

Les données altimétriques terre-mer au service de la gestion des risques littoraux : applications en Languedoc-Roussillon



Cyril VANROYE - Direction Départementale des Territoires et de la Mer de la Vendée

Les données altimétriques terre-mer au service de la gestion des risques littoraux : applications en Languedoc-Roussillon

Bénédicte GUERINEL - Direction Régionale de l'Environnement, de l'Aménagement et du Logement Languedoc-Roussillon



Yves PASTOL, Vincent LAMARRE - Service Hydrographique et Océanographique de la Marine



Nicolas ALEMAN dans la Cadre de sa thèse "Apport de la technologie LIDAR dans la morphodynamique du milieu littoral sableux en LR"



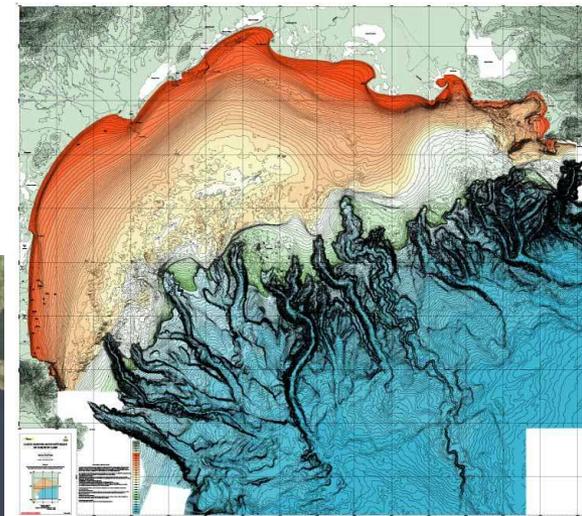
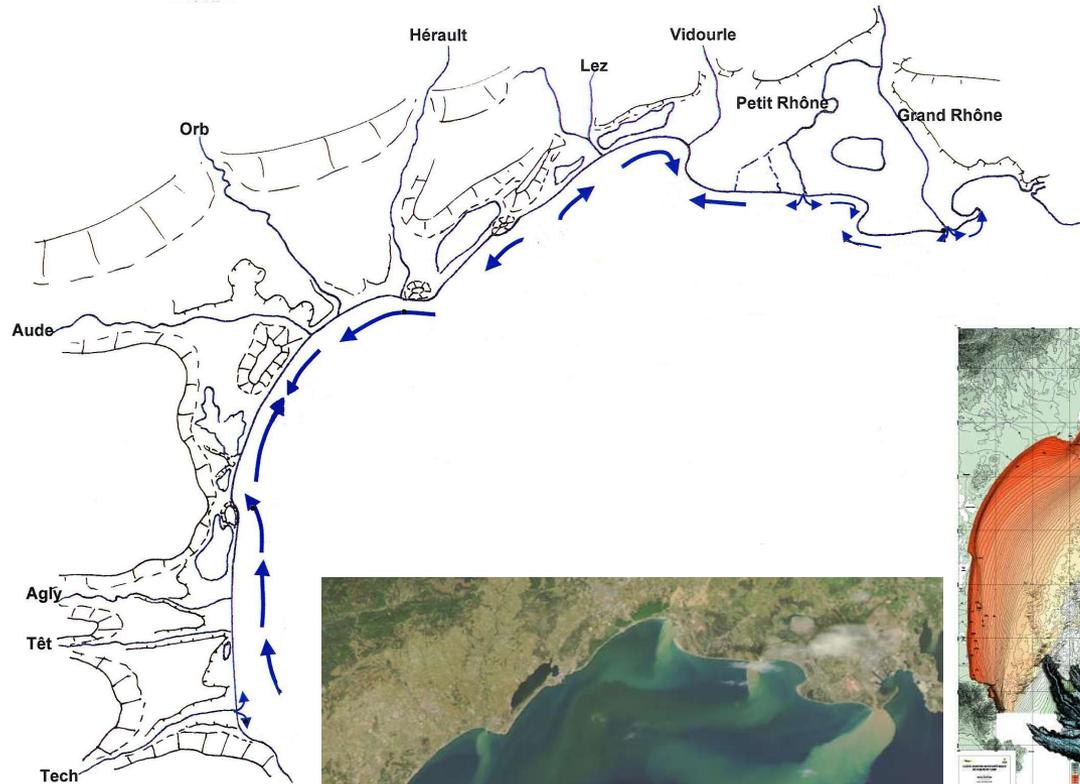
Raphaël CERTAIN, Nicolas ROBIN - Université de Perpignan Voie Domitienne



Le Golfe du Lion



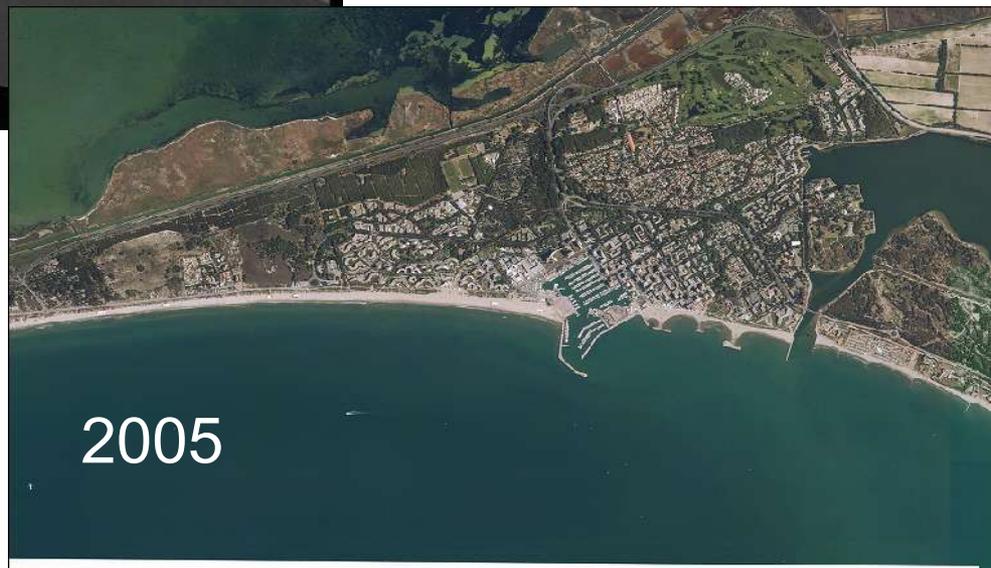
La dynamique sédimentaire en LR



Un littoral récemment aménagé

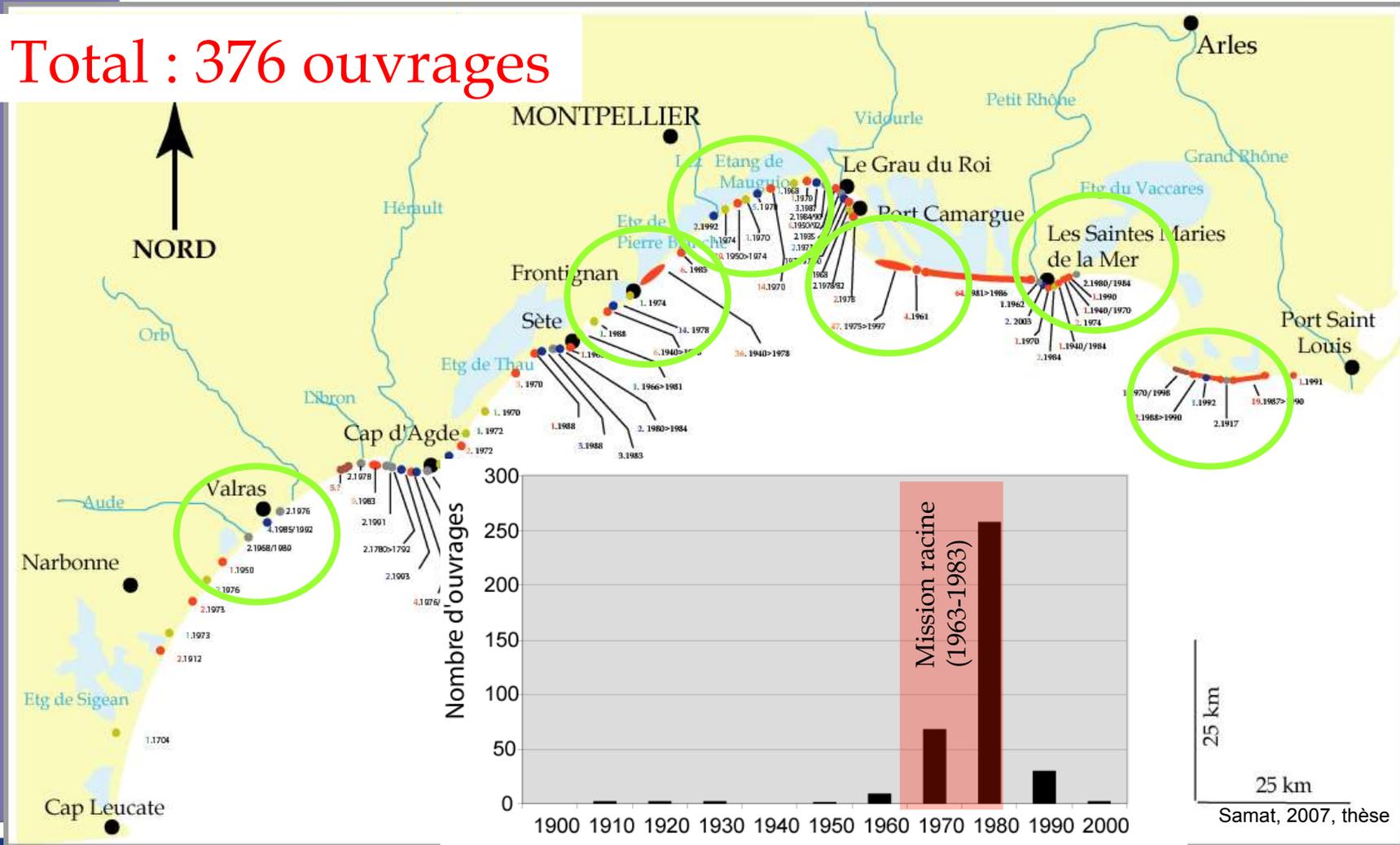


La Grande Motte



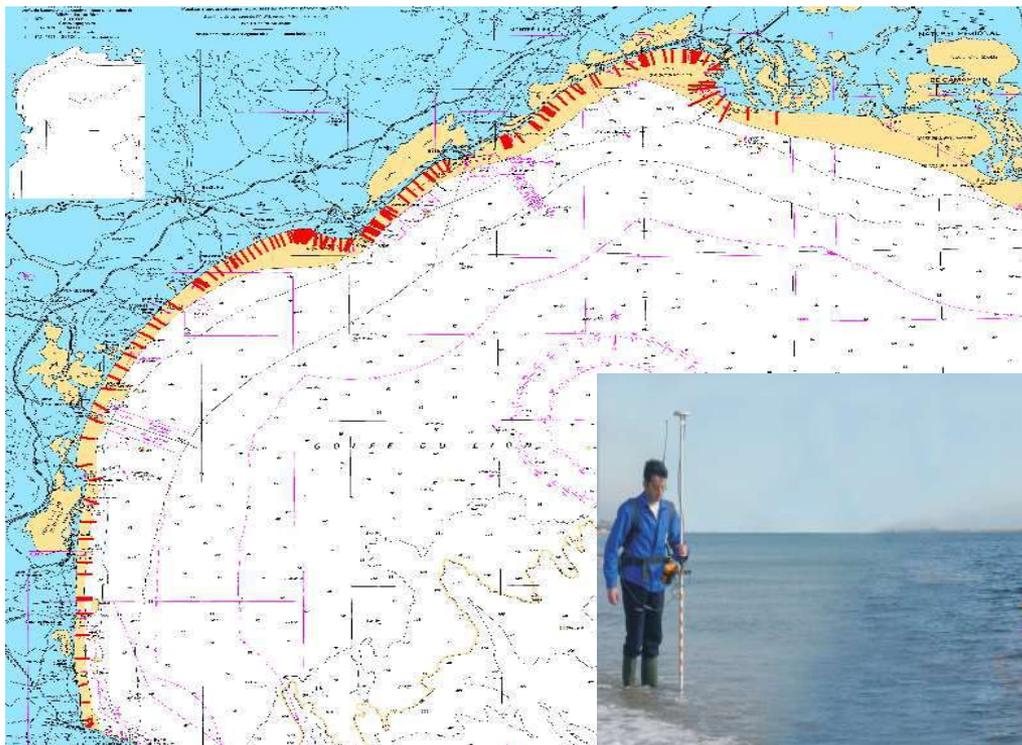
La logique de protection dans le Golfe du Lion

Total : 376 ouvrages

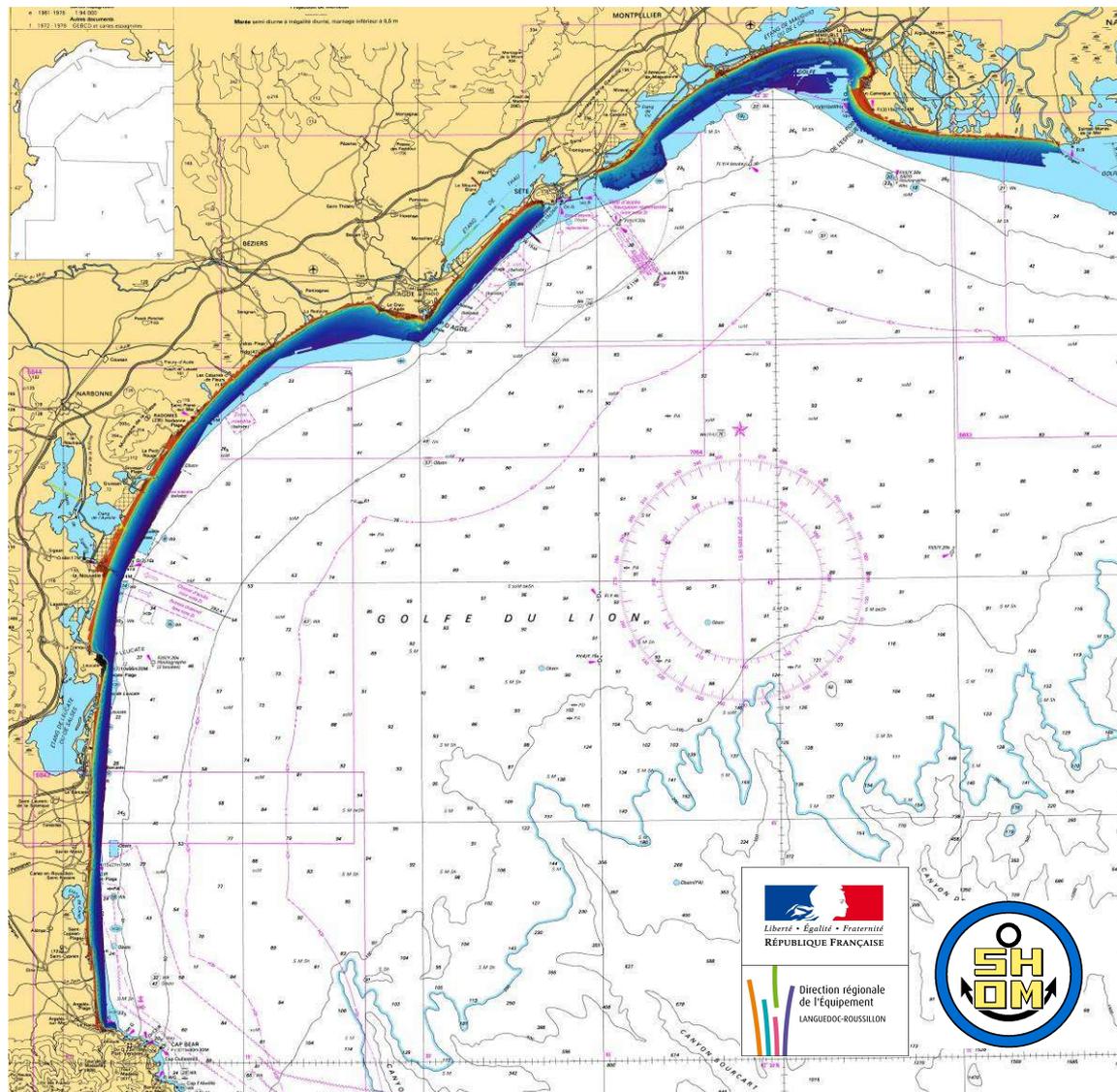


Les premiers suivis morphologiques ...

- Suivi effectué par profils topo-bathymétriques
- Une méthodologie qui a donné des résultats mais qui présente des insuffisances



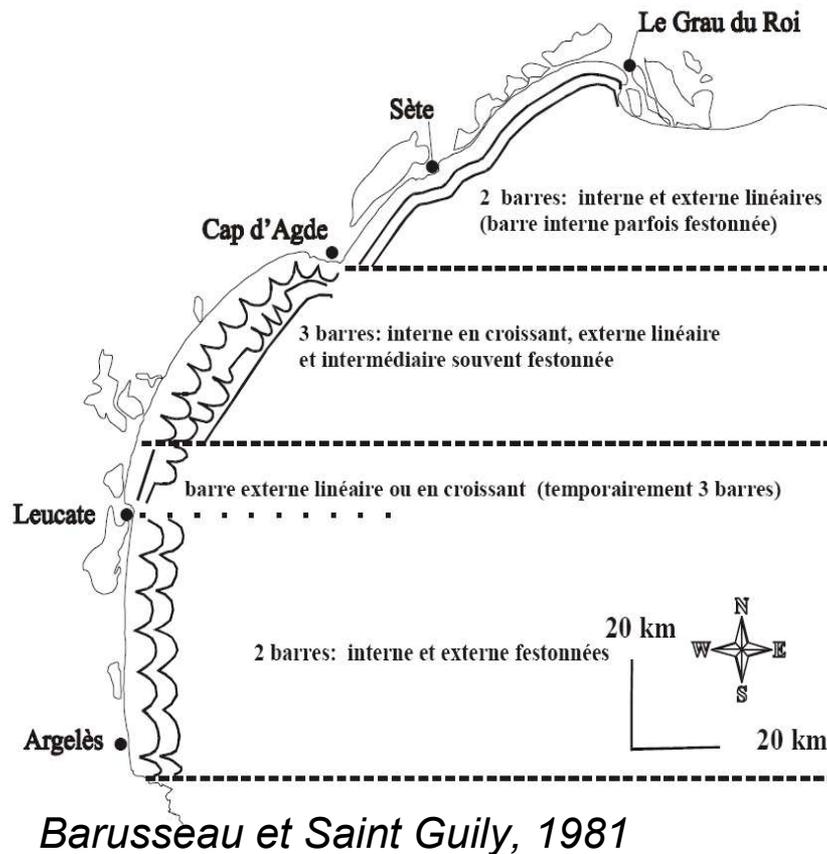
Emprise du chantier 2009



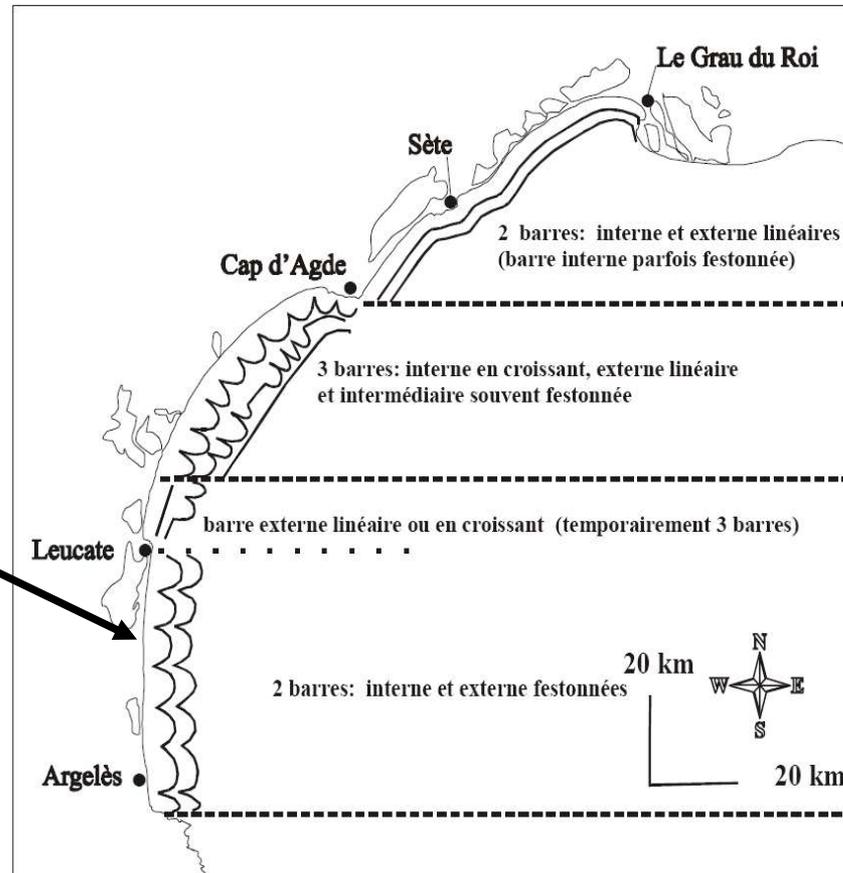
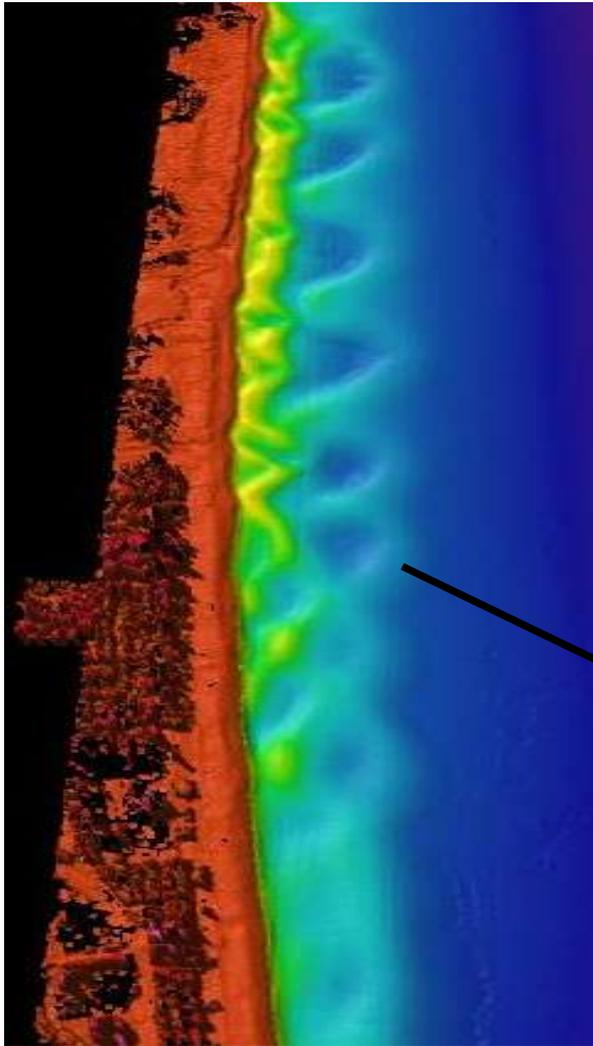
Utilisations de la campagne régionale 2009



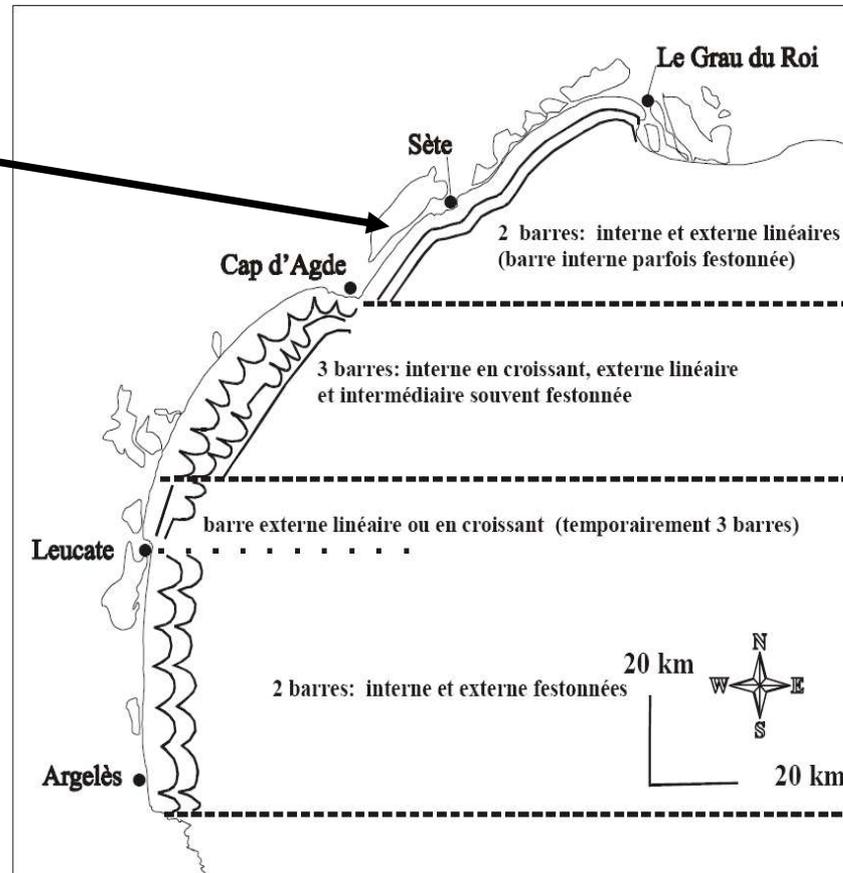
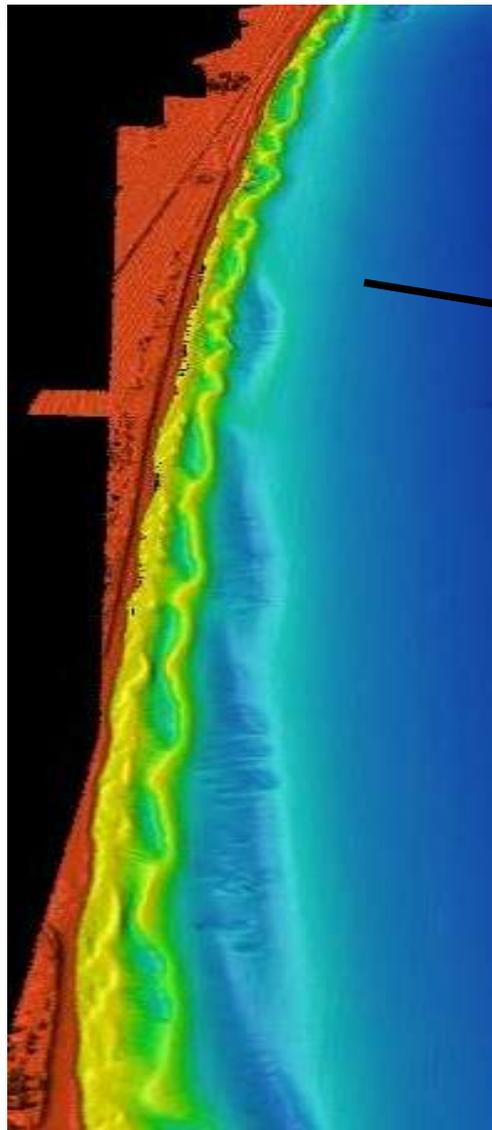
Accès à la morphologie de l'avant-côte



Accès à la morphologie de l'avant-côte



Accès à la morphologie de l'avant-côte



Accès à la morphologie de l'avant-côte

Journal of Coastal Research	SI 64	pg - pg	ICS2011 (Proceedings)	Poland	ISSN 0749-0208
-----------------------------	-------	---------	-----------------------	--------	----------------

Typology of nearshore bars in the Gulf of Lions (France) using LIDAR technology

N. Aleman †, N. Robin †, R. Certain †, C. Vanroye ‡, J.-P. Barusseau † and F. Bouchette ∞

† CEFREM
(UMR5110)
CNRS/University of Perpignan
52 av. P. Alduy
66860 Perpignan Cedex, France
nicolas.aleman@univ-perp.fr

‡ DREAL-LR
Montpellier
520, allée Henri II de Montmorency
34064 Montpellier Cedex 2, France
cyril.vanroye@developpement-durable.gouv.fr

∞ Institute of Mathematics and Modeling
(UMR5149)
CNRS/University of Montpellier 2
Place Eugène Bataillon
34095 Montpellier Cedex, France
frederic.bouchette@math.univ-montp2.fr

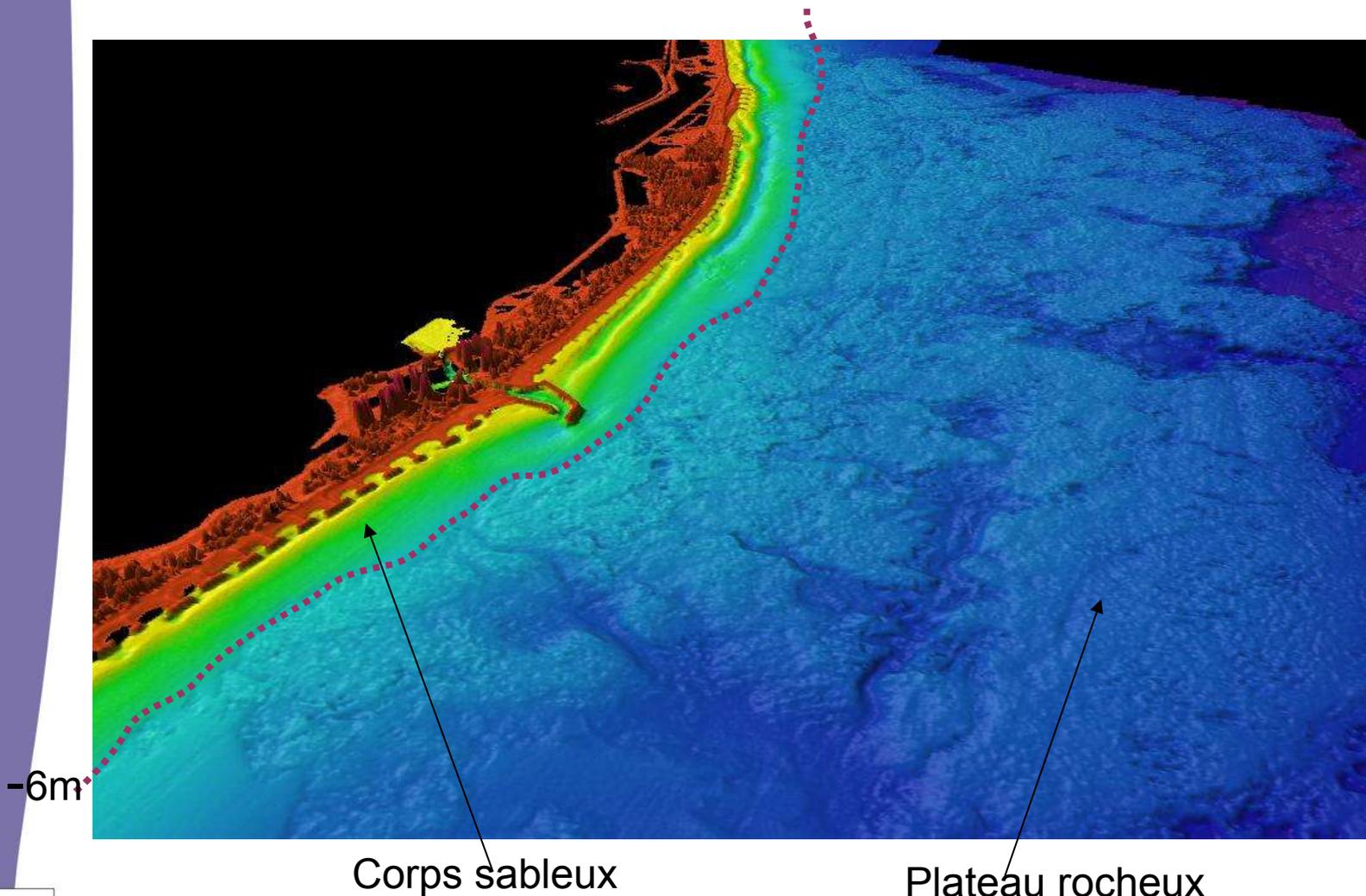


ABSTRACT

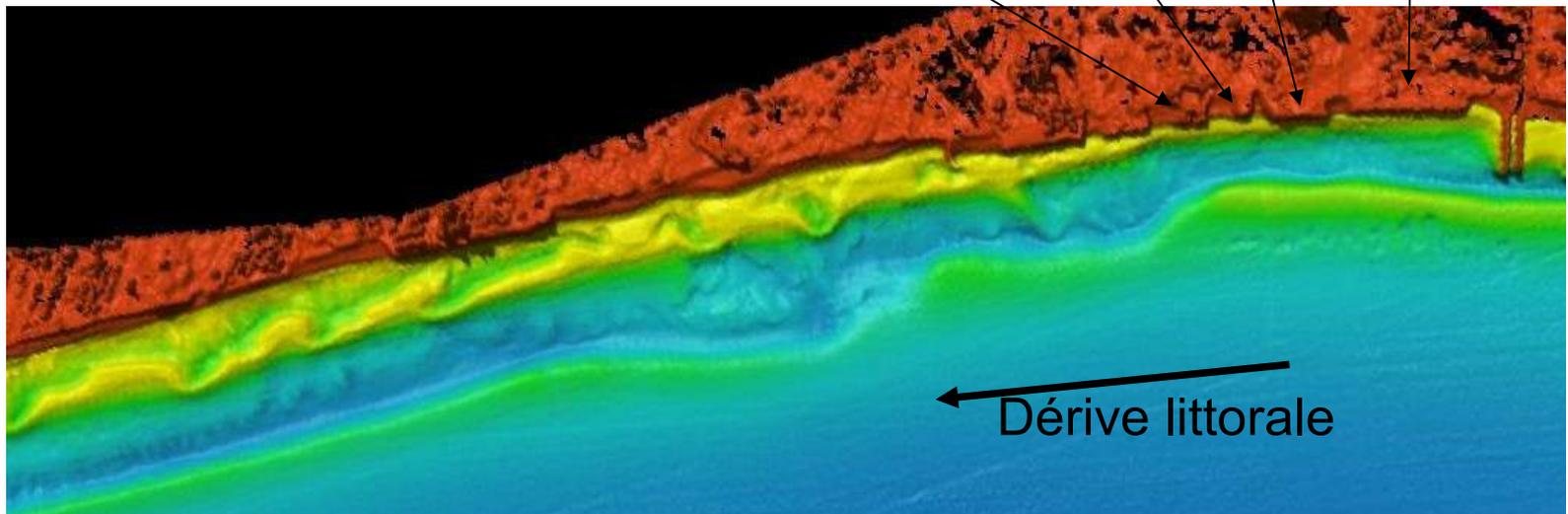
N. Aleman, N. Robin, R. Certain, C. Vanroye, J.-P. Barusseau and F. Bouchette, 2011. Typology of nearshore bars in the Gulf of Lions (France) using LIDAR technology. *Journal of Coastal Research*, SI 64 (Proceedings of the 11th International Coastal Symposium), pg - pg. Szczecin, Poland, ISSN 0749-0208

Nearshore bars are generally present on sandy coasts and play a significant role in wave breaking and sediment exchange between beach and shoreface. The study area is located on the *Languedoc-Roussillon* coast in the Gulf of Lions (southern part of the French Mediterranean coast). This microtidal environment is classified as a wave-dominated coast. The sand coast displays different bar systems (single or multiple; straight or crescentic). The alongshore variability of bar morphology in the nearshore zone was investigated in August 2009 during one week, using a topo-bathymetric LIDAR data set (300 km²). LIDAR makes it possible to cover a large area in a very short time with a high resolution. The topo-bathymetric LIDAR offers the added benefit of morphological information about the beach-sea transition in very shallow water (below 1 m), data often difficult if not impossible to obtain with traditional techniques. The purpose of this paper is 1) to depict the distribution of bars and their characteristics along the 180 km coast of the Gulf of Lions; 2) to update the classifications of sand bars typologies in Languedoc-Roussillon; 3) to pay particular attention to the description of the intricate inner system. Globally, cross-shore distribution of subtidal morphologies is characterized by both an outer and an inner system. The outer system is crescent-shaped in the south and straight in the northern part with a distinctive regional delimitation. The inner system comprises an inner bar and, near the coast, a complex fluctuating bar called Low Bar Beach (LBB). Several intermediate states were identified and added to the new classification proposed in this paper. These results clearly emphasize the importance of LIDAR technology for a better understanding of bar behaviour and single and/or multi-bar beach organisation.

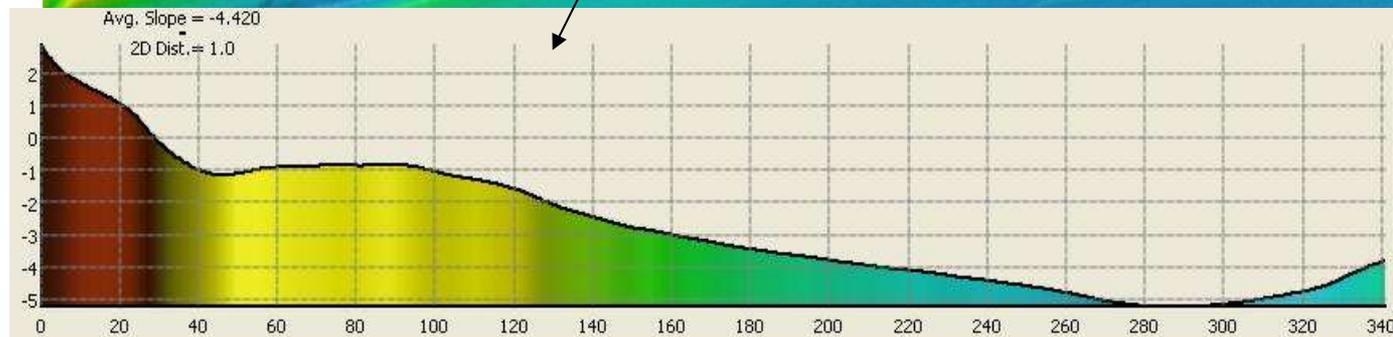
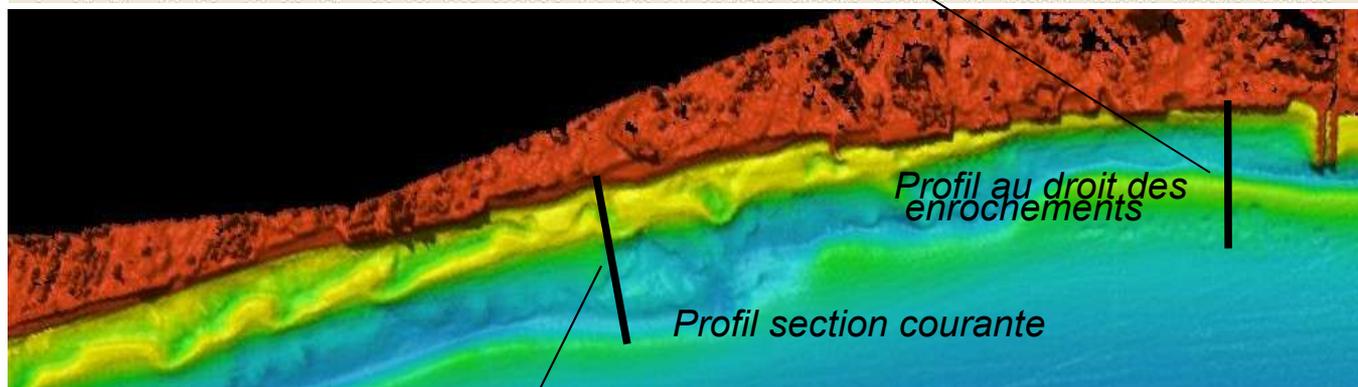
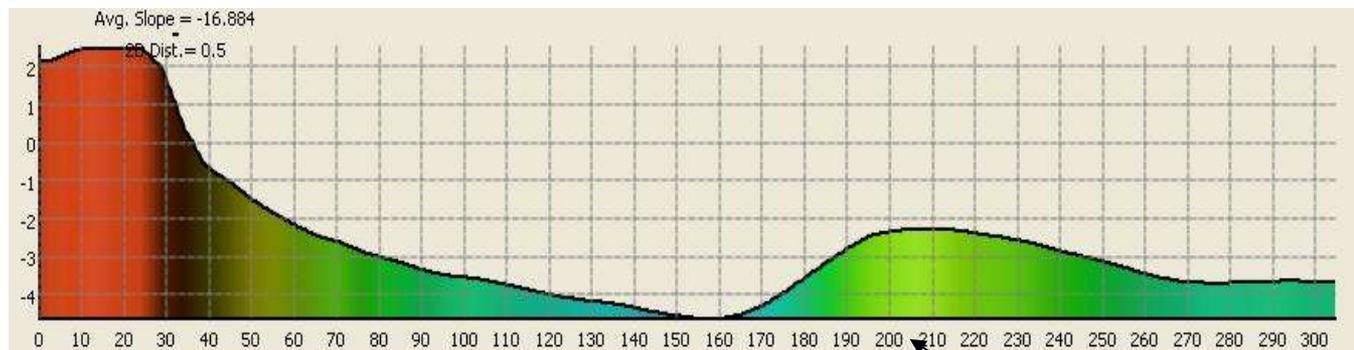
Accès à la morphologie de l'avant-côte



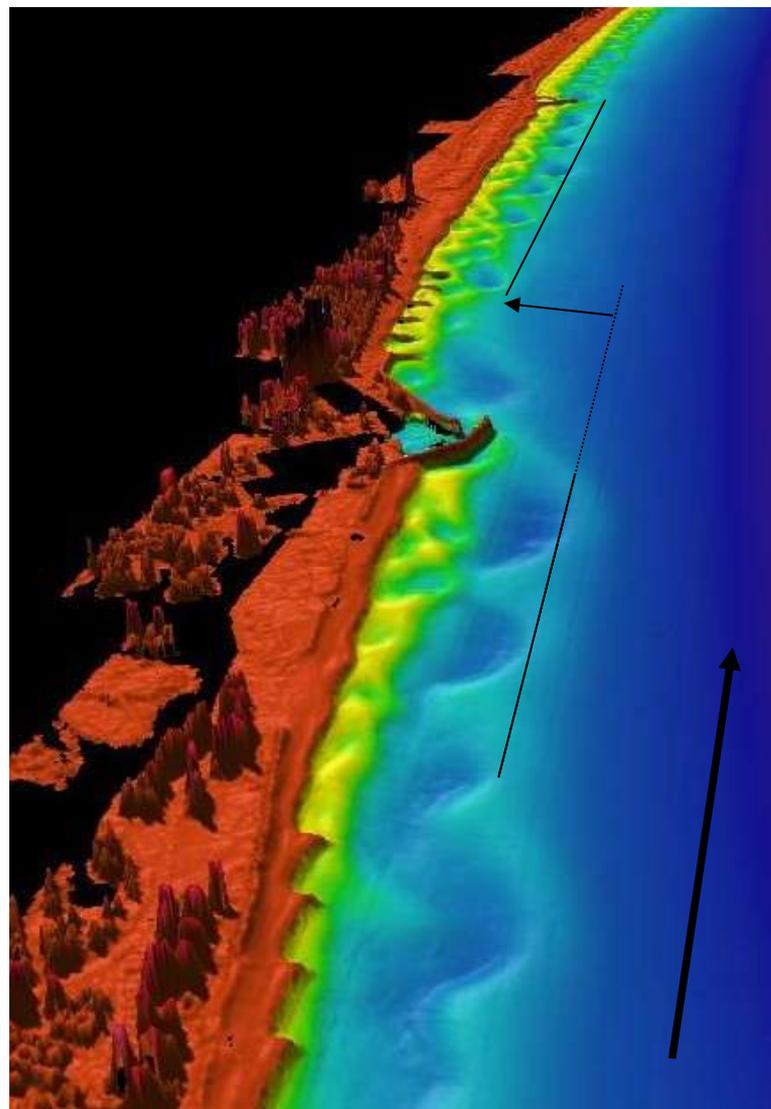
L'impact des ouvrages de protection



L'impact des ouvrages de protection



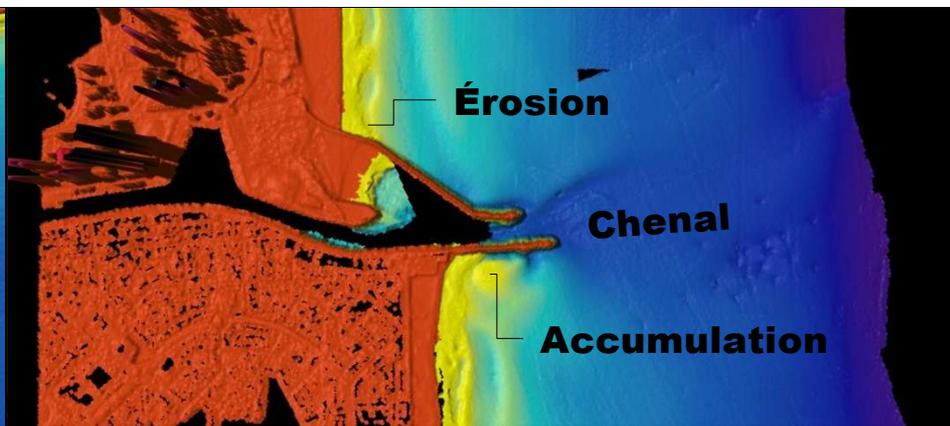
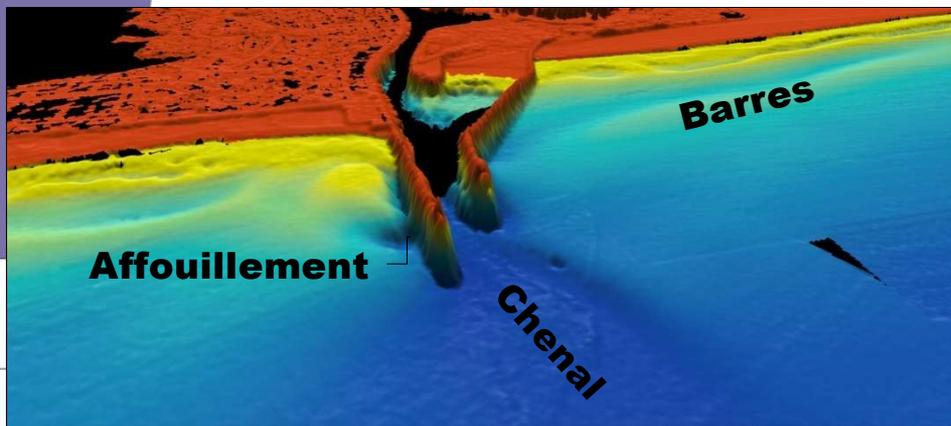
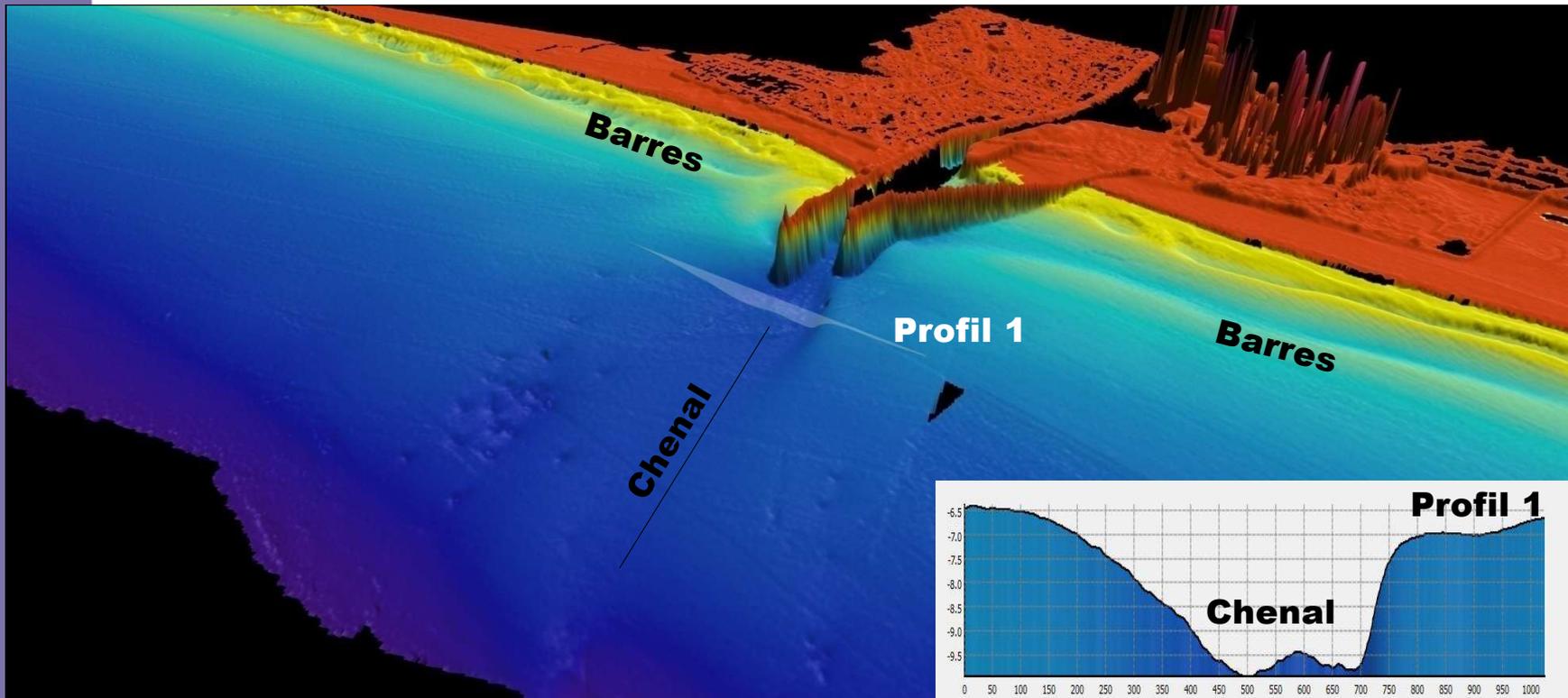
L'impact des aménagements portuaires



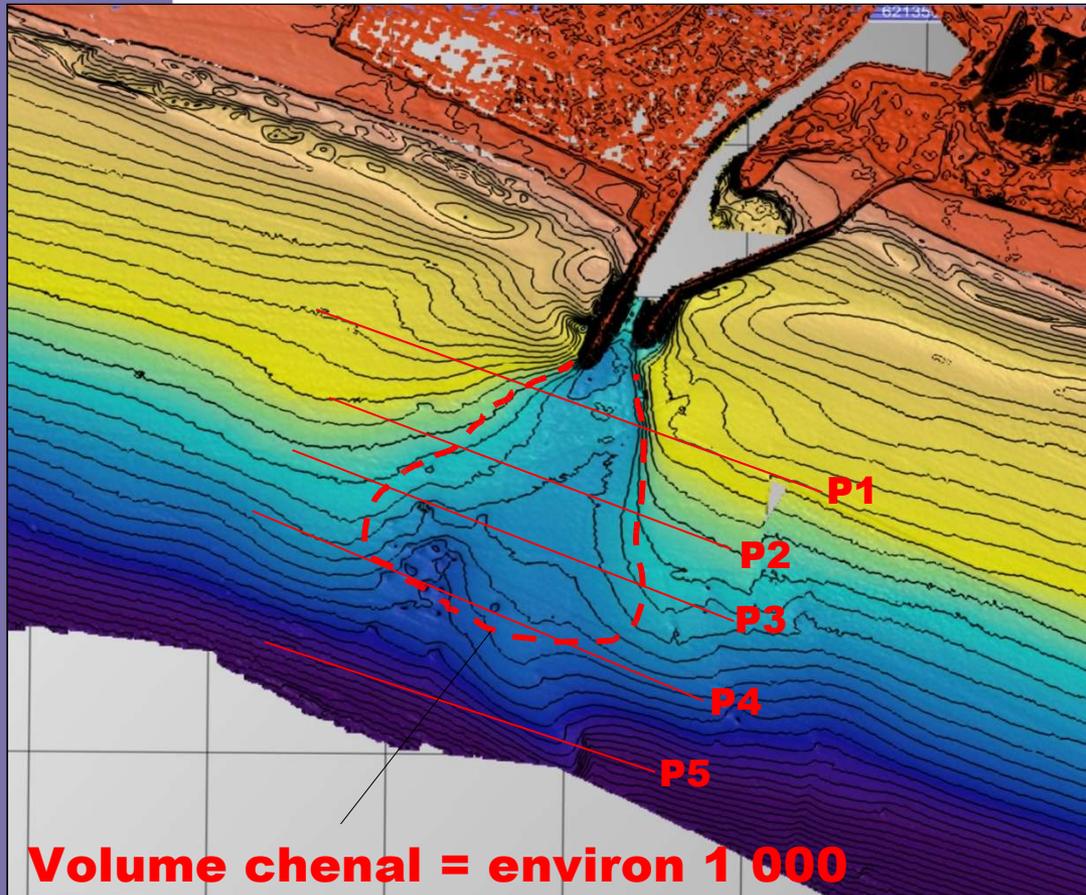
Déplacement du système externe

Sens de la dérive littorale

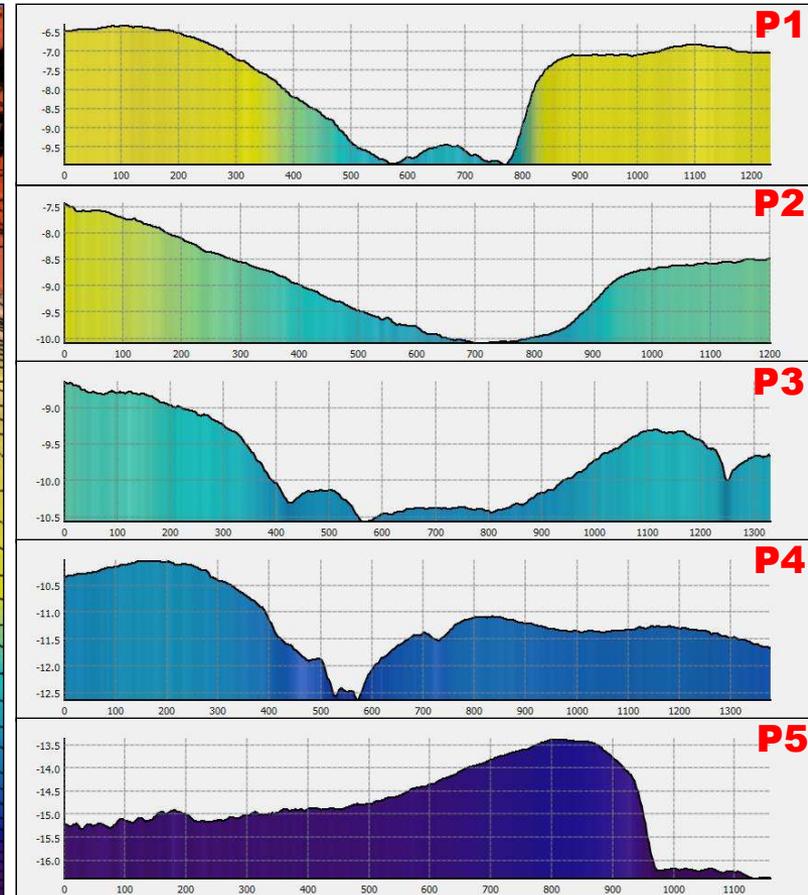
Imagerie Lidar du port de Port-La-Nouvelle



Imagerie Lidar du port de Port-La-Nouvelle



Volume chenal = environ 1 000 000 m³

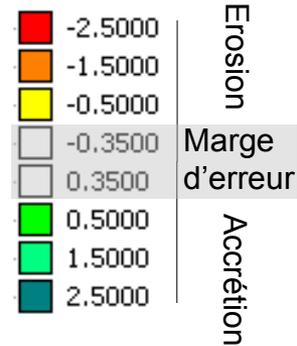
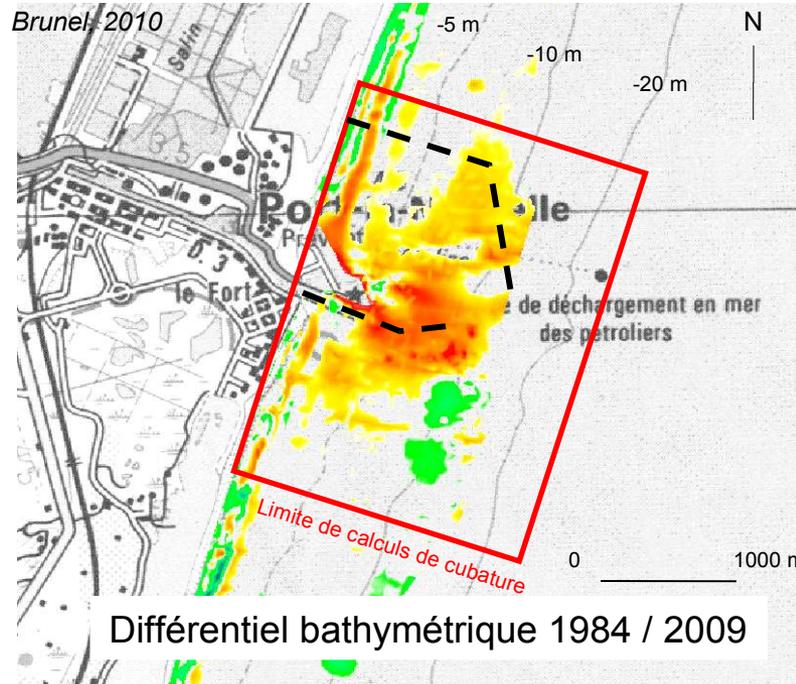
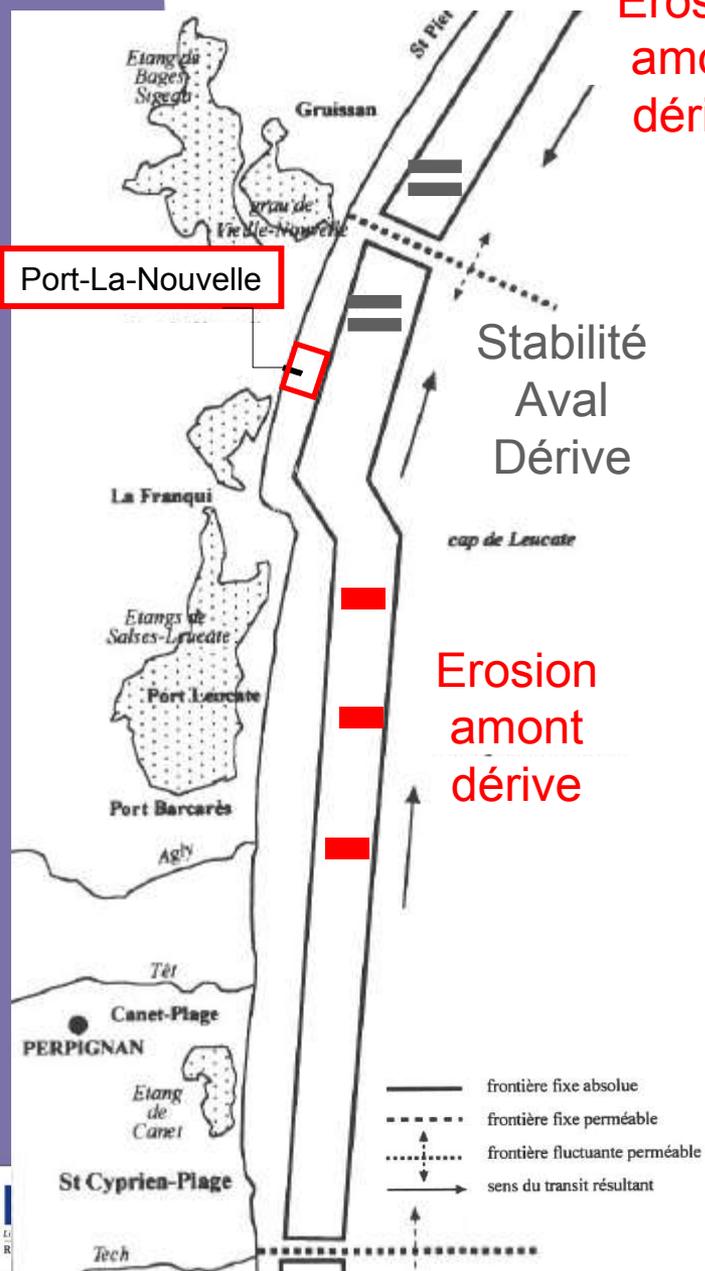


Port-La-Nouvelle

Contexte morpho-dynamique

Erosion
amont
dérive à moyen terme (25 ans) et long terme (89 ans)

Port-La-Nouvelle



Différentiel
1984 / 2009
(En m)

Digues futur port

$$1984/2009 = -2\,131\,000 \text{ m}^3 (+39091 / -105090 \text{ m}^3) \text{ soit } -85\,000 \text{ m}^3 / \text{an}$$

$$1895/1984 = +2\,326\,000 \text{ m}^3 (+77500 / -21130 \text{ m}^3) \text{ soit } +26\,130 \text{ m}^3 / \text{an}$$

= L'apport sédimentaire fourni par la convergence des dérives littorales Nord et Sud se réduisant, l'équilibre sédimentaire actuel mesuré est limité dans le temps

Durand, 1999

Conclusions

Continuité terre-mer et précision font du LIDAR un outil sans équivalent pour la gestion des risques littoraux

Le référentiel Litto3D® ouvre des perspectives techniques :

- dans le champ de la modélisation du phénomène submersion marine
- dans le cadre de l'adaptation au changement climatique

Le référentiel Litto3D® ouvre des perspectives en terme de gouvernance et de vision partagée du littoral