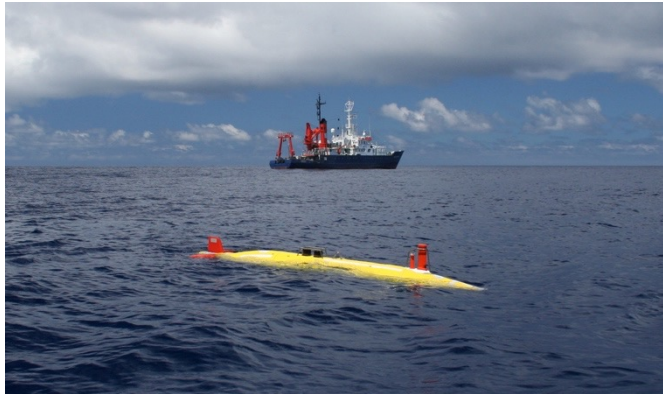
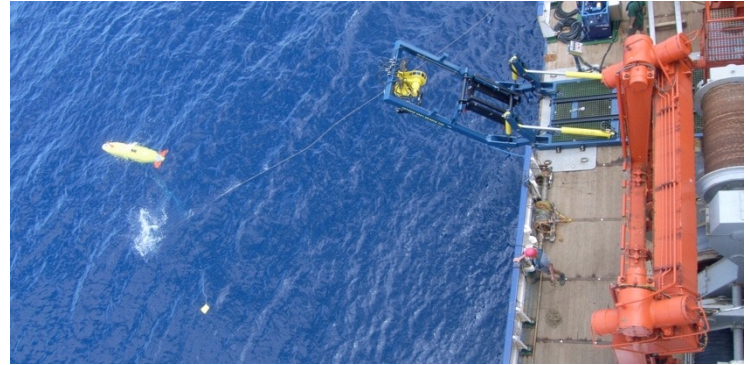


Status of the GEOMAR AUVs

AUV Team GEOMAR

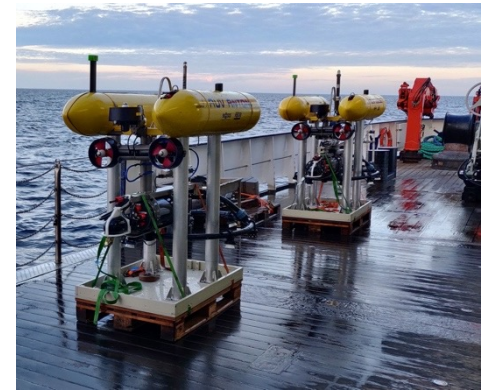
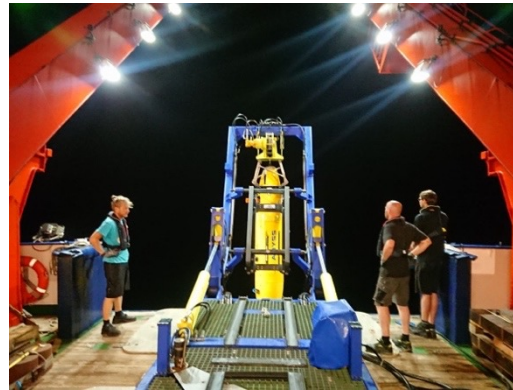
Who are we?

- Group in side TLZ
- Autonomous Underwater Vehicle
- 10 Engineers / Technicians
- 4 Students



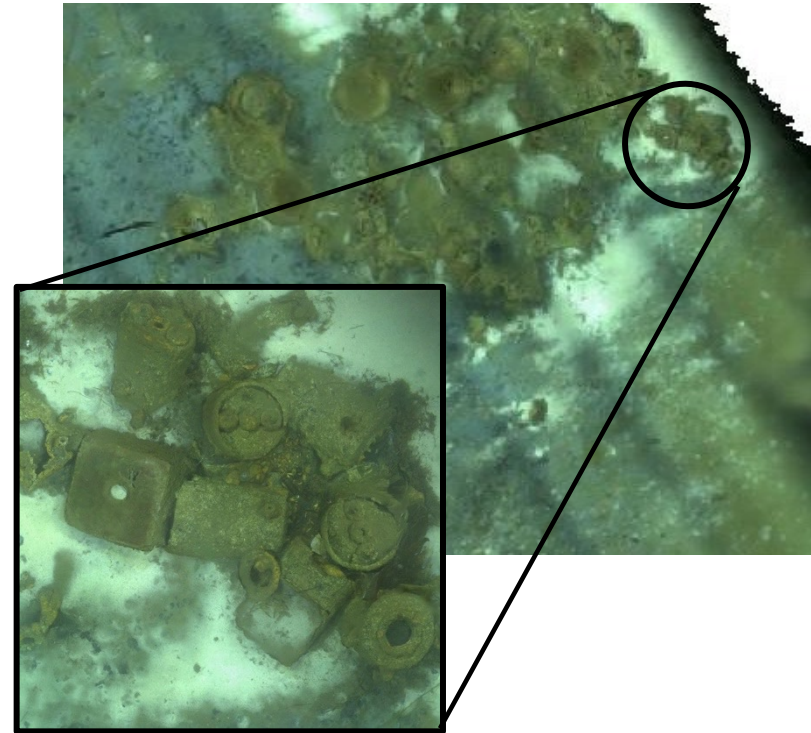
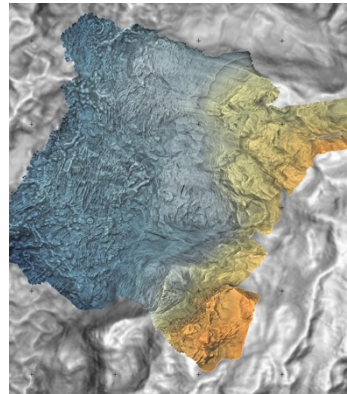
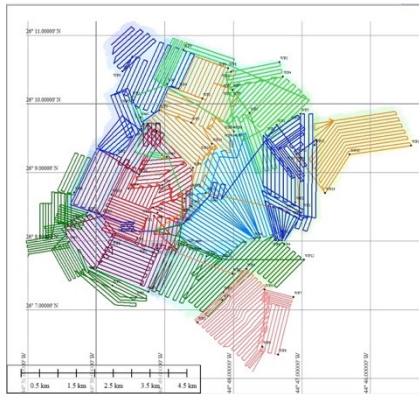
What do we do?

- Operation at sea
- 30 cruises since 2009
- > 350 dive with AUV ABYSS
- > 350 dives with AUV LUISE / ANTON



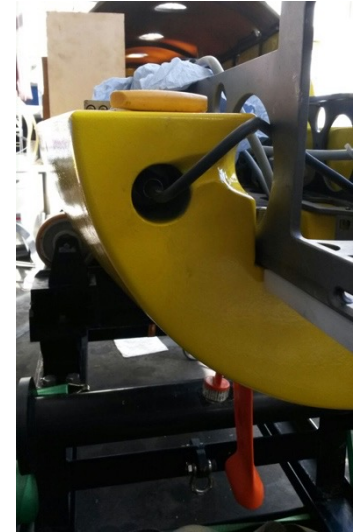
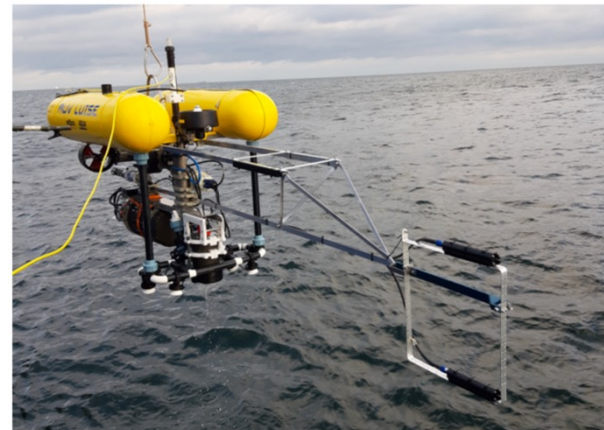
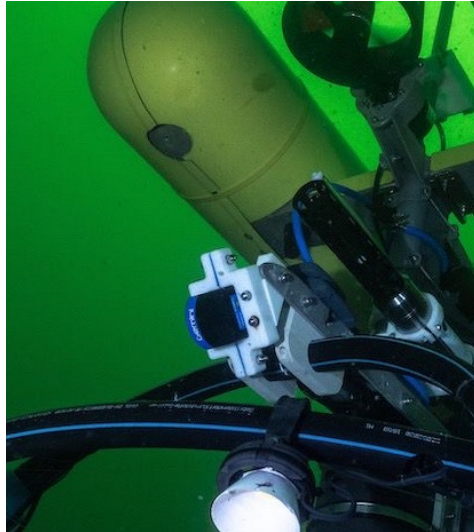
What do we do? / Post processing

- First result on board
- Data including Meta data
- Nav correction (DELPH, MB Navadjust)



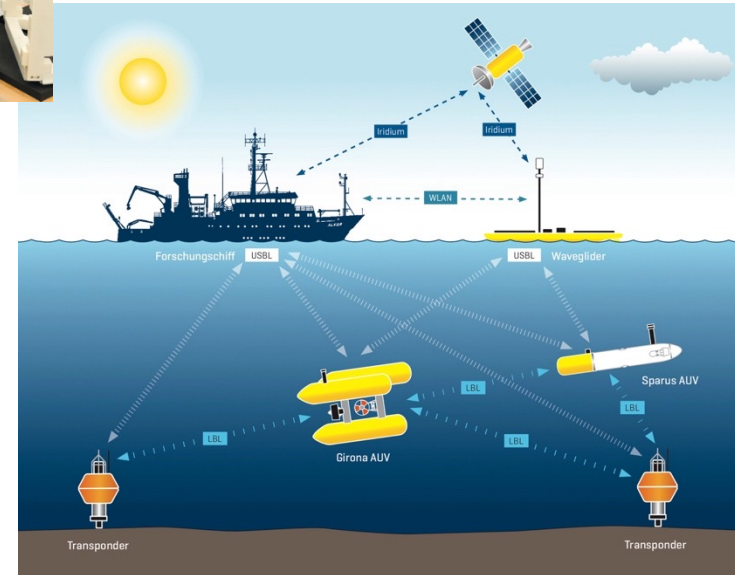
What do we do? / Integration

- Limited integration @ AUV ABYSS
- Full integration @ G500 AUVs



What do we do? / Development

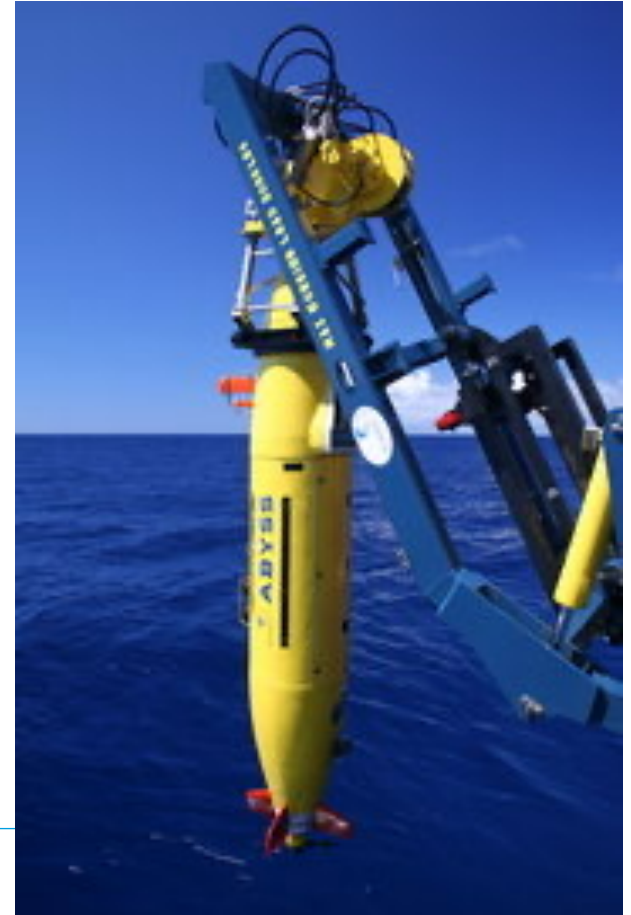
- Application-oriented development
- AUV POSEIDON
- BELUGA



Vehicles / AUV ABYSS

- since 2008
- Typ REMUS 6000 (former Hydroid)
- Acoustic / Optical Mapping
- Exploration (e.g. after hydrothermal structures)

Vehicle Length:	4.00 m
Diameter:	0.66 m
Weight in air:	880 kg
Operating depth range:	10 - 6000 m
Speed range:	2.5 – 4.0 kn
Max. range:	up to 100 km
Endurance:	up to 20 h (sidescan)



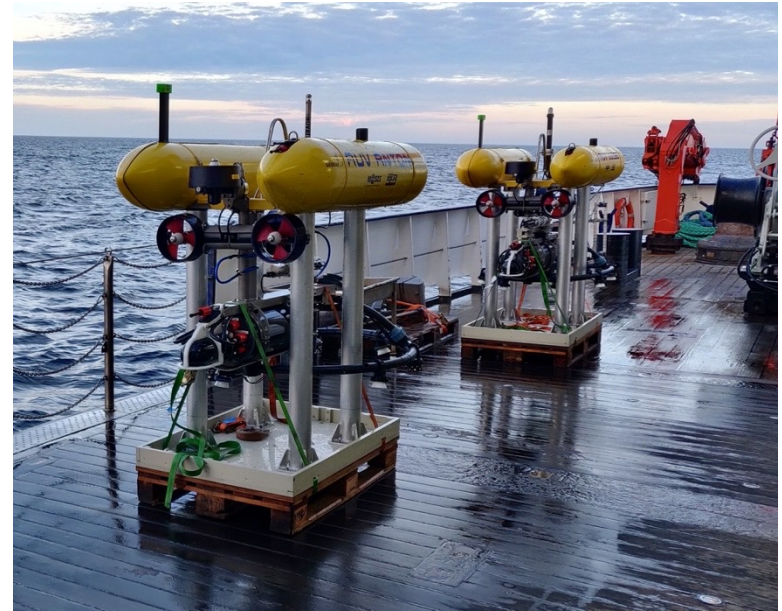
Vehicles / AUV ABYSS



Vehicles / AUV ANTON / AUV LUISE

- ANTON sind 2017, LUISE since 2018
- Type Girona 500 (IQUA Robotics)
- Optical Mapping (e.g. Amunition Dump Sites)
- Entry into open software COLA2
- Test platforms

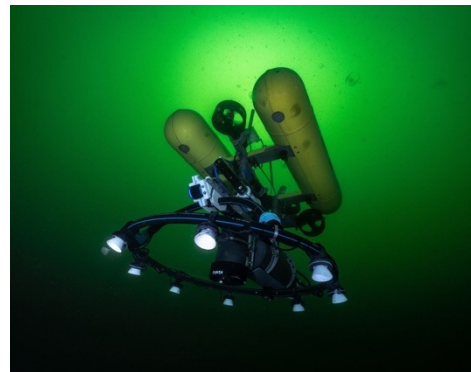
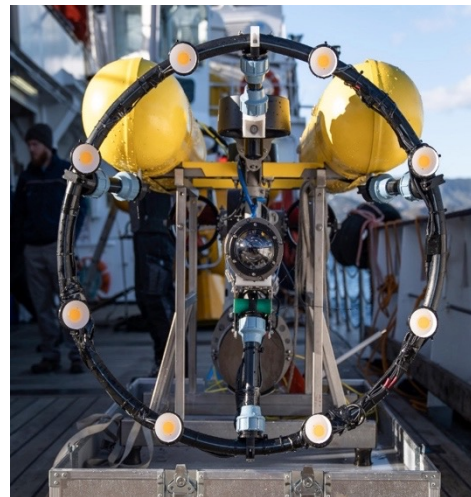
Vehicle Dimension:	1 x 1 x 1.5 m
Weight in air:	140 kg
Operating depth range:	500 m
Speed range:	0 – 1.0 kn
Max. range:	up to 2 km
Endurance:	up to 8 h



Vehicles / AUV ANTON / AUV LUISE



GEOMAR



Vehicles / AUV ALBERT

- since 2021
- Typ Sparus II (IQUA Robotics)
- No operations yet



Vehicle Length:	1.30 m
Diameter:	0.23 m
Weight in air:	50kg
Operating depth range:	200 m
Speed range:	0 - 4.0 kn
Max. range:	up to 40 km
Endurance:	up to 8 h

Vehicles / AUV ALBERT



Sensors / Devices AUV ABYSS

Sensor configurations:

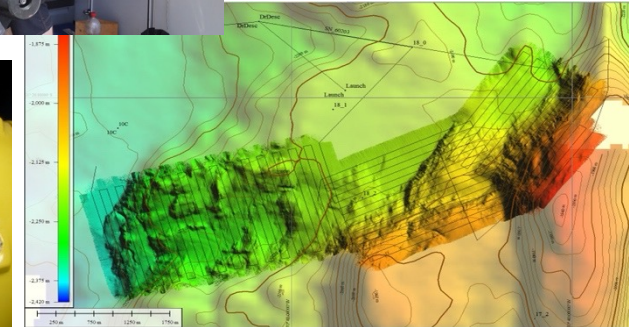
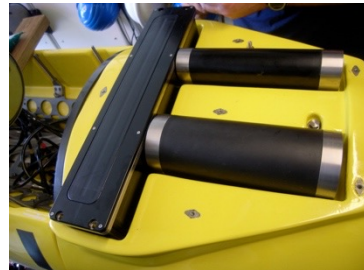
Multibeam RESON T50-S 200/400 kHz or
Edgetech Subbottom Profiler or
Kamera-System DSC

Integrated Sensors:

Edgetech Sidescan Sonar 120/410 kHz
Seabird FastCat SBE49
Wetlabs Eco (Fluorometer / Turbidity)
Redox Sensor
APS Magnetometer

Coverage MBES: Flat terrain 0,8-1,0 km²/h

Coverage SSS: Flat terrain 1,2-1,5 km²/h



Sensors / Devices G500 AUVs

Integrated Sensors:

CoraMo Camera

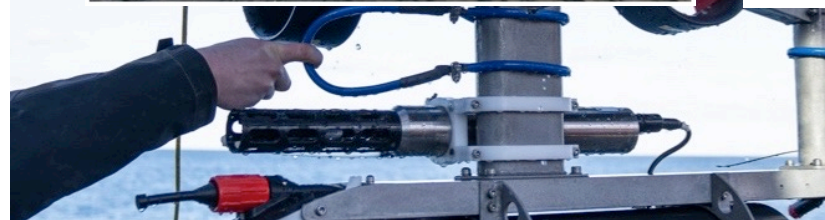
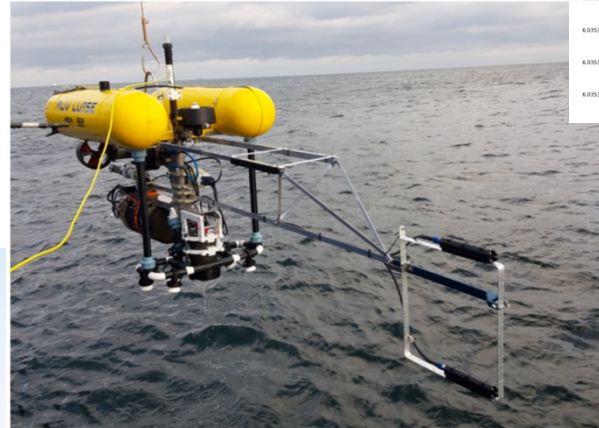
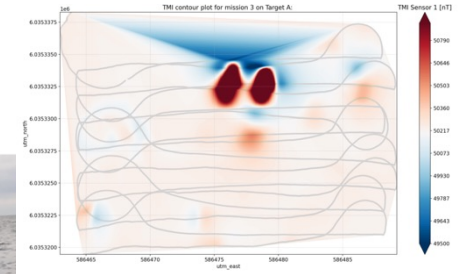
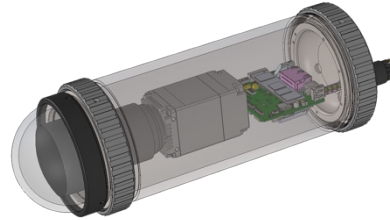
Norbit WBMS MBES

Multi-Channel Fluxgate Magnetometer

Seabird FastCat SBE49

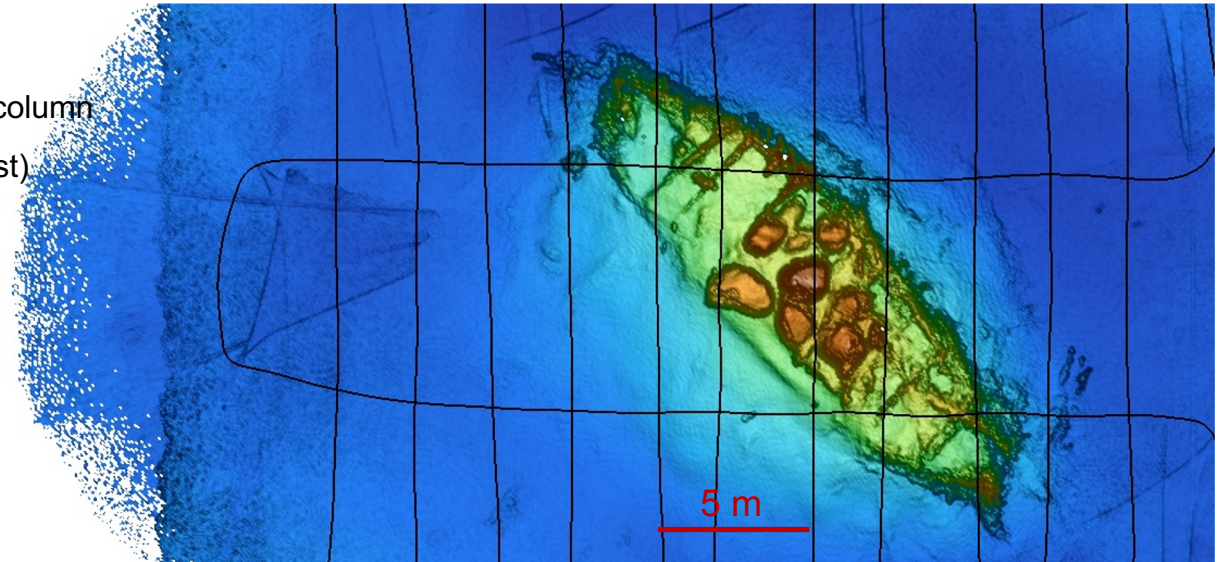
Wetlabs Eco (Fluorometer / Turbidity)

Tritech Gemini 720im MBES

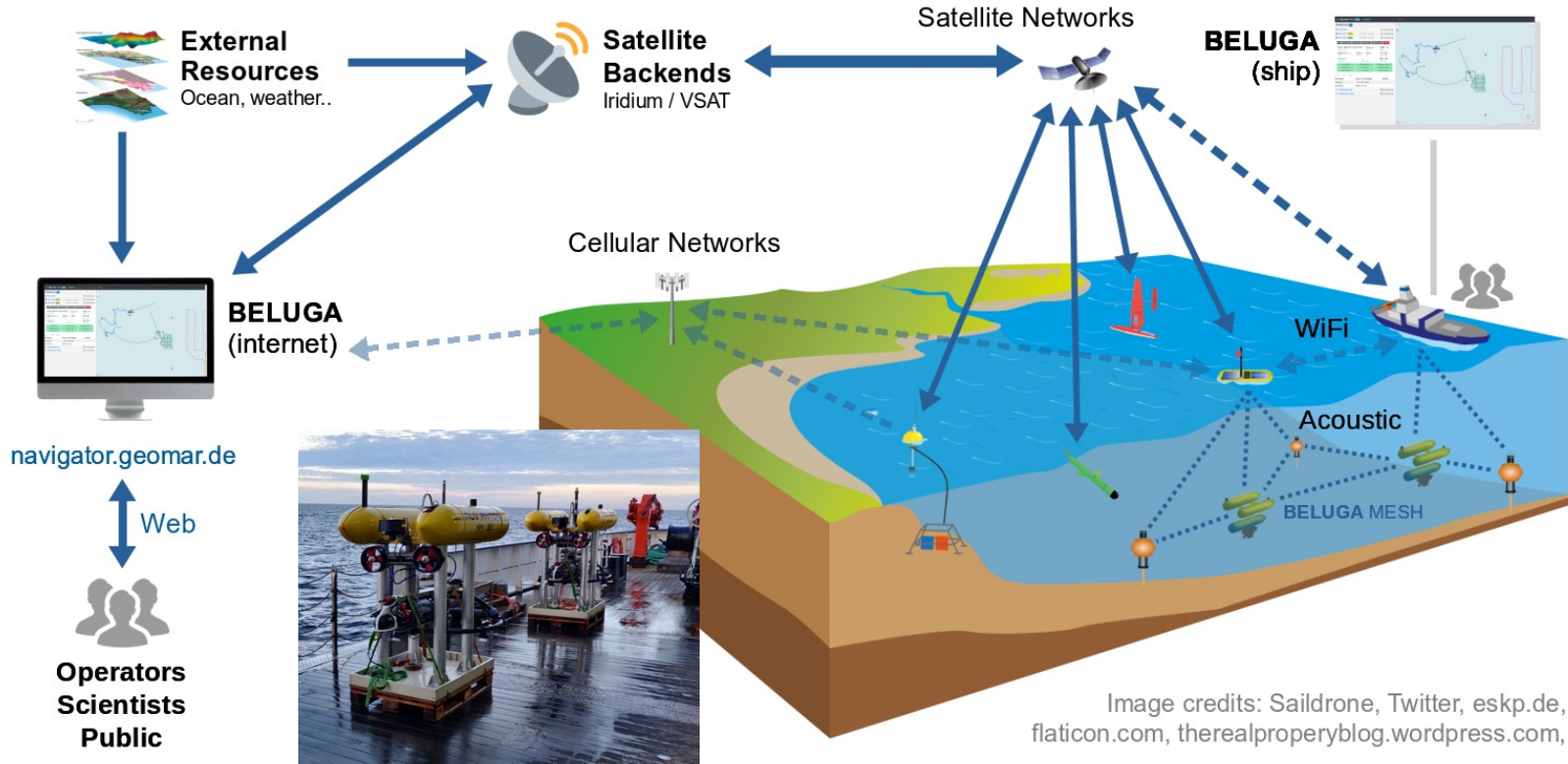


NORBIT WBMS MB

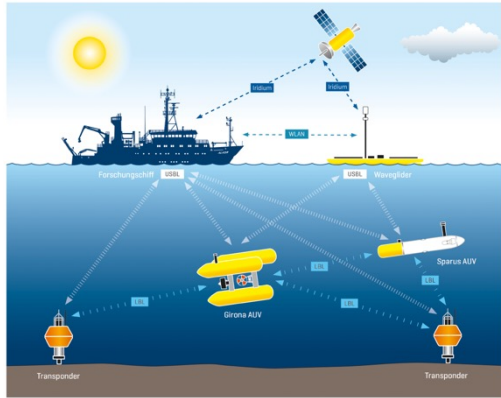
- 256-512 beam
- 400 kHz
- Range 0,2 – 275 m
- Intensity, Sidescan, Snippets, Water column
- Automated data export (incl. Navadjust)



Communication Platform BELUGA



Communication Platform BELUGA



BELUGA Navigator Beta Dashboard

Campaign: AUV Tests L04-21 In Progress · Cruise: L04-21 · Organization: GEOMAR · Chief scientist: Nikolaj Diller · Start: June 03 2021 07:51

Platforms 6

- FK Littorina 5 sec ago
- AUV Luise Diving Safety Network: Acoustic 2 min ago

55° 18.538' N 15° 13.405' E
 Current position
49.7 m ↑ 0.2 m/s
 Depth
Safety keep
 Captain state

No altitude	High temperature	Emergency surface
Navigation error	Battery error	Abort and surface
Water detected	Low battery	Abort mission

Navigation	Safety	Battery	Operation	DVL	USBL	Actions
Parameter	Value	Unit	Last change			
Latitude	55.30897	°	2 min ago			[M]
Longitude	15.22342	°	2 min ago			[M]
Heading	239	°	2 min ago			[M]
Depth	49.7	m	2 min ago			[M]
Altitude	43.8	m	2 min ago			[M]
Velocity X	0.0	m/s	2 min ago			[M]
Velocity Z	-0.2	m/s	2 min ago			[M]
GPS Fix Age	0	s	2 min ago			[M]

- AUV Anton Network: Acoustic - No data -
- TP Emil Seafloor Position 39 min ago
- TP Friedrich Seafloor Position 10 min ago
- TP Gustav Seafloor Position 1 hr ago

AUV Luise > Navigation > Depth

AUV Luise > Navigation > Depth

Communication Platform BELUGA

BELUGA Navigator Beta Dashboard

Campaign: Ocean Change 2021 [Website](#) In Progress Organization: Arved Fuchs Expeditionen Chief scientist: Arved Fuchs Start: June 12 2021 09:00 [Close feed](#)

Platforms 1

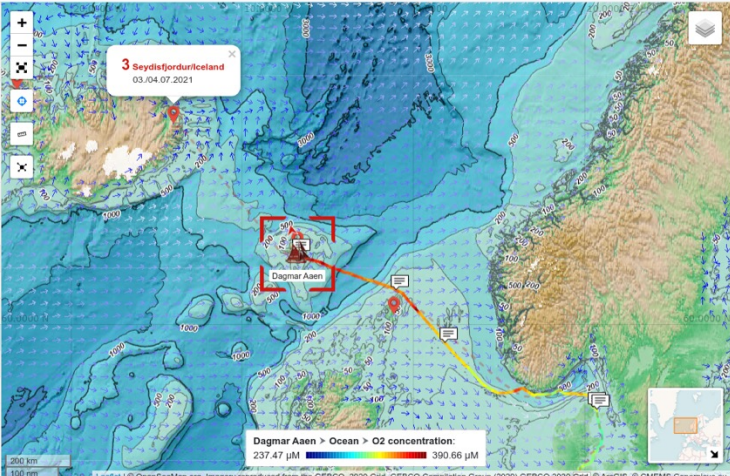
Dagmar Aaen [🔗](#) 🕒 17 min ago

62° 00.475' N 6° 46.033' W 0.0 kn 185.6°
Current position Speed over Ground Course over ground

9.7 °C 1019 hPa 8.8 °C 35.1 PSU
Air temperature Air pressure Water temperature Salinity


Navigation Atmosphere **Ocean**

Parameter	Value	Unit	Last change	Actions
Water temperature	8.79	°C	3 days ago	Chart
Salinity	35.14	PSU	3 days ago	Chart
Conductivity	37.08	mS/cm	3 days ago	Chart
O2 concentration	356.35	µM	3 days ago	Chart
Air saturation	99.12	%	3 days ago	Chart
CO2	458.07	ppm	3 days ago	Chart



Dagmar Aaen > Ocean > O2 concentration 🔄 Refresh

Zoom: **1d** 1w 1m 3m All 25. Jun 2021 → 26. Jun 2021



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Feed 19

Filter by tag...

Podcast #4 Arved Fuchs auf den Faröer Inseln

0:00 / 11:10 🔊

Seit dem Start in Kiel am 17.06. hat Arved Fuchs mit seiner Crew auf der Dagmar Aaen inzwischen 900 Seemeilen zurückgelegt. Bis zum Skagerak war alles ruhig und sommerlich, danach wurde es windig.

Baerbel Fening 📅 June 26 2021 [🎧 Podcast](#)

Ocean Change 2021 - Auf See

Ocean Change 2021

Die "Dagmar Aaen" auf ihrem Weg zu den Faröer-Inseln, aktuell nördlich der Shetlands.

Arved Fuchs Expeditionen 📅 June 26 2021 [📺 Bordleben](#)

Auf See

59° 28.459' N 1° 49.671' E 📍

[🖨️ Imprint](#)

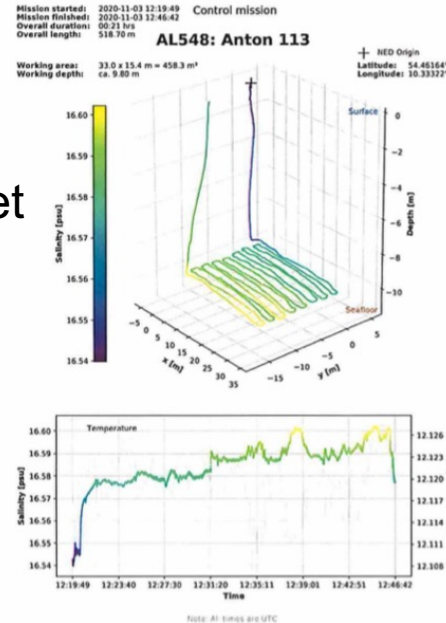
- Automation of the data export
- First overview after dive / QC
- Coordinated handover of dive data set

Copy Tool:

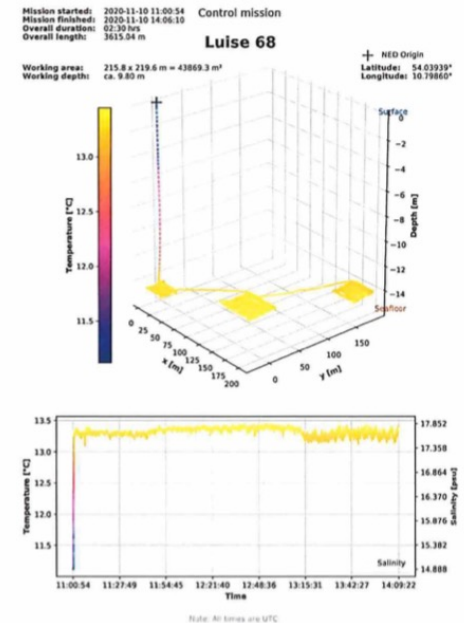
- Preparation (Start, End, Downlink)
- Check data collection / Copy files

Export Tool:

- Preparation of data
- Post-processing Navigation
- Sorting the data
- Generate MDR

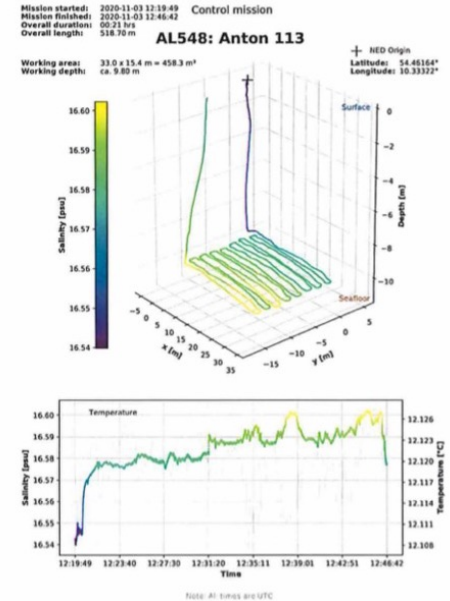
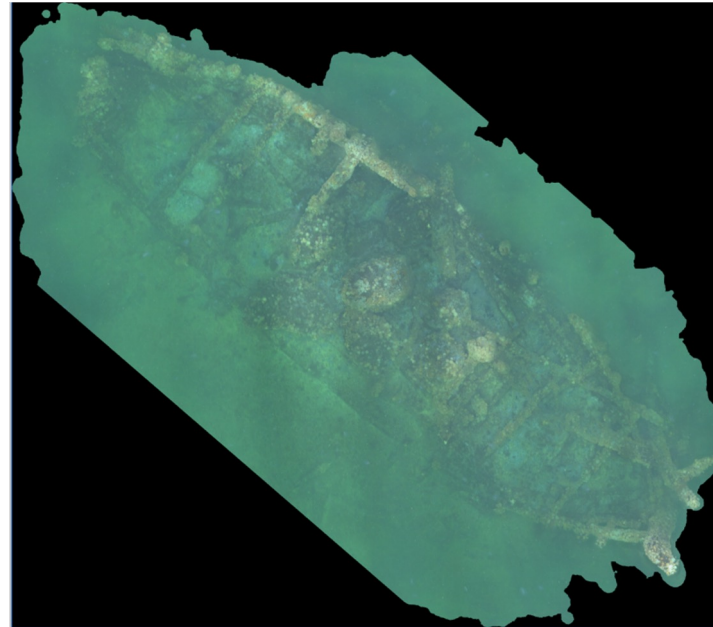
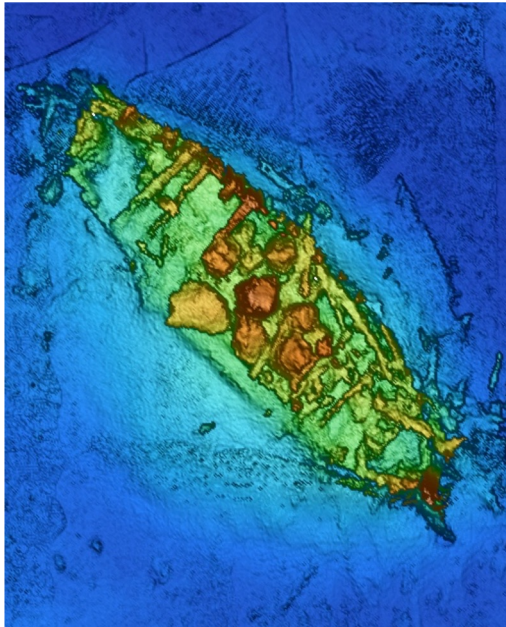


(a) Plot der Salinität für eine Beispielmision.



(b) Plot der Temperatur für eine andere Mission.

Near Future Goal / Deliverable during cruise



Far Future Goal / Holistic Platform for Autonomous Systems

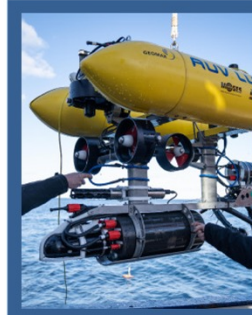
- Platform of AUVs
- Internal Standards
- Re-Use / Portability

Communication / Positioning **BELUGA**

Software Architecture **COLA2**



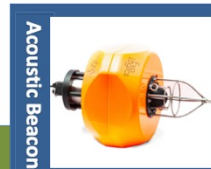
AUV ANTON (deep)
(1,5 kn / 6.000 m / 1.000 kg)



AUV LUISE
(1,5 kn / 500 m / 1.000 kg)



AUV POSEIDON (4 kn / 6.000 m / 1.000 kg)



Acoustic Beacon



AUV ALBERT
(4 kn / 200 m / 50 kg)

Payload / Scientific Sensors

Thank you for your patience.
Are there questions?