

Evaluating Decommissioning Options

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Rigs to Reefs?
Options for Platform Decommissioning



Modeling the Options

- Many alternative options and preferences
- Difficult to analyze exhaustively
- Important to enable stakeholders to examine implications of assumptions and values
- Decision model loaded with all data and assessments used for the analysis
- Integrates quantitative and qualitative aspects



Model User Interface

Diagram - PLATFORM Decommissioning Decision Support Tool

PLATFORM Decommissioning Decision Support Tool

PLATFORM - OST Oil & Gas Platform Decommissioning Decision Support Tool

Platform Decommissioning Options		Multi Attribute Utility Analysis	
Select scenarios to consider	Edit Table	Range weights by attribute	
Define selected scenarios	Sub Table	Attribute ratings by level	Edit Table
Reef enhancements for partial removal	Sub Table	Weights by attribute	Edit table
Shell mound removal option by platform	Sub Table	Attribute rating by option	Calc mid
Use explosives on jacket piles for selected platforms	Sub Table	Multi-attribute score	Calc mid
HLV required for project (tons)	Calc mid	Equivalent cost weights by attribute	
Decommissioning options by selected platforms	Result mid	Cost weights by attribute (\$M)	Edit table
Project Cost Analysis		Equivalent cost by attribute (\$M)	Calc mid
Percent of avoided costs for beneficial use (%)	50% ▼	Total equivalent cost (\$M)	Calc mid
Decommissioning and Avoided Costs (\$)	Calc	Equivalent cost breakeven (\$M)	Calc mid
Avoided costs for beneficial use (\$)	Calc mid	Model Details	
Range percentage (as % of inputs) (%)	Edit Table	Multi Attribute Utility Analysis	
Cost tornado sensitivity (\$)	Calc mid	Model elements	

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Defining Decommissioning Scenarios

Edit Table - Define selected scenarios

Edit Table of Define selected scenarios

Platform

Selected scenarios

	Scenario 1	Scenario 2
Platform A	1 Complete platform removal ▼	2 Partial platform removal ▼
Platform B	1 Complete platform removal ▼	2 Partial platform removal ▼
Platform C	No action ▼	No action ▼
Edith	No action ▼	No action ▼
Ellen	No action ▼	No action ▼
Elly	No action ▼	No action ▼
Eureka	No action ▼	No action ▼
Gail	No action ▼	No action ▼
Gilda	No action ▼	No action ▼
Girra	No action ▼	No action ▼
Grace	No action ▼	No action ▼
Habitat	No action ▼	No action ▼
Harmony	No action ▼	No action ▼

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Defining Specific Impacts

The screenshot shows a software window titled "Diagram - Ocean access impacts". The breadcrumb trail is "PLATFORM Decommissioning Support Tool > Model elements > Ocean access impacts".

Module Inputs

- Use type by selected platforms (SubTable)
- Use distance limit (nautical miles) (11)
- Ocean access data (various) (Edit Table)
- Access Impacts by Removal Option, ... (Sq. nautical miles) (Edit Table)

Module Outputs

- Access type by selected platforms (Calc mid)
- Access impacts for selected platforms (sq. nautical miles) (Calc mid)
- Access impacts (% of State Fed waters) (%) (Calc mid)

Ocean Access Impacts Module Details

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Embedded Data

q Edit Table - Input Decommissioning Costs

Edit Table of Input Decommissioning Costs (\$)

Decommissioning Cost Categories ▼

Platform ▼

	Platform A	Platform B	Platform C	Edith
Proj mgmt & Engr & Planning	0	0	0	0
Permitting & Regulatory Compliance	0	0	0	0
Platform Preparation	957.71K	957.71K	957.71K	1.163564M
Conductors	4.157409M	4.329792M	3.316694M	1.650362M
HLV Mobilization & Demobilization	0	0	0	0
Abrasive Cut Spread Mob/Demob	0	0	0	0
Deck - removal	1.759372M	1.759372M	1.759372M	2.45146M
contingency portion	1.46502M	1.46502M	1.46502M	2.11302M
Pile - removal	1.515498M	1.515498M	1.584834M	4.095035M
Jacket - removal	558.932K	558.932K	558.932K	2.804512M
contingency portion	280.54K	280.54K	280.54K	1.801392M
Transportation & Disposal (metal)	1.327488M	1.327488M	1.327488M	3.086592M
Transportation & Disposal (conductor)	363.358K	379.381K	288.32K	136.641K
Site Clearance	709K	709K	709K	709K
Shell Mound Removal	0	0	0	0
Reef Enhancement	0	0	0	0

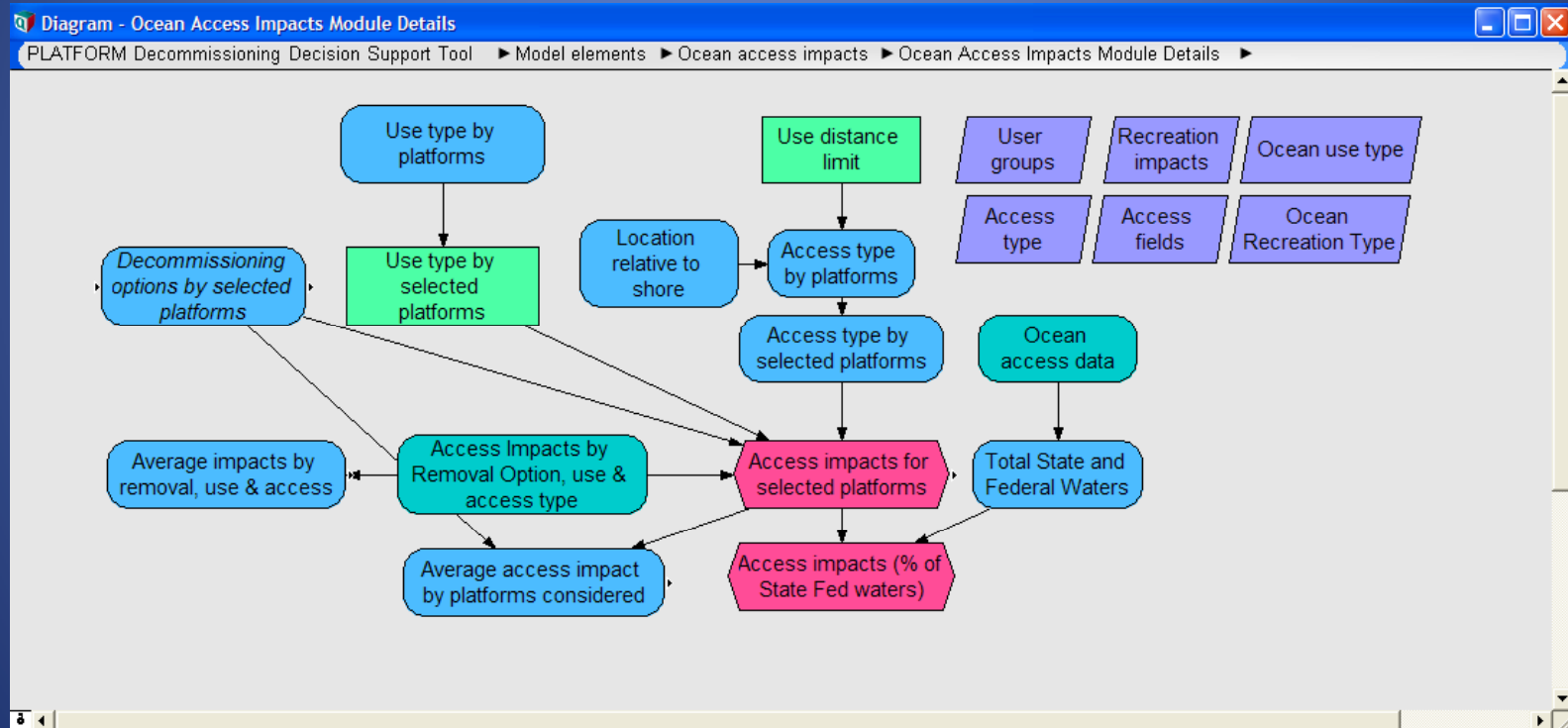
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Explicit Assumptions

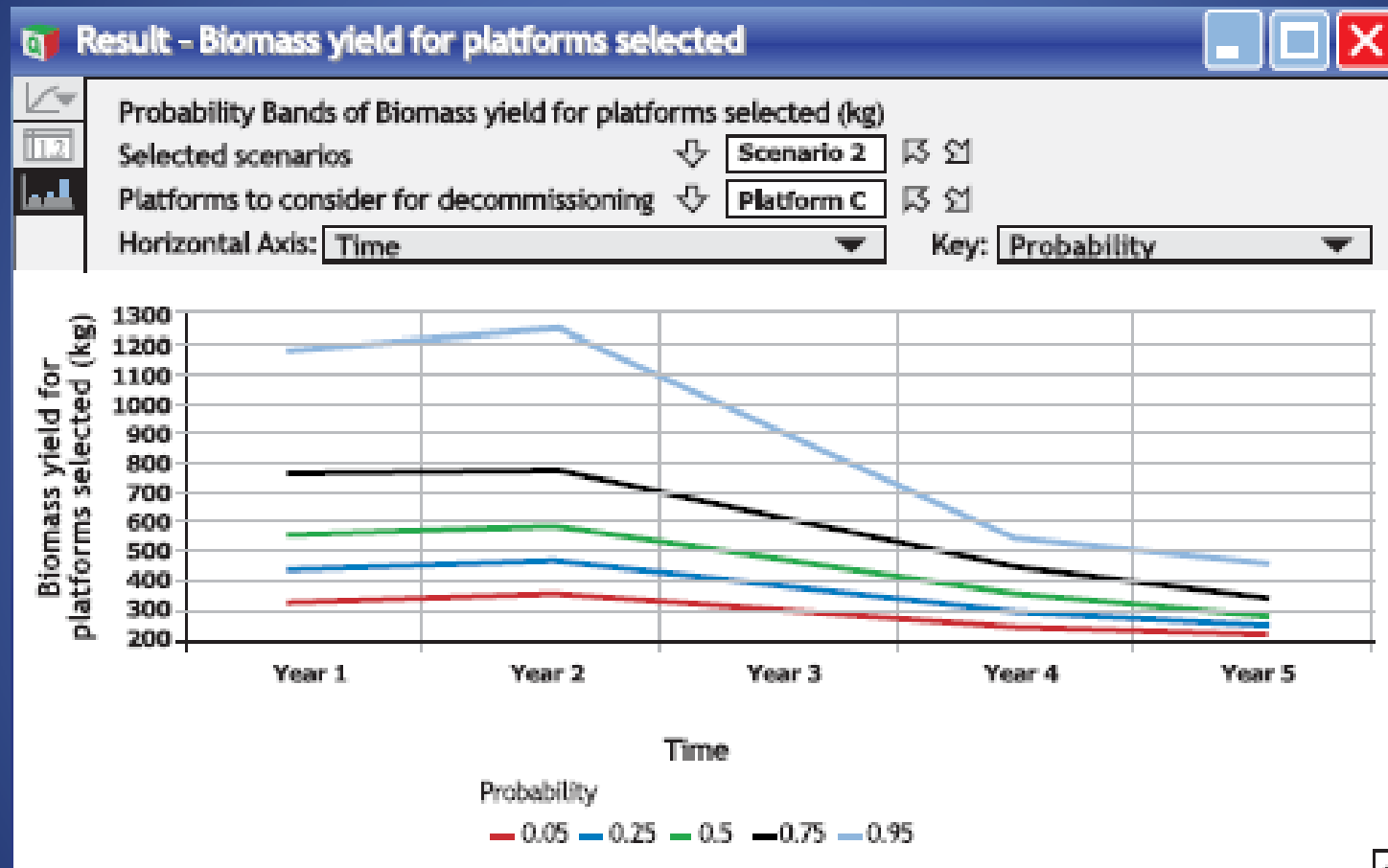
- Causal structure
- Explicit documentation / explanation



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Uncertainty Analysis



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Scoring Outcomes

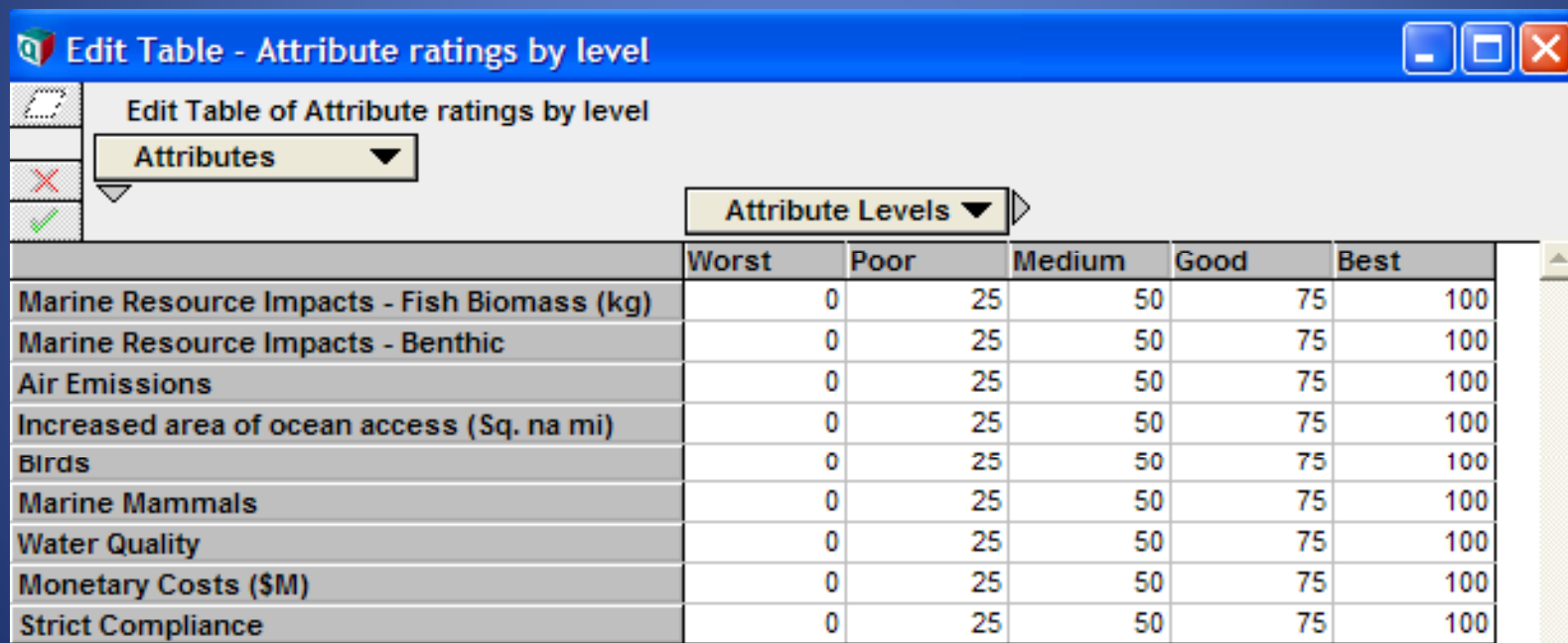
- Based on published literature, studies
- Define range of outcomes from Best to Worst

Water Quality		Accidental Spills & Discharges	
Attribute Level	Attribute Score	Qualitative Description	Condition
Best	100	Status quo	No Action
Good	75	NA	NA
Medium	50	Spill or discharge of contaminated material when partial removal is	Partial Removal
Poor	25	Accidental discharge of minimal amount of contaminated material at sea surface for shallow platforms when complete removal is selected	Complete Removal for Shallow Platforms
Worst	0	Accidental discharge of minimal amount of contaminated material at sea surface for deeper platforms when complete removal is selected	Complete Removal for Deep Platforms



Multi-Attribute Framework

- Default linear scale
- Adjustable by users



Edit Table - Attribute ratings by level

Edit Table of Attribute ratings by level

Attributes

Attribute Levels

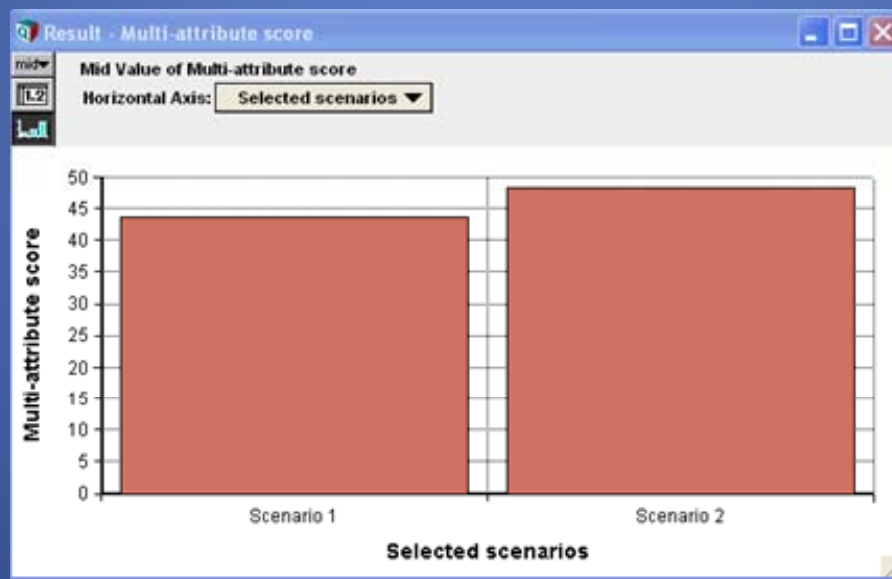
	Worst	Poor	Medium	Good	Best
Marine Resource Impacts - Fish Biomass (kg)	0	25	50	75	100
Marine Resource Impacts - Benthic	0	25	50	75	100
Air Emissions	0	25	50	75	100
Increased area of ocean access (Sq. na mi)	0	25	50	75	100
Birds	0	25	50	75	100
Marine Mammals	0	25	50	75	100
Water Quality	0	25	50	75	100
Monetary Costs (\$M)	0	25	50	75	100
Strict Compliance	0	25	50	75	100

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Overall Scores for Scenarios

- Integrate all quantitative and qualitative impacts
- Adjust assumptions to examine impact on overall score
- Quickly revise and rerun



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