="1.7"/>	<input type="text" value="50000"/>	Other		<input type="text" value="135000"/>
	\$/square foot/year	<input type="text" value="0"/>	<input type="text" value="0"/>	Equipment rentals		<input type="text" value="90000"/>
Storage: Gear and Other				Equipment other than boats lifts		<input type="text" value="90000"/>
Warehouse			<input type="text" value="45000"/>	Travel lift		<input type="text" value="75000"/>
Upland			<input type="text" value="75000"/>	Property Tax: Local		<input type="text" value="125000"/>
Skiff			<input type="text" value="30000"/>	Vessel and other gear		<input type="text" value="750000"/>
Crab pots and other gear			<input type="text" value="25000"/>	Commercial property leasing		<input type="text" value="0"/>
Storage: Vessels			<input type="text" value="0"/>	<i>(includes buildings and land, but excludes storage, gear, and vessels previously listed)</i>		
				Fuel for resale (fee)		<input type="text" value="0"/>
				Other		<input type="text" value="75000"/>

Note: In this step and subsequent steps, if an item does not apply to your harbor, enter a 0 instead of leaving it blank.

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Harbor Description

Harbor Description (Step 3 of 11) ✕

		Square Feet	
Moorage			
Slips			
Linear Feet	<input type="text" value="15000"/>	Commercial Floor Area	<input type="text" value="25000"/>
Square Feet	<input type="text" value="150000"/>	Land Area	<input type="text" value="10000"/>
Parallel Moorage		<i>(includes area occupied by commercial buildings)</i>	
Linear Feet	<input type="text" value="1800"/>	Storage Areas	
Square Feet	<input type="text" value="18000"/>	Warehouse	<input type="text" value="250000"/>
Haul Out		Gear and Other Storage	<input type="text" value="100000"/>
Haul outs per year	<input type="text" value="75"/>	Vessel Storage	<input type="text" value="150000"/>

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Harbor Expenses

Harbor Expenses (Step 4 of 11) ✕

Item	Annual Expenditures	Item	Annual Expenditures
Personal services	<input type="text" value="475000"/>	Equipment	<input type="text" value="425000"/>
Travel	<input type="text" value="225000"/>	Equipment	<input type="text" value="425000"/>
Supplies	<input type="text" value="300000"/>	Vehicle / equipment maintenance	<input type="text" value="12000"/>
Utilities for resale		Interest expense / debt service	<input type="text" value="125000"/>
Water and Sewer	<input type="text" value="55000"/>	Depreciation	<input type="text" value="250000"/>
Electricity	<input type="text" value="45000"/>	Other expenses	<input type="text" value="25000"/>
Repairs and maintenance	<input type="text" value="125000"/>		
Payments in lieu of taxes	<input type="text" value="100000"/>		

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Operating Expenses

Operating Expenses (Step 5 of 11) ✕

Operating expenses	Percent allocated to:	
	Floats, Moorage, and Vessel and Gear Storage Areas	Harbor Commercial Buildings and Property
Personnel services	<input type="text" value="70"/>	<input type="text" value="25"/>
Utilities	<input type="text" value="85"/>	<input type="text" value="15"/>
Repairs and maintenance	<input type="text" value="70"/>	<input type="text" value="25"/>
Supplies	<input type="text" value="70"/>	<input type="text" value="25"/>
Debt service	<input type="text" value="70"/>	<input type="text" value="25"/>
Payments in lieu of taxes	<input type="text" value="85"/>	<input type="text" value="15"/>
Other	<input type="text" value="85"/>	<input type="text" value="10"/>

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Harbor Utilization

Harbor Utilization (Step 6 of 11)



Commercial Fishing Vessels

Primary Moorage (# of Vessels)	Vessel Length (feet)						
	<22	22-32	33-43	44-54	55-74	75-150	151+
Permanent Moorage - Local	<input type="text" value="0"/>	<input type="text" value="110"/>	<input type="text" value="14"/>	<input type="text" value="10"/>	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Permanent Moorage - Non-Local							
Other Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Outside Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Transient Moorage Hailing or Home Port							
Local	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Other Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Outside Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Recreation

Primary Moorage (# of Vessels)	Vessel Length (feet)				
	<22	22-36	37-54	55-75	>75
Permanent Moorage - Local	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Permanent Moorage - Non-Local					
Other Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Outside Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Transient Moorage Hailing or Home Port					
Local	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Other Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Outside Alaska	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Charter Fishing and Commercial Tours

Primary Moorage (# of Vessels)	Vessel Length (feet)						
	<22	22-32	33-43	44-54	55-74	75-150	151+
Permanent Moorage - Local	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Permanent Moorage - Non-Local							

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Harbor Activity

Harbor Activity (Step 7 of 11) ✕

	Type of Vessel		
	Commercial Fishing	Charter/Tour	Recreational
Average days typical vessel is active per year	<input type="text" value="165"/>	<input type="text" value="180"/>	<input type="text" value="180"/>
Local Harbor Activity: Number of days operating in or from local harbor			
Primary moorage in local harbor	<input type="text" value="125"/>	<input type="text" value="125"/>	<input type="text" value="170"/>
Primary moorage in other Alaska harbors	<input type="text" value="15"/>	<input type="text" value="28"/>	<input type="text" value="7"/>
Primary moorage outside Alaska	<input type="text" value="25"/>	<input type="text" value="27"/>	<input type="text" value="3"/>
	<input type="button" value="Back"/>	<input type="button" value="Next"/>	

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Capital Replacement Expenses

Capital Replacement Expenses (Step 8 of 11) ✕

Financing/Bond Interest Rate (%)

	Estimated Replacement Cost	Useful Life, New Equipment (Years)	Percent of Cost Allocated To:	
			Floats, Moorage, and Vessel and Gear Storage Areas	Harbor Commercial Buildings and Property
Buildings	<input type="text" value="500000"/>	<input type="text" value="30"/>	<input type="text" value="70"/>	<input type="text" value="25"/>
Facilities	<input type="text" value="750000"/>	<input type="text" value="30"/>	<input type="text" value="95"/>	<input type="text" value="5"/>
Vehicles	<input type="text" value="135000"/>	<input type="text" value="7"/>	<input type="text" value="70"/>	<input type="text" value="25"/>
Miscellaneous	<input type="text" value="75000"/>	<input type="text" value="5"/>	<input type="text" value="70"/>	<input type="text" value="25"/>

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Float Replacement Expenses

Float Replacement Expenses (Step 9 of 11) ✕

Float Area (sq. feet)	<input type="text" value="75000"/>
Float Replacement Cost (\$/sq. foot)	<input type="text" value="4"/>
Useful Life of Float (years)	<input type="text" value="30"/>

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Local Fiscal Impacts

Local Fiscal Impacts (Step 10 of 11)

Operating Revenues		Operating Expenses	
Locally generated revenues		Harbor	1487000
Tax revenues	155410.8	General government	0
Enterprise revenues	325000	Public safety	0
Rentals and leases	750000	Education	0
Other local revenues	455000	Debt retirement	0
Outside revenue sources		Other	0
Federal operating revenues	0	Capital and float replacement expenses	168250,4122
State Revenue Sharing	0		
State Safe Communities	0		
State Fish Tax Sharing	369645		
Other State revenue	0		
Other outside revenues	0		

Note: Cells with gray numbers have been calculated from earlier input. The numbers are shown only as a reference, and may not be changed at this step.

Back Next

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Borough Fiscal Impacts

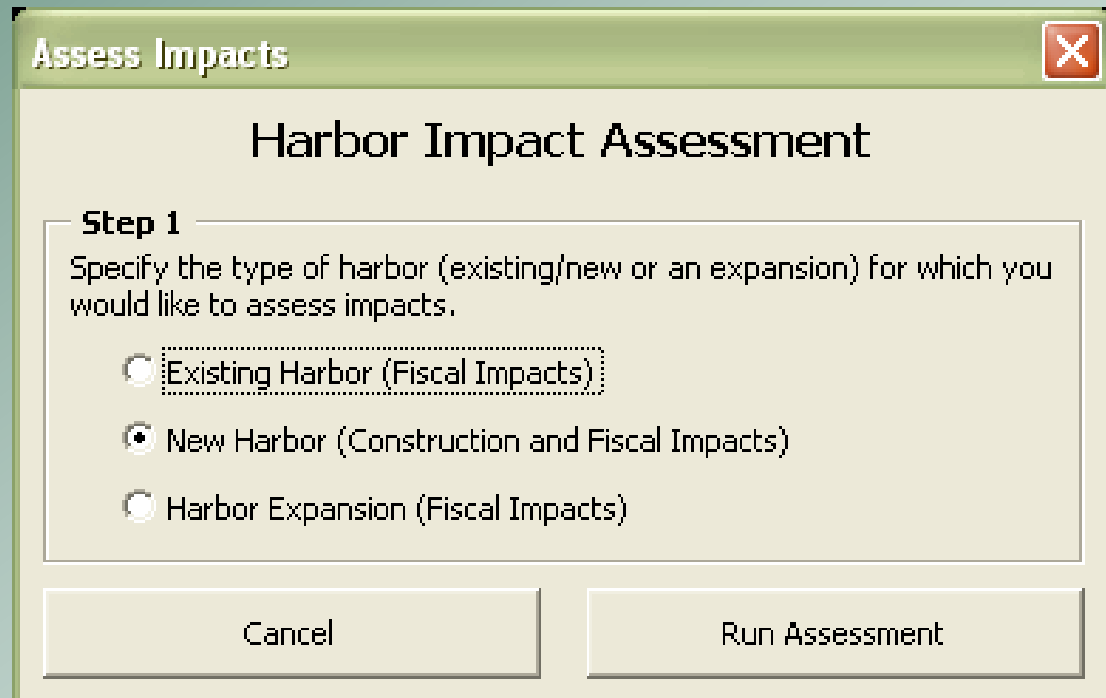
Borough Fiscal Impacts (Step 11 of 11) ✕

Operating Revenues		Operating Expenses	
Locally generated revenues		Harbor	<input type="text" value="0"/>
Tax revenues	<input type="text" value="0"/>	General government	<input type="text" value="0"/>
Enterprise revenues	<input type="text" value="0"/>	Public safety	<input type="text" value="0"/>
Rentals and leases	<input type="text" value="0"/>	Education	<input type="text" value="0"/>
Other local revenues	<input type="text" value="0"/>	Debt retirement	<input type="text" value="0"/>
Outside revenue sources		Other	<input type="text" value="0"/>
Federal operating revenues	<input type="text" value="0"/>		
State Revenue Sharing	<input type="text" value="0"/>		
State Safe Communities	<input type="text" value="0"/>		
State Fish Tax Sharing	<input type="text" value="369645"/>		
Other State revenue	<input type="text" value="0"/>		
Other outside revenues	<input type="text" value="0"/>		

Note: If your community is not located in a borough, enter 0 for all modifiable fields. Cells with gray numbers have been calculated from earlier input. The numbers are shown only as a reference, and may not be changed at this step.

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- **Once you've entered that information, you can estimate impacts:**



Assess Impacts

Harbor Impact Assessment

Step 1

Specify the type of harbor (existing/new or an expansion) for which you would like to assess impacts.

Existing Harbor (Fiscal Impacts)

New Harbor (Construction and Fiscal Impacts)

Harbor Expansion (Fiscal Impacts)

Cancel Run Assessment

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Output from the model:

HARBOR ECONOMIC IMPACT MODEL
SUMMARY REPORT FOR SEWARD SMALL BOAT HARBOR
CONSTRUCTION AND FISCAL IMPACTS OF NEW HARBOR
October 18, 2004

Operational Impacts	State	Borough / Census Area	Local
Total Sales (Direct, Indirect, Induced)	\$14,678,839	\$12,391,320	\$11,369,479
Employment (Direct, Indirect, Induced)	172	143	121
Payments to Labor (Direct, Indirect, Induced)	\$4,026,100	\$3,424,000	\$3,154,200

Harbor Revenues (Direct)

Moorage	\$150,000
Storage gear and vessels	\$175,000
Utilities	\$215,000
Haulout and equipment rental	\$165,000
Business property leasing	\$750,000
Other	\$75,000
Total	\$1,530,000

Harbor Expenses

Personnel services	\$451,000
Utilities	\$100,000
Repairs and maintenance	\$130,000
Supplies	\$285,000
Debt service	\$119,000
Payments in lieu of taxes	\$100,000
Annualized float replacement costs	\$24,000
Annualized other capital replacement costs	\$140,000
Other operating expenses	\$238,000
Total	\$1,036,000

	Borough / Census Area	Local
Government Revenues		
Harbor Revenues	\$0	\$325,000
Other government revenues	\$841,722	\$1,730,071
Total operating revenues	\$841,722	\$2,055,071
Government Expenditures		
Harbor expenditures	\$0	\$1,487,000
Other government expenditures	\$153,144	\$485,676
Total operating expenditures	\$153,144	\$1,972,676

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■ Economic Impacts:

Operational Impacts	State	Borough / Census Area	Local
Total Sales (Direct, Indirect, Induced)	\$14,678,839	\$12,391,320	\$11,369,479
Employment (Direct, Indirect, Induced)	172	143	121
Payments to Labor (Direct, Indirect, Induced)	\$4,026,100	\$3,424,000	\$3,154,200

- Total sales
- Employment
- Payments to Labor

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■ Harbor Revenues and Expenses:

Harbor Revenues (Direct)	
Moorage	\$150,000
Storage gear and vessels	\$175,000
Utilities	\$215,000
Haulout and equipment rental	\$165,000
Business property leasing	\$750,000
Other	\$75,000
Total	\$1,530,000
Harbor Expenses	
Personnel services	\$451,000
Utilities	\$100,000
Repairs and maintenance	\$130,000
Supplies	\$285,000
Debt service	\$119,000
Payments in lieu of taxes	\$100,000
Annualized float replacement costs	\$24,000
Annualized other capital replacement costs	\$140,000
Other operating expenses	\$238,000
Total	\$1,036,000

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■ Government Revenues and Expenses:

	Borough / Census Area	Local
Government Revenues		
Harbor Revenues	\$0	\$325,000
Other government revenues	\$841,722	\$1,730,071
Total operating revenues	\$841,722	\$2,055,071
Government Expenditures		
Harbor expenditures	\$0	\$1,487,000
Other governerment expenditures	\$153,144	\$485,676
Total operating expenditures	\$153,144	\$1,972,676

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- **A new harbor will also have construction impacts:**

Construction Impacts			
	State	Borough / Census Area	Local
Estimated base construction cost for the Inner Harbor			\$1,624,666
Estimated total cost of new harbor including upland facilities			\$4,923,003
Total Sales (Direct, Indirect, Induced)	\$7,596,671	\$6,670,733	\$7,011,516
Employment (Direct, Indirect, Induced)	130	94	82
Payments to Labor (Direct, Indirect, Induced)	\$4,500,373	\$3,229,950	\$2,965,046

- Inner Harbor costs come from DOT's model

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- **This output shows an existing harbor.**
- **You can assess new harbors**
 - enter information as if harbor existed
 - output includes construction impacts
- **You can assess harbor expansions**
 - enter existing information
 - make changes for expansion
 - compare the results

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- **How to use the model:**
 - Decide what you want to model
 - Gather all the required information
 - Harbor finances
 - Estimated revenues and expenses
 - Enter information in the model
 - View output and adjust inputs as needed

Model Demonstration



- **Northern Economics, Inc. was asked to look at funding options for Seward's harbor expansion**
- **We developed revenue estimates based on City's calculations and harbor design**
- **We used the model to estimate increase in bed and sales tax revenues**

Model Demonstration

- **Why only bed and sales tax revenues?**
 - Represents money that flows to the City
 - Does not have a lag like other economic impacts
 - Could be used to pay debt service
- **Full economic impact would be useful for demonstrating need for funding**

Model Demonstration



■ Revenue estimates

■ Initial steps:

- Determine changes
 - Potential increase in rates
 - Increase in slips and transient parallel moorage
- Estimate revenues
 - With rate increase
 - With expansion
 - With rate increase and expansion

Model Demonstration



■ Revenue estimates

■ We estimated:

■ Relative changes in revenues:

- 12% increase in rates
- 27% increase in slips
- 40% increase in transient moorage

■ Changes in revenues for each scenario:

- Base revenues of \$800,000
- Rate increase – up 12% to \$896,000
- Harbor expansion – up 31% to \$1,045,000
- Rate increase and harbor expansion – up 46% to \$1,171,000

Model Demonstration

- **To estimate additional sales tax revenues, we use the model.**
- **We only make two changes:**
 - Vessels in various size categories
 - Revenues from moorage, utilities, etc.
 - Other variables are not important...
unless we want to calculate economic impacts

Model Demonstration



- **Ways to do this calculation:**
 - 1. Enter information for existing and expanded harbors, then compare differences
 - 2. Enter information for change in vessels only
- **Why and how?**
 - 1. Calculate all impacts – wide range of changes
 - 2. Calculate specific impact – bed and sales taxes – with knowledge of how model works

Model Demonstration

- **Looking at bed and sales tax revenues under two situations:**
 - All commercial fishing
 - All recreation
- **Why these choices?**
 - Representative of mix of vessel types
 - Represents a good set of bounds
 - Results can be used to estimate revenues based on fleet composition

Model Demonstration

- **Commercial fishing vessel information – changes in fleet**

Harbor Utilization (Step 6 of 11)

Commercial Fishing Vessels

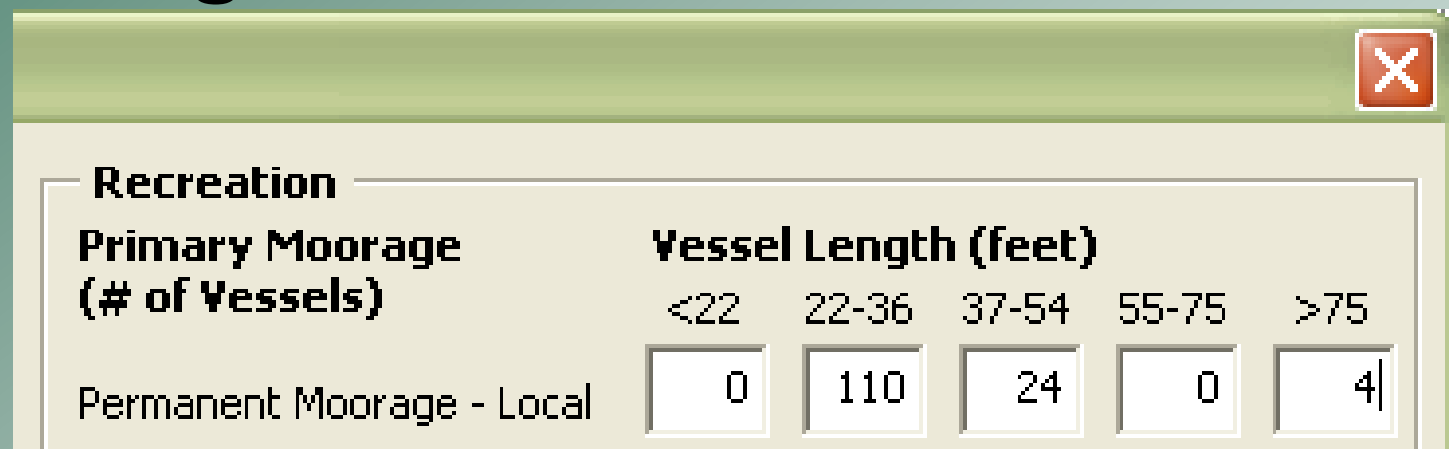
**Primary Moorage
(# of Vessels)**

Vessel Length (feet)

	<22	22-32	33-43	44-54	55-74	75-150	151+
Permanent Moorage - Local	0	110	14	10	0	4	0

Model Demonstration

- **Recreational vessel information – changes in fleet**



Primary Moorage (# of Vessels)	Vessel Length (feet)				
	<22	22-36	37-54	55-75	>75
Permanent Moorage - Local	0	110	24	0	4

Model Demonstration

- **Output – need to go into underlying sheets for this detail...**

- **Commercial fishing**

	V	W	X
39	Harbor related tax revenues		
40		Harbor related sales tax	\$33,347
41		Harbor related bed tax	\$4,601

- **Recreational**

	V	W	X
39	Harbor related tax revenues		
40		Harbor related sales tax	\$10,202
41		Harbor related bed tax	\$5,307

Model Demonstration



- **Adding these numbers:**
 - Commercial Fishing – \$37,948
 - Recreation – \$15,509

Model Demonstration



- **This example only looked at slips**
- **Transient parallel moorage handled separately**

Model Demonstration



■ Findings:

- Rate increase and/or harbor expansion provide funds to cover debt service
- Bed and sales taxes provide additional revenues for use in debt service or operational needs.

Model Demonstration



- **What could we get from a full use of the model:**
 - Construction impacts from expansion
 - Local and regional estimates of
 - Total fees, spending, etc.
 - Economic impacts

Potential Future Improvements



- **Looking forward to future uses and enhancements**
- **Several changes would improve it:**
 - Under the hood changes
 - Interface changes
 - New features

Potential Future Improvements



■ Under the Hood Changes:

- Reorganize the underlying spreadsheets
- Expand coverage to harbors outside of Southcentral Alaska
- Expand customization for communities

Potential Future Improvements



■ Interface changes

- Better Microsoft Excel integration, e.g. exiting
- Better handling of saved information, e.g. location and name

Potential Future Improvements



■ New features

- Predictive changes, e.g. revenues and other numbers change with harbor changes
- Handle impacts of changes internally, e.g. no manual calculations of expansion impacts

Where to Learn More



- **At present, the model and manual are available from Alaska DOT&PF**
- **www.harbormodel.info**
 - Basic website at this time
 - Hope to add links to model files soon

Questions and Comments



- **Any questions or comments?**

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