

Chromo-stereoscopy for Enhanced Viewing in Opaque Environment

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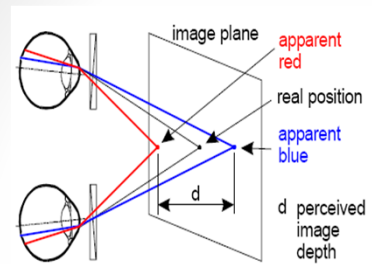
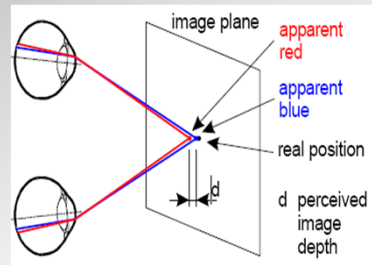
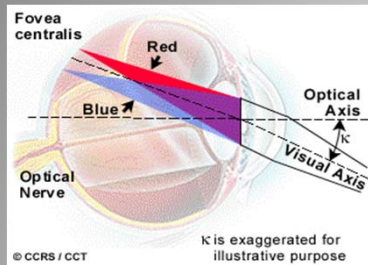


Aim & Objectives

- Assess the usefulness of CS when applied obliquely and users group acceptance
- Create models of marine application represented with CS
- Select users sample
- Assess
 - 3D perception
 - Cartographic factors
 - Colour conventions
 - Shading
 - View angle

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What is CS



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CS in Hydrography

- CS in 2D bathymetric display (CHS, 1997)
- Oblique CS: DTM and hydrographic data (Ostnes, 2005)

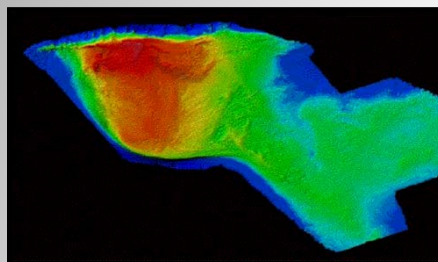


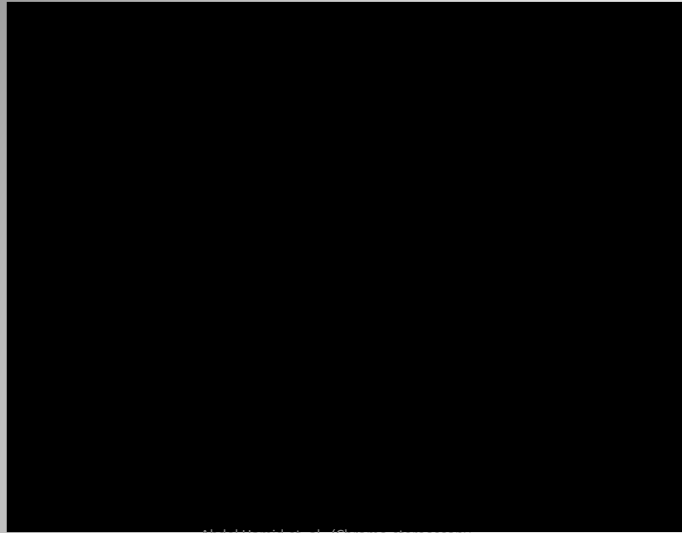
Image of seafloor generated from EM1000 multi-beam data collected on the FG Creed by the Canadian Hydrographic Service -Atlantic

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Rotating DTM

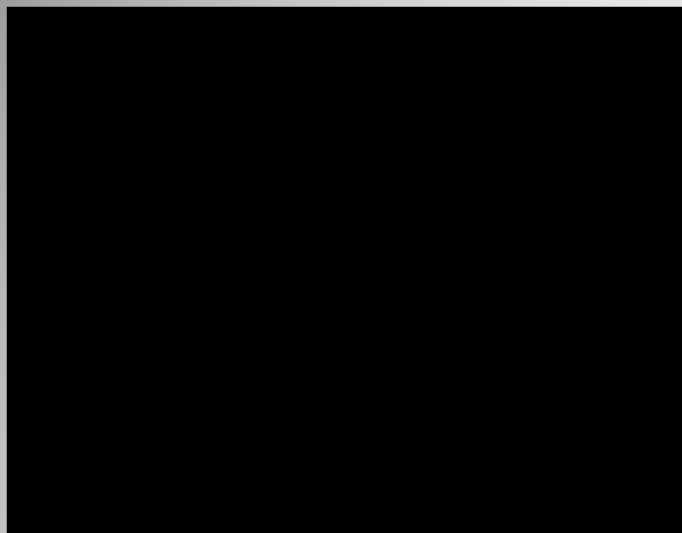


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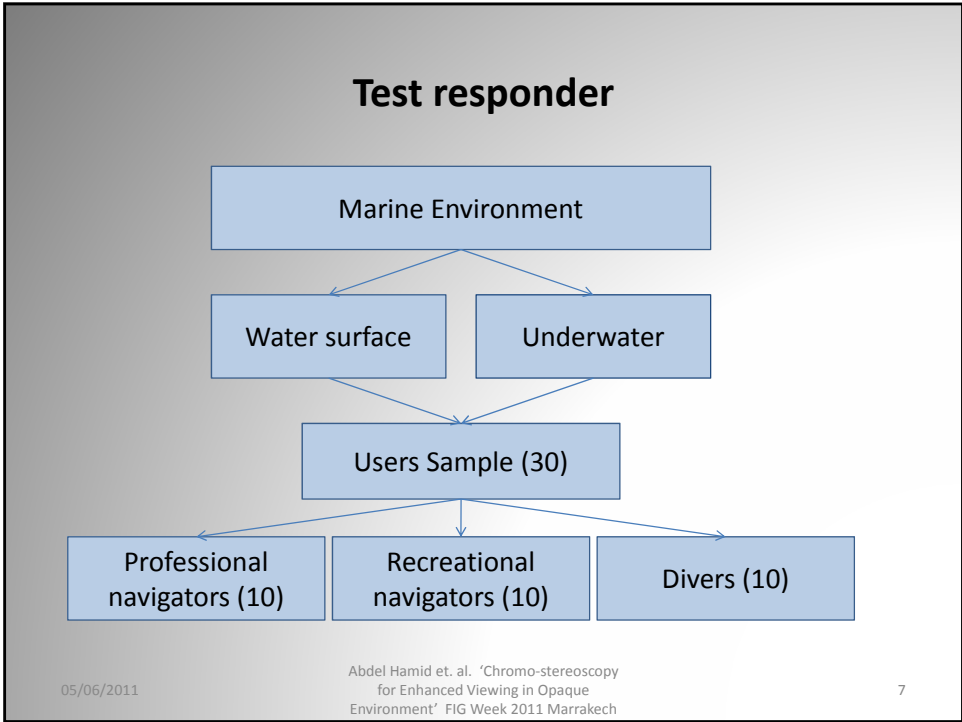
Navigation Scenario



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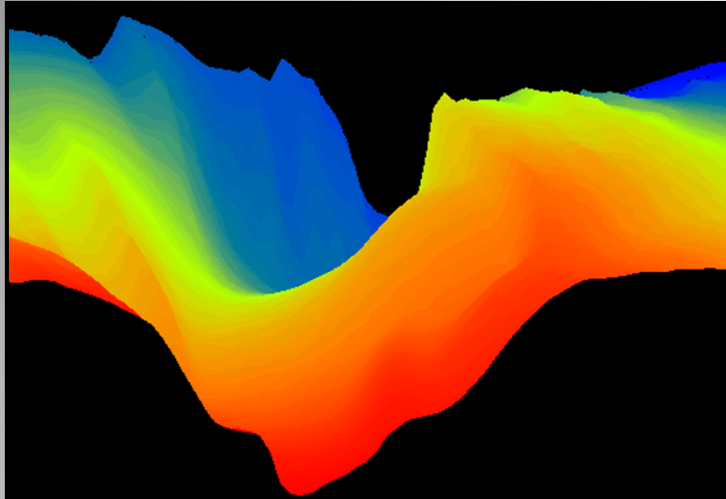
CS advantages and disadvantages

Scenario	User group	key positive	Key negative
DTM display	Navigators	Proximity sense Estimate shoal distance	Unfamiliarity
	Recr. Sailors		
	Divers		
Navigation Scenario	Navigators	Situation awareness in fog	Potential Confusion
	Recr. Sailors	Anti-collision <i>visual</i> alarm	
	Divers		
Underwater Scenario	Navigators	Additional source of information in isolation	-
	Recr. Sailors		
	Divers	Pre-trip briefing	

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DTM of Plymouth Sound without shading

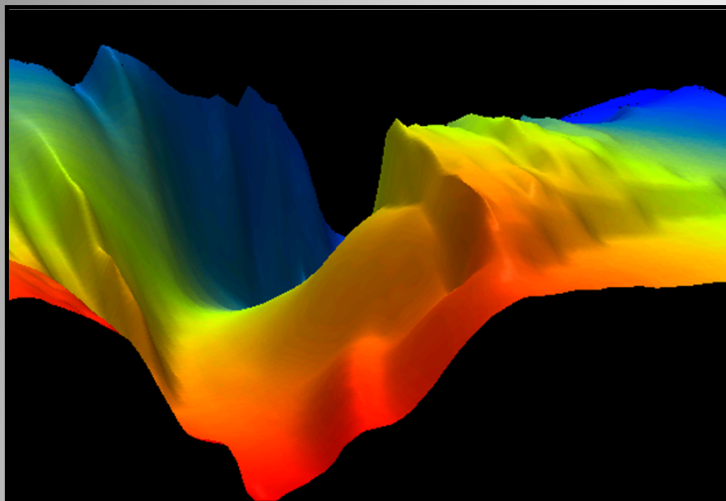


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With Shading

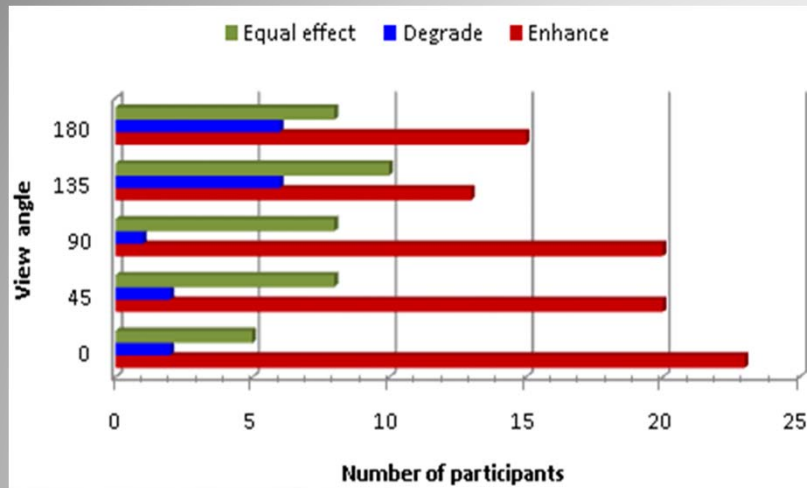


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CS and View angle



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CS and some cartographic elements

Cartographic element	Normal use	With CS effect
Colour convention	Categorise objects and signal information	May cause confusion
Shading	Details about surface relief	Distance estimation to and between objects
View angle	Reveal obscure objects	Enhance understanding when seen from poor viewpoints

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Summary

- CS is a cheap and useful method to display 3D scenes in apparent stereovision
- Unfamiliarity issue could be solved by training
- CS with traditional 3D enhancements (such as shading and changing view angle) augments 3D perception
- CS could be a useful training tool for marine environment users:
 - Briefing divers for new diving areas
 - Highlighting navigation hazards

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Thanks for your attention



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