ZACAM: One Health long-term socioecological research platform

Nathalie Boutin, Jean-Claude Raynal, Delphine Destoumieux-Garzon, Raphaël Mathevet, Marion Vittecoq, Olivier Boutron, Frédéric Thomas

In France, long-term socioecological research (LTSER) platforms called "zones ateliers", which operate under the aegis of the National Centre for Scientific Research (CNRS) through its Ecology & Environment institute, form an interdisciplinary network dedicated to the study of social-ecological systems and the environment. They aim to answer fundamental ecological questions while considering contemporary societal challenges linked to global change.

The "Zone Atelier Santé-Environnement Camargue" (ZACAM) LTSER platform covers the Rhône delta, a vast coastal area known as the Camargue (Figure 1). ZACAM is the 16th LTSER platform in the national network and the very first dedicated to health–environment issues on the Mediterranean coast.

The Camargue region, where natural areas come in direct contact with anthropogenic pressures, offers an ideal setting for studying long-term disease circulation and emergence, as well as co-constructing solutions for prevention and adaptation to local issues. This vast Mediterranean wetland is a recognized biodiversity hotspot and is home to many species, supporting a range of human activities such as crop and livestock farming and tourism. It is also vulnerable to epidemic risks due to the presence of pathogens, making the prevention of environment-related diseases a crucial concern.

ZACAM is focused on the socioecology of health and takes a "full health" perspective that integrates the One Health approach. It has four priority research themes: 1) zoonotic pathogens, 2) antibiotic resistance, 3) ecotoxicology and 4) environmental mental health (Figure 2). The overall goal is to promote health and environment research in the Camargue through an integrative and interdisciplinary approach to identify concrete solutions for local stakeholders. In this way, one key project called ZOOCAM (PEPR PREZODE programme, Figure 1) will explore the dynamics of zoonotic agents in the Camargue, the human and environmental factors influencing their spread, the modelling of current and emerging zoonotic risks, and the way in which these risks are perceived by local stakeholders.

References

Destoumieux-Garzón D., Matthies-Wiesler F., Bierne N., Binot A., Boissier J. *et al.* 2022. Getting out of crises: Environmental, social-ecological and evolutionary research is needed to avoid future risks of pandemics. *Environment International*, 158, 106915. https://doi.org/10.1016/j.envint.2021.106915

Boutin N., Mathevet R., Destoumieux-Garzon D., Vittecoq M., Thomas F. In press. La Zone Atelier santé-environnement CAMargue : recherches socio-écologiques selon des approches « une seule santé » et « pleine santé ». *In* Ragueneau O., Lea V., Charpentier I., Tito de Morais C., Bonnefond M. (Eds), *Zones Ateliers, un réseau de co-recherches sur les socio-écosystèmes : historique et perspectives,* London, ISTE Éditions, Collection Sciences, pp. 243–258.

ENVIRONMENTAL MENTAL HEALTH explores how natural and anthropogenic environmental factors influence psychological well-being. Positive aspects include stress reduction in green spaces, connection with nature and interactions with animals. Negatives aspects involve issues like pollution, ecosystem degradation and anxiety driven by climate change or biodiversity loss. In regions like the Camargue, integrating mental health into One Health approaches addresses the psychological impacts of these environmental challenges on local communities.

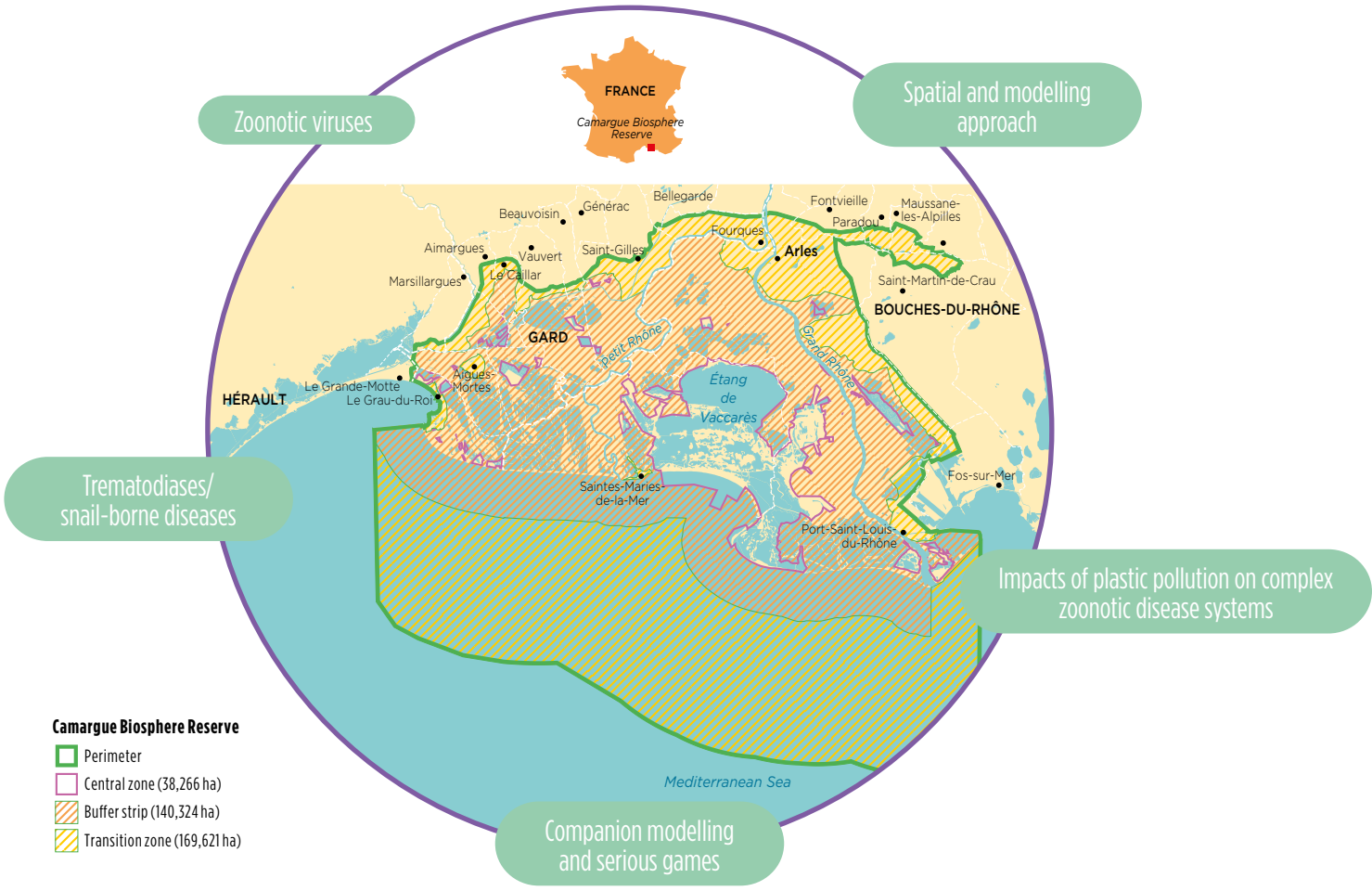


Figure 1. The Camargue Biosphere Reserve, where the ZACAM research platform is focusing its One Health research activities.

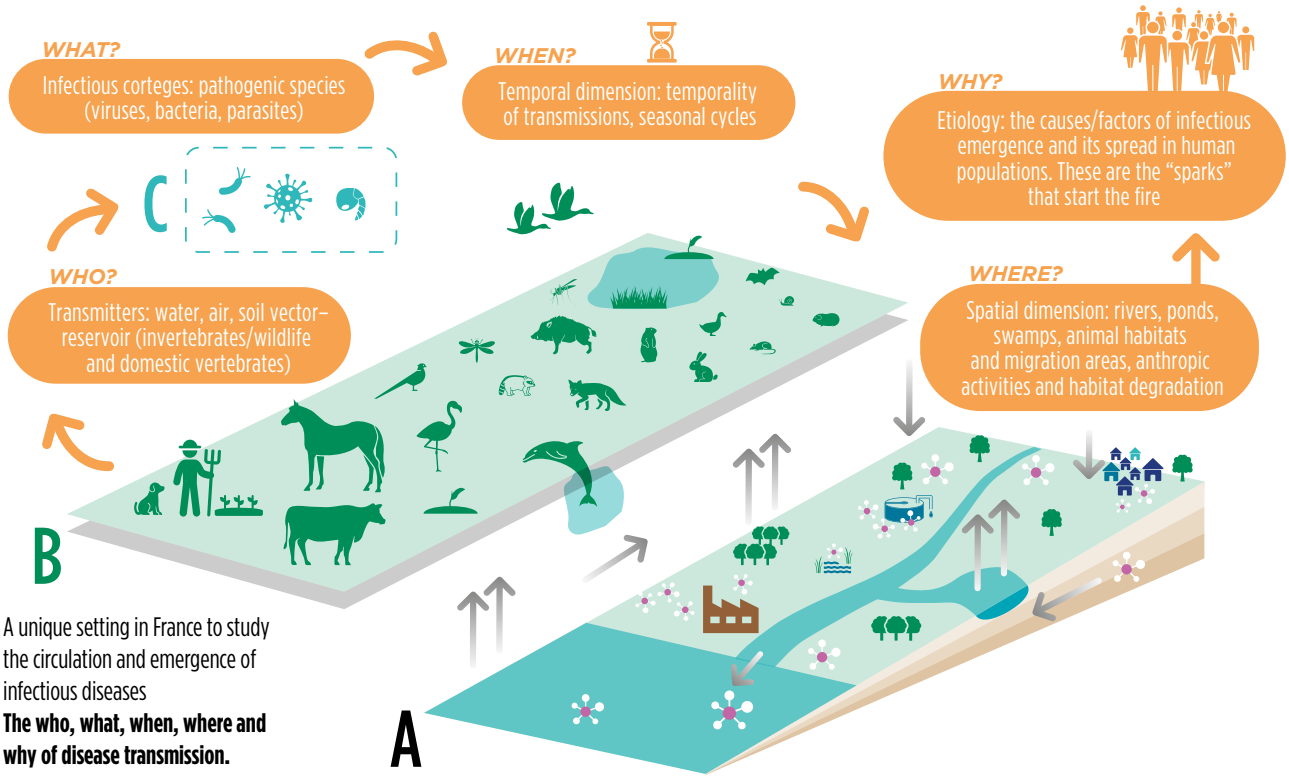


Figure 2. A framework for studying the circulation and emergence of infectious diseases (a priority research area for zoonotic pathogens).
Source: François Renaud.