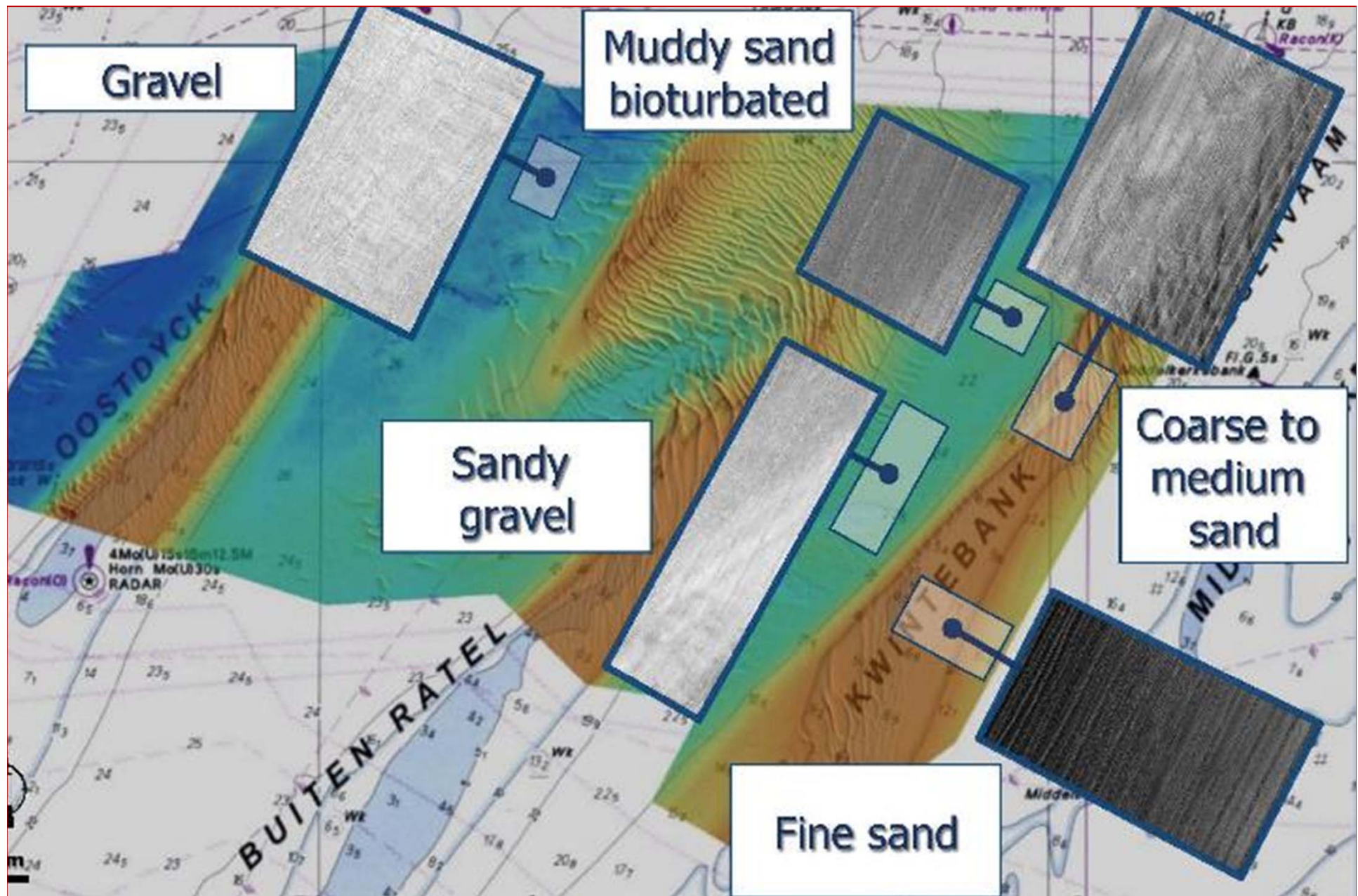




One year into the **GEOHAB** Backscatter Working Group: What outcomes?

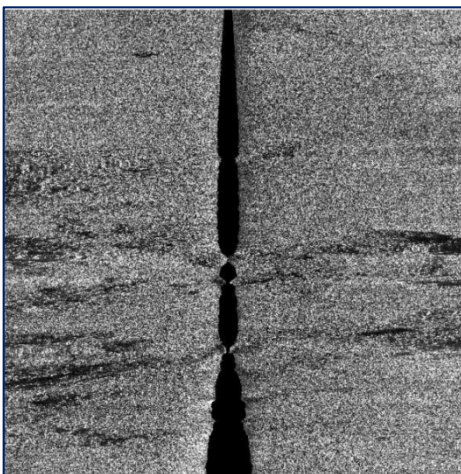
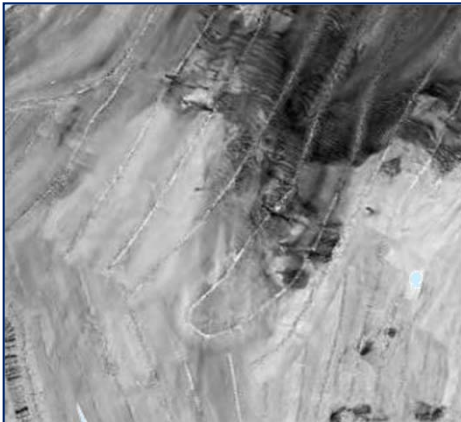
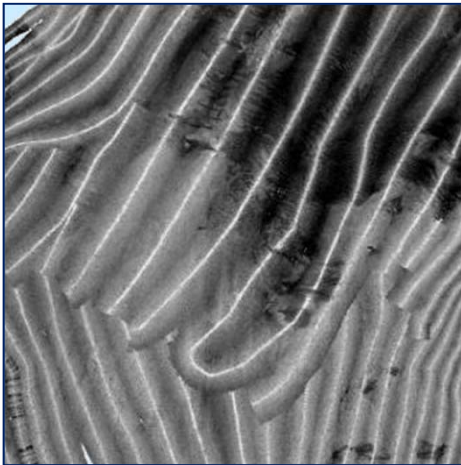
Xavier LURTON & Geoffroy LAMARCHE





Summary

- Context & Motivations
- First-year schedule
- The BSWG Draft Report
 - Chapter 2
 - Chapter 3
 - ...
- Second-year tentative schedule
- BSWG Meeting



Context, **Issues** & Objectives

- **GEOHAB 2013** in Rome + the **Backscatter Workshop**

- What are exactly the **user needs & expectations**?
- How relevantly do we **model & interpret seafloor BS**?
- Are BS data at **appropriate scale & quality level**?
- Can we hope reliable **absolute calibration** w/today MBES?

- **Clarification, recommendations (& standardization?)**
- Specify better the **user requirements / applications**
- Provide **guidelines** for **acquisition & processing**
- Design **calibration** & sensitize users & manufacturers
- Define new or improved **SW tools** (3D, calibration...)
- Build a **database of backscatter descriptors**

First year's schedule

- **9 May 2013** : GEOHAB General meeting – **BSWG creation**
- **May-Jun** : **Herding** of Group members, potential authors, Chairing Group...
- **July** : **Introduction document** w/ objectives and schedule
- **Sep** : **Draft outline**. *DropBox...*
- **Dec** : Official **detailed Outline**
- **Jan-Mar 2014** : **Writing** !!!
- **Mar** : **Review** of contributions
- **Apr 2014**: Modifications & editing of the **BSWG Draft Report**



The BSWG draft report

- **Five thematic chapters**
 - *Fundamentals*
 - *User needs*
 - *BS Sonar measurement*
 - *At-sea acquisition*
 - *Data Processing*
- 5 Teams, with **5 coordinators** leading **> 20 co-authors**
- ~ **130 pages** ...
... and too few figures & examples
- Various stages of **achievement**
- **Several issues** still unresolved

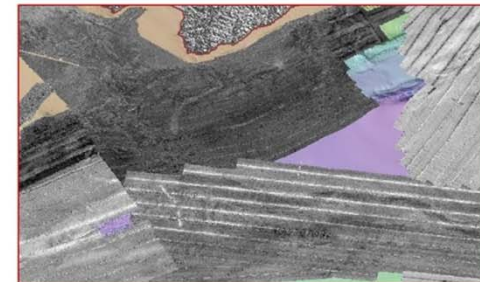
Backscatter measurements by seafloor-mapping sonars

Guidelines and Recommendations

*A collective report by members of the
GeoHab Backscatter Working Group*

Draft Report – May 2014

Editors: Xavier Lurton & Geoffroy Lamarche



Coordinators: Tom Weber, Vanesa Lucieer, Craig Brown,
Glen Rice, Alexandre Schimel

Contributors:

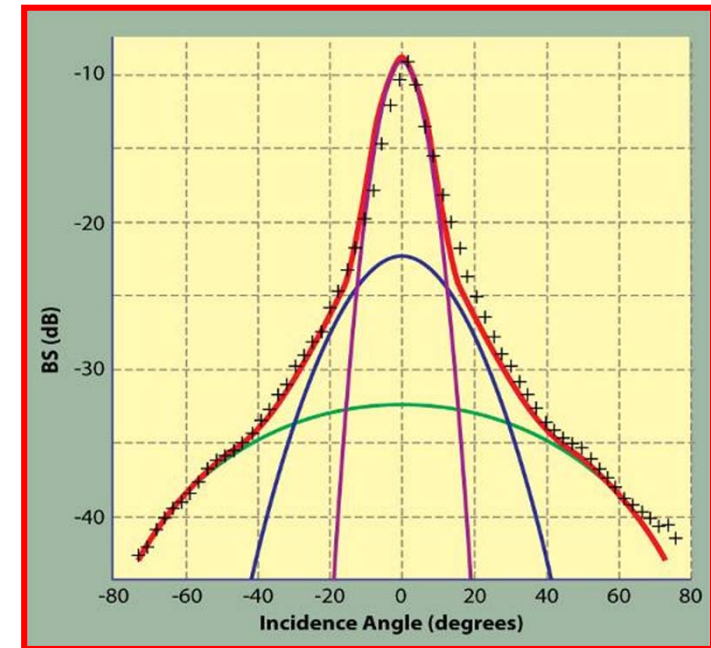
BSWG Document Outline

1. Introduction *X.Lurton & G.Lamarche*
 2. Background and fundamentals *T.Weber (UNH)*
 3. User needs *V.Lucieer (UTAS)*
 4. Backscatter measurement by seafloor-mapping sonars *C.Brown (NSCC)*
 5. Acquisition: best practice guide *G.Rice (NOAA)*
 6. Backscatter processing *A.Schimel (Deakin U.)*
 7. Conclusion *G.Lamarche & X.Lurton*
- Glossary, References, Appendices *E.Heffron (QPS)*



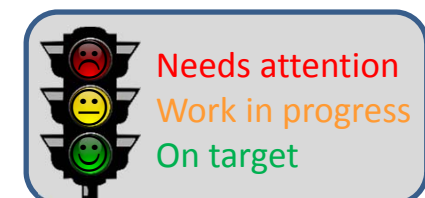
2. Background & Fundamentals

- **Fundamental** notions : waves, reflection, scattering...
- **Definitions:** dB, sonar equation, Target Strength, footprint...
- Simplified presentation of **physical phenomena** and models



()

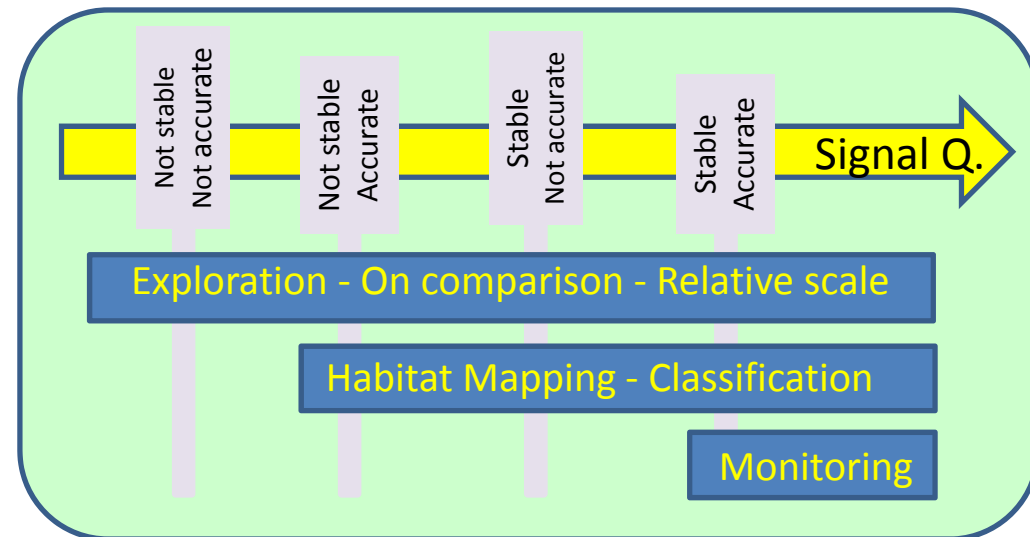
- Non-sediment seafloors
- BS magnitudes vs seafloor type, frequency...
- Discussion / Inversion, characterization



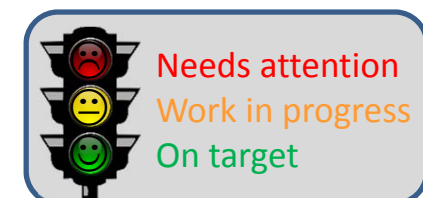
3. User Needs

- Analysis of the needs & expectations
 - Mapping for discovery ↔ Environment monitoring
 - Stability, repeatability, accuracy...
 - Processing procedures

- Processing level definition
- Metadata design
- Specific formats?

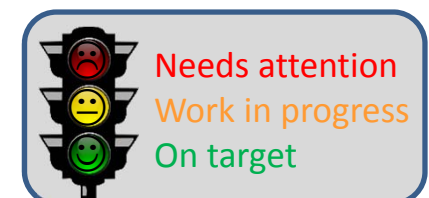
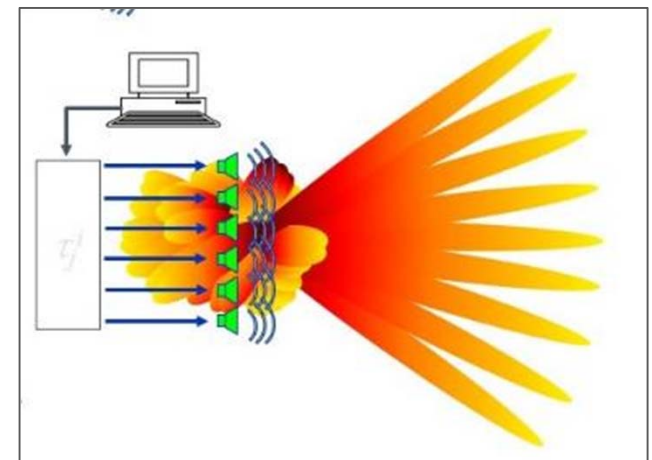
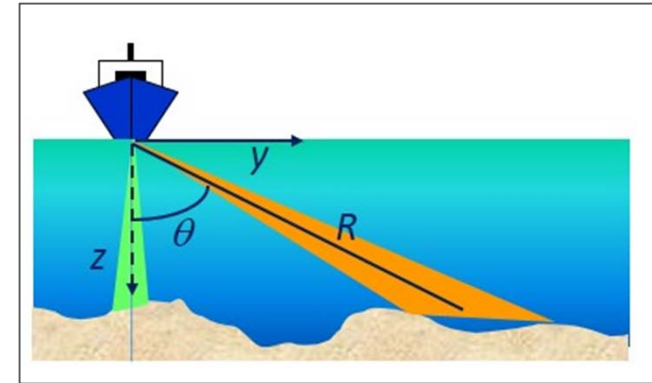


- Discussion of resolution and BS-mapping scales
- Library of field data images



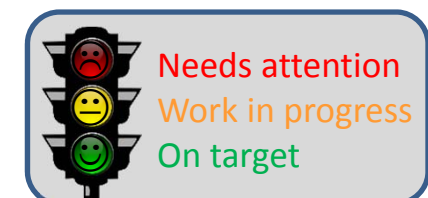
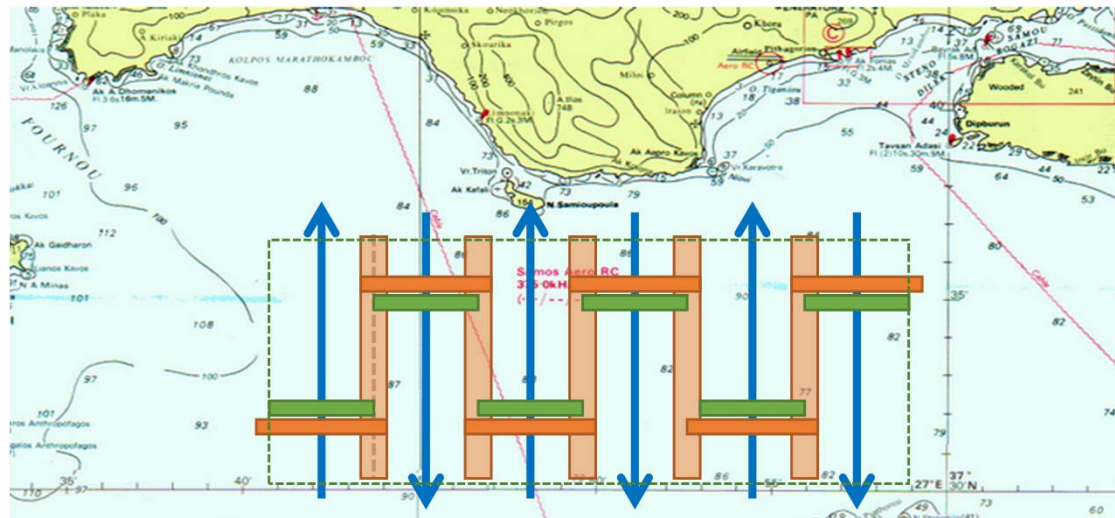
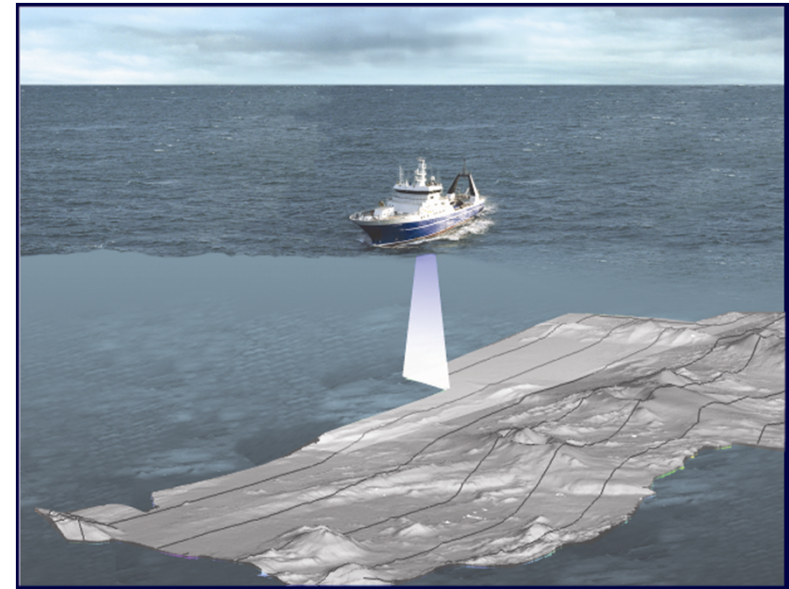
4. Backscatter measurement by seafloor-mapping sonars

- Fundamental principles
 - Sonar operations for BS measurement
- Measurement analysis
 - 7 steps
 - Filtering, TVG, beamforming, sounding detection...
 - Detailed for a number of actual systems
- Intensity calibration: justification, presentation, analysis & discussion
- Recommendations for current (data QC) and future sonars

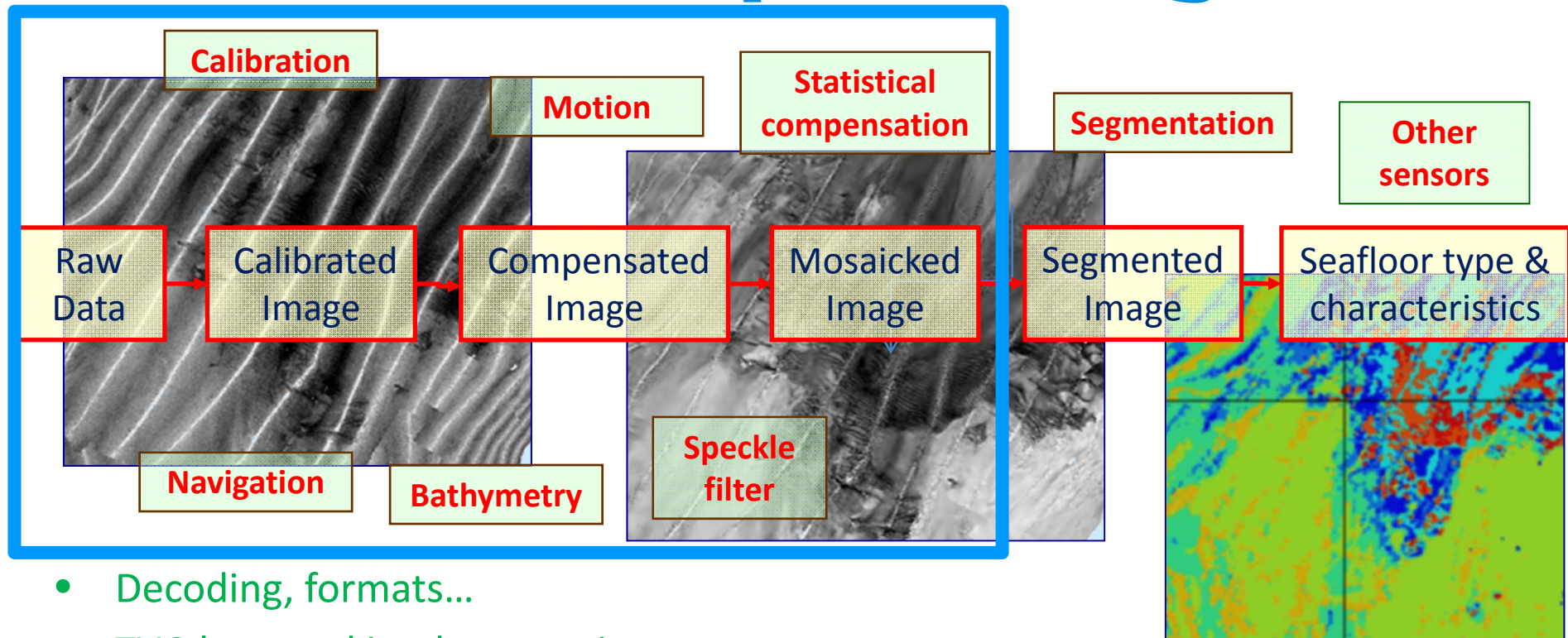


5. Acquisition: best-practice guide

- System & field calibration
- Sonar configuration
- Coverage strategy
- Environmental parameter monitoring
- Recommendations for BS acquisition best practice

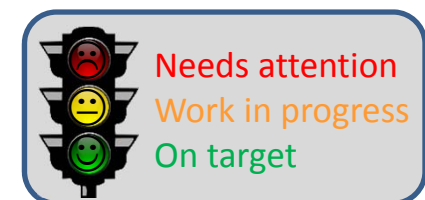


6. Backscatter processing



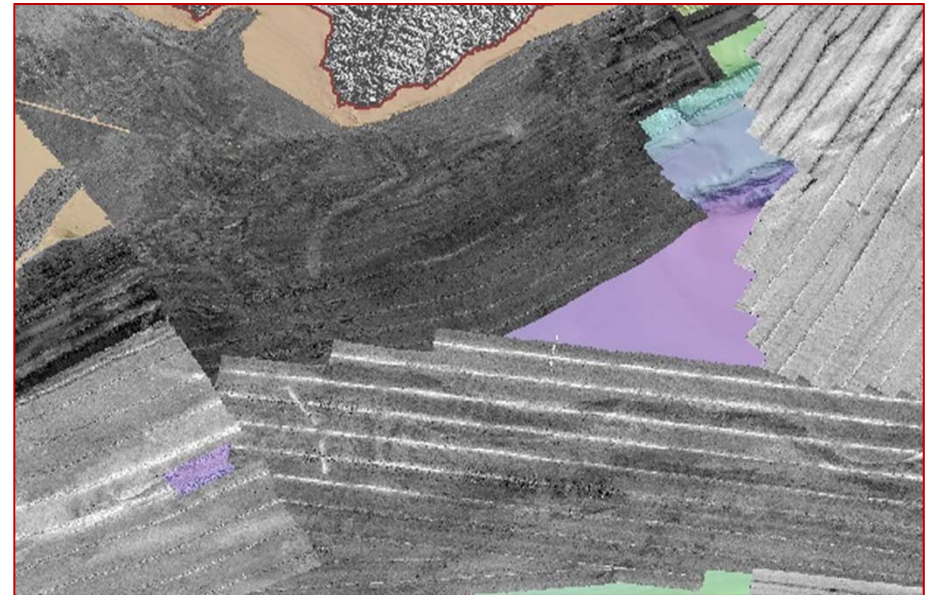
- Decoding, formats...
- TVG laws and implementation
- Corrections: source level & directivity, losses, footprint area
- Backscatter angular dependence
- Mosaicking
- Mapping, gridding...

Detailed for Kongsberg, Reson, R2sonic, GeoAcoustics



Second year's tentative schedule

- **May 2014: GEOHAB**
- **May-Jun :** BSWG comments
 - Adjustment of goals & outline
 - Corrections of current text
- **July : Improved Draft**
- **Sep-Nov :** writing!
- **Dec:** Review & **2nd Draft version**
- **Jan-Feb 2015:** BSWG comments
➔ Edition & Finish
- **Mar : Final version**
- **May 2015 : GEOHAB**



BSWG meeting: open issues

Tuesday 6th May - 18:00–19:30 – Main Auditorium

- **Water column** data: yes or no?
- **Content** : gaps & overlaps
- Which form for the **final product**?
- Authorship, **IP**
- **Presentation** to other communities, conferences?
- **Timeline** to GeoHab 2015

Backscatter Working Group



QUESTIONS?

**Marine Geological and Biological
Habitat Mapping**

Many thanks again to all coordinators and co-authors :

Tom Weber, Vanessa Lucieer, Glen Rice, Craig Brown, Alexandre Schimel, Erin Heffron, Jonathan Beaudoin, Marc Roche, Val Schmidt, Margaret Dolan, Mashkoor Malik, Larry Mayer, Terje Thorsnes, Koen Degrendele, Francisco Gutierrez, Berit Horvei, Eric Maillard, Gordon Keith, Ian Parnum