

# A Comprehensive Approach to Marine, Aerial, and Land Surveying at Northwestern Michigan College



***Hans W. Van Sumeren***  
***Dredging Summit & Expo '19***  
***Waves of Change: Oceans of Opportunity***  
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# Northwestern Michigan College

Founded in 1951 - First Community College in the State of Michigan

#2 ranked Veterans college in the country

Top 10 in nation for short term study abroad

Industry leading Commercial Pilot program

GLMA -1 of 6 federally authorized maritime academies



## Strategic Directions

- Global preparation
- National/International leadership/competencies
- Networked delivery
- Lifelong relationships
- Transcribe most learning



# Drivers for today's education

## Sector Change – Innovation and Transformation

### Traditional – Who We Have Been

- Place Based
- Time Based
- Knowledge Transfer
- Public Good
- Long Development Cycles
- Risk Averse
- Reactive
- Access

### Future – Who We Are Becoming

- Content Based
- Competency Based
- Synthesis and Application
- Private Good
- Short Development Cycles
- Risk-taking
- Proactive
- Success



# Networked Delivery



2009

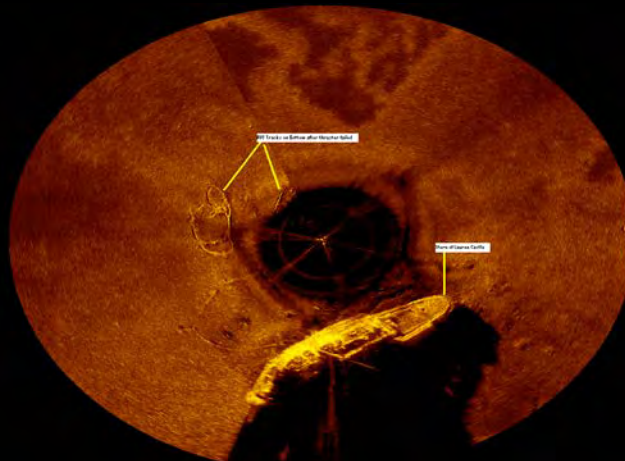
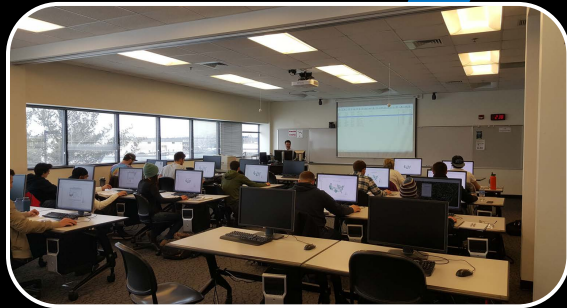


Image – Brian Abbott, Nautilus Marine Group

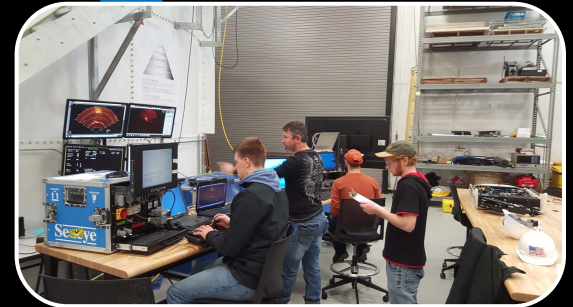
# Content Focused



Applied Team Training



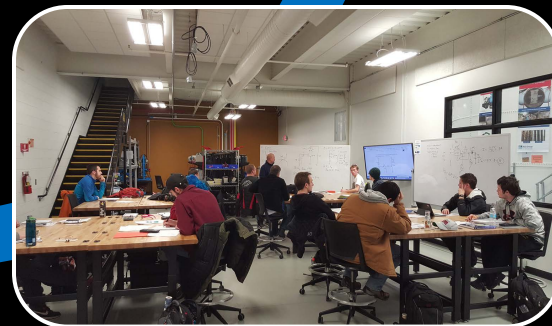
Programming, GIS



Marine Platforms

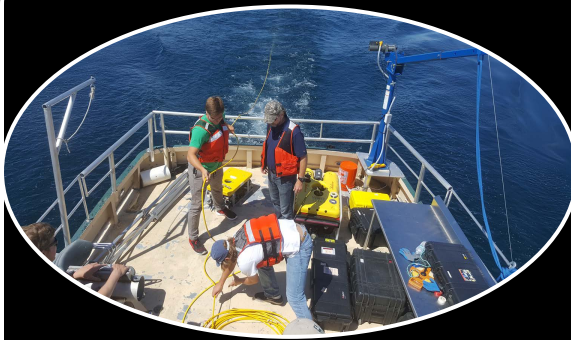


Hydraulics



Electronics

# Applied Competencies



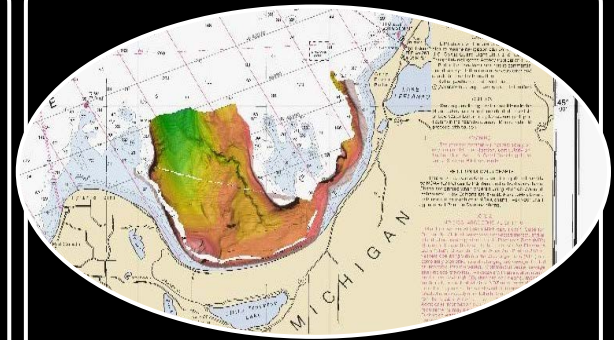
## Foundation

Mathematics  
Science  
Communication



## Core Technical

Electronics/Hydraulics  
Marine Platforms  
GIS/Programming



## Specialized

Data Processing  
Advanced Platforms  
Project Management

Introductory Skills



Advanced Applications

# Northwestern Michigan College

## Marine Technology Program Overview

### Bachelor Degree – Marine Technology

Bachelor Science Marine Technology  
(Currently in ABET certification process)

### Associate Degree – Marine Technology

AAS Engineering Technology – Marine

### Dept. of Labor Apprentice Program

US DOL Sponsored program

### Marine Center

1-2 Week short format courses – topic specific

### Marine Technology Camp

1 Week Camp, Co-sponsored with MTS

### ROV Pilot Certificate

7 Week Training programs, ADCI credentialed

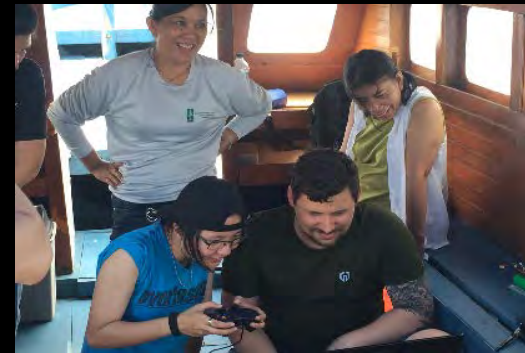


# Global Perspectives

Yellow River Conservancy Technical Institute, China est 2012



Manado State Politeknik, Bunaken Island, Indonesia est 2017





# Marine Center – short duration solutions for professional surveying and mapping markets

- ROV Operations and Technologies
- Marine Sensors and Data Acquisition
- Advanced Unmanned Aerial Technologies
- Survey Fundamentals and HD Scanning



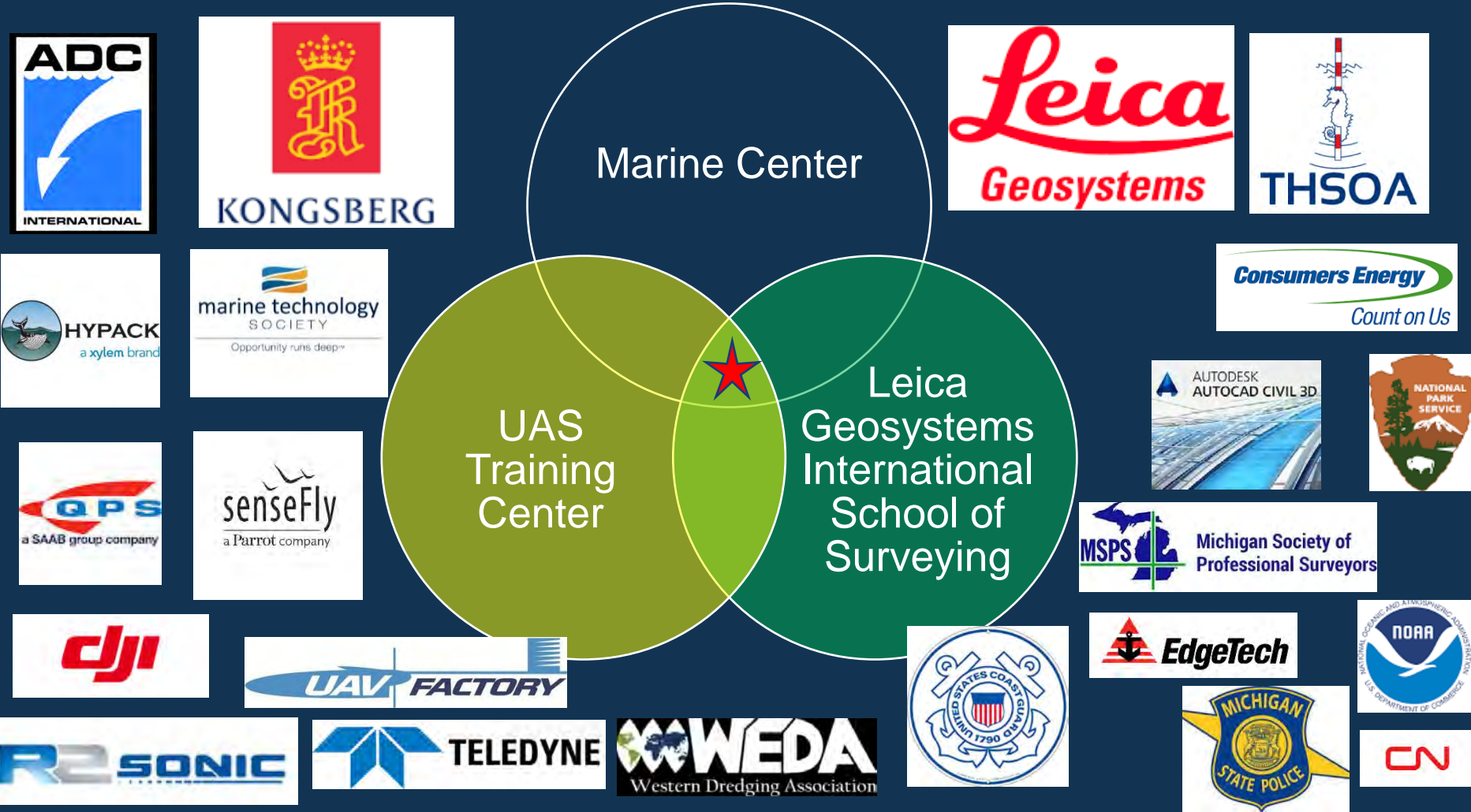
Yuba Intergalactic Airfield  
NMC UAS TRAINING CENTER

NMC MAIN CAMPUS

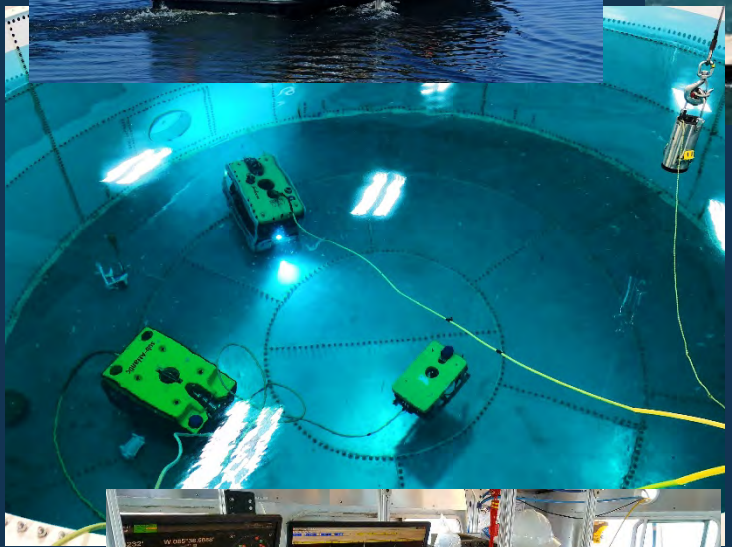
NMC AERO PARK CAMPUS

NMC GREAT LAKES CAMPUS

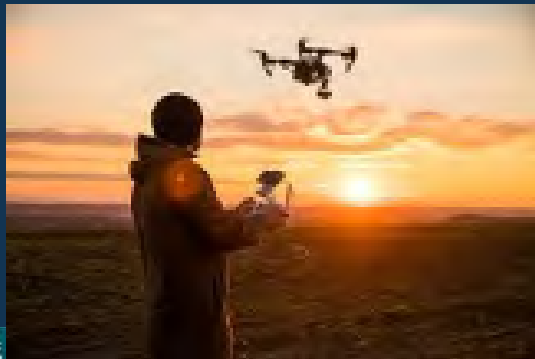
# Leveraging Assets & Partnerships



# Comprehensive equipment support - Marine



# Comprehensive equipment support - UAS



# Surveying

- Built entirely for Industry and by Industry



Fundamentals of Surveying  
Introduction to GIS  
CAD for Surveying



Construction Survey  
Applications  
Surveying Calculations  
Boundary Surveying



Great Lakes Research  
Technologies  
Remote Sensing Systems  
UAS Survey Operations

Core Fundamentals ----- Internships ----- Job Competencies

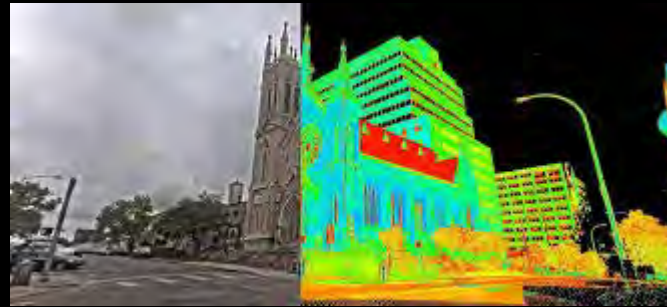
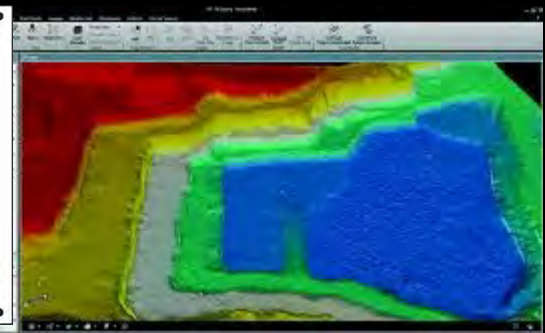
# Comprehensive equipment support - Land surveying



The  
**Marine Center**  
Northwestern Michigan College

The Leica Geosystem  
International School of Surveying

*Leica*  
Geosystems



# Marine Center Training Courses



Marine	Aerial	Land Surveying
ROV Ops Certification (ADCI Certification)	UAS FAA Certification	Fundamentals of Land Surveying
Marine Technology Fundamentals	UAS Flight Fundamentals	Conventional Surveying Techniques
Marine Acoustics	Aerial Surveying & Imagery (Fundamentals)	GNSS Positioning Techniques (Operations & Datums)
Bridge Pier Inspection	Aerial Surveying & Imagery (Advanced)	Surveying Data Processing, Adjustments and Imaging
Marine Data Processing	Integrated Marine Near Shore Surveys	Route Surveying (Roads, Rails, Bridges)
SONAR for Search and Recovery	Advanced UAS Platforms	Pipeline Surveying (Manifests, Tally, Cataloging Observations)
ROV for Search and Recovery	Aerial Image Data Processing	Precision Leveling & Integration of Surveying Measurements
Marine Project Management		Boundary Surveying for the New Surveyor
LEAN Marine		Forensic Mapping for Law Enforcement
Marine Archaeology Technology		High Definition Scanning
Marine Technology Camps		

# Surveying and Mapping at Northwestern Michigan College

- Partnerships and networks are key
- Competency based approaches
- Advisory boards and industry feedback are critical
- Proactive and adaptive
- Education is a business



# Thank you

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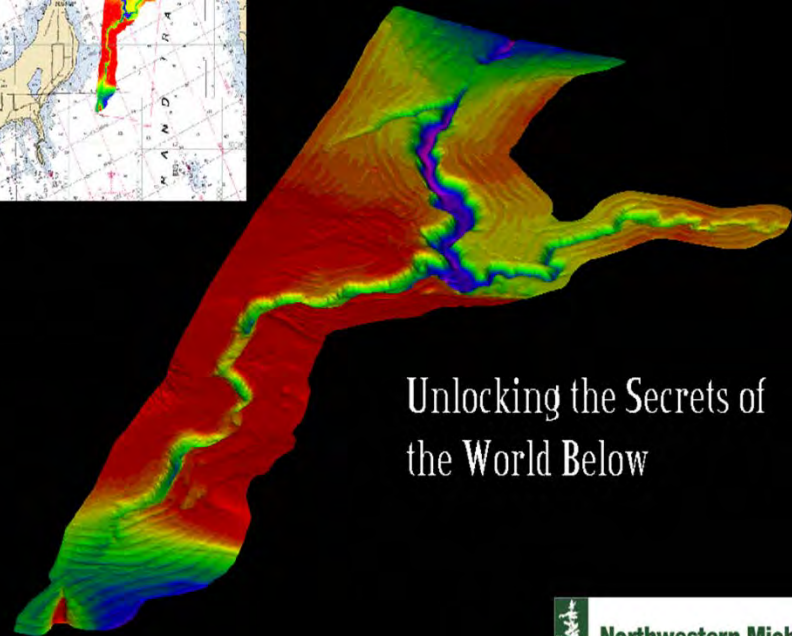
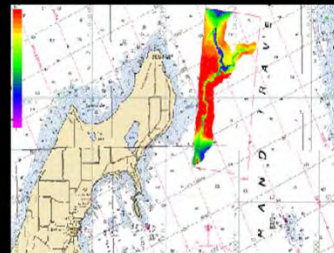
[WWW.NMC.EDU](http://WWW.NMC.EDU)

[WWW.NMC.EDU/Marine-Center](http://WWW.NMC.EDU/Marine-Center)

[WWW.NMC.EDU/Surveying](http://WWW.NMC.EDU/Surveying)

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Unlocking the Secrets of  
the World Below

