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ECOLOGICAL COASTAL STRATEGIES AND TOOLS FOR RESILIENT EUROPEAN SOCIETIES

Colloque français ECOSTRESS

« Submersion marine, une réalité mais pas une fatalité : les défis d'une adaptation innovante »

A l'Académie de l'Agriculture, 18 rue Bellechasse, 75007 Paris

Les zones côtières, définies comme des territoires habités exposés aux submersions marines sont aujourd'hui entièrement couvertes par la politique française de prévention des risques naturels, modifiée en tenant compte de la directive européenne inondation, des conséquences de la tempête Xynthia en 2010, et de la nouvelle organisation des gouvernements locaux. Les autorités locales sont maintenant en charge de mettre en œuvre cette politique qui peut s'appuyer sur de nouveaux outils réglementaires et techniques dont l'objectif est de les aider à décider pour réduire l'impact d'une submersion et permettre le développement durable de leur territoire.

Ainsi, les différentes parties prenantes des zones littorales veulent assumer leurs responsabilités sur la base d'informations fiables. Ce besoin d'informations permet d'une part, une meilleure compréhension des défis des zones côtières et d'autre part, permet d'établir une réelle confiance dans les outils développées au niveau national et européen.

Ces deux objectifs sont en lien avec ceux du projet ECOSTRESS dont l'objectif est de développer un système d'aide à la décision intégrant les forces des outils réglementaires et techniques, et notamment le potentiel des informations issues du programme européen Copernicus. Par conséquent, il est possible d'intégrer les résultats d'ECOSTRESS testés sur le site de la Mer de Wadden au sein d'un plus large groupe de travail réunissant les différents acteurs français autour de la problématique décrite ci-dessus.

Les participants représenteront les parties prenantes de la prévention en zone côtière comme des maires et leurs services d'appui, des représentants de l'administration d'Etat, des experts dans l'utilisation des informations utiles au développement d'outils d'aide à la décision.

PROGRAMME

L'atelier de travail se propose de faire connaître l'intérêt des analyses multicritères pour l'aide à la décision, au travers des résultats du projet ECOSTRESS. Il montrera aussi que les outils développés peuvent permettre aux autorités locales de faire des choix stratégiques à l'échelle de la ville et du territoire alentour, incluant l'objectif de la reconstruction résiliente. Le programme est organisé pour permettre la discussion entre les participants.

9h00-9h30 : accueil, café

9h30-10h30 : Objectifs de la journée et introduction à ECOSTRESS et COPERNICUS

09h30-09h40: objectifs de la journée, François GERARD, AFPCN.

09h40-10h00: objectifs et principaux résultats du projet ECOSTRESS, Chiara CASAROTTI, EUCENTRE.

10h00-10h20: Utilisation des informations du volet océanique de COPERNICUS dans les études en zone côtière, Sylvain CAILLEAU, Mercator-Océan.

10h20-10h30: Questions et réponses.

10h30-12h30: Les défis de la zone côtière, le cas français

10h30-10h50: Point de vue d'un Maire d'une ville côtière sur la vulnérabilité et la prévention (TBC).

10h50-11h30: Le cas de deux zones côtières : Baie de Bourgneuf (Atlantique) et Baie de Somme (Manche), Jean MAGNE, Communauté de communes Océan Marais de Mont et Gaëlle SCHAUNER, Syndicat mixte Baie de Somme Grand Littoral Picard.

11h30-11h45: Le cadre réglementaire français, incluant les partenariats publics privés, Boris LECLERC, DGPR/Ministère de l'Ecologie.

11h45-12h00: Gouvernance et gestion de la vulnérabilité en Europe, Alberto MONTI, IUSS Pavie, EUCENTRE.

12h00-12h30: Questions et réponses.

12h30-14h00: Buffet sur place

14h00-16h00 : Ce qu'ECOSTRESS peut apporter aux études de vulnérabilité des zones côtières.

14h00-14h20: L'outil d'auto-évaluation de la vulnérabilité sociale, Daniele DEL BIANCO, ISIG.

14h20-14h40: L'outil d'évaluation des dommages, Mario MARTINA, IUSS Pavie, EUCENTRE.

14h40-15h00: L'outil d'évaluation de la vulnérabilité par approche écosystémique, Emiliana VALENTINI, EUCENTRE.

15h00-15h20: L'outil intégré d'évaluation de la vulnérabilité disponible sur internet, Ghada EL SERAFY, DELTARES.

15h20-15h40: Questions et réponses.

15h40-16h40: Table ronde et débat – Quel avenir pour les outils intégrés d'étude de la vulnérabilité des zones côtières ? Quel rôle pour les partenariats publics privés ?

Avec la participation, entre autres, de l'équipe du projet Ecostress, d'Arnaud GUEGUEN, GIP Littoral Aquitain, de Roland NUSSBAUM, Mission Risques Naturels, et de Carlos OLIVEROS, BRGM.

16h40-17h00: Conclusion

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ECOSTRESS French stakeholders workshop

"COASTAL INUNDATION, REALTY BUT NOT FATALITY: THE CHALLENGES OF INNOVATING ADAPTATION"

6 November 2015

Académie d'Agriculture, Paris, France

Coastal zones, defined as inhabited areas exposed to marine submersions are now entirely covered by the French natural risk prevention policy, as revised in accounting the European directive on floods, the consequences of the Xynthia storm in 2010 and the new French organisation of local governments. The local Governments are now in charge of implementing this policy which can rely on new legal and technical tools whose objective is to help them making decision to reduce the impact of submersion and enable the sustainable development of their Communities.

Therefore the coastal stakeholders want to assume their responsibilities on a really well informed basis. The need is first for a deep understanding on the coastal zones challenges an second for a real confidence on the tools being developed at national and European level.

These two objectives are in line with those of the ECOSTRESS project whose objective is to develop a web base decision aid system integrating the potential of legal and technical tools, with a special emphasis on the use of Copernicus data services. Therefore it is possible to integrate ECOSTRESS results tested on the Wadden Sea and Northern Adriatic Sea within a larger workshop gathering French stakeholders around the problematic described above.

Attendees will includes stakeholders active in coastal areas prevention policies and project: local decision makers like mayors or local State administration representatives, representatives of the technical services supporting the decision makers, experts in the use of data and information useful for developing decision support tools.

9.00-9.30	**Registration and coffee**
9.30-10.30	**Objectives of the workshop and introduction to ECOSTRESS and COPERNICUS**
9.30-9.40	Purpose of the workshop *François GERARD, AFPCN*
9.40-10.00	Objectives and main results of the ECOSTRESS project *Chiara CASAROTTI, EUCENTRE*
10.00-10.20	Mainstreaming information from the COPERNICUS ocean component into coastal areas studies *Sylvain CAILLEAU, Mercator-Ocean*
10.20-10.30	Q&A
10.30-12.30	**The challenges of the coastal zones**
10.30-10.50	The views of a coastal city Mayor about vulnerability and prevention
10.45-11.30	The case of two French coast areas : Baie de Bourgneuf (Atlantic) and Baie de Somme (Channel) *Jean MAGNE, Communauté de communes Océan Marais de Mont et Gaëlle SCHAUNER, Syndicat mixte Baie de Somme Grand Littoral Picard*
11.30-11.45	The French legal framework including the use of PPPs *Boris LECLERC, Ministry of Ecology*
11.45-12.00	Governance and management of vulnerability in Europe *Alberto MONTI, EUCENTRE*
12.00-12.30	Q&A
12.30-14.00	**Lunch on site**
14.00-16.00	**What can ECOSTRESS offers to coastal areas vulnerability studies?**
14.00-14.20	The social vulnerability self evaluation tool *Chiara BIANCHIZZA, ISIG*
14.20-14.40	The damage assessment tool *Mario MARTINA, EUCENTRE*
14.40-15.00	The ecosystem based vulnerability evaluation tool *Emiliana VALENTINI, EUCENTRE*
15.00-15.20	Ensemble forecast, Water quality, Uncertainty *Ghada EL SERAFY, DELTARES*
15.20-15.40	Q&A
15.40-16.40	**Concluding round table and debate – which future for integrated tools in coastal vulnerability studies ? which role for PPP?** Round table with ECOSTRESS researchers, French DRR stakeholders – Q&A
16.40-17.00	**Conclusion and wrap-up.**

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RÉSUMÉS DES INTERVENTIONS DU PROJET ECOSTRESS

Governance and management of vulnerability in Europe

Alberto Monti - EUCENTRE

ECOSTRESS highlights the need to develop an improved collaborative risk governance framework for coastal flooding risk in Europe. This framework shall comprise governmental actors at supranational (i.e., EU), national, and local levels, but also private sector participants, including not only builders, developers and professionals in the construction sector, but also the private insurance, reinsurance and financial markets players.

From a legal viewpoint, Directive 2007/60/EC set the stage for flood risk assessment and reduction in Europe, requiring EU Member States: (i) to assess if all water courses and coast lines are at risk from flooding; (ii) to map the flood extent and assets and humans at risk in these areas and (iii) to take adequate and coordinated measures to reduce this flood risk. A key governance aspect of the Directive is the emphasis placed on public information and participation in the coastal flood risk management process. The review and analysis of its current level of implementation in various European jurisdictions shows differences and similarities in approaches. A comparison with the legal and public policy initiatives taken in this field in the United States, with a special focus on the activities steered by the Federal Emergency Management Agency (FEMA), further enriches the picture and suggests possible improvements going forward.

As concerns the reduction of financial vulnerability, the comparative review of alternative forms of Public-Private Partnerships (PPP) aimed at covering the growing costs of coastal flooding across the world indicates that there is ample room for improvement of the current situation in Europe. As emphasized by the G20/OECD Methodological Framework for Disaster Risk Assessment and Risk Financing (2012), a comprehensive and integrated approach is required for financial strategies, following an assessment of the availability, adequacy and efficiency of different types of financial tools available to the population and within the economy, as well as of their relative costs and benefits, in comparison with possible further risk reduction to complement or substitute for these tools.
The availability and cost of risk transfer and financing instruments is influenced by uncertainties characterizing the risk assessment process: supplying reliable and consistent data on hazards, exposures and vulnerabilities, or at least facilitating their collection, recording, storage and dissemination can greatly enhance the capacity of markets.

In conclusion, ECOSTRESS shows that proactive governance and collaboration mechanisms can be established to effectively involve both public and private stakeholders with a view to developing and implementing innovative policies and tools to reduce financial vulnerability in Europe.

Social Vulnerability: assessment and self assessment tool

Daniele Del Bianco, Chiara Bianchizza - ISIG

Our presentation will present the work done for the quantification of social vulnerability through a 'static vulnerability index tool'. It will also illustrate the method developed (through SWOT analysis) to include a quantitative self-assessment (done by local communities/risk managers) to balance the results of the static vulnerability index with an appraisal of opportunities/threats that intervene dynamically on that situation.

The aim is to provide a tool that is both able to deliver quantitative data (useful for spatialisation/mapping) and support communities in an automous self assessment towards the development of efficient strategies to increase their resilience.

The case study is the Italian Northern Adriatic area and the tool will be presented illustrating results for the piloting in this geographic area.

Flood damage modeling

Mario Martina - EUCENTRE

Damage modeling is a key component in flood risk assessments. A conventional approach for estimating direct flood damages is the use of depth-damage functions. However, at present, there are few studies that describe in detail the parameters involved in the models and the hypotheses used for the development of these functions based on synthetic approaches and/or actual flood damage data. Within Ecostress project a synthetic approach was adopted for the development of a damage model for residential buildings. The approach follows the loss assessment procedure usually applied by the insurance loss adjusters. Required information consisted of all those variables that are necessary to define hazard characteristics at building location, compute the exposure value of the building and the replacement costs of its components. In detail, the model requires four input tables. The hazard module includes the variables describing the features of the flood event at building location (e.g. water depth outside the building, water depth inside the basement, maximum velocity of the flood, duration of the event, contaminant and sediment load). The exposure module includes both extensive variables (e.g. foot print area, number of floors) and "vulnerability" variables, where the latter affect damage estimation in two different ways: by changing the replacement value/unit prices of the building and its components (e.g. the finishing level, building type) or by modifying the function(s) describing damage mechanisms (e.g. building structure, plant distribution). The replacement values table and the unit-price table include respectively the replacement value of the building and the unitary replacement costs of the different building components (e.g. doors and pavement replacement per square meter). The final output of the model is represented by different sets of damage functions describing all the building components (e.g. plasters, plants), depending on hazard, exposure and vulnerability characteristics.

The ecosystem based flood vulnerability evaluation tool

Emiliana Valentini, Alessandra Nguyen Xuan, Federico Filipponi & Andrea Taramelli - EUCENTRE

With respect to the increasing risks related to global changes, the concept of ecosystem services has the capacity to contribute to the safety of social and natural systems and to the vulnerability reduction. Extensive tidal flats, salt marshes, dunes and sandy spits between mainland and the seawaters, regulate sediment transport and vegetation presence and distribution that contribute to the balance between erosion and flood.

By using remote sensing observations, we investigate the distribution patterns of different variables along the coastline of a delta and we speculate on their role under forcing factors like significant waves (surges) from sea. The magnitude of interactions within the variables sets and the presence of habitats are discussed by comparing applications of the already developed InVEST Coastal Vulnerability model (Natural Capital project – USA) and the fuzzy based approach developed during the ECOSTRESS EU project in order to provide a prototype demonstrator of innovative Tools for Resilient European SocietieS.

L'outil d'évaluation de la vulnérabilité aux inondations basée sur l'écosystème

Emiliana Valentini, Alessandra Nguyen Xuan, Federico Filipponi & Andrea Taramelli - EUCENTRE

En ce qui concerne les risques croissants liés aux changements globaux, le concept de services écosystémiques a la capacité de contribuer à la sécurité des systèmes sociaux et naturels et à la réduction de la vulnérabilité. Vastes plaine de marée, marais salants, dunes et crache de sable entre le continent et les eaux de mer, régulent le transport des sédiments et la présence de la distribution de la végétation qui contribuent à l'équilibre entre l'érosion et les inondations.
En utilisant des données obtenues par l'observation de la Terre (EO data), nous étudions les modèles de distribution des différentes variables le long de la côte d'un delta et nous spéculons sur leur rôle en présence des forçages marins tels que la hauteur significative des vagues (surge). La magnitude des interactions entre les variables considérées et la présence d'habitats sont discutées en comparant les applications du modèle InVEST de vulnérabilité côtière déjà développé (InVEST Coastal Vulnerability model - Natural capital - Etats-Unis) et l'approche basée sur la logic fuzzy développés dans le UE projet ECOSTRESS pour fournir un démonstrateur prototype d'un outil innovant pour la résilience des sociétés européennes.

Ensemble Forecast, Water quality, Uncertainty

Ghada El Serafy, Sandra Aguilar - DELTARES

- Examine feasibility & cost-benefit of risk prevention related to the use of wetlands, coastal systems and dry lands to mitigate flood.
- Combined Sentinel data w/ field studies and statistics in GIS
- Thematic maps & analyses for coastal regions such as Wadden Sea and Northern Adriatic coast.
- Training to implement algorithm for risk analysis & "Building with Nature

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