Clara Therville [1, 2, 3], Ute Brady [4], Olivier Barreteau [2], François Bousquet [1], Raphaël Mathevet [3], Sandrine Dhenain [2], Frédéric Grelot [2], John Marty Anderies [4]

[1] *CIRAD, UPR GREEN, Montpellier, France*
[2] *IRSTEA, UMR GEAU, Montpellier, France*
[3] *CNRS, UMR 5175 CEFE, Montpellier, France*
[4] *ASU, School of Human Evolution and Social Change, Tempe, United States*

Coastal areas around the world are facing multiple challenges leading to diverse adaptations to manage their vulnerability. Since coastal regions represent complex social-ecological systems (SES) that are characterized by high interdependency among individual components, adaptations can have a wide range of positive and negative consequences. To better anticipate these feedbacks and identify interdependencies among multiple components of a SES, frameworks of analysis can be particularly useful. We used Anderies et al.'s (2004, 2015) Robustness Framework to analyse a case study located along the Languedoc coastline in southern France. Through the examples of land-use planning and coastal management policies, we identified the main changes taking place, the responses to those changes, and resulting consequences at the system scale. We found that the presence of multiple, interacting global changes place growing pressure upon resources and infrastructures, leading to a redefinition of social organization. The study highlights the importance of envisioning coastal SES at multiple scales and considering them as a combination of nested and interdependent feedback systems where choices made in separate decision-making contexts will have cross-scale implications for the whole SES. This modular configuration can be seen as a network of adjacent action situations and raises challenges about the definition of modules' boundaries and coordination. Refining the robustness framework with additional institutional analysis can be helpful to analyze multiple interdependencies, to foresee consequences of adaptation in inter-related decisional contexts, and to promote collective action to cope with global change along coastlines.

Contributed session oral presentation:

Framing coastal management in the face of global changes: insights from a cross-country comparison

Clara Therville [1, 2, 3], Tara Quinn [4], Sandrine Dhenain [1], Chloé Guerbois [5], François Bousquet [1], Christo Fabricius [5], Raphaël Mathevet [3], Katrina Brown [4]

[1] *CIRAD, UPR GREEN, Montpellier, France*
[2] *IRSTEA, UMR GEAU, Montpellier, France*
[3] *CNRS, UMR 5175 CEFE, Montpellier, France*
[4] *Exeter University, Exeter, United Kingdom*
[5] *Nelson Mandela Metropolitan University, Sustainability Research Unit, George, South Africa*

People living along coastlines are facing multiple risks such as flooding, submersion and erosion. The association of growing issues and risks in the face of global change is challenging the responses of individual, collective and public authorities to manage vulnerability of these areas and of their social and ecological components. Depending on the context and on the dominant world views, decision-makers are referring to a multitude of discursive arguments to tell their stories about coastal management and to comment on their adaptation choices. Here, we identify the main frames mobilized in coastal management in three contexts: Cornwall in England, Languedoc in France and Garden Route in South Africa. Through a revision of coastal management documents and a thematic analysis of interviews conducted with institutional decision-makers, we identify the main frames mobilized in the three study cases. Two opposed frames of response emerged across the three sites: the command and control VS living with the

risk frames. However, these frames are unequally mobilized through the case studies, and differently introduced and justified. Determinants related to the context, occurrence of extreme events, availability of resources to adapt or socio-political history of the country are pushing towards the use of one of the frame rather than the other. Conversely, the use of the same frame in two different contexts can be explain by a different set of determinants related to the context. This study highlights how adaptation reflects both how different stakeholders diversely interpret information about global change and adaptation, but also how these rationales are strongly context-dependent, leading to diverse cognitive and non-cognitive barriers and opportunities for renewed responses in the face of global change along coastlines.

Contributed session oral presentation:

In role in a rolling landscape: Re-thinking multi-scale vulnerability transfers in the Anthropocene

Raphaël Mathevet [1], Olivier Barreteau [2], Bruno Bonté [2], François Bousquet [3], Pauline Bremond [2], Sandrine Dhenain [2], Frédéric Grelot [2], Clara Therville [1, 2, 3]

[1] *CNRS UMR 5175 CEFE, Montpellier, France*

[2] *IRSTEA UMR GEAU, Montpellier, France*

[3] *CIRAD GREEN, Montpellier, France*

To explore transfers of vulnerability and their consequences with local stakeholders in southern France, a role-playing game session with 50 elected representatives and experts coming from various sectoral organizations was organized. The role-playing game involved 4 different landscapes of a coastal region: a littoral area, an agricultural plain, an urbanized area, and a river valley—with each landscape set up on a separate table. The participants were positioned either as land managers in different sectors (urban, agricultural, biodiversity conservation, green tourism, mass tourism) or elected decision-makers in charge of collective decisions and negotiation with other territories. For each round, the players had the option of placing infrastructures (dikes, irrigation networks, labelling, nature reserves) in management units under their responsibility in order to influence development trajectories. Based on their decisions, the land cover and use of these areas were updated (resident and tourist populations, agricultural crops, biodiversity). Different events, e.g. coastal erosion, river flooding, salinity change, droughts, and population growth affected the different territories. Participants had to meet their individual goals and collectively address the various pressures associated with changes in their territory. This experiment and its collective debriefing showed that adaptations at the local scale enabled players to temporarily cope with the pressures of global change by transferring these pressures to other territories. Overall, the weight of urbanization in short-term decision-making remains crucial. Protecting farmland and biodiversity remains challenging in the face of demographic pressure. Financial resources and coordination are not enough, it is key to have trust and flexible regulations in order to be able to innovate and adapt. Sensitizing land users to the processes of vulnerability transfers may improve social-ecological solidarity between them and gives meaning to their actions and their consequences. We assume that through this learning experiment, participants reinforce their resilience to future changes.

Contributed session oral presentation:

Stewardship in nature and the biosphere not always the pathway to sustainability

Lisa Heider, Christo Fabricius

Nelson Mandela Metropolitan University, South Africa, George, South Africa