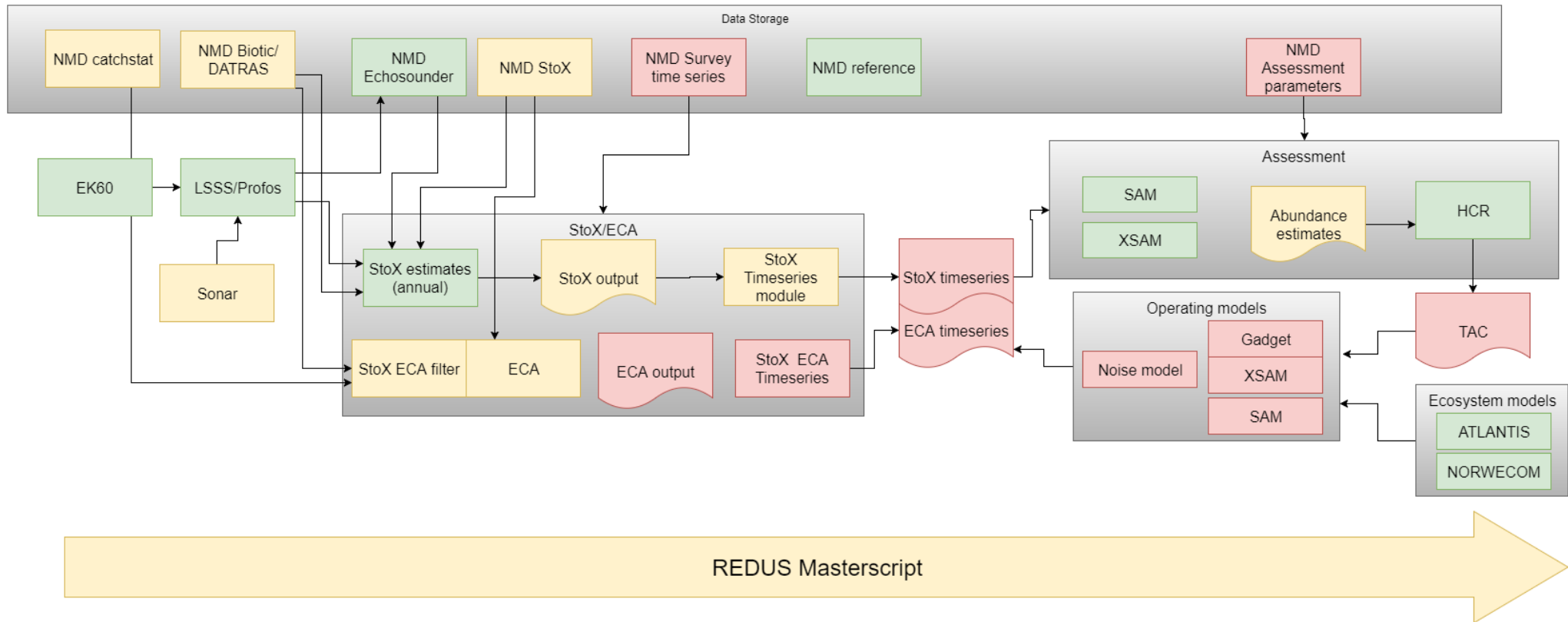


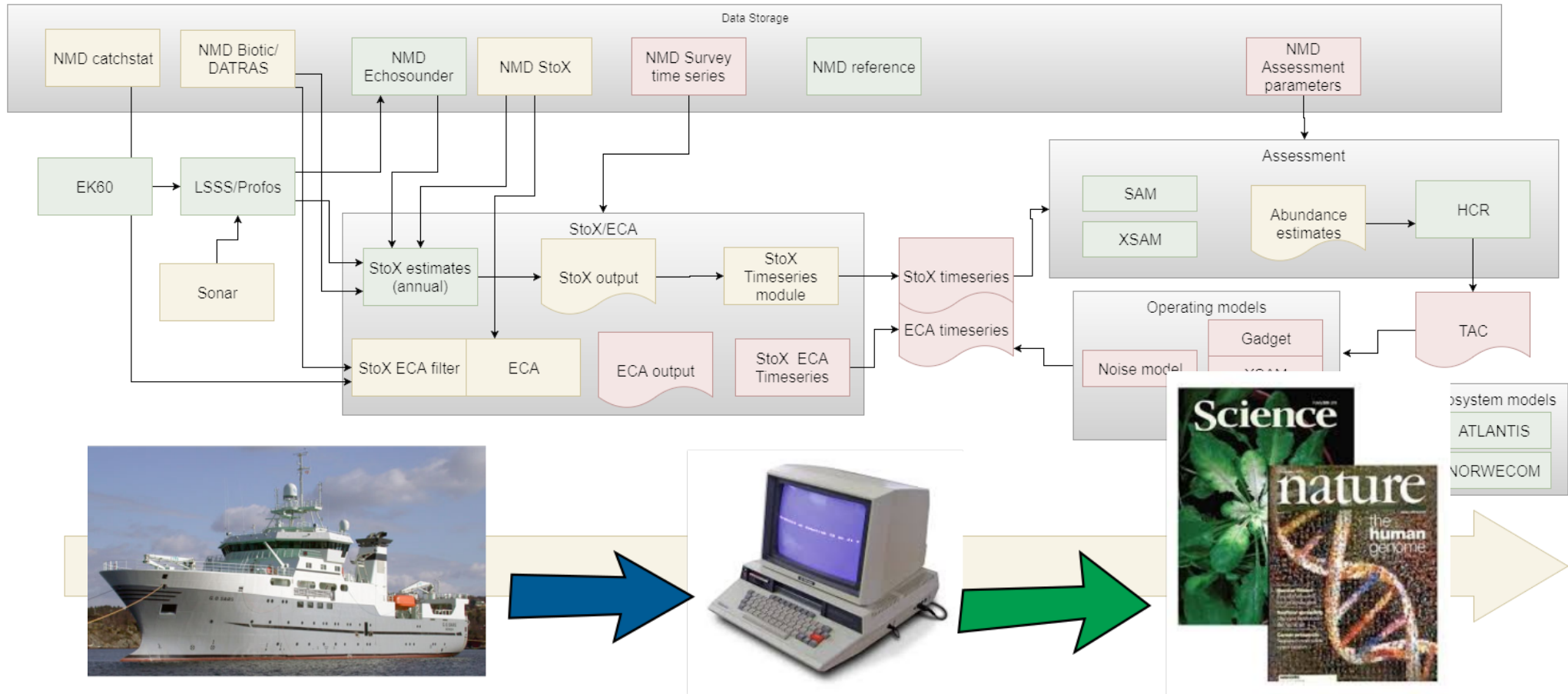
Machine intelligence and the data-driven future of science

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A management advice model

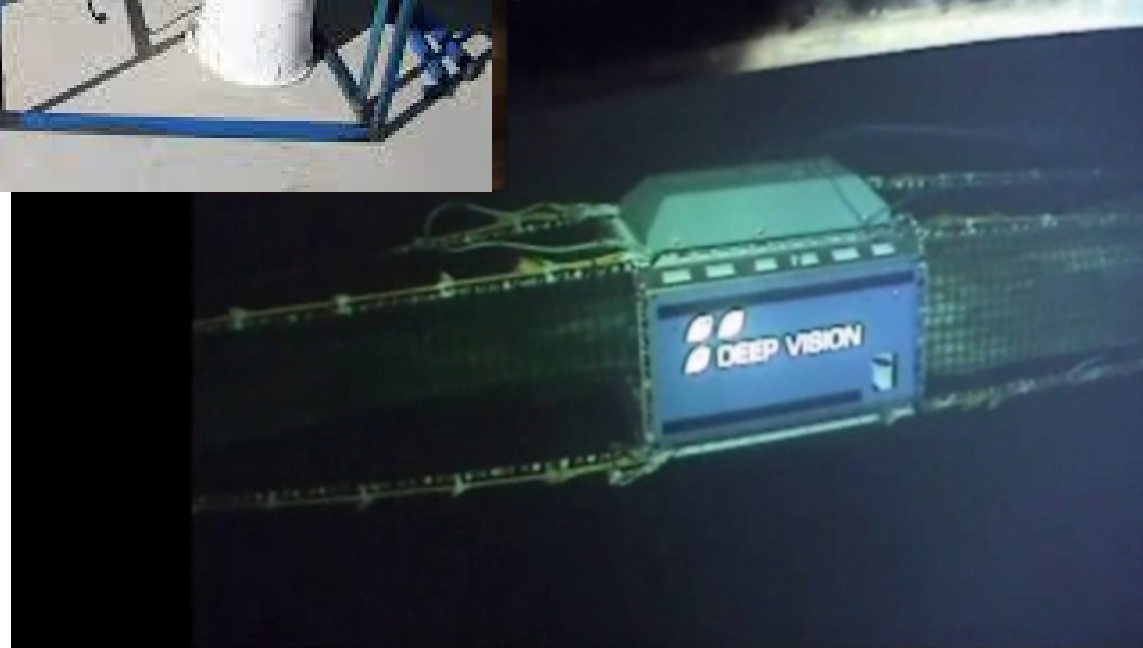
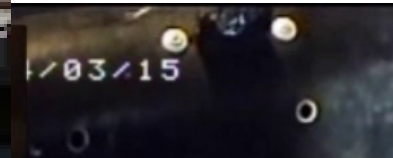


A simplified model



Oceans of data

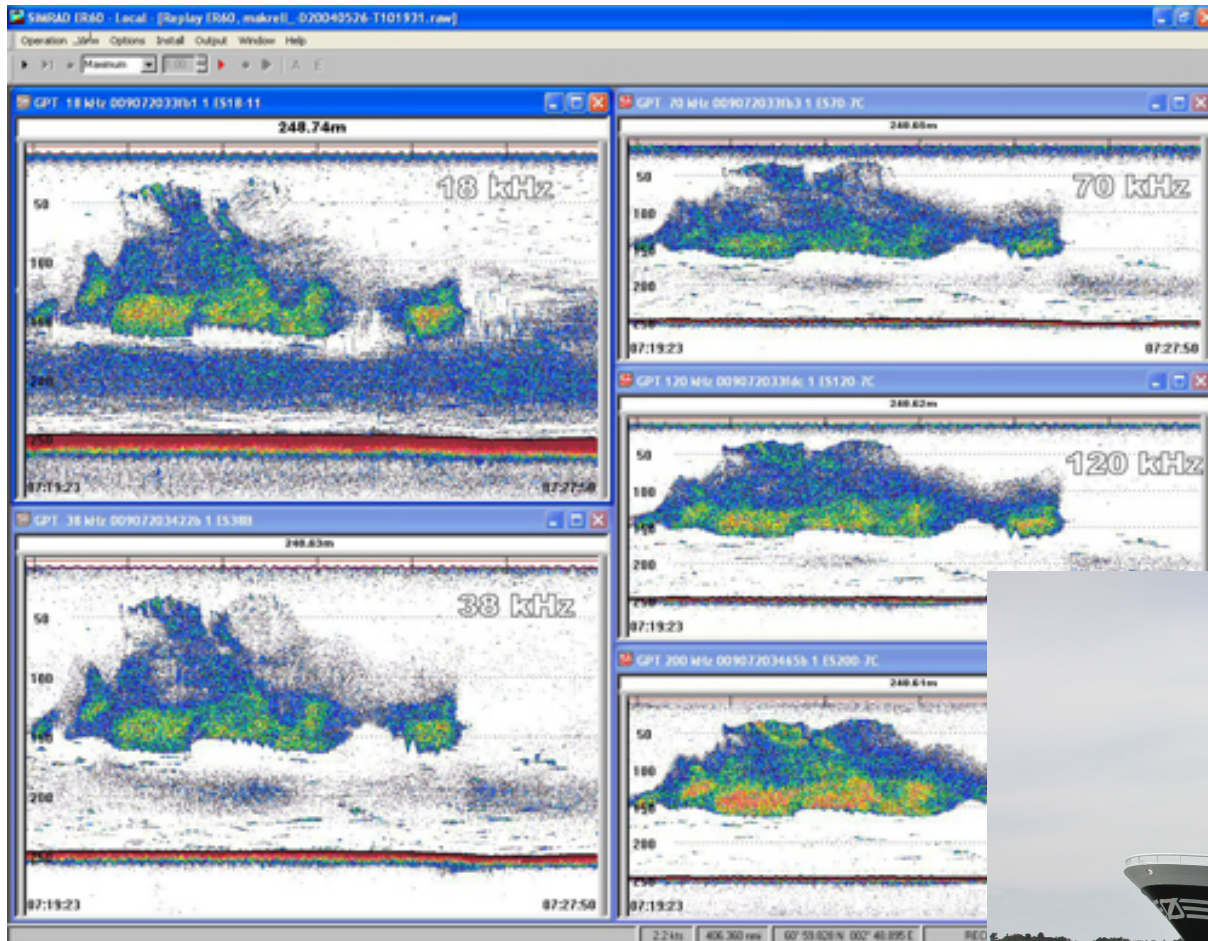
Images



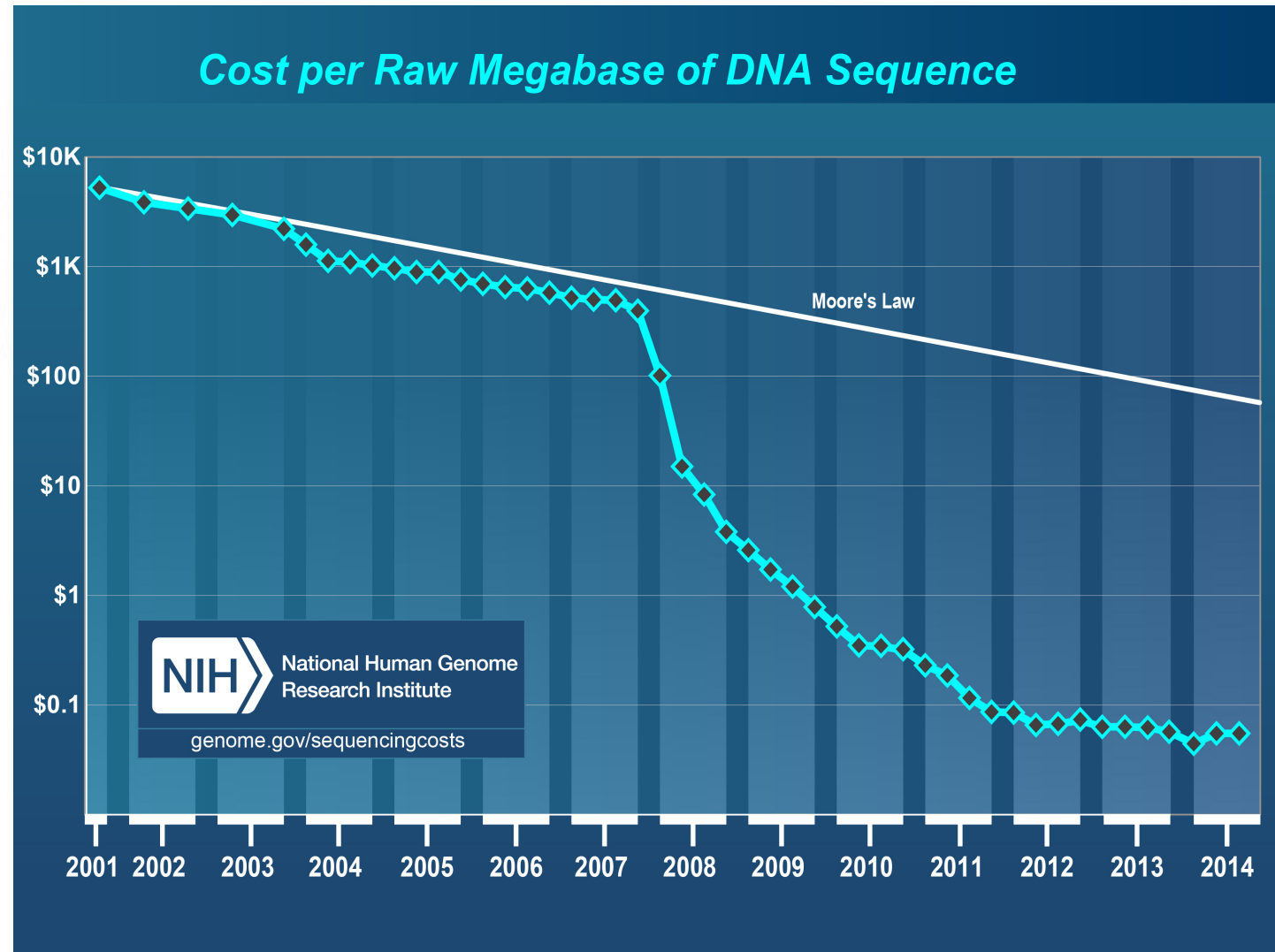
Floats, ROVs, and AUVs (oh my!)



Acoustics



Molecular methods



The Analysis Bottleneck

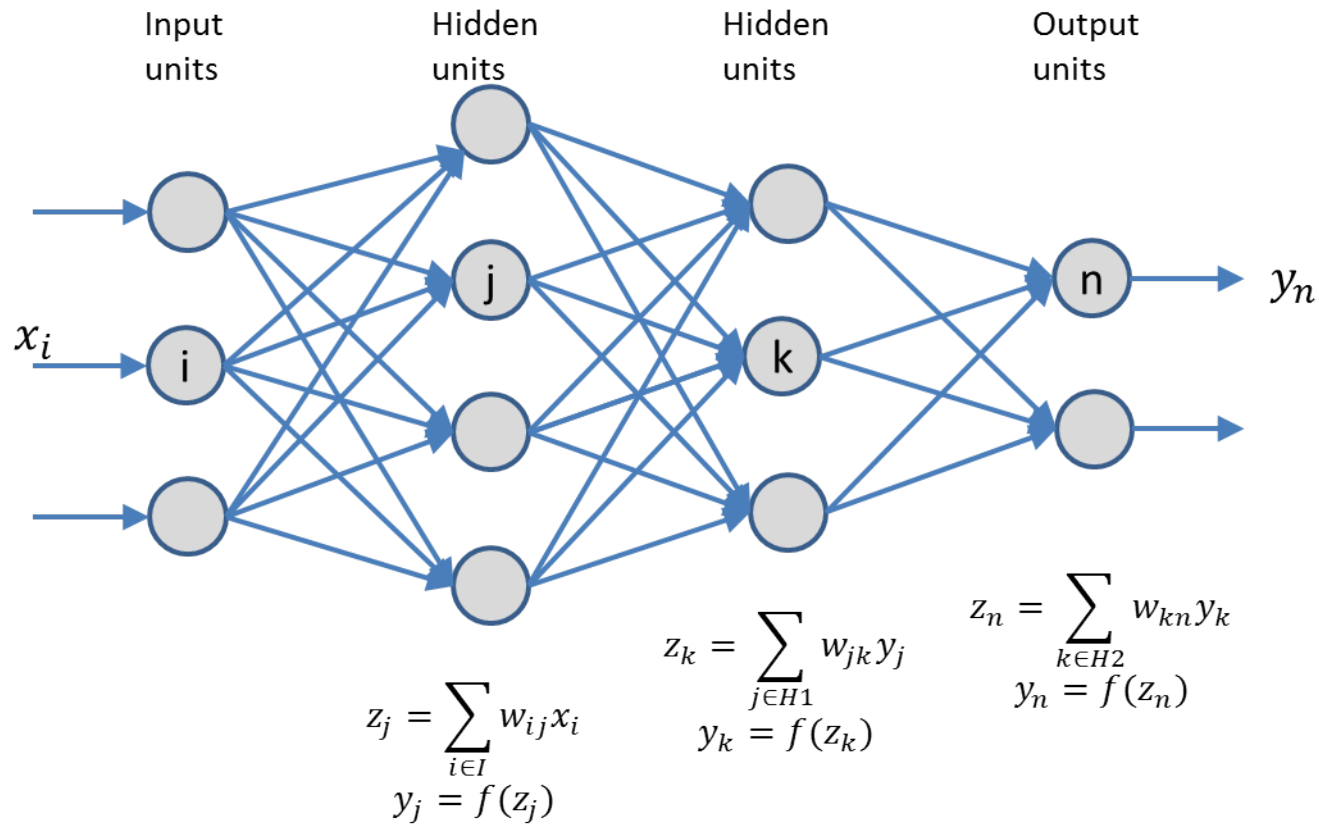


Can we drink from the firehose?











The Deep Learning Revolution

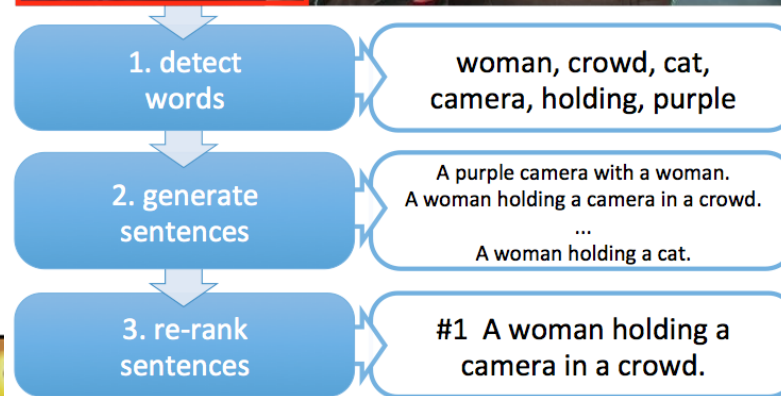
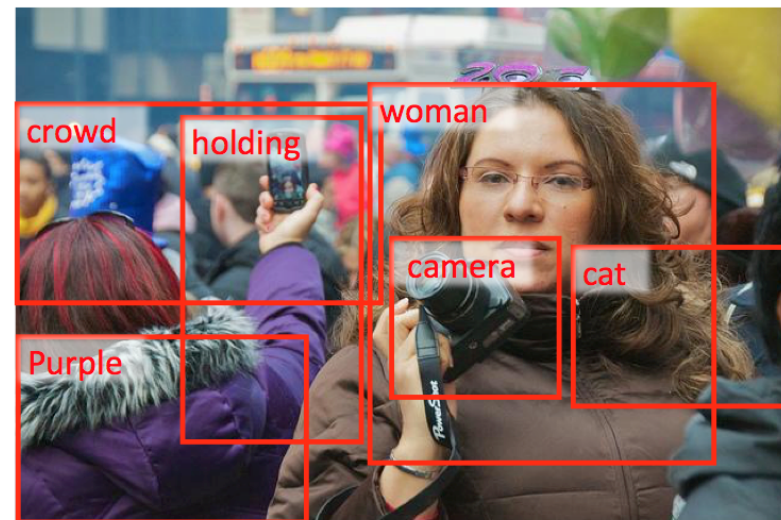
What is machine learning?



The ImageNet challenge

			
<p>lens cap</p>	<p>abacus</p>	<p>slug</p>	<p>hen</p>
<p>reflex camera Polaroid camera pencil sharpener switch combination lock</p>	<p>abacus typewriter keyboard space bar computer keyboard accordion</p>	<p>slug zucchini ground beetle common newt water snake</p>	<p>hen cock cocker spaniel partridge English setter</p>
			
<p>tiger</p>	<p>chambered nautilus</p>	<p>tape player</p>	<p>planetarium</p>
<p>tiger tiger cat tabby boxer Saint Bernard</p>	<p>lampshade throne goblet table lamp hamper</p>	<p>cellular telephone slot reflex camera dial telephone iPod</p>	<p>planetarium dome mosque radio telescope steel arch bridge</p>

Example applications



But not just images!



Revolution - why now?

20 years in the making:

- important algorithmic advances
- increase in computer power
- *large data sets for training*



Data, data, everywhere



EMODnet



Deep Vision and echosounder data



Our data-driven future

Lower cost - higher value!

Secure | <https://webgate.ec.europa.eu/maritimeforum/en/node/3981>


European Commission > Maritime Forum > Communities > Are the marine data in the North Sea fit for purpose?

Communities Search F.A.Q

Are the marine data in the North Sea fit for purpose?

Published on: Mon, 07/11/2016 - 11:22 91 views

It is difficult to ascertain the value of a dataset until the data itself are visible, highlighting serious deficiencies with the metadata. Also, although there may not appear to be a data gap at first sight, the detailed analyses uncover gaps which do exist



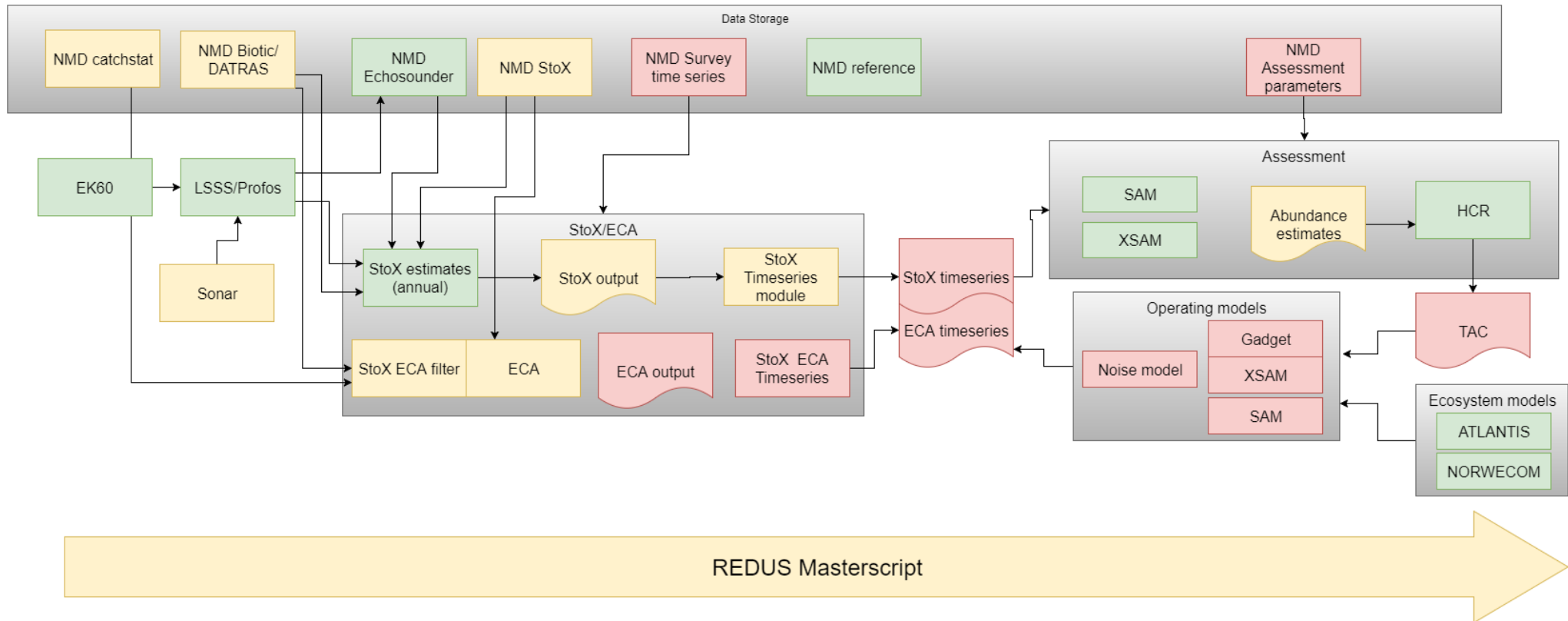
[final report \(40Mb\)](#)

DG Mare commissioned a series of 'Checkpoint' studies, one for each European... whether the aims of providing good quality data of sufficient spatial coverage and the public and private sectors, have been met, particularly considering the divers... This report outlines the approach adopted to answer the challenges set for the N... challenges and key findings, and provides recommendations for further developo...



Make data great again!

Automating the data flow



Even more data

The
Economist

World politics

Business & finance

Economics

Science & technology

Culture

Exploring the oceans

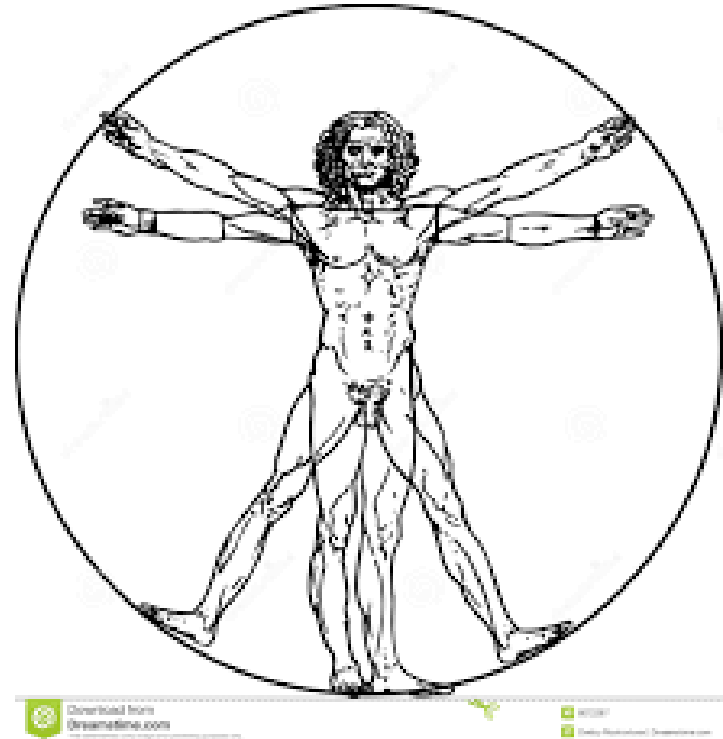
20,000 colleagues under the sea

Fleets of robot submarines will change oceanography

Jun 9th 2012



To boldly go...



Complex adaptive systems?

Summary

- *The analysis bottleneck*
limits data usefulness
- *Machine learning methods*
can automate analysis
- This will have
profound consequences

Thanks!



Research Topic

Complexity in Marine Systems: Developing a pragmatic approach to understanding and managing their emergent features

Liked Comment

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Marine ecosystems with their diverse interlinked network of species exhibit all the classic features of complex adaptive systems. These features such as non linearity, regime shifts, multiple stable states, adaptation and the emergence of patterns from the interactions within the system make the prediction ...

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