Call for Phd application at Irstea-INRA

UMR G-EAU / UMR BETA

Flood risks, amenities and residential choices

Three-year PhD fellowship: may begin from 1st September 2018 on

Research team

1) Irstea, UMR G-EAU (Gestion de l'eau, acteurs, usages) - Ecole Doctorale Economie et Gestion (EDEG), Université de Montpellier, Montpellier. 2) INRA, UMR BETA (Bureau d'Economie Théorique et Appliquée), Nancy. The doctoral student will be registered in Montpellier. Stays in Nancy are to be scheduled.

Supervision

PhD supervisors :
Katrin Erdlenbruch, senior researcher in economics, Irstea, UMR G-EAU, Montpellier.
Serge Garcia, senior researcher in economics, INRA, UMR BETA, Nancy.
A thesis committee with researchers from external research groups will be formed.

Short Phd project description

Floods cause major damage and disruptions worldwide. In France, floods affect one resident in four and one job in three and were responsible for around 30 billion Euros of economic damage over the last 30 years. Yet, more and more people are settling in risky areas, because of the presence of local infrastructures (schools, shops), natural amenities (coastal zones, rivers, no-build landscapes) and lower real estate prices than outside risky areas (Beltran et al. 2017, Bin et al. 2008).

Flood exposure is a function of two elements: individual choices and public policies. Individuals can adapt to the risk (Richert et al., 2017) or avoid areas at risk. Public policy can protect homes in risky areas or support individual avoidance measures by imposing zoning and by carrying out risk information policies (Mauroux 2015), such as risk prevention plans (PPRi) or acquirer-tenant information (IAL) in France.

This Phd project first focuses on the individual choices of residence and the trade-offs that households make between amenities and flood risks (see e.g. Tu et al. 2016 for amenities offered by green spaces). To do so, we propose a *Choice Experiment* approach to estimate risk and amenity values during residence choice, while taking into account attitudes, perception and information in relation to flood risks (Ben Akiva et al. 2002). The PhD student will answer the question: What role do negative externalities (such as flood risks) and positive externalities (such as amenities) play in residential choices?

Second, in order to predict the evolution of populations in risk-prone areas, we propose the dynamic modelling of mobility. The model will be based both on the estimation of mobility factors (Dieleman 2001) and a conceptualization of individual decisions related to residence change (Klabunde et Willekens 2016). The PhD student will answer the question: What movements in flood zones can be predicted during the next decades and what do these forecasts mean for the vulnerability of societies?

Finally, we will evaluate the effectiveness of certain flood prevention policies in France, using cost-efficiency and cost-benefit methods, and compare them with other prevention policies. The PhD student will answer the question: Given individual residence choices and population movement projections, how effective are zoning and information policies? The effectiveness of the tested policies can be discussed in comparison with other prevention policies.

The project will be based on a case study area in France.

References

Ben-Akiva, M., J. Walker, A.T. Bernardino, D.A. Gopinath, T. Morikawa, and A. Polydoropoulou (2002). Integration of Choice and Latent Variable Models. in *Perpetual Motion: Travel Behaviour Research Opportunities and Application Challenges*, (Elsevier Science, Ed. Mahmassani), Chapter 21, 431-470.

Beltrán, A., Maddison, D., Elliott, R. (2017). The impact of flooding on property prices: A repeat-sales approach, *EAERE conference paper*, 50p.

Bin, O., Crawford, T., Kruse, J.B., Landry, C.E. (2008). Viewscapes and Flood Hazard: Coastal Housing Market Response to Amenities and Risk, *Land Economics*, 84, 3: 434-448.

Creach, A. Cartographie et analyse économique de la vulnérabilité du littoral atlantique français face au risque de submersion marine, Thèse de doctorat, université de Nantes, novembre 2015.

Dieleman, F. M. (2001). Modelling residential mobility; A review of recent trends in research, *Journal of Housing and the Built Environment* 16: 249–265.

Klabunde, A., Willekens, F. (2016). Decision-Making in Agent-Based Models of Migration: State of the Art and Challenges, *Eur J Population* 32:73–97.

Mauroux, A. (2015). Exposition aux risques catastrophiques, politiques de prévention et marchés de l'immobilier en France. Un état de la connaissance économique, *Etudes et Documents n° 134*, Commissariat Général au Développement Durable, november 2015.

Richert, C., Erdlenbruch, K., Figuières, C. (2017). The determinants of households' flood mitigation decisions in France - on the possibility of feedback effects from past investments. *Ecological Economics* 131, 342- 352.

Tu G., Abildtrup J., Garcia S. (2016). Preferences for urban green spaces and peri-urban forests: An analysis of stated residential choices. *Landscape and Urban Planning*, 148, 120-131.

Discipline

Economics

Skills and qualifications required

Master 2 level qualification in economics or econometrics
Skills in statistics, econometrics, modelling and simulation
Interest in applied research approaches in an interdisciplinary environment
Excellent command of English and French
Knowledge of environmental issues and issues linked to natural hazards

Phd fellowship

Three year contract
Gross monthly salary: env.1875 € (about 1500 € net)

Application procedure

Candidates should send their application letter and curriculum vitae to Dr. Katrin Erdlenbruch (Irstea, G-EAU) et Dr. Serge Garcia (INRA, BETA)

katrin.erdlenbruch@irstea.fr Tel.: +33 (04)67 04 63 87
serge.garcia@inra.fr Tel.: +33 (03)83 39 68 69. Mobile : +33 (0)6 81 20 20 85

A first selection of candidates will take place on 1st June.