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# The Role of Hydrography in Reducing Risk and Supporting Economic Development

Sam Harper – International Hydrographic Projects Manager

The Blue Economy Conference – Tuesday 14<sup>th</sup> April 2015



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## Introduction

### What is Hydrography?

*“Hydrography is the applied science which deals with the measurement and description of the physical features of oceans, seas, coastal areas and inland waters, as well as with the prediction of their change over time.”*



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## Outline

- **UKHO – Who we are, What we do and How we do it**
- **The International Hydrographic Organisation (IHO)**
- **Hydrography and the Blue Economy**
- **Hydrography in the UK**
- **Challenges the Hydrographic Community Face**
- **UKHO Activities**
- **The Way Ahead**



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## UK Hydrographic Office

- **Brief History**
  - Established in 1795 by Royal Warrant
  - First Chart Produced in 1800
  - Printing moves to Taunton in 1939
  - Rest of Office moves to Taunton in 1968
  - 1996/97 became a Trading Fund and first ENC is produced



Taunton Site 2014



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## UK Hydrographic Office

### ■ Status Within Government

- 1990 – Defence Agency – owned by MOD
- 1996 – Trading Fund therefore self-financing

### ■ UKHO Oversight

- MOD Business Strategy and Governance – oversee MOD Trading Funds and Agencies; sit on Hydrographic Office Board
- Shareholder Executive – oversee all Government businesses; sit on the UKHO Owner's Council
- Owner's Council – chaired by the Minister (representing owner); representatives from all customer and shareholder groups



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## UK Hydrographic Office

### ■ Our Role

**We meet national, defence and civil requirements for navigational and other hydrographic information.**

- We are the MOD's Specialist Geospatial Centre (SGC) for the maritime environment
- We produce and maintain a global series of charts and publications
- We advise the UK Government on policy formation
- Support the Maritime and Coast Guard Agency in fulfilling the UK's SOLAS obligations
- We represent the UK at International Hydrographic Organisation (IHO) and other international fora

**We produce over 3500 charts and 200 publications in digital and analogue**



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## UK Hydrographic Office

### ■ Other activities:

- UKHO Capacity Building Programme
- Support the IHO Capacity Building programme through the Regional Hydrographic Commissions
- Support other organisations' Capacity Building programmes e.g. IMO, IALA etc.
- Partner with other UK Gov departments to provide expertise
- Support Foreign Government Hydrographic Offices by providing survey support and advice



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## International Hydrographic Organisation (IHO)

**The International Hydrographic Organization is an intergovernmental consultative and technical organization that was established in 1921 to support safety of navigation and the protection of the marine environment**

■ 82 Members

### Objectives:

- The coordination of the activities of national hydrographic offices
- The greatest possible uniformity in nautical charts and documents
- The adoption of reliable and efficient methods of carrying out and exploiting hydrographic surveys
- The development of the sciences in the field of hydrography and the techniques employed in descriptive oceanography

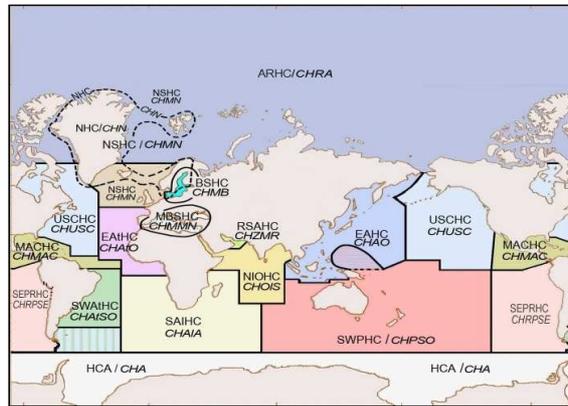




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# International Hydrographic Organisation (IHO)

## ■ Regional Hydrographic Commissions



17 Regional Hydrographic Commissions spread across the globe



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## Hydrography and the Blue Economy

### Some Facts and figures:

- Government statistics indicate £13.8 Billion direct contribution to UK economy in 2011
- 80% of UK energy supplied by sea
- 600 Ports and 290 offshore installations
- Generally accepted that 90% of global trade borne by sea

**This underlines the dependency on access to the sea for prosperity and security, not just in the UK but around the world.**

Source Oxford Economics 2013



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## Hydrography and the Blue Economy

### Cost : Benefit of commissioning hydrographic effort

*"It is difficult to quantify the full economic and commercial benefits which flow from a national hydrographic programme, but several studies by IHO Member States indicate that the cost to benefit ratio is at least 1:10 for nations with a significant dependence on maritime trade or interests."*

International Hydrographic Organisation - 2010

**In the case of Vanuatu the ration is estimated to be 1:90!**



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## Hydrography and the Blue Economy

### ■ Global waters that are Unsurveyed or Require Resurvey (0-200m deep)

- Caribbean >80%
- West Africa >80%
- Polar Regions >96%
- Australia approx 65%
- Greece approx 65%
- USA approx 40%
- UK approx 30%
- France approx 19%



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## Hydrography and the Blue Economy

**Hydrography is an enabler for almost any endeavour that happens in, on or around the seas or oceans**

Would a plan for sustainable land use in the UK be developed without a completed map?



Town and Country  
Planning Act 1990

CHAPTER 3

First Published 1990  
Reprinted Incorporating Corrections 2005

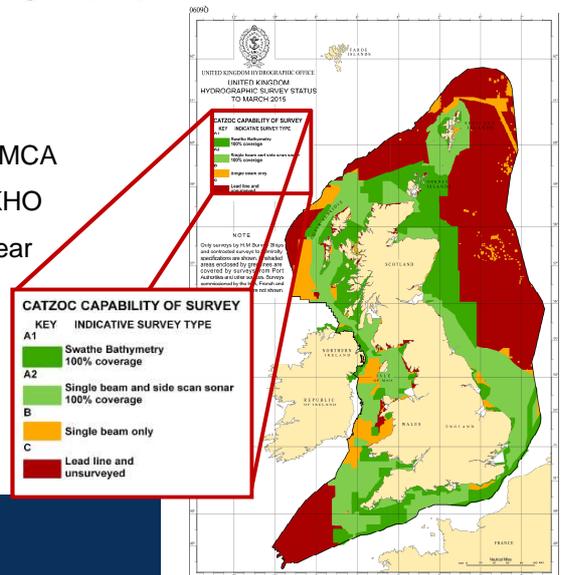


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## Hydrography in the UK

### ■ Civil Hydrography Programme (CHP)

- Administered by the MCA
- Supported by the UKHO
- Budget of £5m per year



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## Challenges the Hydro Community Face

**What are the challenges that we face in promoting the value of Hydrography?**

- Visibility



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#### Geography programmes of study: key stage 3

##### National curriculum in England

###### Purpose of study

A high-quality geography education should inspire in pupils a curiosity and fascination about the world and its people that will remain with them for the rest of their lives. Teaching should equip pupils with knowledge about diverse places, people, resources and natural and human environments, together with a deep understanding of the Earth's key physical and human processes. As pupils progress, their growing knowledge about the world should help them to deepen their understanding of the interaction between physical and human processes, and of the formation and use of landscapes and environments. Geographical knowledge, understanding and skills provide the frameworks and approaches that explain how the Earth's features at different scales are shaped, interconnected and change over time.

###### Aims

The national curriculum for geography aims to ensure that all pupils:

- develop contextual knowledge of the location of geographically significant places – both terrestrial and marine – including their defining physical and human characteristics and how these provide a geographical context for understanding the actions of processes
- understand the processes that give rise to key physical and human geographical features of the world, how these are interdependent and how they bring about spatial variation and change over time
- are competent in the geographical skills needed to:
  - collect, analyse and communicate with a range of data gathered through experiences of fieldwork that deepen their understanding of geographical processes
  - interpret a range of sources of geographical information, including maps, diagrams, globes, aerial photographs and Geographical Information Systems (GIS)
  - communicate geographical information in a variety of ways, including through maps, numerical and quantitative skills and writing at length.

Published: September 2013



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## Challenges the Hydro Community Face

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- Funding





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## Challenges the Hydro Community Face

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- Visibility
- Funding
- Difficulties in quantifying the impact hydrography has on the economy – difficult to justify spending



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- Difficulties in quantifying the impact hydrography has on the economy – difficult to justify spending
- Hydrography just isn't sexy!



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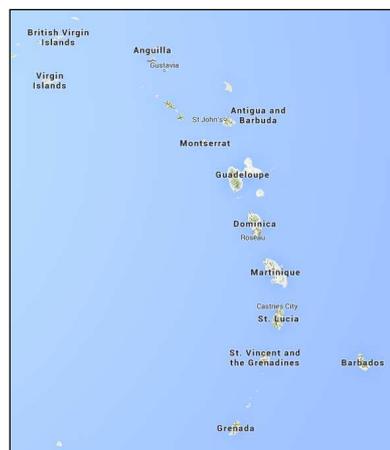
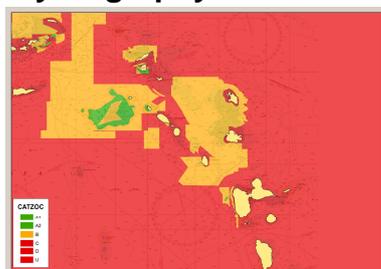
- Visibility
- Funding
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- Hydrography just isn't sexy!
- Some coastal states are not large enough to support the necessary infrastructure



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## Challenges the Hydro Community Face

- **Small Island Developing States (SIDS) struggle to justify spending on hydrography**





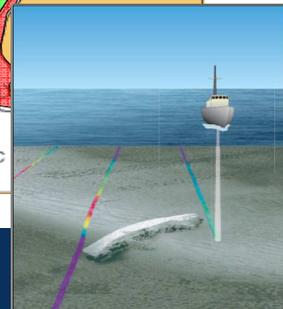
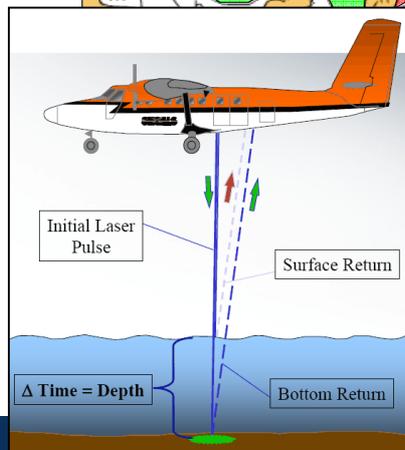
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## Challenges the Hydro Community Face

### What are the challenges that we face in promoting the value of Hydrography?

- Visibility
- Funding
- Difficulties in quantifying the impact hydrography has on the economy – difficult to justify spending
- Hydrography just isn't sexy!
- Some coastal states are not large enough to support the necessary infrastructure
- Poor at making use of data collected for other purposes

## Data Sources Used to Compile Charts

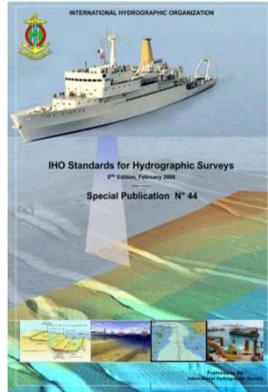




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## Challenges the Hydro Community Face

**In order to embrace  
the concept of  
'collect once use  
many times',  
minimum standards  
and key metadata  
are required**



### **UK Civil Hydrography Programme**

Survey Specification

Civil Hydrography Services in European Waters

August 2013



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## UKHO Activities

**What are the UKHO and partners doing to try and  
tackle some of these issues?**

- Outreach
  - A number of road show events
  - Promoting **World Hydrography Day - 21 June 2015**

***“Our seas and waterways - yet to be fully charted and explored”***



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## UKHO Activities

### What are the UKHO and partners doing to try and tackle some of these issues?

- Outreach
- The Civil Hydrography Annual Seminar (CHAS)



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## UKHO Activities

### MCA Pan-Government MoU on hydrographic data Sharing

- Established by the MCA, DEFRA and the UKHO





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## UKHO Activities

### What are the UKHO and partners doing to try and tackle some of these issues?

- Outreach
- The Civil Hydrography Annual Seminar (CHAS)
- International Capacity Building and Hydro Projects

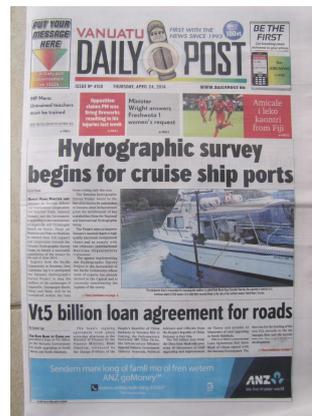


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## UKHO Activities

### International Capacity Building and Hydro Projects

- Capacity Building Coordinator for 4 RHCs
- Deliver training courses in Cartography and Hydrography around the world





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## UKHO Activities

### Promote a Regional Approach to Hydrography

- Assisting the Organisation of Eastern Caribbean States (OECS) to gain funding for a large scale regional survey programme
- Assisting the Secretariat of the Pacific Community (SPC) to develop a regional survey unit



SPC  
Secretariat  
of the Pacific  
Community



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## UKHO Activities

### What are the UKHO and partners doing to try and tackle some of these issues?

- Outreach
- The Civil Hydrography Annual Seminar (CHAS)
- International Capacity Building and Hydro Projects
- Bathymetry Data Archive Centre (DAC)

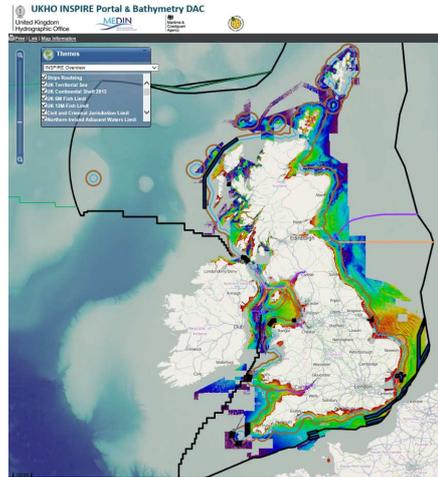


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## UKHO Activities

### UKHO Bathymetry Data Archive Centre

- Data free to download
- Complies with the INSPIRE Directive
- Supports data sharing



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## UKHO Activities

### What are the UKHO and partners doing to try and tackle some of these issues?

- Outreach
- The Civil Hydrography Annual Seminar (CHAS)
- International Capacity Building and Hydro Projects
- Bathymetry Data Archive Centre (DAC)
- Research into new technologies

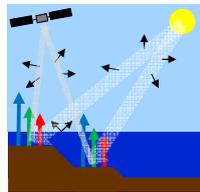


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## UKHO Activities

### The UKHO actively researches new technologies..

- Satellite Derived Bathymetry
- Crowd Sourcing
- Novel survey platforms
- ....



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## UKHO Activities

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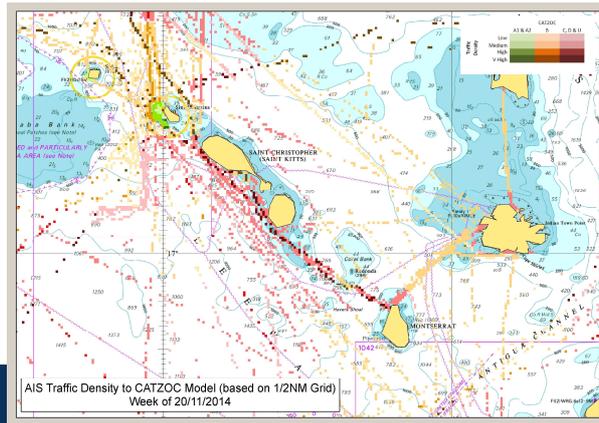
- Outreach
- The Civil Hydrography Annual Seminar (CHAS)
- International Capacity Building and Hydro Projects
- Bathymetry Data Archive Centre (DAC)
- Research into new technologies
- Looking at objective methods of survey prioritisation/ risk analysis



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## UKHO Activities

**Using various sources and types of spatial data to identify survey priorities:**



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## UKHO Activities

**What are the UKHO and partners doing to try and tackle some of these issues?**

- Outreach
- The Civil Hydrography Annual Seminar (CHAS)
- International Capacity Building and Hydro Projects
- Bathymetry Data Archive Centre (DAC)
- Research into new technologies
- Shamelessly plugging Shallow Survey 2015!



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## UKHO Activities

UKHO and MCA, in partnership with Plymouth University are  
Hosting Shallow Survey 2015 14<sup>th</sup> – 18<sup>th</sup> September

# SHALLOW SURVEY 2015

The 7<sup>th</sup> International Conference on  
High-Resolution Surveys in Shallow Water

Plymouth University  
14-18 September 2015



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## The Way Ahead - Summary

### Embrace a 21<sup>st</sup> Century approach to seabed mapping

This means:

- Using objective methods of survey prioritisation
- Embrace new technologies and a 'composite' approach to seabed mapping
  - Active survey effort:
    - Reconnaissance level e.g. remote sensing
    - Focused level e.g. High accuracy techniques
  - Passive survey effort:
    - Crowd Sourcing
- Making use of data collected for other purposes *"collect once use many times"*
- Finding more innovative ways of sharing and using data 'International Spatial Data Infrastructure'
- Taking a community approach to CB, planning and funding hydrography



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**Thank You For Listening**