



**SUBSEA TECHNOLOGY**

# Covert Communications Using Free Space Optical Modems

Ioseba Tena

UDT 2019



**POSITIONING  
NAVIGATION  
COMMUNICATION  
MONITORING  
IMAGING**

# Introduction to Sonardyne

Leading independent provider of underwater acoustic, inertial, optical and sonar technology

**70+**

The number of countries where we operate

**>275**

Sonardyne employees worldwide

**>45**

The age of our company

**10,000**

Transducer manufactured each year

**10mm**

Positioning accuracy of 6G acoustic technology

**156,000**

Total square footage of our facilities

**500Mb/s**

The speed we can transfer data subsea

**12,000m**

How deep our equipment can operate

**100%**

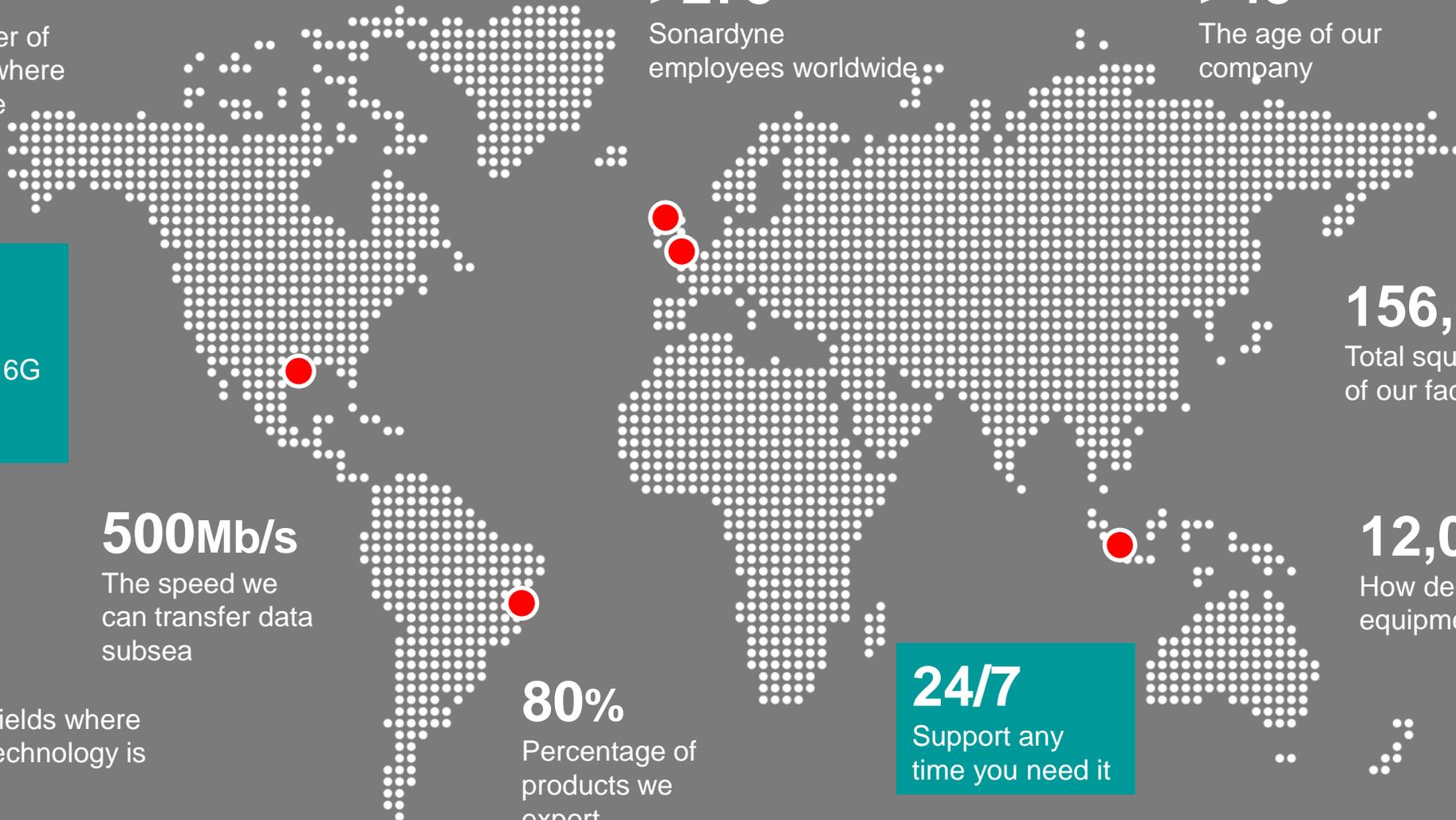
Deep water fields where Sonardyne technology is used

**80%**

Percentage of products we export

**24/7**

Support any time you need it



**MAS**

**Force Multipliers**

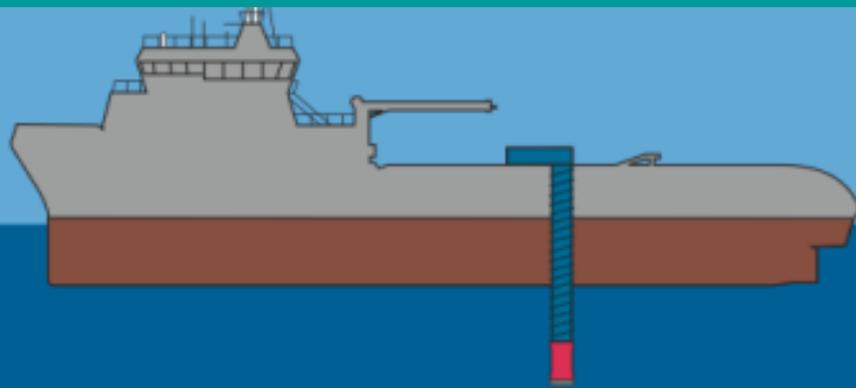


BlueComm

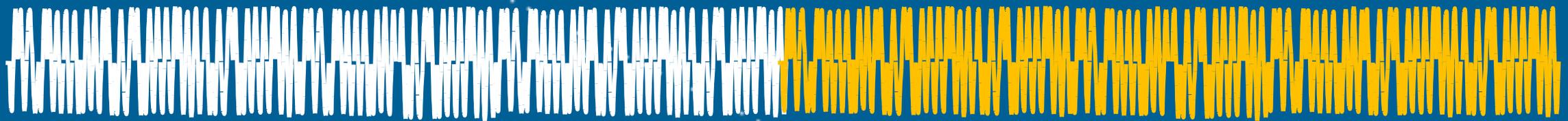
Acoustics



“Today we can track and communicate across full Ocean depths.”



# Sonardyne Wideband® 2



Track

Exchange Data



USBL

BlueComm



AUV Communications for Data Harvesting and Control



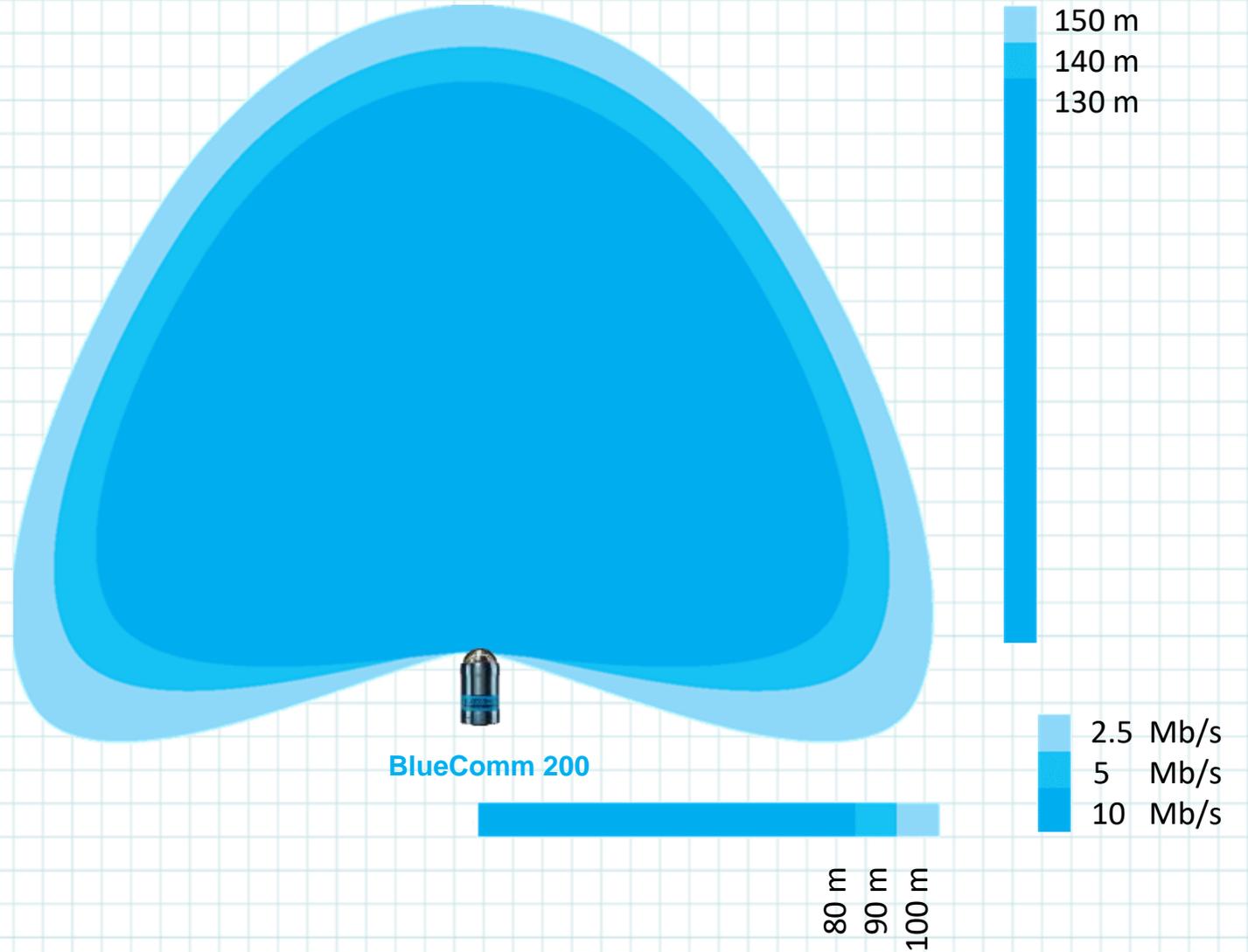
**Market leading subsea free  
space optical modems**

Blue light travels furthest



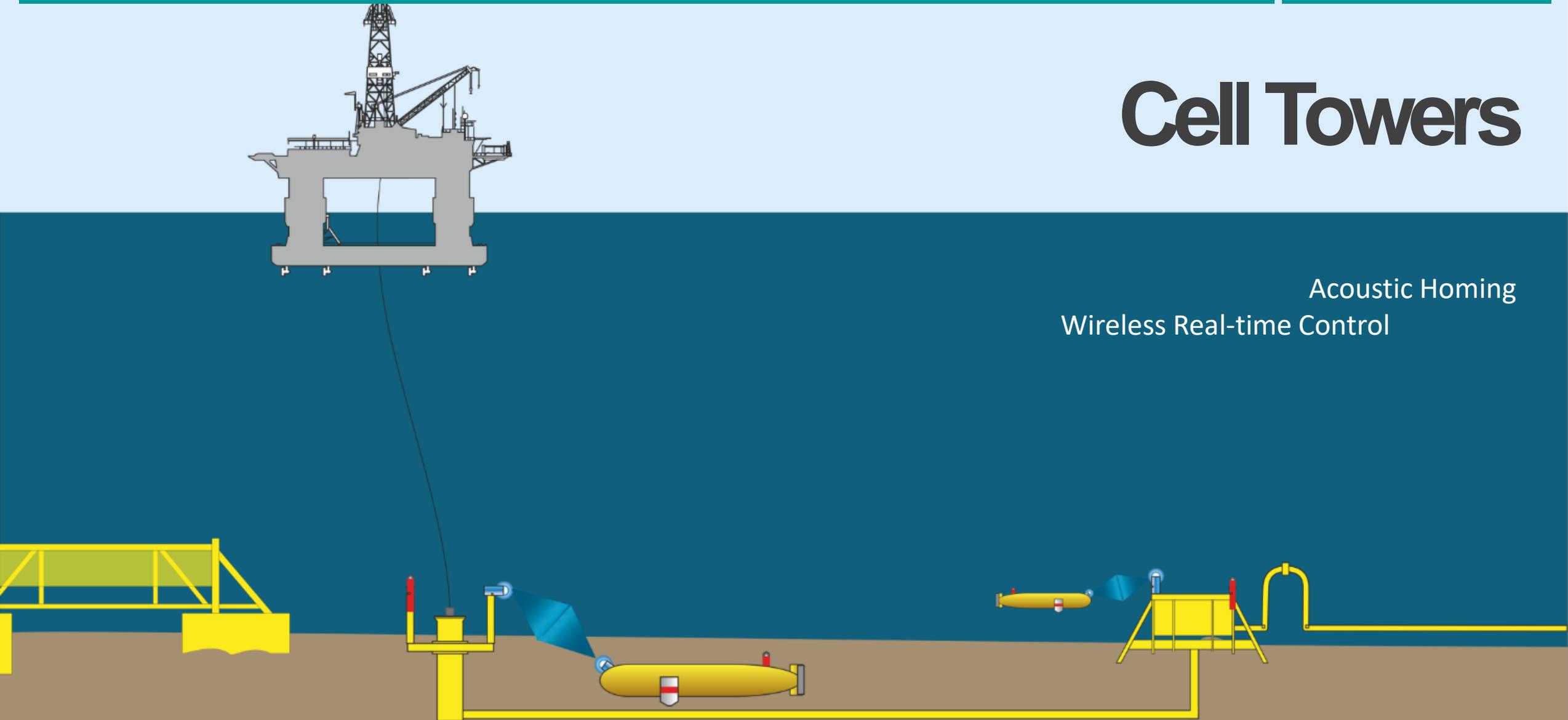
**BlueComm 200**

150m Max Range  
1-10 Mbps  
450nm Centre  $\lambda$



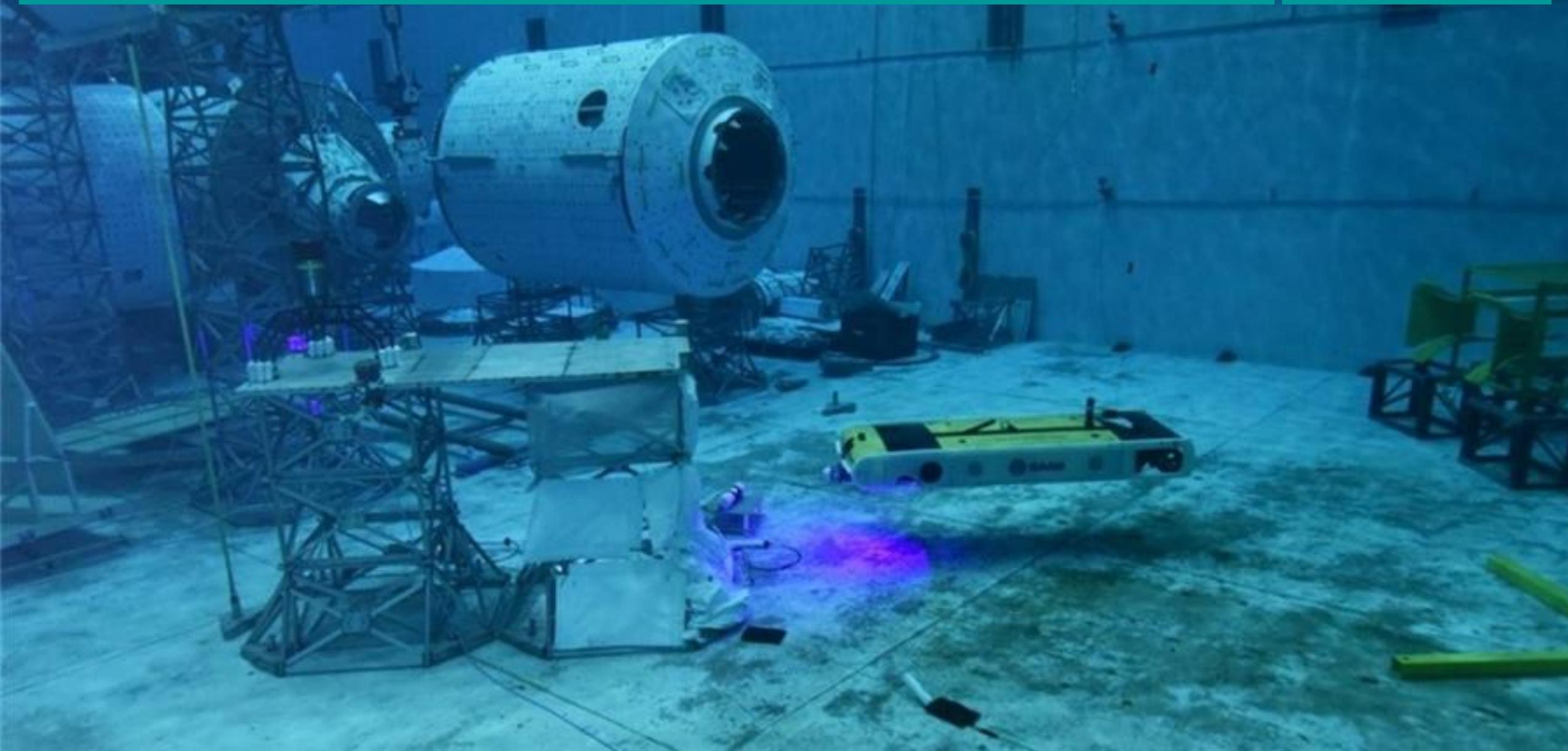
# Cell Towers

Acoustic Homing  
Wireless Real-time Control



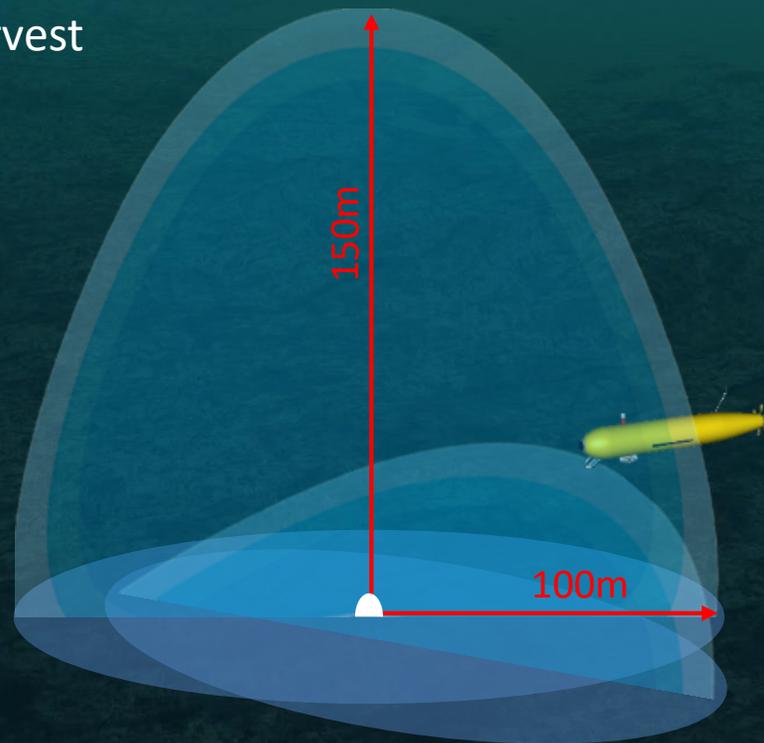
BlueComm

Combined Optical & Acoustics for Life of Field Applications



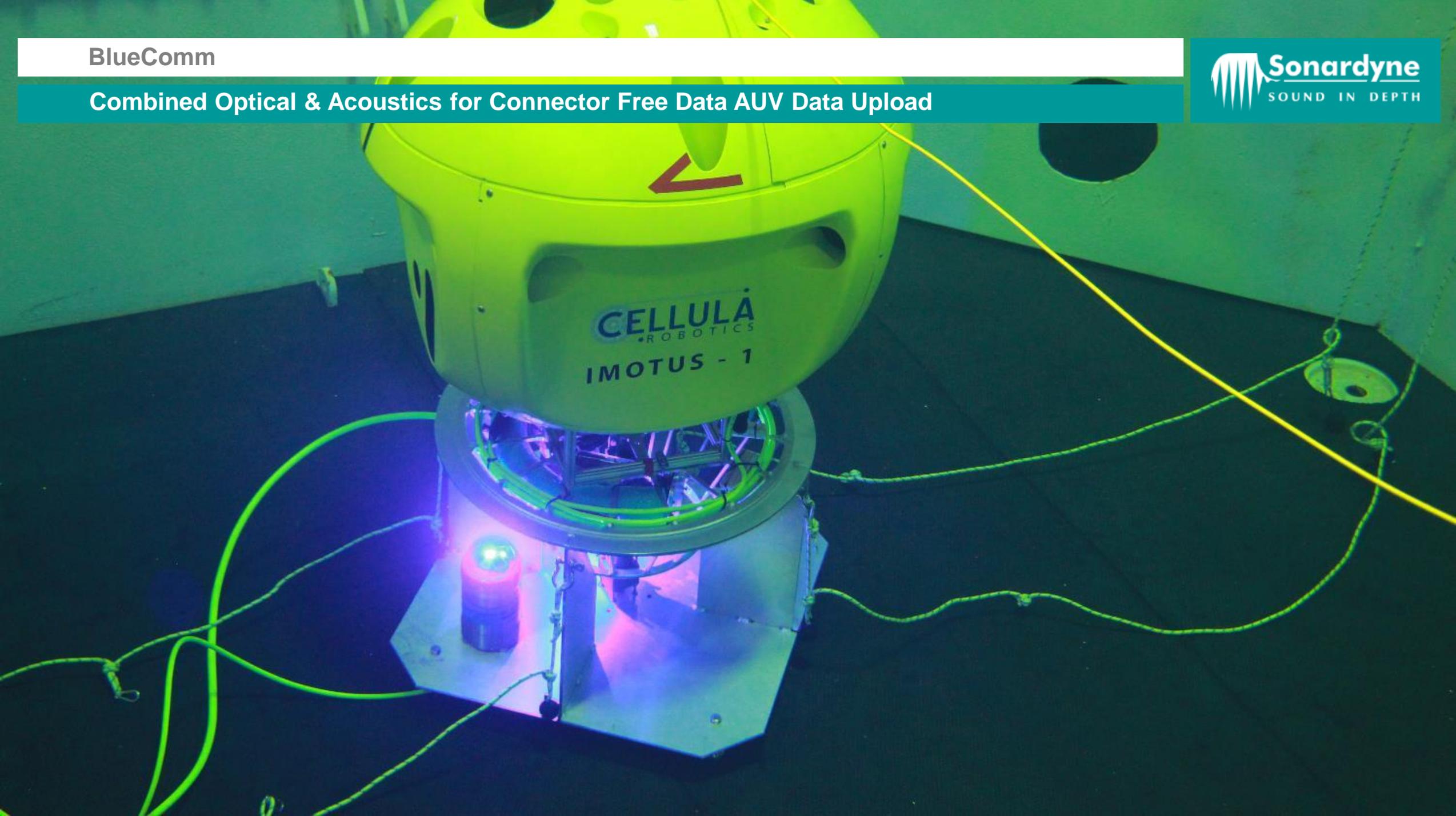
# Comms Outposts

Acoustic Homing  
Wireless Data Harvest



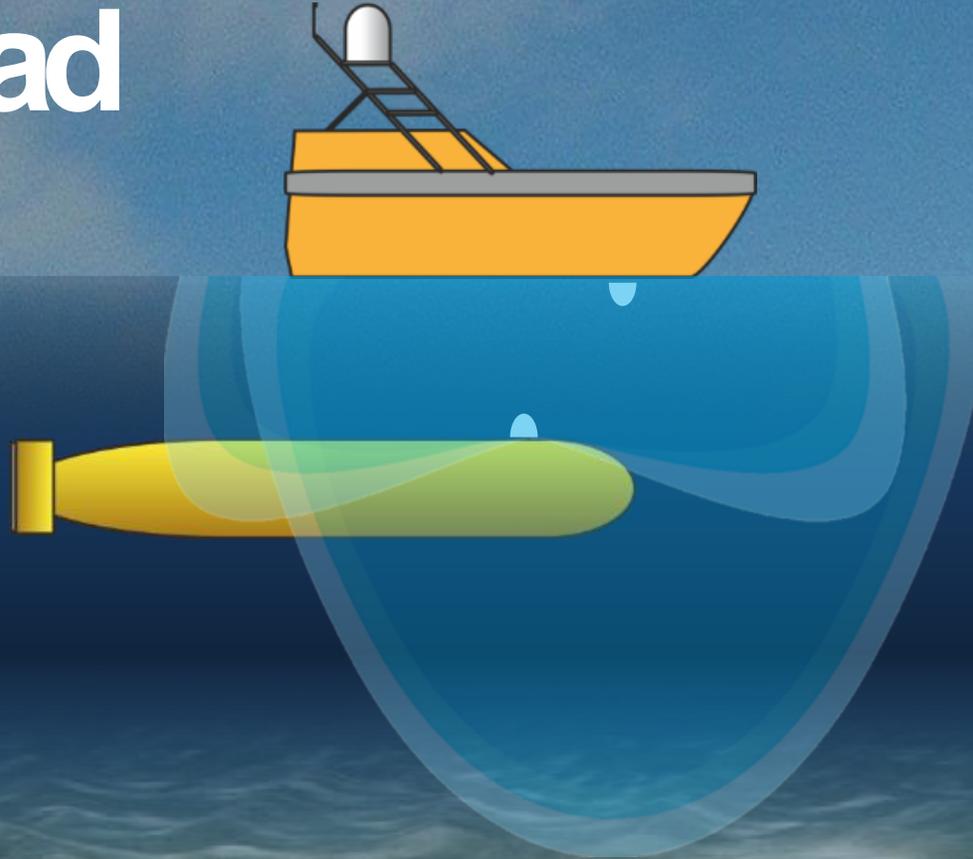
BlueComm

Combined Optical & Acoustics for Connector Free Data AUV Data Upload



# Data Upload

Acoustic Homing  
Wireless Data Upload

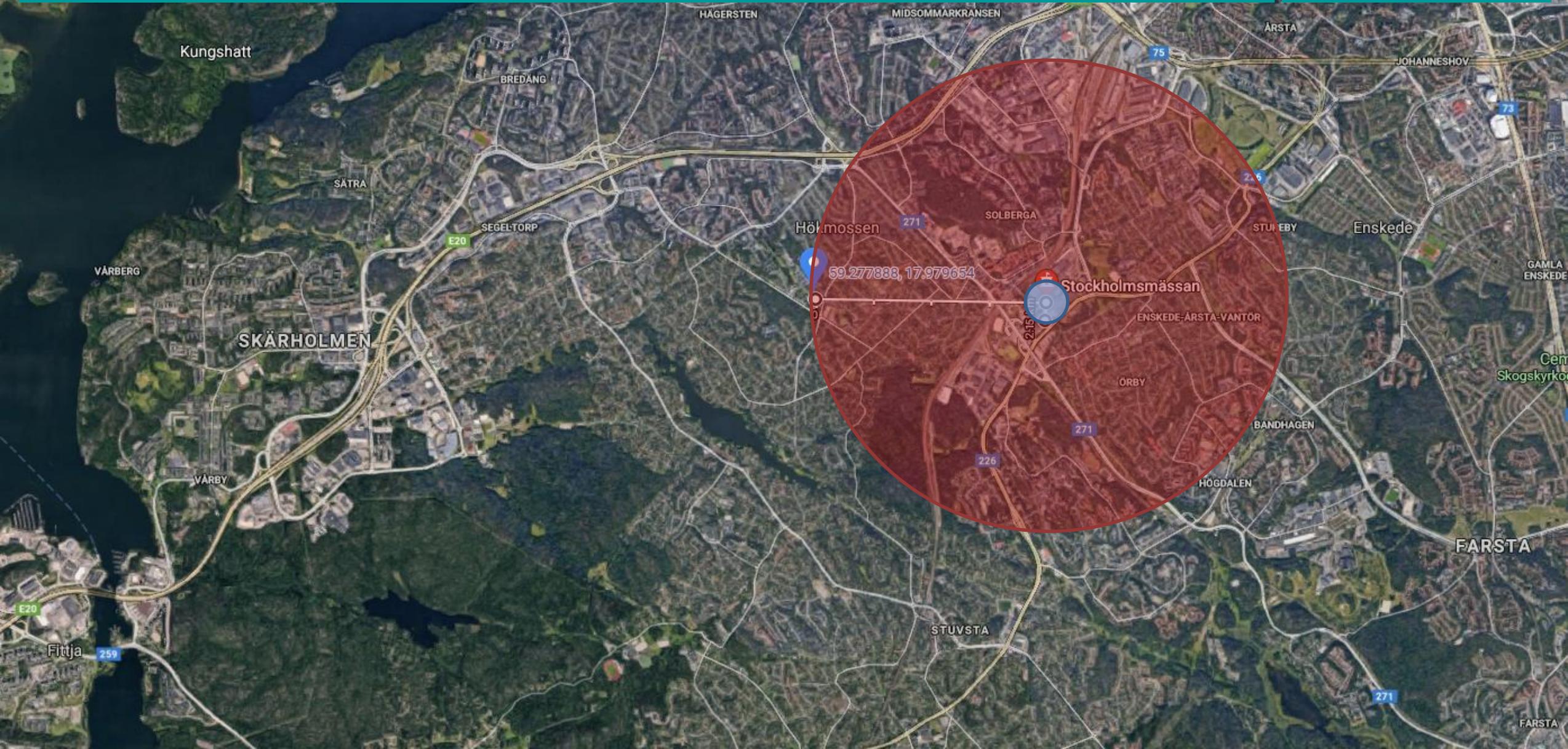


BlueComm

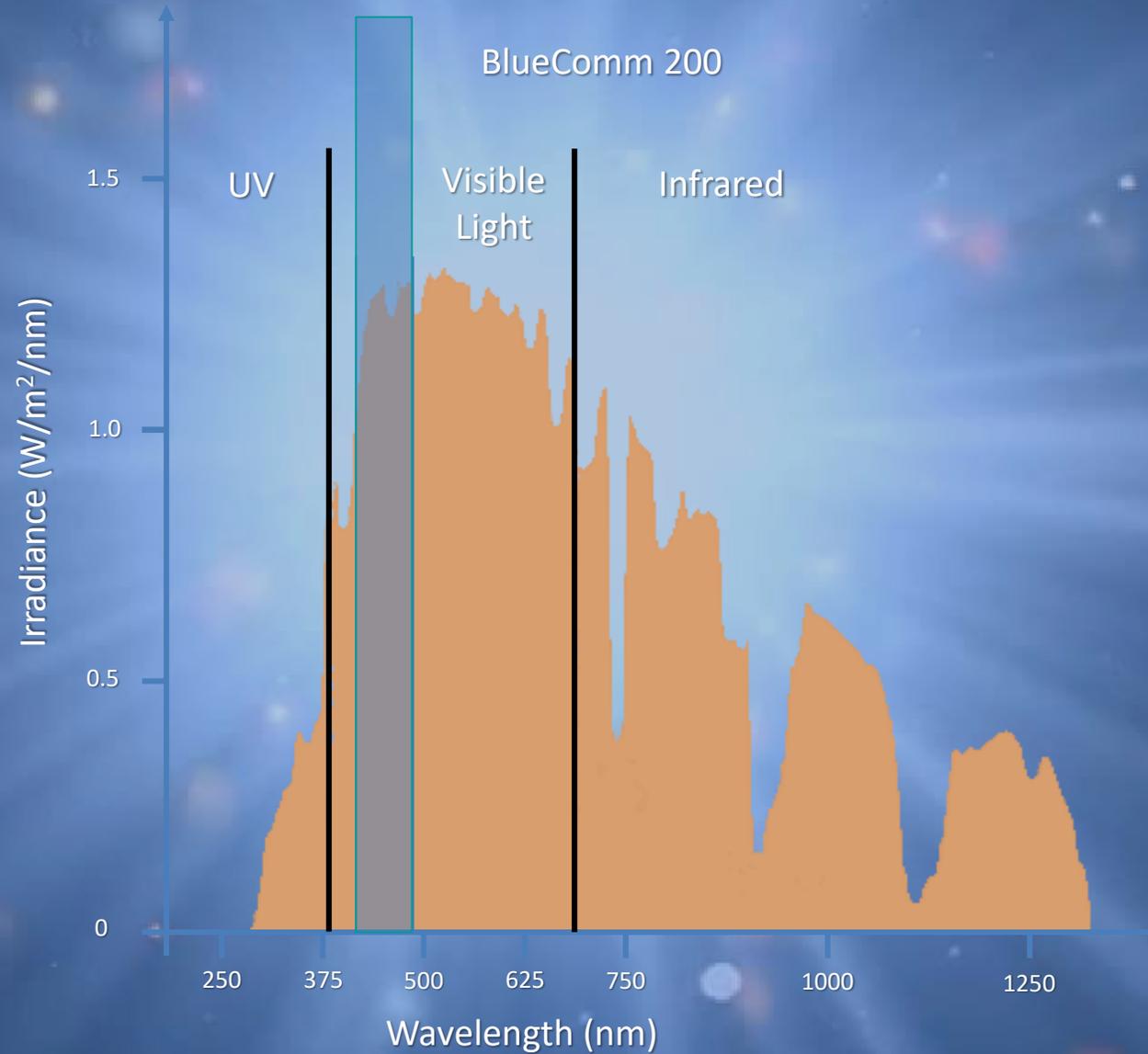
Combined Optical & Acoustics for Connector Free Data AUV Data Upload

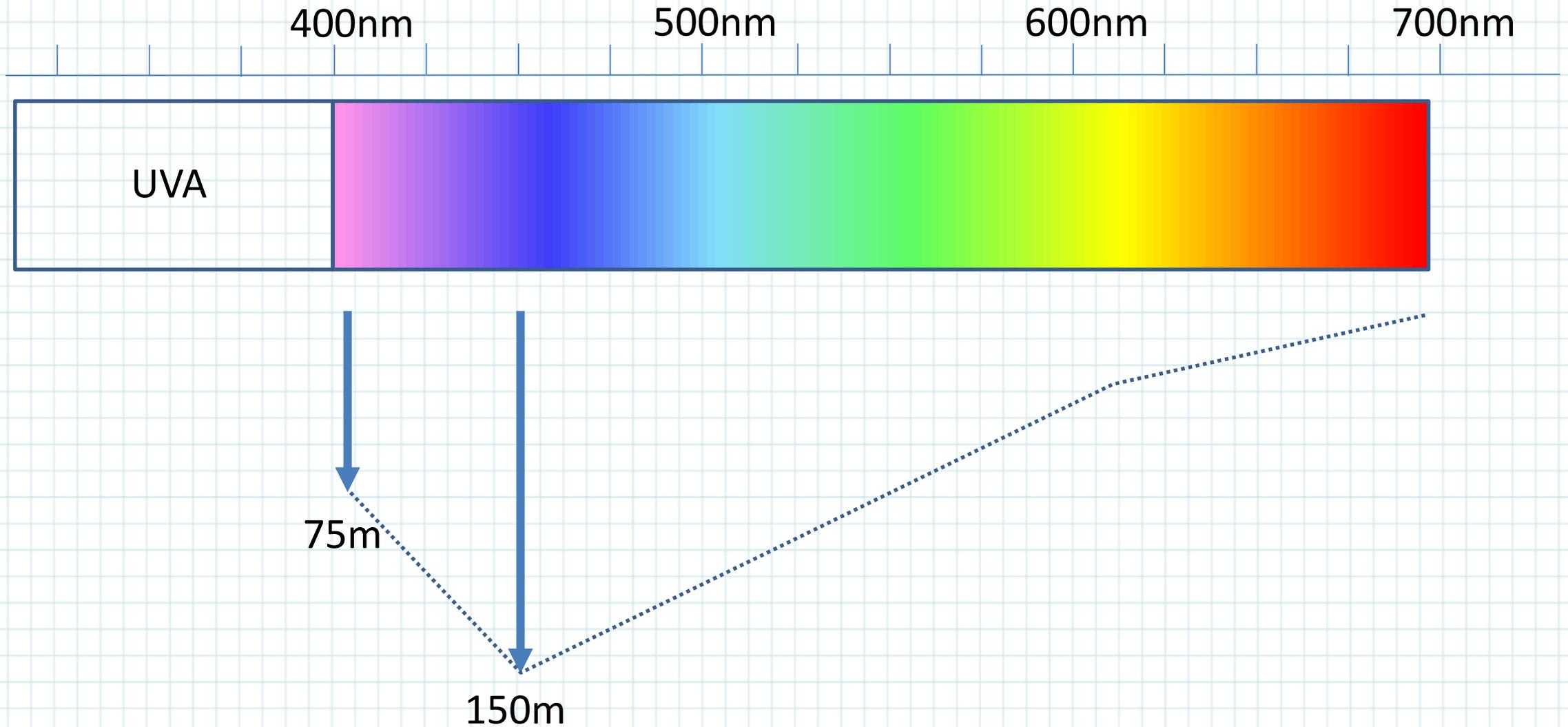


If they are that close to you, the game is up!

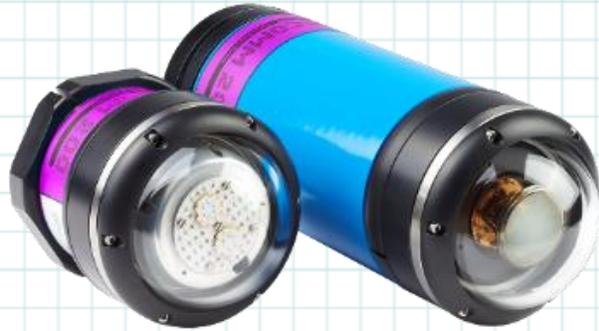


Interference from light



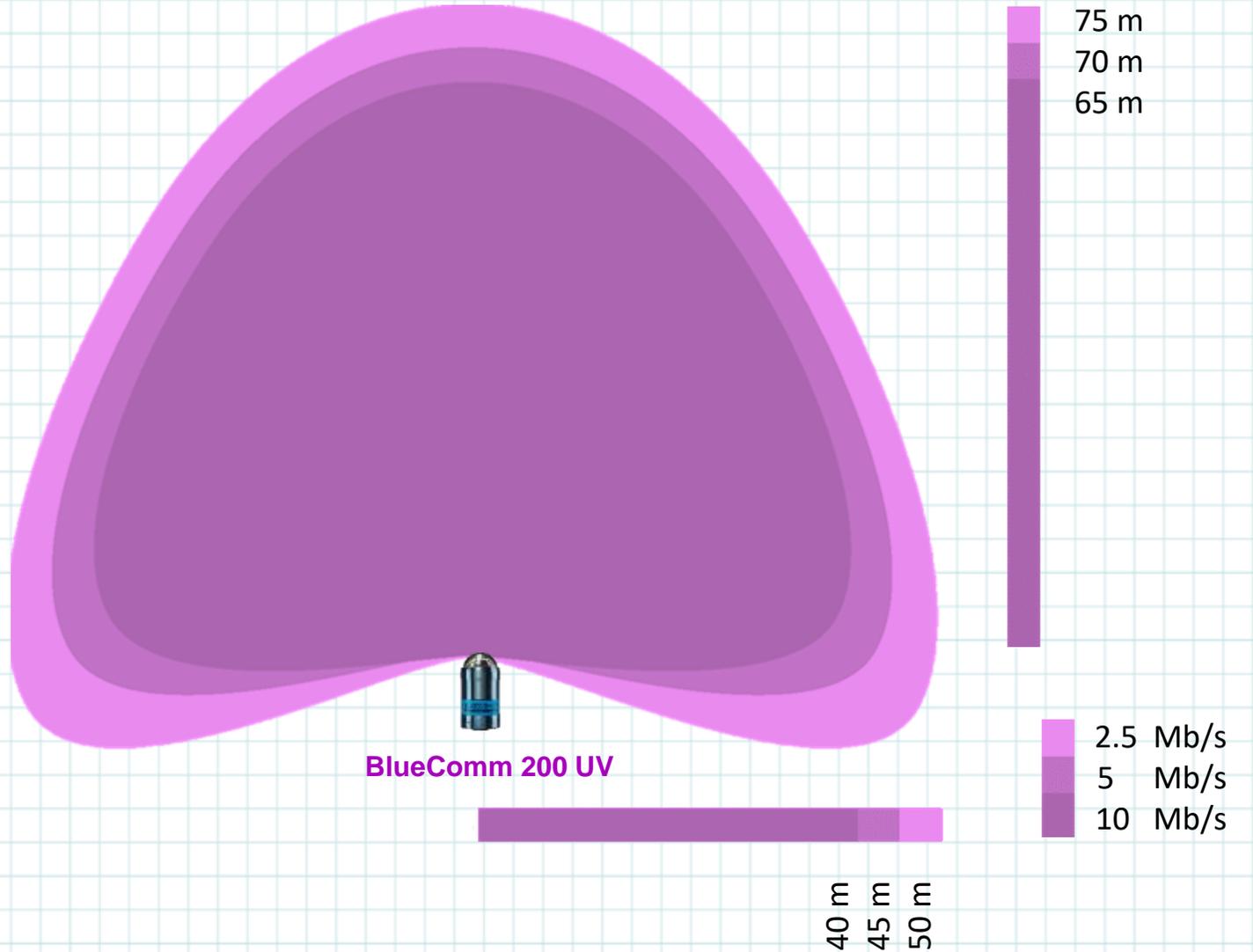


Options available to meet your needs

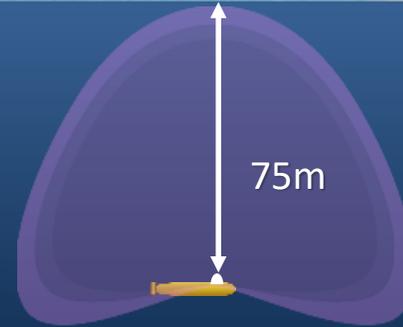
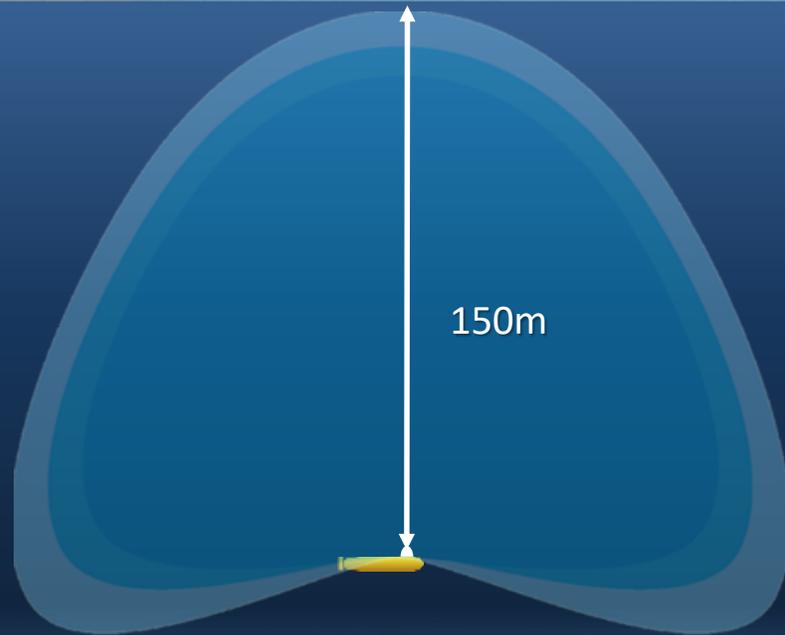


**BlueComm 200 UV**

75m Max Range  
1-10 Mbps  
405nm Centre  $\lambda$



# Depth = Covert

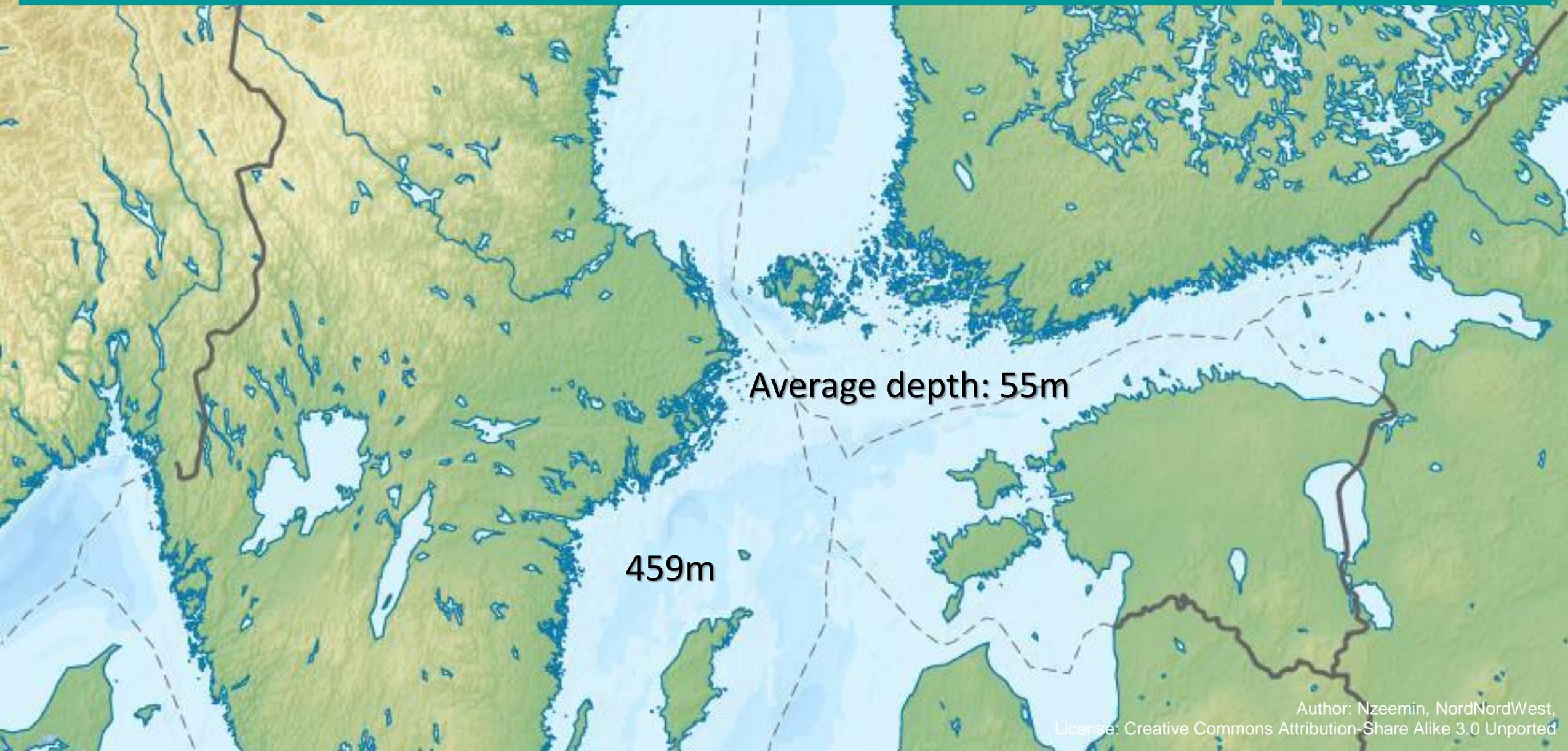


BlueComm

Combined Optical & Acoustics for Connector Free Data AUV Data Upload



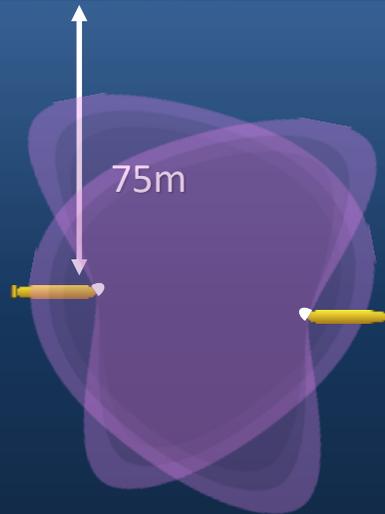
TOTAL/Ifremer Vortex Vehicle > Mediterranean – Night Operations



Average depth: 55m

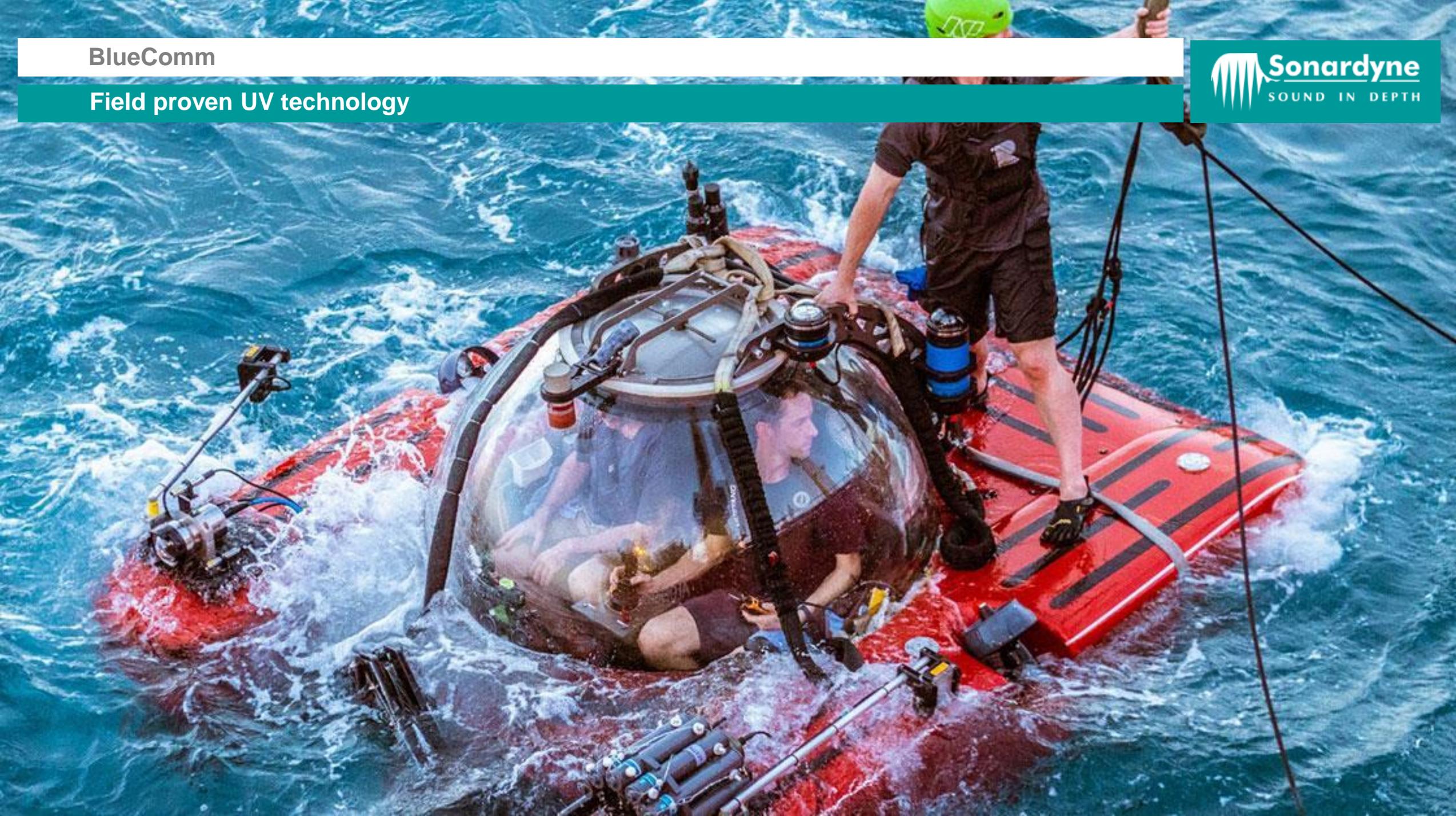
459m

# Geometry



BlueComm

Field proven UV technology



BlueComm

Field proven UV technology



Picture Courtesy of Nekton Foundation



**SUBSEA TECHNOLOGY**

**Thank you for your time today  
Any questions?**

**SONARDYNE.COM**



**POSITIONING  
NAVIGATION  
COMMUNICATION  
MONITORING  
IMAGING**