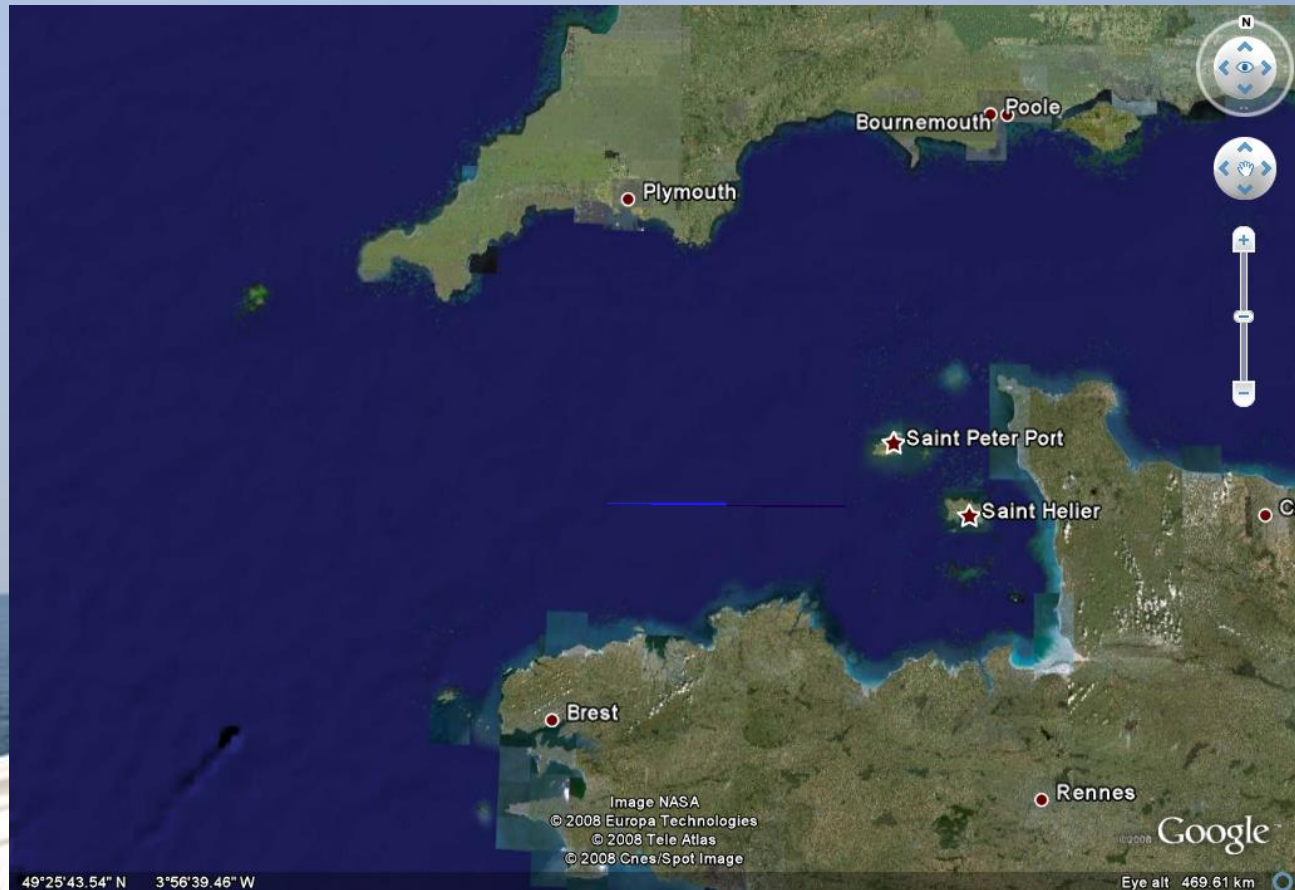


Hydrography at MSc and Category A level: a European perspective

Victor Abbott & Nicolas Seube

La Manche

- A map of our localities ...



Plymouth

- **University of Plymouth**
- **RNHMS Training School**
- **Plymouth Marine Laboratory**
- **Marine Biological Association**
- **Sir Alister Hardy Foundation for Ocean Science**
- **National Marine Aquarium**



Plymouth

- **Navigation ...**
- **Postgraduate hydrography, Category A**
- **Undergraduate**
- **Professional Institutions**
- **... Business; commercial**



Current MSc Hydrography

- **6 modules in Term 1, including three weeks of field/practical activities**
- **3 modules in Term 2, chosen from 8**
- **3 nominated modules for the current FIG/IHO/ICA Category A qualification**
- **Modules fortnightly to support part-time students and link to ENSIETA**



Plymouth

- **Field work afloat, on boat handling and charting**
- **Land survey for coastlining, tides and sensor alignment**
- **Navigation simulator**
- **Conferences and exhibitions as opportunities arise**



Brest

- **ENSIETA**
- **Service Hydrographique et Oceanographique de la Marine**
- **Centre Militaire d'Océanographie**
- **Brest University (IUEM, LPO)**
- **IFREMER**



Brest

- **Grande Ecole/Grandes Ecoles**
- **Scientific environment (1st in France for Marine science)**
- **SHOM (military)**
- **Acoustics**
- **Bathymetric data processing**
- **Computing**



A-LEVELS - HIGH SCHOOL DIPLOMA

Universities

⇔ B.Sc.

⇔ M.Sc.

⇔ Ph.D.

PREPARATORY SCHOOLS

National competitive exam

**GRANDES ECOLES
(ENSIETA, ECN, ... 250)**

2 years
▲
▼

3 years
▲
▼

The three year curriculum

Y1

Introductory engineering courses

Y2

Hydrography

Mech. Eng.

Elec. Eng.

Fieldwork

Summer Practical Training (3m)

Y3

**Hydrography
Oceanography**

3 options

2 options

Training (6 months)

Course content (2nd year, master 1)

Semester 1:

- Geodesy, Positioning (80h)
- Bathymetry (60h)
- Physical oceanography (45h)
- Signal processing (30h)
- Computer science (45h)
- Numerical methods (25h)
- Acoustic propagation (25h)

Semester 2:

- Tide (40h)
- Bathymetric data processing (60h)
- Hydrography (40h)
- Geology/Geophysics (40h)
- GIS (30h)
- Survey Project (100h)
- Seismic (25h)
- Image processing (25h)

Volume	
<i>Non-Scientific</i>	160 h
Scientific	320 h

Lecturers 2 nd year	
Ensieta	40%
External	60%

Volume	
<i>Non-Scientific</i>	175 h
Scientific	330 h

Course content (3rd year, master 2)

Hydrography (220h)

- Cartography (40h)
- Law of the Sea (15h)
- Hydrography for offshore construction (20h)
- Hydrography for coastal engineering (20h)
- Underwater acoustics (40h)

Oceanography (225h)

- Sediment dynamics (30h)
- Geophysical Fluid Dynamics (30h)
- Waves (20h)
- Numerical estimation (20h)
- Coastal modelling, data assimilation (50h)
- Oceanographic survey project (85h)

- Bathymetric data processing (20h)
- Inertial measurements (15h)
- Signal processing (25h)

OR

- 60h Ocean-Atmosphere
- or
- 60h Geophysics

Lecturers 3rd year

Ensieta	20%
External	80%

Volume

Non-Scientific	100 h
Scientific	450 h

Hydrography

- **FIG/IHO/ICA**
 - Category A
 - Category B
- **Dredging companies**
- **Hydrocarbon exploration**
- **Contract survey companies**



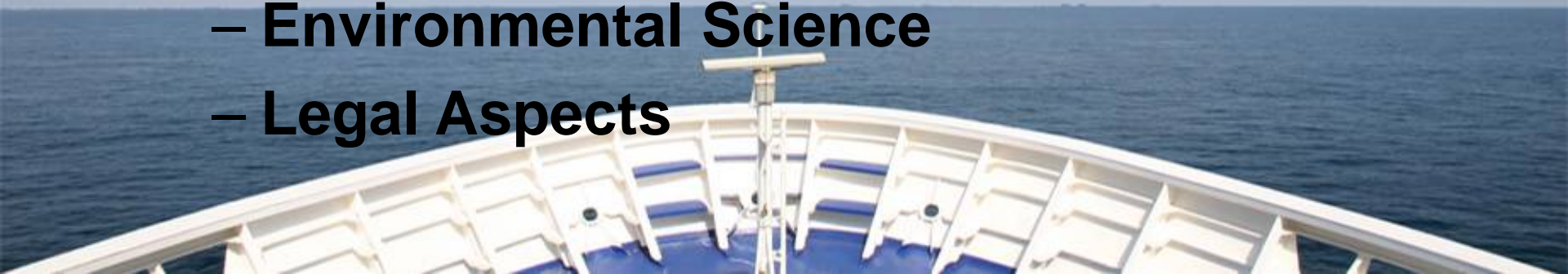
Common FIG/IHO/ICA syllabus

- **Basic**
 - **Mathematics and Statistics**
 - **Information and Communication Technology**
 - **Physics**
 - **Nautical Science**



Common FIG/IHO/ICA syllabus

- **Essential**
 - Bathymetry
 - Water Levels and Flow
 - Positioning
 - Hydrographic Practice
 - Hydrographic Data Management
 - Environmental Science
 - Legal Aspects



Common FIG/IHO/ICA syllabus

- **Options, i**
 1. **Nautical Charting Hydrography**
 2. **Hydrography to Support Port Management and Coastal Engineering**
 3. **Offshore Seismic Surveying**
 4. **Offshore Construction Hydrography**



Common FIG/IHO/ICA syllabus

- **Options, ii**
 5. Remote Sensing
 6. Military Hydrography
 7. Inland Waters Hydrography



Motivations for a Brest/Plymouth common course

- **An EU distributed course**
- **Students can travel**
- **Students can take benefits of each institution**
- **IHO standard: common guideline**



Motivations

- **Both have Category A certification**
- **High demand from industry, but low resource allocation for hydrography education**
- **Create a teaching group, bigger than local group could be in any future!**
- **Give more field experience to students**



Changes required

- **Teaching hours**
- **Extra term**
- **Practicals**
- **Language**



Opportunities

- **Student and lecturer exchange**
- **Student projects**
- **Responsiveness to industry**
- **Links with other academic institutions**



Conclusion

- **The proposal offers exciting opportunities**
- **Cooperation should improve the student experience**
- **We hope that industry will join in on the developments**

