

Project Name:

Northwestern Michigan College Data Collection of North Leelanau

Peninsula, Lake Michigan

Authors: Jackson Hollocker, Sam Brooks, Ben Meyers, Chris Groleau, Max Streeter, Alec Rice

Date: 04/27/23

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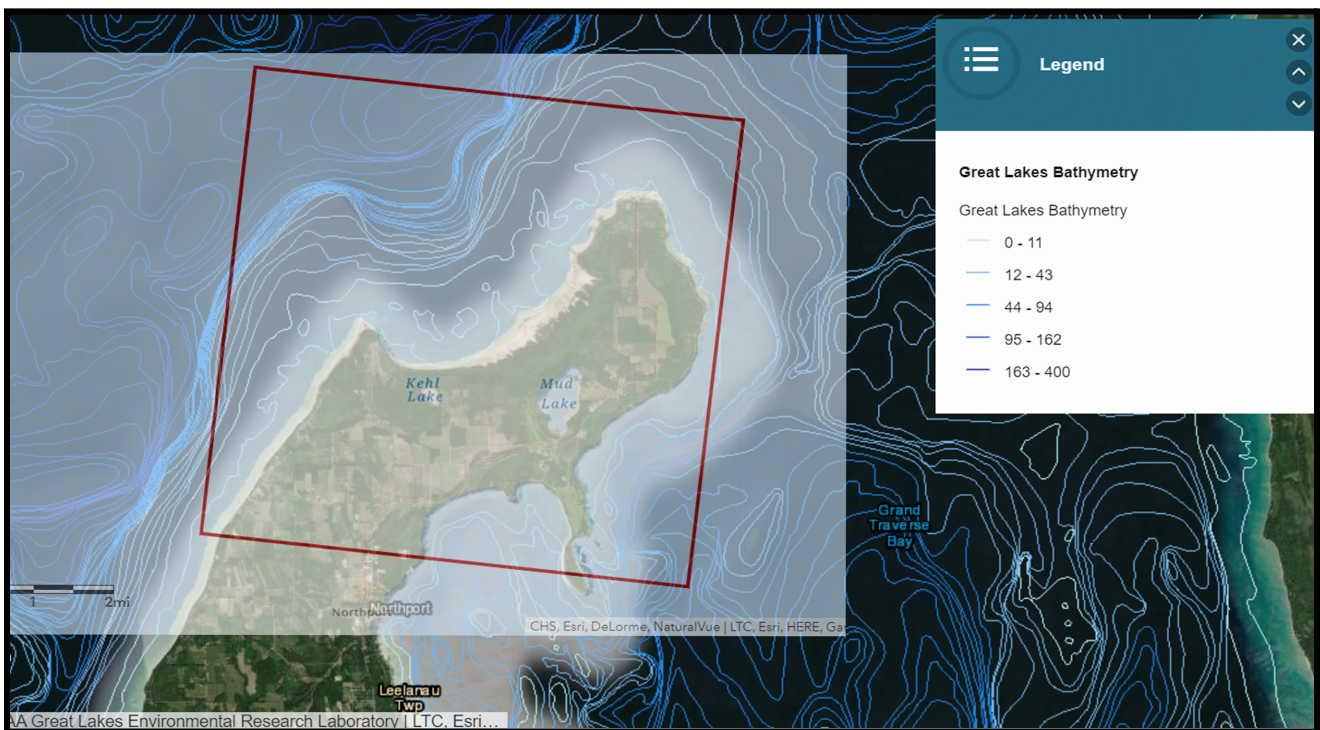
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PROJECT OVERVIEW

In May 2023, students at Northwestern Michigan College will begin the first phase of a multi-year collection of bathymetric data, backscatter data, and ground truthing data. The Northwestern Michigan College Data Collection of North Leelanau Peninsula, Lake Michigan project will be located in the northern area of the Leelanau peninsula in a 10 km x 10 km grid square designated as a high priority by project stakeholders. Data collected in this project will become available for public access on the SeaSketch database which contains internationally shared Great Lakes bathymetric data.



BUSINESS CASE

This project is worth the investment because it is helping with the Lakebed 2030 initiative. The data collected from the Lakebed 2030 initiative will contribute to the public knowledge of Great Lakes bathymetry, along with the environment in the AOI and potential targets. Additionally, this survey will provide opportunities for more field and project management experience for Northwestern Michigan College's marine technology program students. It allows the students to set and complete a project that will be recognized by a variety of different employers and research organizations.

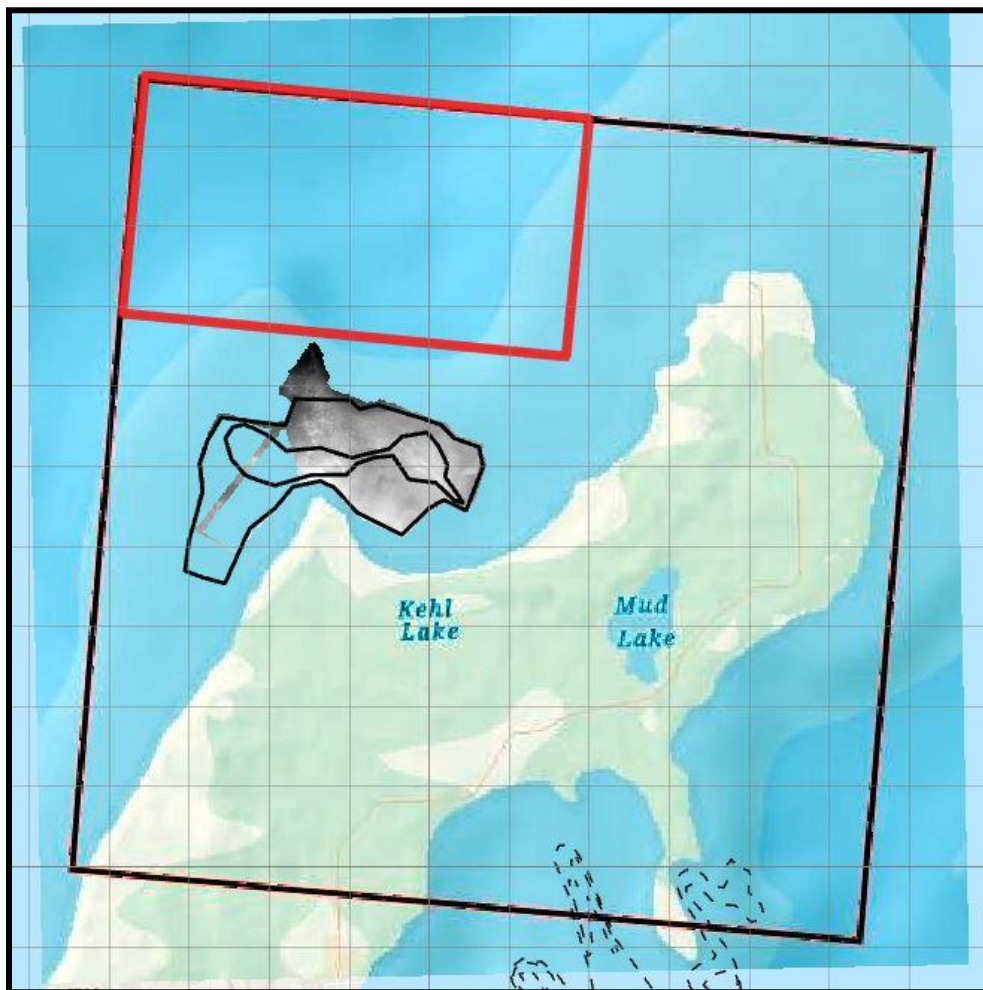
PROJECT SCOPE

The main service for this project would be using multibeam sonar to collect bathymetric data and backscatter data within the area of interest (AOI) determined by stakeholders. The area designated for our project is a 10 km square located northwest of the tip of the Leelanau peninsula.

The 2040p MK2 Kongsberg multibeam sonar system acquired for this project has the capability to find points of interest that would later be inspected by a remotely operated vehicle (ROV) or by another sonar system. Northwestern Michigan College will provide a research vessel, multibeam, side scan, and ROV.

Our service will provide a detailed map of the area of interest and find significant targets. These targets could be notable ground features such as shipwrecks or significant habitat changes on the bottom that could lead to a better understanding of the lakebed.

Survey operations at the Leelanau Peninsula AOI will consist of several phases over the course of approximately four years. The work done during each phase will be planned based on equipment availability and stakeholder priorities. Work during phase one (spring/summer 2023) will be based on stakeholder interest in specific high-priority areas and high-priority data within the AOI. Priority 1 zone data collection will take place in the deeper region of the AOI shown by the red rectangle in the image below. This region has been requested for survey by stakeholders at NOAA, NMC, and the lighthouse due to a lack of existing data and suspicion of shipwrecks. Priority two collection (2024) will take place on Cathead Reef to support the USGS and MDNR initiative to map reefs in the Great Lakes.



Assumptions:

The following is a list of key assumptions associated with the implementation of the project.

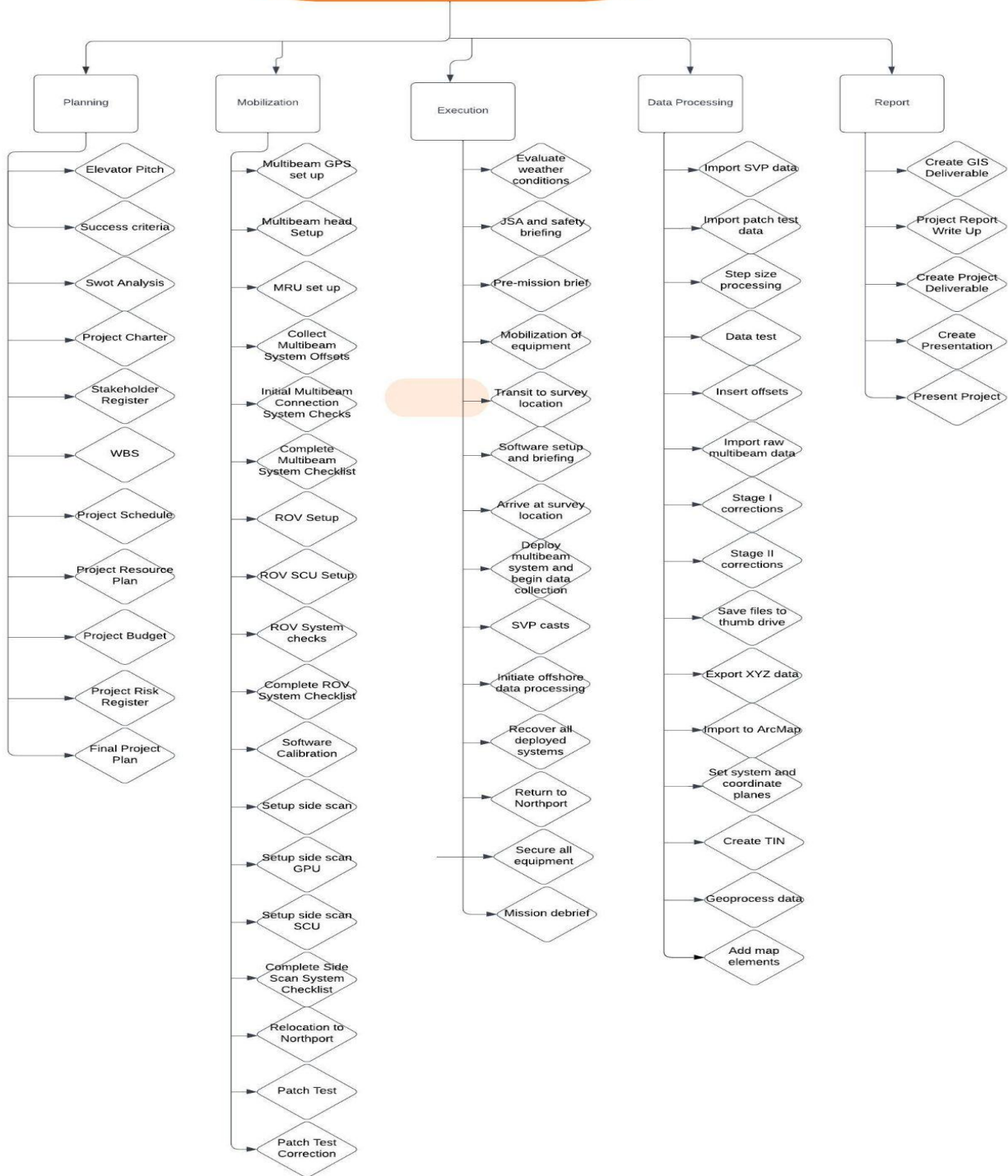
- Full access to areas to be surveyed
- Power requirements for equipment will be satisfied
- Utilization of personnel is efficient (cooperation between WSI433/WSI310 students)
- Weather will be ideal for the operation of equipment
- Effective communication

Constraints:

The following is a list of key constraints associated with the implementation of the project.

- Limited to 4 days of operations
- One day for equipment mobilization
- One research vessel
- Limited equipment capabilities
- Equipment malfunctions
- Inclement weather conditions

Northwestern Michigan College Data Collection of North Leelanau Peninsula, Lake Michigan Year 1 Project



The process behind the Work Based Structure (WBS) for this project analyzes all aspects of the project at hand. The WBS is separated into five main phases; planning, mobilizing, executing, data processing, and reporting. The planning phase outlines each aspect of the project scope, schedule, and budget. The mobilization phase states how each piece of equipment will be set up in order to complete the project. The execution of the project gives the outline of where the data is collected and what equipment is used to collect the data. It also states the days on which the team plans to do in order to complete the outlined project. The final two phases are the data processing and the report. These two stages take the data that the team collected and process it into a deliverable for the stakeholders.

COMMUNICATION PLAN

The communication approach that we used to contact our stakeholders was through emails, phone calls, and Zoom meetings. The importance of the communication between the team and the stakeholders was to ensure the desired portion of the area of interest was collected. It was also important to collect data in the proper form the stakeholders wanted; whether visual, through sonar, or another method. The communication between the team and the stakeholders helped shape most of the project.

SCHEDULE

	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1	Planning	86 days	Mon 1/2/23 8:00 AM	Mon 5/1/23 5:00 PM	
2	1.1	Start Project	0 days	Mon 1/2/23 8:00 AM	Mon 1/2/23 8:00 AM	
3	1.2	Elevator Pitch	6 days	Wed 1/4/23 8:00 AM	Wed 1/11/23 5:00 PM	2
4	1.3	Success criteria	5 days	Thu 1/12/23 8:00 AM	Wed 1/18/23 5:00 PM	
5	1.4	Swot Analysis	10 days	Thu 1/19/23 8:00 AM	Wed 2/1/23 5:00 PM	
6	1.5	Project Charter	6 days	Wed 2/15/23 8:00 AM	Wed 2/22/23 5:00 PM	3,4,5
7	1.6	Stakeholder Register	6 days	Wed 3/1/23 8:00 AM	Wed 3/8/23 5:00 PM	6
8	1.7	WBS	6 days	Thu 3/9/23 8:00 AM	Thu 3/16/23 5:00 PM	6,7
9	1.8	Project Schedule	5 days	Fri 3/17/23 8:00 AM	Thu 3/23/23 5:00 PM	8
10	1.9	Project Resource Plan	6 days	Wed 3/29/23 8:00 AM	Wed 4/5/23 5:00 PM	6
11	1.10	Project Budget	1 day	Fri 4/7/23 8:00 AM	Fri 4/7/23 5:00 PM	6,10
12	1.11	Project Risk Register	6 days	Wed 4/12/23 8:00 AM	Wed 4/19/23 5:00 PM	11
13	1.12	Final Project Plan	4 days	Wed 4/26/23 8:00 AM	Mon 5/1/23 5:00 PM	12
14	2	Mobilization	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
15	2.1	Mobilization Start	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	13
16	2.2	Multibeam GPS set up	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	15
17	2.3	Multibeam head Setup	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	15
18	2.4	MRU set up	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	15
19	2.5	Collect Multibeam System Offsets	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
20	2.6	Initial Multibeam Connection System Checks	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	16,17,18

	WBS	Task Name	Duration	Start	Finish	Predecessors
21	2.7	Complete Multibeam System Checklist	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	19,20
22	2.8	ROV Setup	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
23	2.9	ROV SCU Setup	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
24	2.10	ROV System checks	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
25	2.11	Complete ROV System Checklist	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
26	2.12	Software/Hardware Calibration	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
27	2.13	Set up side scan	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
28	2.14	Set up side scan GPU	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	22,23,24
29	2.15	Set up side scan SCU	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	19
30	2.16	Complete Side Scan System Checklist	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
31	2.17	Relocation to Northport	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
32	2.18	Patch Test	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	
33	2.19	Patch Test Correction	1 day	Mon 5/15/23 8:00 AM	Mon 5/15/23 5:00 PM	27,28,29
34	3	Execution	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	
35	3.1	Evaluate weather conditions	1 day	Tue 5/16/23 8:00 AM	Tue 5/16/23 5:00 PM	21
36	3.2	JSA and safety briefing	4 days	Tue 5/16/23 8:00 AM	Fri 5/19/23 5:00 PM	32
37	3.3	Pre-mission brief	4 days	Mon 5/15/23 8:00 AM	Thu 5/18/23 5:00 PM	

	WBS	Task Name	Duration	Start	Finish	Predecessors
38	3.4	Mobilization of equipment	4 days	Mon 5/15/23 8:00 AM	Thu 5/18/23 5:00 PM	
39	3.5	Transit to survey location	4 days	Wed 5/17/23 8:00 AM	Mon 5/22/23 5:00 PM	35
40	3.6	Software setup and briefing	4 days	Mon 5/22/23 8:00 AM	Thu 5/25/23 5:00 PM	36
41	3.7	Arrive at survey location	4 days	Mon 5/22/23 8:00 AM	Thu 5/25/23 5:00 PM	21,36
42	3.8	Deploy multibeam system and begin data collection	4 days	Fri 5/19/23 8:00 AM	Wed 5/24/23 5:00 PM	31,38
43	3.9	SVP	4 days	Tue 5/23/23 8:00 AM	Fri 5/26/23 5:00 PM	39
44	3.10	Initiate offshore data processing	4 days	Fri 5/26/23 8:00 AM	Wed 5/31/23 5:00 PM	40
45	3.11	Recover all deployed systems	4 days	Fri 5/26/23 8:00 AM	Wed 5/31/23 5:00 PM	41
46	3.12	Return to Northport	4 days	Thu 5/25/23 8:00 AM	Tue 5/30/23 5:00 PM	42
47	3.13	Secure all equipment	4 days	Mon 5/29/23 8:00 AM	Thu 6/1/23 5:00 PM	43
48	3.14	Mission debrief	4 days	Thu 6/1/23 8:00 AM	Tue 6/6/23 5:00 PM	44
49	4	Data Processing	10 days	Mon 5/15/23 8:00 AM	Fri 5/26/23 5:00 PM	
50	4.1	Import SVP data	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	46
51	4.2	Import patch test data	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	47
52	4.3	Step size processing	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	
53	4.4	Data test	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	43

	WBS	Task Name	Duration	Start	Finish	Predecessors
54	4.5	Insert offsets	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	32
55	4.6	Import raw multibeam data	1 day	Fri 5/19/23 8:00 AM	Fri 5/19/23 5:00 PM	44,51
56	4.7	Stage I corrections	8 days	Mon 5/15/23 8:00 AM	Wed 5/24/23 5:00 PM	52
57	4.8	Stage II corrections	10 days	Mon 5/15/23 8:00 AM	Fri 5/26/23 5:00 PM	53
58	4.9	Save files to thumb drive	5 days	Mon 5/15/23 8:00 AM	Fri 5/19/23 5:00 PM	54
59	4.10	Export XYZ data	1 day	Fri 5/26/23 8:00 AM	Fri 5/26/23 5:00 PM	50,55
60	4.11	Import to ArcMap	1 day	Thu 5/25/23 8:00 AM	Thu 5/25/23 5:00 PM	56
61	4.12	Set system and coordinate planes	1 day	Fri 5/26/23 8:00 AM	Fri 5/26/23 5:00 PM	55
62	4.13	Create TIN	1 day	Fri 5/26/23 8:00 AM	Fri 5/26/23 5:00 PM	58
63	4.14	Geoprocess data	1 day	Mon 5/8/23 8:00 AM	Mon 5/8/23 5:00 PM	59
64	4.15	Add map elements	1 day	Mon 5/8/23 8:00 AM	Mon 5/8/23 5:00 PM	60
65	5	Report	5 days	Mon 5/22/23 8:00 AM	Fri 5/26/23 5:00 PM	
66	5.1	Create GIS Deliverable	5 days	Mon 5/29/23 8:00 AM	Fri 6/2/23 5:00 PM	62
67	5.2	Project Report Write Up	5 days	Mon 5/22/23 8:00 AM	Fri 5/26/23 5:00 PM	63
68	5.3	Create Project Deliverable	5 days	Mon 5/22/23 8:00 AM	Fri 5/26/23 5:00 PM	
69	5.4	Create Presentation	5 days	Mon 5/22/23 8:00 AM	Fri 5/26/23 5:00 PM	64
70	5.5	Present Project	5 days	Mon 5/22/23 8:00 AM	Fri 5/26/23 5:00 PM	

RESOURCE PLAN & PROJECT BUDGET

RESOURCE COST OVERVIEW

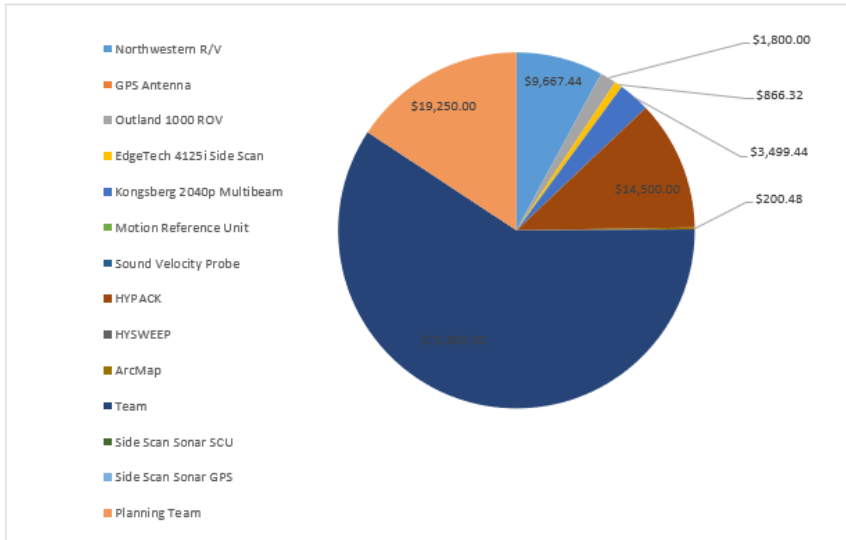
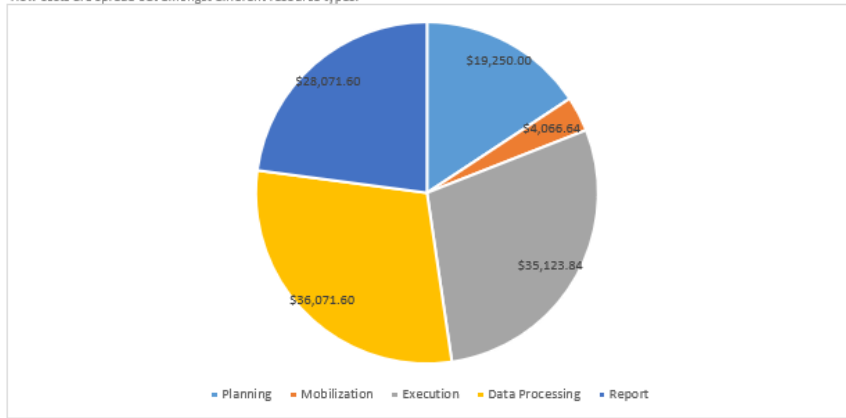
COST DETAILS

Cost details for all work resources.

Name	Standard Rate	Cost
Northwestern R/V	\$41.67/hr	\$9,667.44
GPS Antenna	\$0.00/hr	\$0.00
Outland 1000 ROV	\$25.00/hr	\$1,800.00
EdgeTech 4125i Side Scan	\$8.33/hr	\$866.32
Kongsberg 2040p Multibeam	\$20.83/hr	\$3,499.44
Motion Reference Unit	\$0.00/hr	\$0.00
Sound Velocity Probe	\$0.00/hr	\$0.00
HYPACK	\$62.50/hr	\$14,500.00
HYSWEEP	\$0.00/hr	\$0.00
ArcMap	\$1.79/hr	\$200.48
Team	\$350.00/hr	\$72,800.00
Side Scan Sonar SCU	\$0.00/hr	\$0.00
Side Scan Sonar GPS	\$0.00/hr	\$0.00
Planning Team	\$43.75/hr	\$19,250.00

COST DISTRIBUTION

How costs are spread out amongst different resource types.



*Resources with a zero cost is factored into the cost of a total sonar system.

Actual Cost

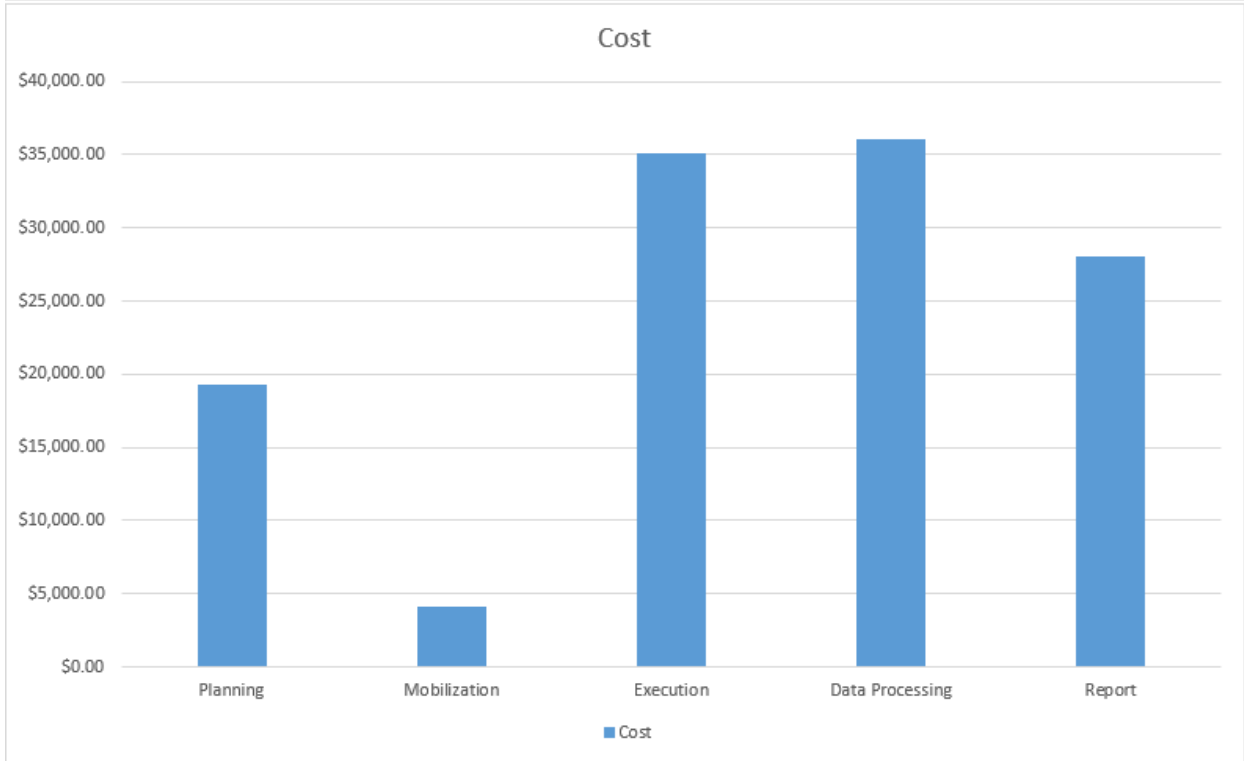
Remaining Cost

Cost Variance

\$15,400.00

\$107,183.68

\$122,583.68



Name	Remaining Cost	Actual Cost	Cost
Planning	\$3,850.00	\$15,400.00	\$19,250.00
Mobilization	\$4,066.64	\$0.00	\$4,066.64
Execution	\$35,123.84	\$0.00	\$35,123.84
Data Processing	\$36,071.60	\$0.00	\$36,071.60
Report	\$28,071.60	\$0.00	\$28,071.60

RISK MANAGEMENT PLAN

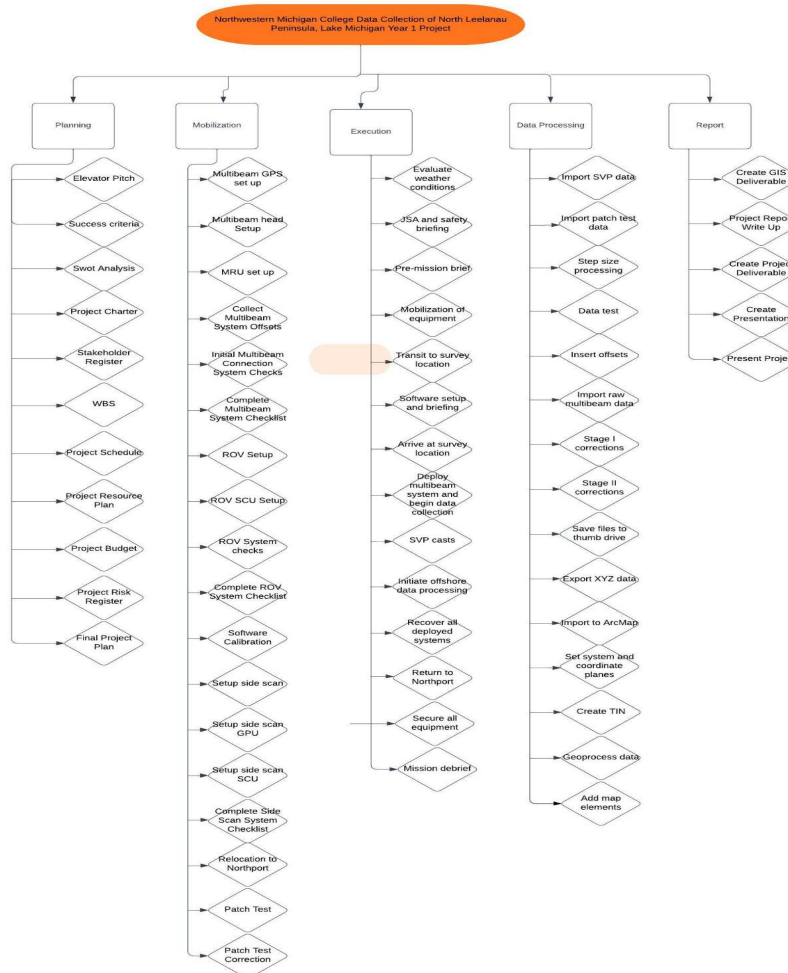
Risk	Definition	Response Plan	Responsible Person
ROV Problems	Technical problems result in loss of functionality.	Provide a JSA in support of ROV operations. Identify ROV backup for Outland 1000.	J. Hollocker
Vessel Problems	Vessel cannot resume charter due to operating issues.	Conduct pre-checks the day prior to project start.	J. Lutchko
Missing Equipment	Missing necessary equipment needed to conduct the project mission.	Acquire an equipment checklist for each day of operations.	J. Hollocker
Personnel Health & Safety	Injured or unhealthy personnel.	Conduct a daily JSA of operations to identify high-risk evolutions and instruct people on project safety.	J. Hollocker
Sonar Malfunctions	Issues with initial set-up or operations.	Reference set-up manuals to help if troubleshooting is required.	J. Hollocker
Losing Equipment	Equipment needed for collection has been misplaced or lost.	Ensure tie-off points are secure and inspect cables before deployment, as well as secure idle equipment.	J. Hollocker and crew
Losing Data	Data was either not collected or lost due to transfer or corruption issues.	Bring a USB device and create a Google Drive to back up data, and back it up 2 times per day, and more if possible.	J. Hollocker and Crew

SUMMARY

The Northwestern Michigan College project management team will conduct the first stage of a multiyear project in May 2023. The Northwestern Michigan College Data Collection of North Leelanau Peninsula, Lake Michigan Project will include bathymetry and backscatter data collected from several sonar systems along with additional data collected from a remotely operated vehicle. The data will be shared with stakeholders directly and publicly shared to the NOAA database SeaSketch.

APPENDIX

Work breakdown structure



Stakeholder Register

Project Management: Stakeholder Register

Project Name: Northwestern Michigan College Data Collection of North Leelanau Point, Lake Michigan						Project Manger: Jackson H
Stakeholder's Name	Position	Preferred Communication Method	Contact Information	Location	Role	Major Requirements & Expectations
Peter Esselman	USGS Habitat mapping specialist	Email	pesselman@usgs.gov	USGS Great Lakes Science Center	Point of contact with USGS	Cathead Reef Data
Dave Clapp	DNR Mapping	Email	CLAPPD@michigan.gov	MI DNR	Lead mapping specialist for reef mapping project	Cathead Reef Data
Ed Bailey	NMC Marine Project Management Instructor	In person	ebailey@nmc.edu	NMC	Guide NMC project team	Successful Survey and increase recognition for opportunities
John Lutchko	NMC Marine Technology Advisor & Northwestern R/V captain	In person	jlutchko@nmc.edu	NMC	Subject matter expert. Research vessel captain	Successful Survey and increase recognition for opportunities
Hans VanSumeren	NMC Marine Technology Advisor	In person	hvanumeren@nmc.edu	NMC	Subject matter expert	Successful Survey and increase recognition for opportunities
Linden Brinks	GLOS Geospatial Analyst	Email	linden@glos.org	MI	Communication contact for GLOS	Data Collection of AOI
Cathleen Yung	Geospatial Coordinator	Email	cathleen.yung@noaa.gov	MI	Communication contact for GLOS	Data Collection of AOI
NMC Project Management Class	Project Team	email	hollcjc@mail.nmc.edu	NMC	Project management, data collection, and deliverables	Successful Survey and increase recognition for opportunities
Scott Swan	Data Analysis Expert	email	sswan@mail.nmc.edu	NMC	Subject Matter Expert	Successful data collection/transfer of material
WSI 310	Sub Project Team	email	N/A	NMC	Data Collection and deliverables	Assisting WSI 433 with the collection of data
Kongsberg	Equipment Donator	email	N/A		Provides Equipment for Collection	Sonar arrives on time with all nessary
Steph Staley	AOI Interest in Shipwrecks	email	sstaley2525@gmail.com	MI	Intel on more detailed AOIs	Opportunities to find shipwrecks within
	NOAA GL Nav Manager	email	thomas.loeper@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Dennis Donahue	NOAA GLERL	email	dennis.donahue@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Ben Turschak	MI DNR	email	turschakb1@michigan.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Brandon Krumwiede	AA's Office for Coastal Managem	email	brandon.krumwiede@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Gust Annis	The Nature Conservancy	email	gannis@tnc.org	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Diana Olinger	NOAA/NOS/OCM	email	diana.olinger@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Douglas Pearsall	The Nature Conservancy	email	dpearsall@tnc.org	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Heather Stirratt	AA's Office for Coastal Managem	email	heather.stirratt@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Andrew Briggs	gan Department of Natural Reso	email	briggsa4@michigan.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Meghan Hemken	AA's Office for Coastal Managem	email	meghan.hemken@noaa.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Mike Grimm	The Nature Conservancy	email	mgrimm@tnc.org	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Philippa Kohn	The Nature Conservancy	email		N/A	GLOS	Cathead Reef and Lighthouse Point Data

Project Management: Stakeholder Register

Project Name: Northwestern Michigan College Data Collection of North Leelanau Point, Lake Michigan						Project Manger: Jackson H
Stakeholder's Name	Position	Preferred Communication Method	Contact Information	Location	Role	Major Requirements & Expectations
Chris May	The Nature Conservancy	email	cmay@tnc.org	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Jana Stewart	U.S. Geological Survey (USGS)	email	jsstewar@usgs.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Kurt Kowalski	U.S. Geological Survey (USGS)	email	kkowalski@usgs.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Thomas Weaver	S-WRD MI-OH Water Science Ce	email	tlweaver@usgs.gov	N/A	GLOS	Cathead Reef and Lighthouse Point Data
Brandon Krumwiede	OAA's Office for Coastal Manageme	email	brandon.krumwiede@noaa.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Matthew Kovach	The Nature Conservancy	email	matthew.kovach@tnc.org	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Stephanie Hickel	The Nature Conservancy	email	stephanie.hickel@tnc.org	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Brian Weidel	U.S. Geological Survey	email	bweidel@usgs.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Walter Barnhardt	U.S. Geological Survey	email	wbarnhardt@usgs.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Michelle Selzer	MI DEGLE	email	SELZERM@michigan.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Kate Lederle	Great Lakes and Energy	email	lederlek@michigan.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Stephanie Swart	Great Lakes and Energy	email	SWARTS@michigan.gov	N/A	SPS Great Lakes	Cathead Reef and Lighthouse Point Data
Charles Menza	NCCOS Great Lakes	email	Charles.menza@noaa.gov	N/A	SPS NOAA- Wide	Cathead Reef and Lighthouse Point Data
VictorHom	ources Services Branch/Office of W	email	victor.hom@noaa.gov	N/A	SPS NOAA- Wide	Cathead Reef and Lighthouse Point Data
Mary Mullusky	N/A	email	mary.mullusky@noaa.gov	N/A	SPS NOAA- Wide	Cathead Reef and Lighthouse Point Data
Jessica Nation	N/A	email	N/A	N/A	NOAA	Data processing assistance
Meredith Westinghouse	N/A	email	N/A	N/A	NOAA	Data processing assistance
NMC Admissions Office	NMC Admissions Office	Email	admissions@nmc.edu	NMC	Exposure to students enrolling in NMC	Increase in marine technology interest
Nick Nissley	President of NMC	Email	nnissley@nmc.edu	NMC	Increase visibility of NMC's Marine Tehcnology program	Well developed report and presentation

Risk Register

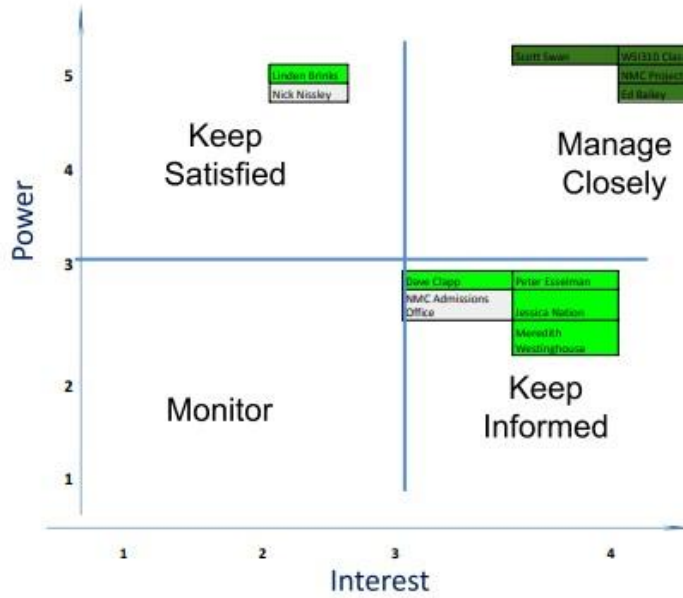
Project Name: Northwestern Michigan College Data Collection of North Leelanau Peninsula, Lake Michigan				Current Revision Prepared by: Jackson Hollocker, Sam Brooks						Date of Last Update:								
Risk Identification		Objectives Impacted by Risk	Initial Risk Assessment				Threat Response Strategy			Opportunity Response Strategy			Residual Risk			Risk Owner	Start Date for Risk	End Date for Risk
Description of Risk	WBS		Probability Scale	Impact Scale	Risk Score	For Threats		For Opportunities	Probability Scale	Impact Scale	Risk Score							
			Quality	Cost		Schedule	Response Techniques		Quality	Cost		Schedule						
			5	4		3	Avoid the Threat		5	4		3	Exploit the Opportunity					
		1	2	1	8-15	HIGH	Transfer the Threat	2	2	1	8-15	HIGH						
		2	1	1	4-8	MEDIUM	Mitigate the Threat	3	1	1	4-8	MEDIUM						
		1	1	1	1-3	LOW	Accept the Threat	1	1	1	1-3	LOW						
		Project Objectives Impacted	Probability	Impact	Risk Matrix Score	Threat Response	Threat Response Description	Opportunity Response	Opportunity Response Description	Probability	Impact	Risk Matrix Score						
Multibeam Deployment Failure	2.1, 2.2, 2.17, 3.8, 4, 5	Scope	3	3	9	HIGH	Avoid the Threat	Ensure proper mobilization of multibeam, and create checklists to ensure proper setup	Accept the Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	2-Jun-23		
SIS Problems	2.17, 3.8, 4	Schedule	4	2	8	MEDIUM	Accept the Threat	Gain a proper understanding of how the software works and what is needed to run the software	Accept the Opportunity	2	2	4	MEDIUM	J Hollocker	05/15/2023	1-Jun-23		
Multibeam Pole Mount Unusable	2.17, 3.8, 4, 5	Schedule	2	3	6	MEDIUM	Accept the Threat	Complete equipment inspection and attempt to repair/fix any problems with the pole	Accept the Opportunity	2	2	4	MEDIUM	J Hollocker	05/15/2023	2-Jun-23		
Broken/Missing Cables	2, 3, 4, 5	Schedule	3	2	6	MEDIUM	Avoid the Threat	Create checklists to ensure proper connection and use of cables	Accept the Opportunity	2	3	6	MEDIUM	J Hollocker	05/15/2023	2-Jun-23		
Sonar Head Damaged	2.1, 2.2, 2.17, 3.8, 4, 5	Cost	1	3	3	LOW	Avoid the Threat	Ensure proper mobilization of sonar, and create checklists to ensure proper setup	Accept the Opportunity	1	3	3	LOW	J Hollocker	05/15/2023	2-Jun-23		
Problems With Northwestern	2.16, 3.5, 3.7, 3.12	Schedule	3	3	9	HIGH	Mitigate the Threat	Ensure correct maintenance and upkeep is done to reduce probability of failure	Accept the Opportunity	3	3	9	HIGH	J Hollocker	05/15/2023	05/25/2023		
ROV Unusable	2.7, 3.4, 3.8, 4, 5	Scope	2	2	4	MEDIUM	Accept the Threat	Prepare alternate methods of survey IE scanning sonar in event of ROV failure	Accept the Opportunity	1	2	2	LOW	J Hollocker	05/15/2023	2-Jun-23		
ROV Electrical Issues	2.7, 3.4, 3.8, 4, 5	Scope	2	1	2	LOW	Mitigate the Threat	Troubleshoot any electronics issues	Accept the Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	2-Jun-23		
ROV Camera Issues	2.7, 3.4, 3.8, 4, 5	Scope	2	1	2	LOW	Mitigate the Threat	Troubleshoot camera failures	Accept the Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	2-Jun-23		

ROV SCU Damaged	2, 7, 3, 4, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Use caution when plugging, unplugging and using liquids around the SCU	Accept the Opportunity	Trouble Shooting Opportunity	1	2	2	LOW	J Hollocker	05/15/2023	2-Jun-23
Missing ROV Components	2, 7, 3, 4, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Refrence checklist	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/15/2023	2-Jun-23
Sidescan Usuable	2, 12, 2, 15, 3, 8, 4, 5	Scope	1	1	1	LOW	Accept the Threat	Use alternate methods of sonar imagry	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/15/2023	15-May-23
Sidescan Tether Broken	2, 12, 2, 15, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Use caution and properly secure tether	Accept the Opportunity	Trouble Shooting Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	15-May-23
Sidescan SCU Damaged	2, 12, 2, 15, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Use caution when plugging, unplugging and using liquids around the SCU	Accept the Opportunity	Trouble Shooting Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	15-May-23
Sidescan Missing Components	2, 12, 2, 15, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Refrence checklist	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/15/2023	15-May-23
Sidescan Software Not Compatable	2, 12, 2, 15, 3, 8, 4, 5	Scope	1	1	1	LOW	Avoid the Threat	Troubleshoot using manual, contact customer service	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/15/2023	15-May-23
Computers Unuasble	2, 3, 4, 5	Scope	2	1	2	LOW	Accept the Threat	Backup computers	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/15/2023	2-Jun-23
Storage Drive Corrupted	3, 8, 3, 10, 4, 5	Schedule	2	2	4	MEDIUM	Accept the Threat	Back up data to thumb drives and cloud as frequently as possible	Accept the Opportunity		2	1	2	LOW	J Hollocker	05/19/23	2-Jun-23
No SIS Software Key	3, 8, 3, 10, 4, 5	Schedule	1	3	3	LOW	Mitigate the Threat	Ensure SIS software access is available for use before project execution begins	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/19/23	2-Jun-23
Arc Map license Not Available	4, 11-4, 15, 5	Schedule	2	2	4	MEDIUM	Mitigate the Threat	Communicate with Scott Swan to obtain ARC Map	Accept the Opportunity		1	1	1	LOW	J Hollocker	05/25/23	2-Jun-23
NO Access to Software	3, 8, 3, 10, 4, 5	Schedule	2	3	6	MEDIUM	Mitigate the Threat	Ensure access to equipment compatible software before starting project	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/19/23	2-Jun-23
SIS Connectivity Issues	3, 8, 3, 10, 4, 5	Schedule	3	2	6	MEDIUM	Accept the Threat	Complete equipment/software compatibility tests and checks before mobilizing equipment	Accept the Opportunity	Trouble Shooting Opportunity	3	2	6	MEDIUM	J Hollocker	05/19/23	2-Jun-23
Deliverable Requirements Not Met	5	Quality	1	3	3	LOW	Avoid the Threat	Create checklists to ensure all desired project goals are identified and completed	Accept the Opportunity		1	2	2	LOW	J Hollocker	5/22/23	2-Jun-23
Lost Data	3, 8, 3, 10, 4, 5	Scope	1	3	3	LOW	Mitigate the Threat	Data Backups	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/19/23	2-Jun-23
Poor Data Collection/ Resolution is Bad	4, 5	Quality	2	3	6	MEDIUM	Avoid the Threat	Test collection resolution before survey	Accept the Opportunity		2	2	4	MEDIUM	J Hollocker	05/08/23	2-Jun-23
Incorrect IMU Offsets	3, 8, 3, 10, 4	Quality	2	2	4	MEDIUM	Avoid the Threat	Measure carefully and verify results with SME	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/19/23	2-Jun-23
Not Enough SVP Casts	3, 8, 3, 10, 4	Quality	2	2	4	MEDIUM	Avoid the Threat	Execute SVP casts at regular intervals	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/19/23	2-Jun-23
Inadequate Data Processing	4, 5	Quality	1	2	2	LOW	Avoid the Threat	Backups of RAW data.	Accept the Opportunity	Chance to Improve technical skills	1	2	2	LOW	J Hollocker	05/08/23	2-Jun-23
Poor Georeferencing	4, 5	Quality	1	3	3	LOW	Avoid the Threat	Clarify georeferencing points and ensure GPS is working properly	Accept the Opportunity	Chance to Improve technical skills	1	3	3	LOW	J Hollocker	5/8/23	2-Jun-23
Safety Risks	2, 3	Schedule	2	3	6	MEDIUM	Mitigate the Threat	JSA, Life jackets, and PPE	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/15/2023	6-Jun-23
Weather Impact on Survey	2, 3	Schedule	5	3	15	HIGH	Accept the Threat	Find another place to survey inside bay	Exploit the Opportunity	Good weather can result in good conditions of surveying.	5	3	15	HIGH	J Hollocker	05/15/2023	6-Jun-23
Injuries	2, 3	Cost	2	3	6	MEDIUM	Mitigate the Threat	First Aid, PPE, JSA	Accept the Opportunity		1	2	2	LOW	J Hollocker	05/15/2023	6-Jun-23

Internal Team Conflict	1, 2, 3, 4, 5	Quality	2	2	4	MEDIUM	Mitigate the Threat	Conflict resolution Strategy	Accept the Opportunity	1	1	1	LOW	J Hollocker	01/02/2023	26-May-23
Impact on NMC's Reputation Pending on Survey Results	5	Quality	5	3	15	HIGH	Accept the Threat	implement CRM strategies and de-escalate conflict when possible	Exploit the Opportunity	3	2	6	MEDIUM	J Hollocker	5/22/23	2-Jun-23
Lack of Experience With New Team	2, 3, 4	Schedule	3	1	3	LOW	Mitigate the Threat	Communicate with and monitor team members potentially unfamiliar with equipment and software	Accept the Opportunity	1	1	1	LOW	J Hollocker	05/15/2023	1-Jun-23
Poor Communication	1, 2, 3, 4, 5	Schedule	2	1	2	LOW	Mitigate the Threat	implement CRM strategies	Accept the Opportunity	1	1	1	LOW	J Hollocker	01/02/2023	2-Jun-23
Strategic Arguments	1, 2, 3, 4, 5	Schedule	3	1	3	LOW	Avoid the Threat	Leadership listens to concerns and makes decision.	Accept the Opportunity	2	1	2	LOW	J Hollocker	01/02/2023	2-Jun-23
Absent Team Members	1, 2, 3, 4, 5	Schedule	3	1	3	LOW	Accept the Threat	Continue with survey unless too many are absent	Accept the Opportunity	3	1	3	LOW	J Hollocker	01/02/2023	2-Jun-23
Poor Scheduling	1, 2, 3, 4, 5	Schedule	1	2	2	LOW	Avoid the Threat	Create WBS and assign specific tasks to be completed on specific dates where possible	Accept the Opportunity	1	2	2	LOW	J Hollocker	01/02/2023	2-Jun-23
Illness	1, 2, 3, 4, 5	Schedule	3	2	6	MEDIUM	Accept the Threat	Enough Crew to rreplace absent techs	Accept the Opportunity	3	1	3	LOW	J Hollocker	01/02/2023	2-Jun-23
Poor Planning	1, 2, 3, 4, 5	Schedule	3	2	6	MEDIUM	Avoid the Threat	Go over plan before survey	Accept the Opportunity	2	1	2	LOW	J Hollocker	01/02/2023	2-Jun-23
Not All Risks are Considered	1, 2, 3, 4, 5	Quality	2	2	4	MEDIUM	Avoid the Threat	Attempt to consider as many realistic risks that could impact the project in a risk register	Accept the Opportunity	1	1	1	LOW	J Hollocker	01/02/2023	2-Jun-23
Scope Creep	1, 2, 3, 4	Scope	1	2	2	LOW	Avoid the Threat	Consult and review project schedule frequently and clearly identify project scope and goals	Accept the Opportunity	1	2	2	LOW	J Hollocker	01/02/2023	1-Jun-23
Team Members Overallocated	1, 2, 3, 4, 5	Schedule	2	2	4	MEDIUM	Avoid the Threat	Complete WBS and make sure resources/team members are not overallocated	Accept the Opportunity	1	2	2	LOW	J Hollocker	01/02/2023	2-Jun-23
Poor Leadership	1, 2, 3, 4, 5	Quality	2	2	4	MEDIUM	Mitigate the Threat	implement CRM strategies to question poor decisions made by leadership	Accept the Opportunity	2	2	4	MEDIUM	J Hollocker	01/02/2023	2-Jun-23
Discover a Shipwreck	3, 4	Quality	3	3	9	HIGH	Accept the Threat	Use search patterns and search resolution that are more likley to result in finding a shipwreck	Accept the Opportunity	2	3	6	MEDIUM	J Hollocker	05/15/2023	1-Jun-23
Contribute to Public Knowledge of Great Lakes Bathymetry	4, 5	Scope	4	3	12	HIGH	Accept the Threat	Collect useable bathymetric data to enhance Public knowledge of great lakes bathymetry	Exploit the Opportunity	5	2	10	HIGH	J Hollocker	05/08/2023	2-Jun-23
Team Leading Project	1, 2, 3, 4, 5	Quality	5	2	10	HIGH	Accept the Threat	Build knowledge of project management and CRM strategies to lead team.	Exploit the Opportunity	4	2	8	MEDIUM	J Hollocker	01/02/2023	2-Jun-23
Adding to NOAA SeaSketch database	4, 5	Scope	4	3	12	HIGH	Mitigate the Threat	Team should become familiar with seasketch and remain contacted with NOAA	Exploit the Opportunity	5	3	15	HIGH	J Hollocker	05/08/2023	2-Jun-23
Handling New Equipment	2, 3	Quality	5	3	15	HIGH	Accept the Threat	Team should attempt to familiarize themselves with new equipment if possible ahead of time	Exploit the Opportunity	5	2	10	HIGH	J Hollocker	05/15/23	8-May-23

Power Interest Grid

Stakeholders - Power/Interest grid



Color Code
Unaware
Aware
Cautious
Neutral
Supportive
Leading

Steph Stalvy	Heather Stratt	Thomas Weaver	Stephanie Swert
Tom Looper	Andrew Briggs	Brandon Krumwiede	Charles Menas
Dennis Donahue	Maghan Hamlen	Matthew Kovach	Victor Horn
Ben Turschak	Mike Graven	Stephanie Hicel	Mary Mullosky
Brandon Krumwiede	Phillippo Kohn	Brian Wenzel	
Scott Acott	Chris May	Walter Barabardi	
Diana Ginger	Jana Stewart	Michelle Setzer	
Douglas Pearsall	Kurt Kowalski	Kate Ledette	

Stakeholder Engagement Matrix Part 1

Stakeholder Name	Status	Unaware	Resistant	Cautious	Neutral	Supportive	Leading
Dave Clap	Current					x	
	Desired					x	
Ed Bailey	Current						x
	Desired						x
John Lutchko	Current						x
	Desired						x
Hans VanSumeren	Current						x
	Desired						x
Linden Brinks	Current					x	
	Desired					x	
Cathleen Yung	Current						x
	Desired						x
Peter Esselman	Current					x	
	Desired					x	
NMC Project Team	Current						x
	Desired						x
Scott Swan	Current						x
	Desired						x
	Current					x	

Stakeholder Engagement Matrix Part 2

Stakeholder Name	Status	Unaware	Resistant	Cautious	Neutral	Supportive	Leading
WSI 310	Desired					x	
	Current						
	Desired						
Konsberg Guy	Current					x	
	Desired					x	
Steph Staley	Current	x					
	Desired					x	
Tom Loeper	Current					x	
	Desired					x	
Benjamin Bonk	Current					x	
	Desired					x	
Ben Turschak	Current					x	
	Desired					x	
Brandon Krumwiede	Current					x	
	Desired					x	
Gust Annis	Current					x	
	Desired					x	
Diana Olinger	Current					x	
	Desired					x	
Douglas Pearsall	Current					x	
	Desired					x	
Heather Stirratt	Current					x	
	Desired					x	

Stakeholder Engagement Matrix Part 3

Stakeholder Name	Status	Unaware	Resistant	Cautious	Neutral	Supportive	Leading
Andrew Briggs	Current					x	
	Desired					x	
Meghan Hemken	Current					x	
	Desired					x	
Mike Grimm	Current					x	
	Desired					x	
Philippa Kohn	Current					x	
	Desired					x	
Chris May	Current					x	
	Desired					x	
Jana Stewart	Current					x	
	Desired					x	
Kurt Kowalski	Current					x	
	Desired					x	
Thomas Weaver	Current					x	
	Desired					x	
Brandon Krumwiede	Current					x	
	Desired					x	
Matthew Kovach	Current					x	
	Desired					x	

Stakeholder Engagement Matrix Part 4

Stakeholder Name	Status	Unaware	Resistant	Cautious	Neutral	Supportive	Leading
Stephanie Hickel	Current					x	
	Desired					x	
Brian Weidel	Current					x	
	Desired					x	
Walter Barnhardt	Current					x	
	Desired					x	
Michelle Selzer	Current					x	
	Desired					x	
Kate Lederle	Current					x	
	Desired					x	
Stephanie Swart	Current					x	
	Desired					x	
Charles Menza	Current					x	
	Desired					x	
Victor Hom	Current					x	
	Desired					x	
Mary Mullusky	Current					x	
	Desired					x	
Jessica Nation	Current					x	
	Desired					x	
	Current					x	

Stakeholder Engagement Matrix Part 5

Stakeholder Name	Status	Unaware	Resistant	Cautious	Neutral	Supportive	Leading
Meredith Westinghouse	Desired					x	
NMC Admissions Office	Current	x					
	Desired					x	
Nick Nissley	Current	x					
	Desired					x	

RACI Chart

WBS	Activity / Task Name	Stakeholder	RACI	Stakeholder	RACI	Stakeholder	RACI	Stakeholder	RACI
1	Planning	Team	R	Ed Bailey	C				
1.1	Elevator Pitch	Team	R	Ed Bailey	C				
1.2	Success criteria	Team	R	Ed Bailey	C				
1.3	Swot Analysis	Team	R	Ed Bailey	C				
1.4	Project Charter	Team	R	Ed Bailey	C	John Lutchko	C	Hans Van Summeran	C
1.5	Stakeholder Register	Team	R	Ed Bailey	C				
1.6	WBS	Team	R	Ed Bailey	C				
1.7	Project Schedule	Team	R	Ed Bailey	C				
1.8	Project Resource Plan	Team	R	Ed Bailey	C				
1.9	Project Budget	Team	R	Ed Bailey	C				
1.10	Project Risk Register	Team	R	Ed Bailey	C				
1.11	Final Project Plan	Team	R	Ed Bailey	C				
2	Mobilization	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.1	Multibeam GPS set up	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.2	Multibeam head Setup	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.3	MRU set up	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.4	Collect Multibeam System Offsets	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.5	Initial Multibeam Connection System Checks	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.6	Complete Multibeam System Checklist	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.7	ROV Setup	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.8	ROV SCU Setup	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.9	ROV System checks	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.10	Complete ROV System Checklist	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.11	Software Calibration	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.12	Setup side scan	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.13	Setup side scan GPU	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.14	Setup side scan SCU	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.15	Complete Side Scan System Checklist	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.16	Relocation to Northport	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
2.17	Patch Test	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C

2.18	Patch Test Correction	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3	Execution	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.1	Evaluate weather conditions	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.2	JSA and safety briefing	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.3	Pre-mission brief	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.4	Mobilization of equipment	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.5	Transit to survey location	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.6	Software setup and briefing	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.7	Arrive at survey location	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.8	Deploy multibeam system and begin data collection	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.9	SVP casts	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.10	Initiate offshore data processing	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.11	Recover all deployed systems	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.12	Return to Northport	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.13	Secure all equipment	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
3.14	Mission debrief	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
4	Data Processing	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
4.1	Import SVP data	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.2	Import patch test data	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.3	Step size processing	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.4	Data test	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.5	Insert offsets	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.6	Import raw multibeam data	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.7	Stage I corrections	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.8	Stage II corrections	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.9	Save files to thumb drive	Team	R	John Lutchko	C	Hans Van Summeren	C		
4.10	Export XYZ data	Team	R	Scott Swan	C				
4.11	Import to ArcMap	Team	R	Scott Swan	C				
4.12	Set system and coordinate planes	Team	R	Scott Swan	C				
4.13	Create TIN	Team	R	Scott Swan	C				
4.14	Geoprocess data	Team	R	Scott Swan	C				
4.15	Add map elements	Team	R	Scott Swan	C				
5	Report	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
5.1	Create GIS Deliverable	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
5.2	Project Report Write Up	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C

5.3	Create Project Deliverable	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
5.4	Create Presentation	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C
5.5	Present Project	Team	R	John Lutchko	C	Hans Van Summeren	C	Scott Swan	C