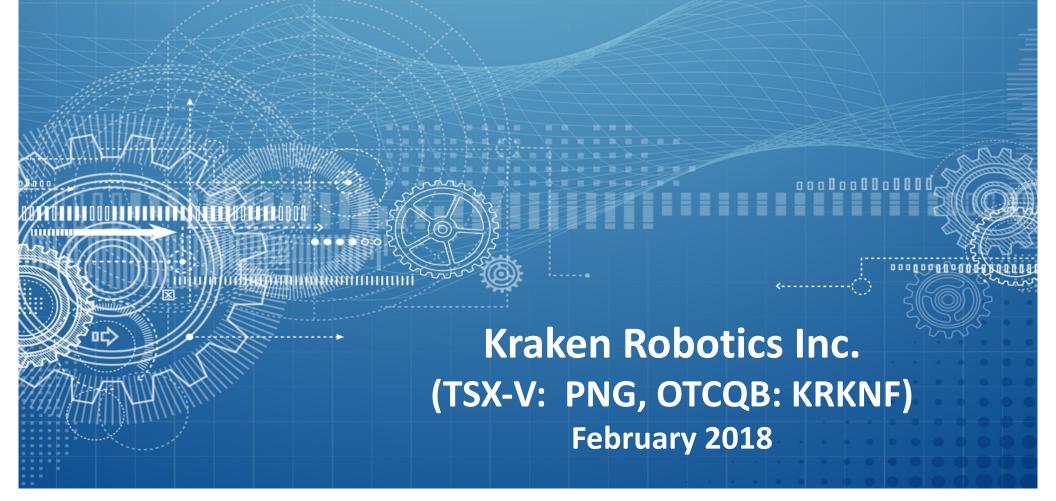


# World Leaders in Underwater Sensors & Robotics





# **Forward Looking Statements**

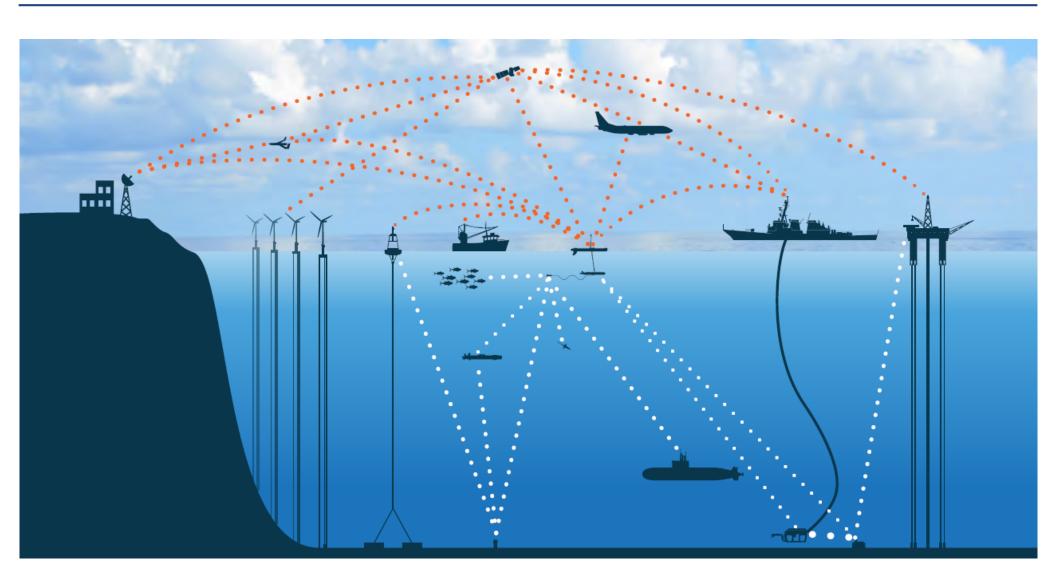
Some statements herein contain forward-looking information. The use of any of the words "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "will," "plans," "project," "should," "target" and similar expressions are intended to identify forward-looking statements. These statements may include, but are not limited to, statements with respect to potential markets and contracts, the completion of a proposed transaction, sales and EBITDA projections or potential applications.

These statements address future events and conditions and, as such, involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the statements. Such factors and assumptions include, among others, the effects of general economic conditions, the ability to project future sales and margins from current fundamentals and assumptions about market share, changing foreign exchange rates and actions by government authorities or cross-border authorities with jurisdiction over waterways, and negotiations and misjudgments in the course of preparing forward-looking information. Kraken believes the expectations reflected in those statements are reasonable but no assurance can be given that these expectations will prove to be correct and such forward-looking statements included in, or incorporated by reference into, this presentation should not be unduly relied upon. These statements speak only as of the date of this presentation. In addition, there are known and unknown risk factors which could cause the Company's actual results, performance or achievements to differ materially from any future results, performance or achievements expressed or implied by the forward-looking statements.

Known risk factors include risks associated with the ability to close contracts, working capital risk to be able to build inventory, loss of key personnel, lack of patents protecting intellectual property, changes in competing technology, continuing shrinkage of military budgets or other target customer budgets, risks associated with publicly traded company obligations, inability to raise required capital, and other potential risks that arise in the normal course of business. Forward-looking statements are made based on management's beliefs, estimates and opinions on the date that statements are made and the Company undertakes no obligation to update forward-looking statements if these beliefs, estimates and opinions or other circumstances should change, except as required by law.



# The Digital Ocean – Maritime RaaS





## **Corporate Overview**

#### Kraken Is A Leader in Maritime Robotics

- Founded in 2012. IPO in February 2015 (TSX-V: PNG)
- Leveraging over \$25M in sensors & robotics IP, technology and products
- Evolving from Sensors to-Robotics as a Service (RaaS)

#### Advanced Technology & Proven Products

- Validated by leading navies and international defence contractors
- Exporting to 10 countries. Over US\$100M in active contract pursuits
- Significant contract wins over past 6 months confirms value proposition

#### Experienced Management & Technical Team

- 40+ employees in Canada, USA and Germany.
- Significant ocean technology expertise, deep industry insights, key relationships

#### A Significant Market Opportunity

- Maritime robotics positioned where aerial drones were in mid-90s
- Industry growing from US\$2B in 2017 to over US\$5B industry by 2020
- International partnerships and multi-sector collaboration to extend reach and revenue



Since 2012, Kraken has been named to the annual MTR 100 list every year — the top 100 marine technology companies in the world.





# Reasons to Own Kraken Stock (TSX-V:PNG)

- Strong technology offering in industry with high barriers to entry
- \$100M+ active business pursuits with expected awards in next 12 months
- Short listed as one of two suppliers for contract worth \$70M+ to Kraken
- Proven technology, high value add, high margin business (60%+ gross margins)
- Emerging commercial market validation with recent notable contract wins with GE Oil and Gas; Ocean Infinity (conducting the MH370 search)
- Management and insiders own 37% of outstanding shares
- Current market cap is less than the value of \$25M+ company IP
- Maritime Robotics as a Service (RaaS)



#### **Corporate Structure**

#### Kraken Robotics Inc.

(TSX-V:PNG)
Toronto, Canada

#### Kraken Robotic Systems Inc.

St. John's/Halifax, Canada

- Synthetic Aperture Sonar
- RT SAS Signal Processing
- RT 3D Seabed Mapping
- 3D Visualization Software
- Correlation Velocity Logs
- KATFISH SAS Towfish
- Handling Systems/A-LARS
- THUNDERFISH AUV

#### Kraken Underwater Systems LLC

Fairfax, USA

- **Engineering Services**
- **Business Development**

#### Kraken Robotik GmbH

Bremen, Germany

- Laser/Optic Sensors
- Artificial Intelligence
- Machine Learning
- AUV Control Systems
- Subsea Docking
   Systems
- Brazilian Support Office

#### Kraken Power GmbH

Rostock, Germany

- Pressure Tolerant
  - Molding
- Batteries & BMS
- Drives
- Thrusters
- JELLYFISH H-ROV



#### **Strong Management & Technical Team**

#### Karl Kenny, President & CEO

- Co-founder of Telepix Imaging Inc., sold for \$50 million + shares
- Co-founder Marport Canada, President and CEO until Dec 2011
- Twice named to Top 50 CEOs by Atlantic Business Magazine
- Ex-Canadian Navy maritime surface officer and Microsoft employee pre-public company

#### **Greg Reid, Chief Financial Officer**

- 20+ years of finance, investment, and business development experience
- Founding partner of Wellington West Capital Markets, led technology and clean technology research and then investment banking efforts
- CPA, CA, CFA

#### **Jeff Bartkowski, Director of Business Development**

- 12 years experience in the marine technology industry specializing in imaging, navigation, and positioning
- 10+ years of sales and business development experience with both commercial and defense customers
- Worked at both larger marine technology companies such as Teledyne-RESON and iXBlue and start-ups such as Sea Machines Robotics

#### **David Shea, VP Engineering**

- Designed, built & operated AUVs for International Submarine Engineering, University of Southern Mississippi & University of Victoria
- BEng in Electrical Engineering from University of Victoria, specializing in Mechatronics
- Formerly Engineering Manager for Marine Robotics Inc. (Marport spin off)

#### **Dr. Tom Tureaud, VP Underwater Systems**

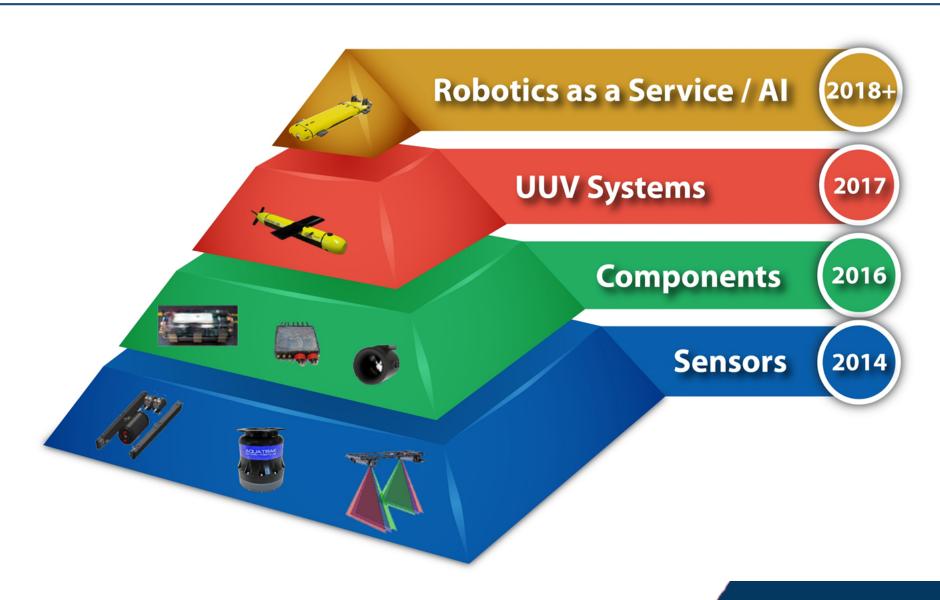
- 30 years experience in the underwater community across a wide spectrum of disciplines, including technology development, prototype underwater systems development, & management of highly effective engineering teams.
- Previously senior engineer at Draper Laboratory and recently chief engineer at Vehicle Controls Technology.
- PhD in Mechanical Engineering from the University of Notre Dame.

#### Dr. Jakob Schwender, Managing Director for Kraken Germany

- 10 years at DFKI, (the German Research Center for Artificial Intelligence) as an expert in autonomy, systems and software engineering for robotics, mission management, SLAM navigation, embedded systems, sensor processing and sensor fusion.
- PhD in Robot Navigation in 2013 and since then had led a multi-disciplinary team on autonomy.

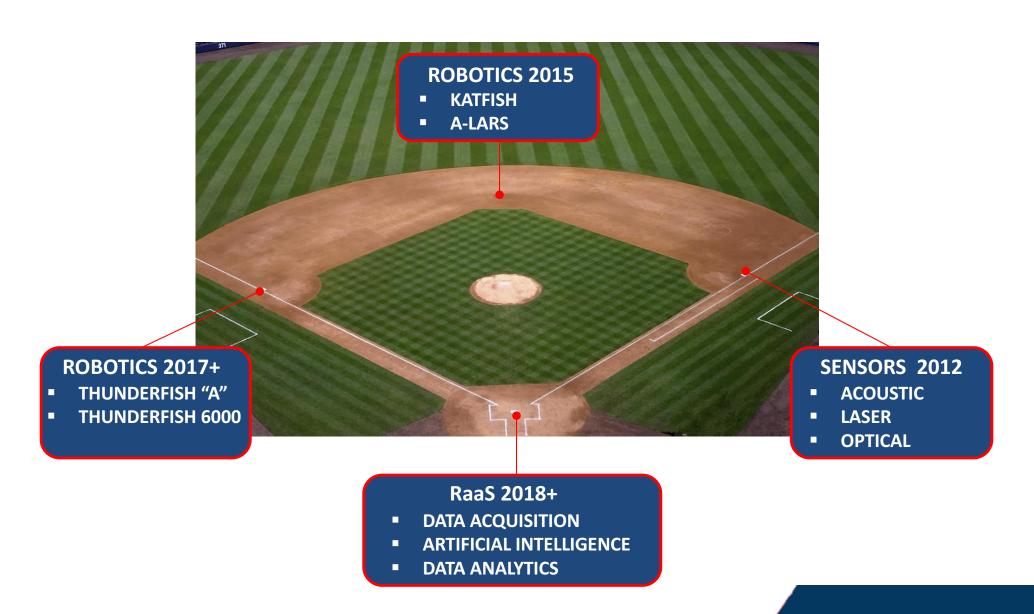


# Over \$25M in Sensor & Robotics IP





# **Kraken's Business Strategy**





## Maritime Products from \$50K to \$3M+

#### **Product Portfolio**

#### **Sensors & Software**

- AQUAPIX® Synthetic Aperture Sonar
- SEAVISION™ 3D Underwater RGB Laser
- INSIGHT™ RT Sensor Signal Processing
- SOUNDVIEW™ RT 3D Seabed Mapping
- 3D Visualization Software
- AQUATRAK® Correlation Velocity Logs
- Pressure Tolerant Encapsulation
- Batteries & Battery Management
- Drives & Thrusters
- LARS & Underwater Docking Systems

# Unmanned Underwater Vehicles KATFISH US\$ 1,500,000 Now JELLYFISH US\$ 1,000,000 Hybrid Operation THUNDERFISH US\$ 3,000,000 Autonomous 2018-2020











































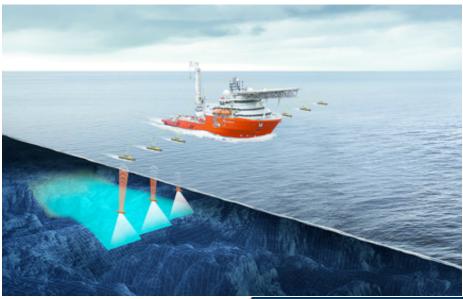




#### **Recent Contract Announcements**

- **ECA Robotics** French defense company; 2<sup>nd</sup> order for integration on Alister 18 AUV.
- Atlas Elektronik KATFISH partner on India bid, MINSAS sale and integration onto SeaCat AUV, teaming agreement on Canadian RMDS and other
- Unnamed Defence Customer \$2M robotics contract
- Ocean Infinity \$3M contract to equip Kongsberg Hugin AUVs; will deploy flotilla of AUVs at once
- **GE Avitas** Partnership for underwater robotics for predictive maintenance analytics of subsea assets
- PRNL \$750,000 for robotics hardware and software for digitalization of oil fields



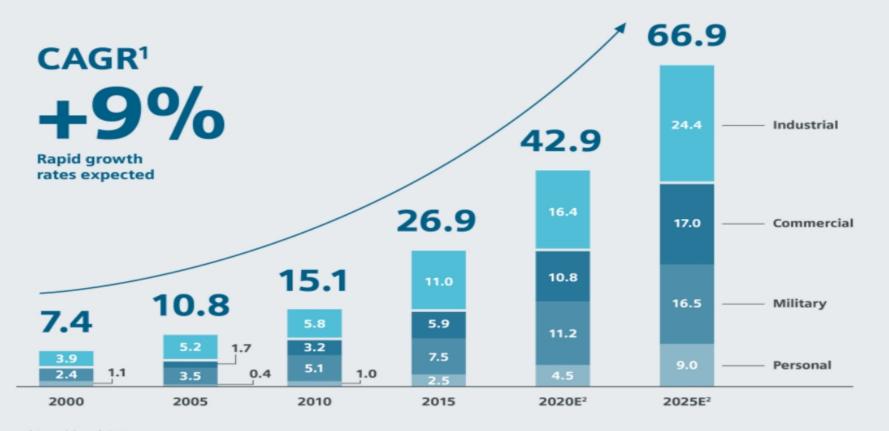




#### **Robotics Are Transforming Industries**

Worldwide Spending on Robotics is Expected to Reach US\$ 67 Billion by 2025

Global robotics market (US\$ Billions)



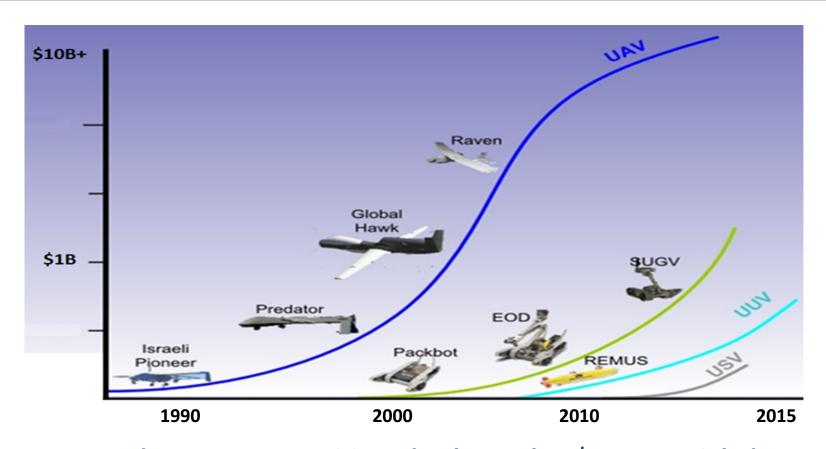
<sup>1</sup> Compound Annual Growth Rate

Source: International Federation of Robotics, Japan Robot Association; Japan Ministry of Economy, Trade & Industry; euRobotics; company fillings; BCG analysis.

<sup>2</sup> E = Expected



#### Maritime Robotics Poised For Major Growth



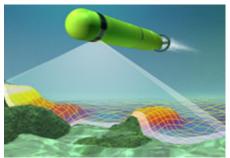
Ocean drones now positioned where the \$10B+ aerial drone industry was in the 2000's. Ocean drones market growing from under \$1B in 2010 to over \$5B by 2020.



## **US\$5B Maritime Robotics Market By 2020**









**MILITARY** 

#### **COMMERCIAL**

Hydrography, Oil & Gas, Subsea IRM, Science and Emerging Sectors

40%

\$2B

60%

\$3B

Mine Counter Measures

Intel, Surveillance and Reconnaissance

Anti-Submarine Warfare

Cable & Pipeline Survey

Subsea Infrastructure Monitoring

Inspection, Repair & Maintenance

Hydrography & Seabed Mapping

Search, Locate & Recovery

Treasure Hunting & Salvage

Offshore Wind, Wave and Tidal Farms

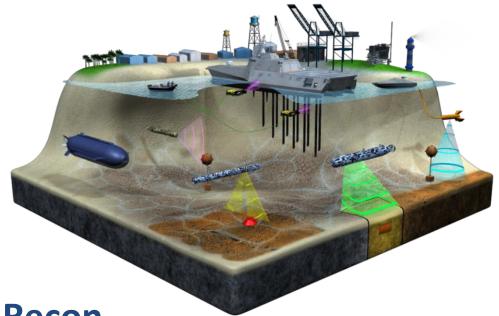
Ocean Thermal Energy Conversion

Seafloor Mineral Extraction



## **Military Applications**

- Mine Warfare500,000 underwater mines
- Anti-Submarine Warfare 400 operational submarines



Intelligence, Surveillance, Recon
 Special forces, covert operations, environmental assessment

Resurgence in underwater warfare driving demand for unmanned systems for "dull, dirty, dangerous" missions.



## **Offshore Energy Applications**

- >7,000 fixed platforms
- >200 floating platforms
- >4,000 subsea wells
- >650 offshore drilling rigs
- >200,000 km subsea pipelines
- >4,000 offshore wind turbines
- >600,000 subsea connectors



Maintenance of existing infrastructure is a major driver for underwater sensors and robotics.

## **Synthetic Aperture Sonar Technology**



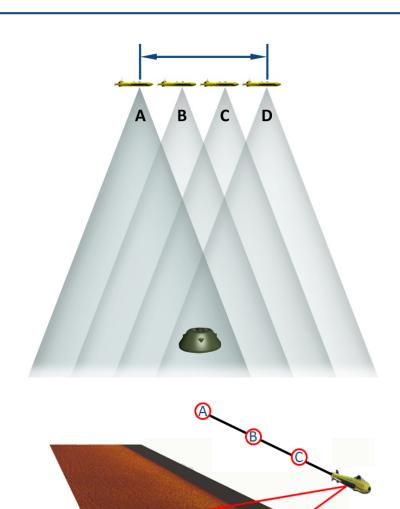
Compared to conventional sidescan sonar systems, SAS significantly improves the image resolution allowing for automatic detection and classification of small objects on the seafloor.

The principle of SAS is to move a sonar along a line and illuminate the same spot on the seafloor with several acoustic pings. This produces a "synthetic aperture" equal to the platform distance traveled.

SAS uses sophisticated signal processing software to coherently recombine the acoustic pings and create ultra-high resolution images.

SAS image resolutions are MCM GRADE (5cm) and provide over 10x the area coverage rates of conventional sidescan sonar.

Interferometric SAS enables real-time 3D bathy data that's co-registered with the imagery.



## Why Synthetic Aperture Sonar?



#### **Ultra High Image Resolution**

- Constant along/across track resolution of 3cm x 3cm
- 15x better compared to Real Aperture Sonar

#### **Increased Area Coverage Rate**

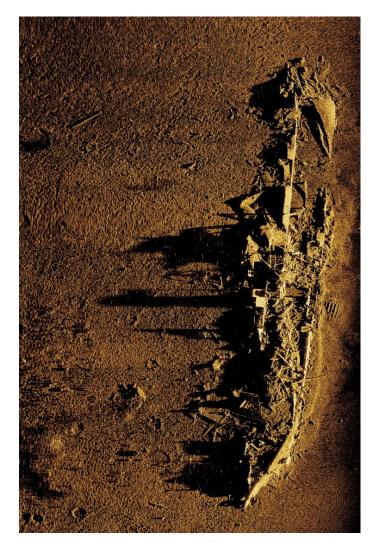
- Up to 4 km<sup>2</sup>/h
- Up to 600m swath
- 10x better compared to Real Aperture Sonar

#### **Operational Safety**

- Ability to fly high off-bottom
- 10x UUV altitude (ie. 30m altitude = 300m range /600m swath)

#### **Additional By-Products**

- Real-time, co-registered high resolution 3D bathymetry
- Multi-aspect creates optical-like quality imagery
- Shadow enhancement improves target classification
- Enables Real Time ATR
- SAS micro-navigation output to INS increases accuracy



**Image courtesy ECA Robotics** 

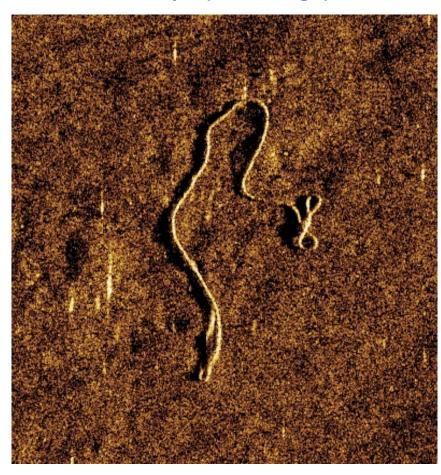


# **Synthetic Aperture Sonar Technology**

#### **Conventional Sonar vs Kraken's Sonar – Towrope (50m range)**



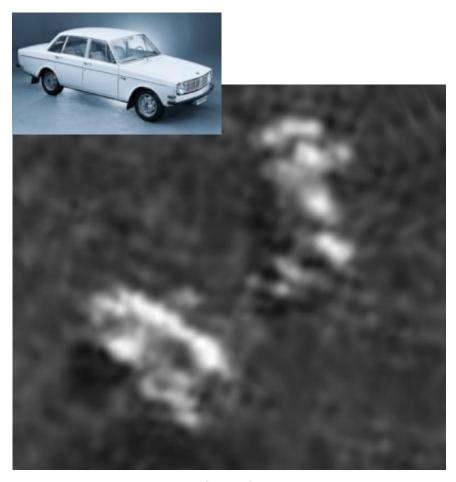
**Conventional Sonar** 



Kraken AquaPix® SAS

# **Synthetic Aperture Sonar Technology**





Conventional Side Scan Sonar Pixel Resolution: 20cm @ 80m range



Kraken AquaPix® SAS
Pixel Resolution: 3cm @ 80m range

# Kraken's SAS on US Navy Drone - Nov. 2017





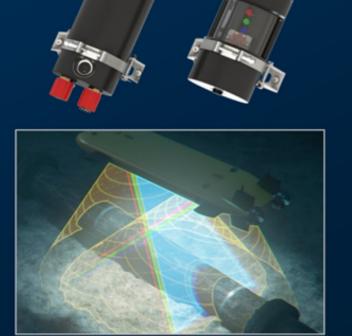


#### World's First Full Colour 3D Underwater Laser

SEAVISION"

3D UNDERWATER
IMAGING SYSTEM

- Ultra-high resolution
- Twin pods enable flexible mounting on ROVs and AUVs
- Dynamic (profiling) or static (scanning) operation
- Full colour point clouds from RGB lasers
- Unprecedented scan speed (300,000 points/second)
- High-sensitivity colour camera with live video streaming
- No wet moving parts
- Real-time signal and image processing
- Embedded inertial navigation system
- Simple in-field, on-deck calibration
- Compact and lightweight
   (42 cm length x 11.4 cm diameter, 6 kg)
- Low capital cost

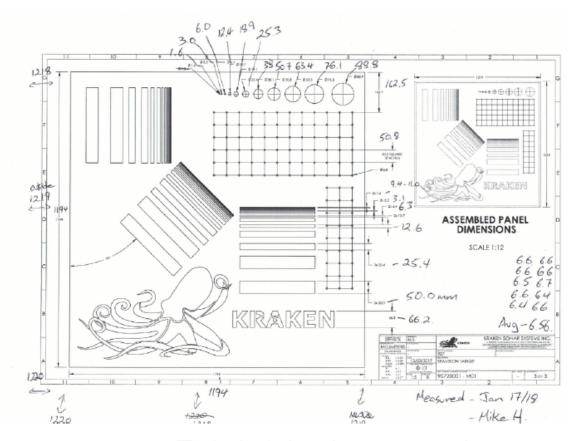




# **SeaVision Plane Target**



Still Image



Technical drawing + manual measurements

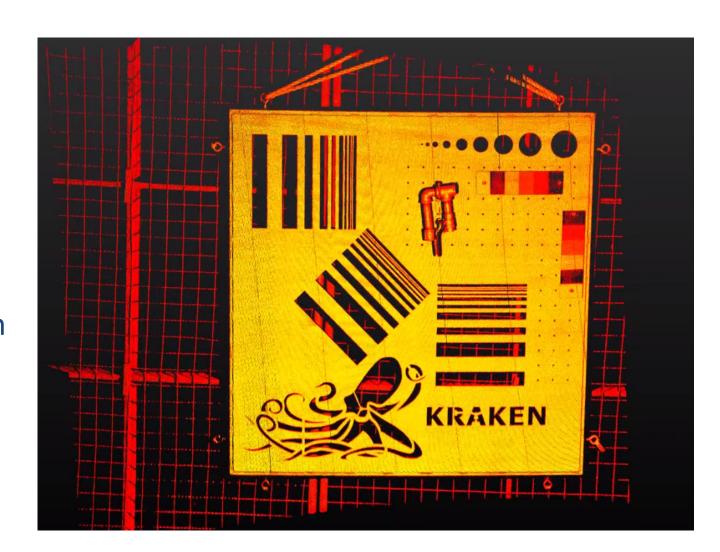


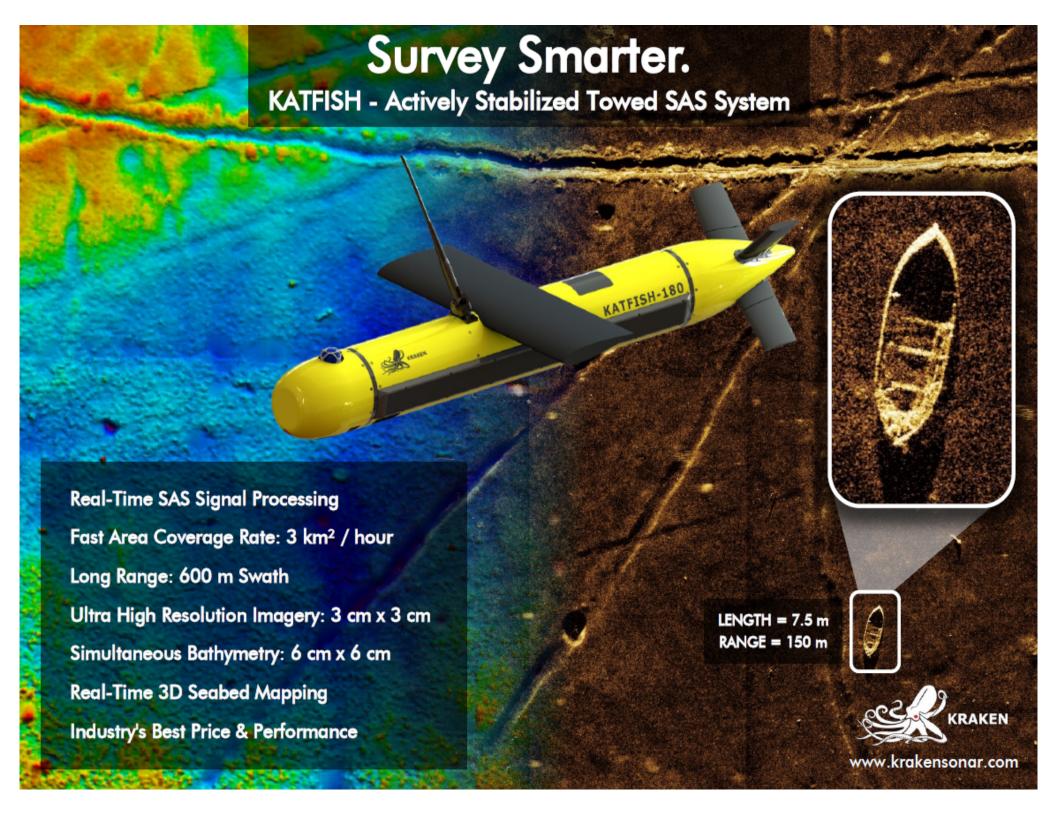


Scan Time: 8 seconds

Distance: 2 metres

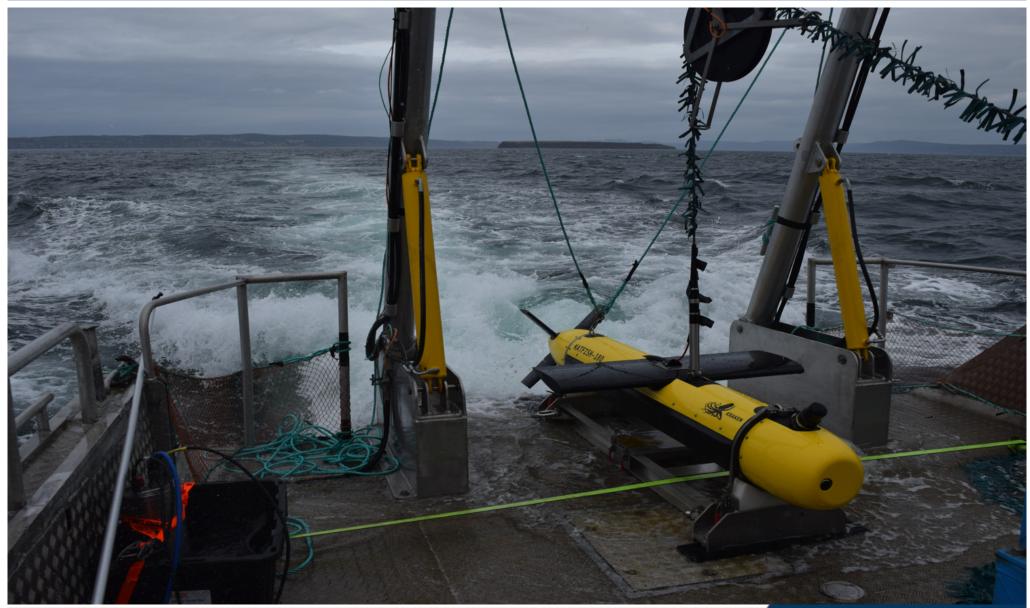
Point Spacing: 1.5mm







#### **KATFISH – Tethered Underwater Towfish**

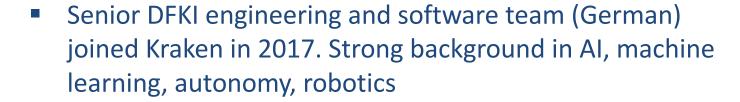






# **THUNDERFISH® - Next Gen Hovering AUV**

- Kraken acquired all AUV IP and technology assets from Marine Robotics Inc. (MRI) in 2015
- Former MRI engineering and software team work at Kraken. MRI assets and IP from KATFISH enable 70% IP for next-gen AUVs



 Fraunhofer (Germany) partnership provides Kraken exclusive access to AUV IP. Kraken acquired Fraunhofer AUV that is deployed as a technology demonstrator – ThunderFish Alpha





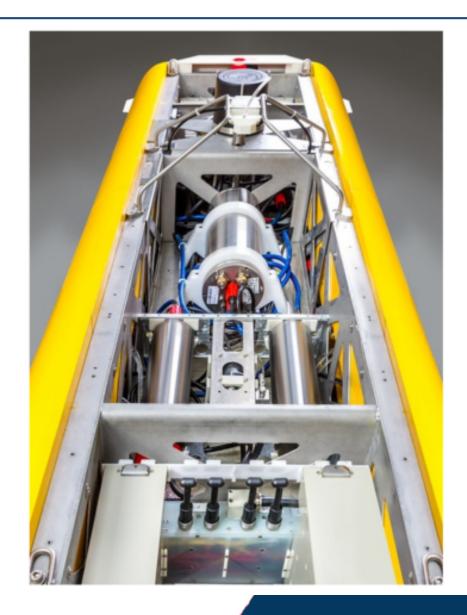




# **THUNDERFISH® Technology Demo Platform**









## **THUNDERFISH ® - Autonomous Underwater Vehicle**





## Avro Arrow – August 2017 – First RaaS Job





#### Kraken ThunderFish® AUV

- Wet-flooded payload section
- Kraken MINSAS 120 Sonar
- Kraken Real-Time SAS Processor
- Reson T-20 MBES
- Sonardyne Sprint INS
- Full integration into control system



#### **Operational Area in Lake Ontario**

- 150+ hours of real world field trials and shakedown
- Demonstrated onboard, real-time SAS processing
- Located rockets, missiles
- Successfully located two Avro Arrow Free Flight Models
- Expect follow on work in 2018

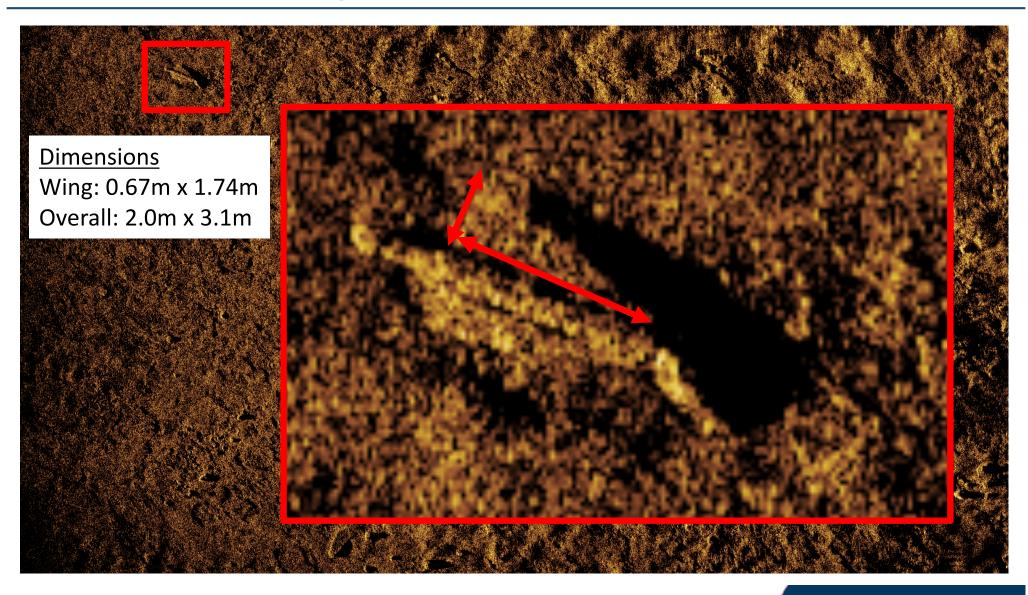


# **THUNDERFISH in Lake Ontario**



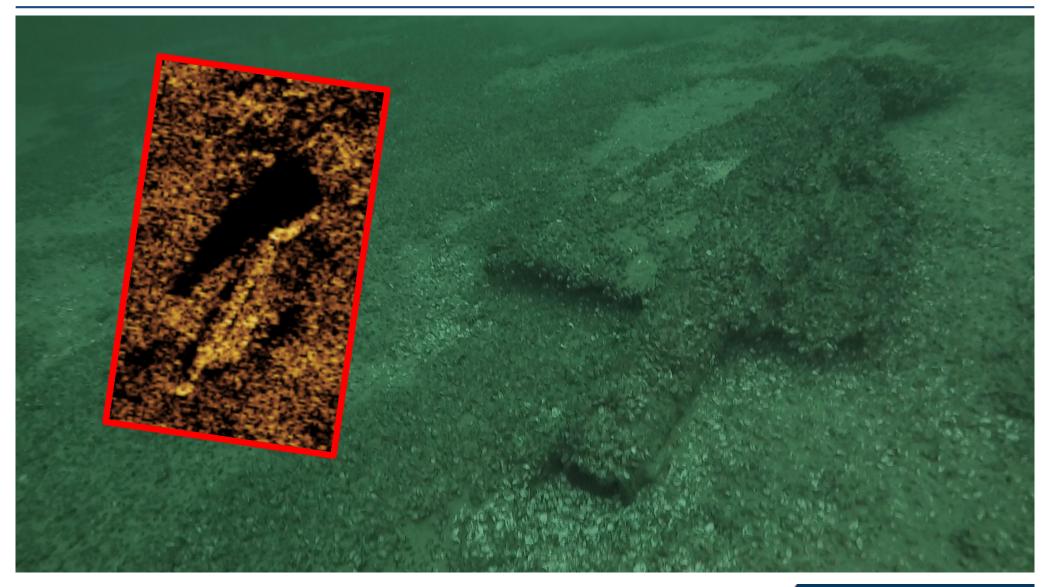


# Avro Arrow – August 2017





# Avro Arrow – August 2017



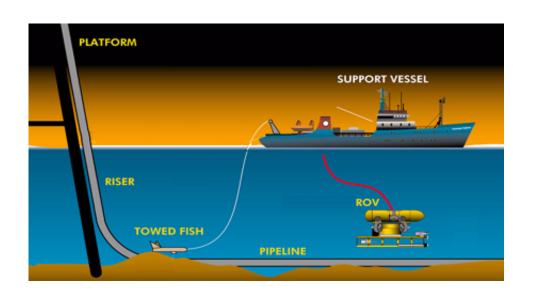


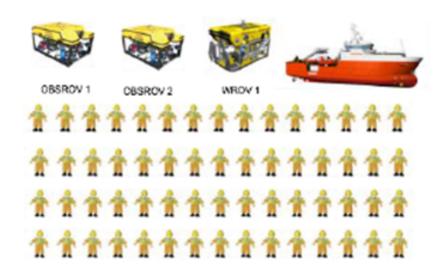
# Maritime Robotics as a Service (RaaS)

- Future underwater robotic intelligence will come in the form of Robotics as a Service (RaaS).
- Instead of selling hardware, RaaS firms own their fleet and provide customers a recurring data acquisition and seabed intelligence service
- Customers do not have to incur significant capex and maintenance costs and lower total cost of data acquisition
- Kraken is positioned to become a leader in Maritime RaaS.



## **Maritime RaaS Application: Pipeline Survey**





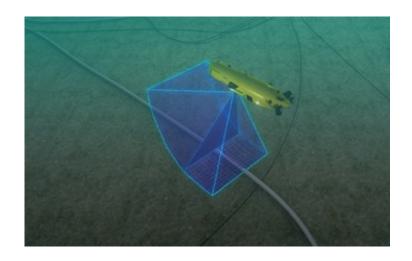
**Shipboard Personnel: 40 - 60 people** 

Daily Opex: \$150,000 - \$200,000 per day

**Speed of Advance: 2 knots max.** 

# **Maritime RaaS Offers Compelling Value Proposition**





Conventional	RaaS	Operator Benefit
\$150,000 per day	\$20K per day	Significantly Lower Opex
60 Survey / Ops Personnel	4 Ops Personnel	Mitigates Operational HSSE
Emergency Response: 72 Hours	Emergency Response: Immediate	Mitigates Production Losses and Safety Issues
Daily Area Coverage: 50 miles	Daily Area Coverage: 100 miles	Increased Area Coverage & Ability to "Force Multiply"



# **2017 Milestones – Strategic**

#### **Strategic**

- Established Kraken Robotik GmbH in Bremen, Germany
- Reached Exclusive Robotics IP Agreement with Fraunhofer Institute
- Established Kraken Power GmbH in Rostock, Germany.
- OTCQB Stock listing in the U.S.
- Took delivery of AUV from Fraunhofer and renamed THUNDERFISH
- Found Avro Arrow models with THUNDERFISH AUV in First RaaS Project
- Rebranded as Kraken Robotics Inc.
- Announced strategic cooperation with GE Avitas for underwater robotics for predictive maintenance
- Finalist Supercluster team member as part of Ocean Technology Supercluster Canadian government to choose winning clusters in Q1/18



# 2017 Milestones – Financial (C\$)

#### **Financial**

- \$1.5M Grant from NRC and \$0.75M Grant from RDC
- Completed Private Placement of \$2.1M; sold Non-Core Asset Proceeds \$0.9M
- \$0.2M First contract for KRG for customized SeaVision for subsea crawler
- \$0.4M Repeat Contract from European Defence Contractor (ECA Robotics)
- \$0.4M Contract from Atlas Elektronik of Germany
- \$3M Contract with Ocean Infinity for SAS sensors on Hugin AUVs
- \$0.5M RaaS contract (Avro Arrow test model search)
- \$2M Robotics contract with unnamed customer
- \$0.1M Paid trial with major global defense company
- \$0.75M Contract with PRNL for robotics for digitization of oil fields

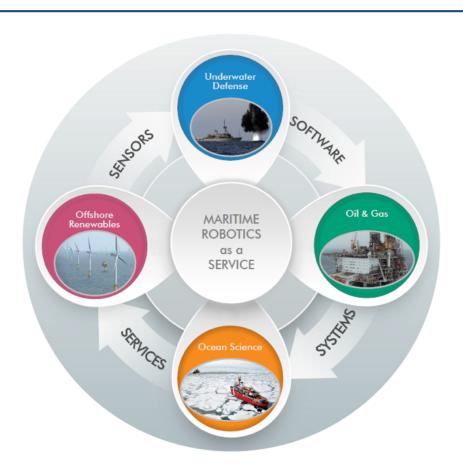


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- Management and insiders own 37% of outstanding shares
- Current market cap is less than the value of \$25M+ company IP
- Maritime Robotics as a Service (RaaS)

# **Questions?**





#### **Karl Kenny**

**President & CEO** 

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