

An ecosystem approach to fisheries: the seabob shrimp in Surinam



Tomas Willems^{1,2}, Annelies De Backer¹, Kris Hostens¹ & Magda Vincx²

¹Institute for Agricultural and Fisheries Research - Biological Environmental Research

²Ghent University, Department of Biology, Marine Biology Section



INTRODUCTION

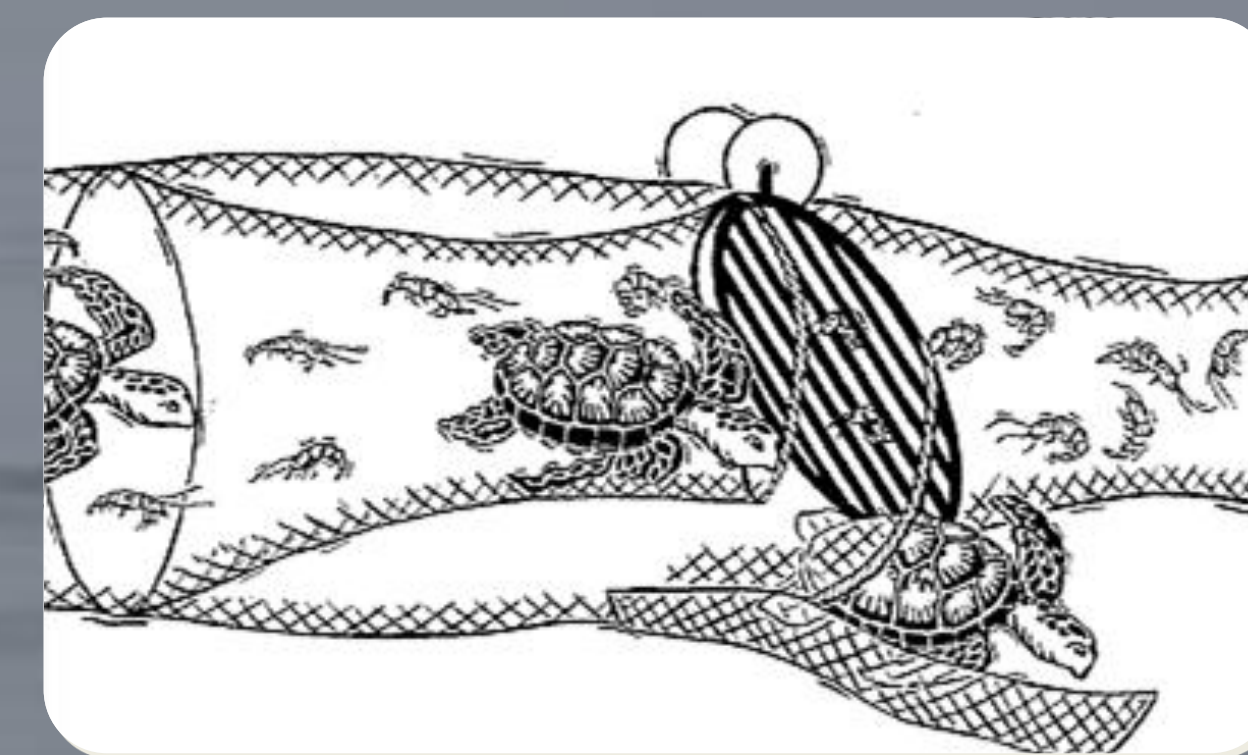
The continental shelf waters of Surinam (South – America) are heavily influenced by the nutrient- and sediment-rich outflow of major rivers. **Atlantic seabob shrimp** *Xiphopenaeus kroyeri* (Crustacea: Penaeoidea) (Heller, 1862) occurs abundantly in this area and is fished by a fleet of 20 otter-trawlers, catching some 10.000 tons/yr. for export to the US and Europe. Due to **regulating measures**, mainly regarding by-catch and fishing ground restrictions, the seabob fishery in Surinam was awarded an **MSC-ecolabel** in 2011. Together with a smaller artisanal fleet - providing the local market- seabob fisheries are an important economic activity in the coastal area, generating considerable **foreign income** and constituting an important **domestic protein supply** in Surinam.



Surinam, with the Amazon outflow to the south-east ©Flashearth



Seabob shrimp ©TW



Operation of a Turtle Excluder Device ©Knauss Fellows



Fisherman demonstration a bycatch reduction panel ©CM



Marine Stewardship Council
Certified sustainable seafood



Shrimp trawlers at work in the Gulf of Mexico ©Landsat NASA

PROBLEM

Survival of the fishery is directly dependent on the **availability of wild seabob shrimp** to catch.

Stock assessment (Medley, 2009): seabob **populations** are healthy and not overfished, but **ecology** remains largely unknown.

→ **Distribution in the coastal area:** which environmental parameters are important?

→ **Trophic role of the seabob:** what is the effect of seabob removal on other species in the foodweb?

→ **Impact of fishing gear:** is seabob trawling altering benthic habitats?

Does current fishing compromise future catches or severely impact the marine environment?

LOOKING FOR ANSWERS: BIO-ENVIRONMENTAL RESEARCH

2012: Distribution and foodweb study

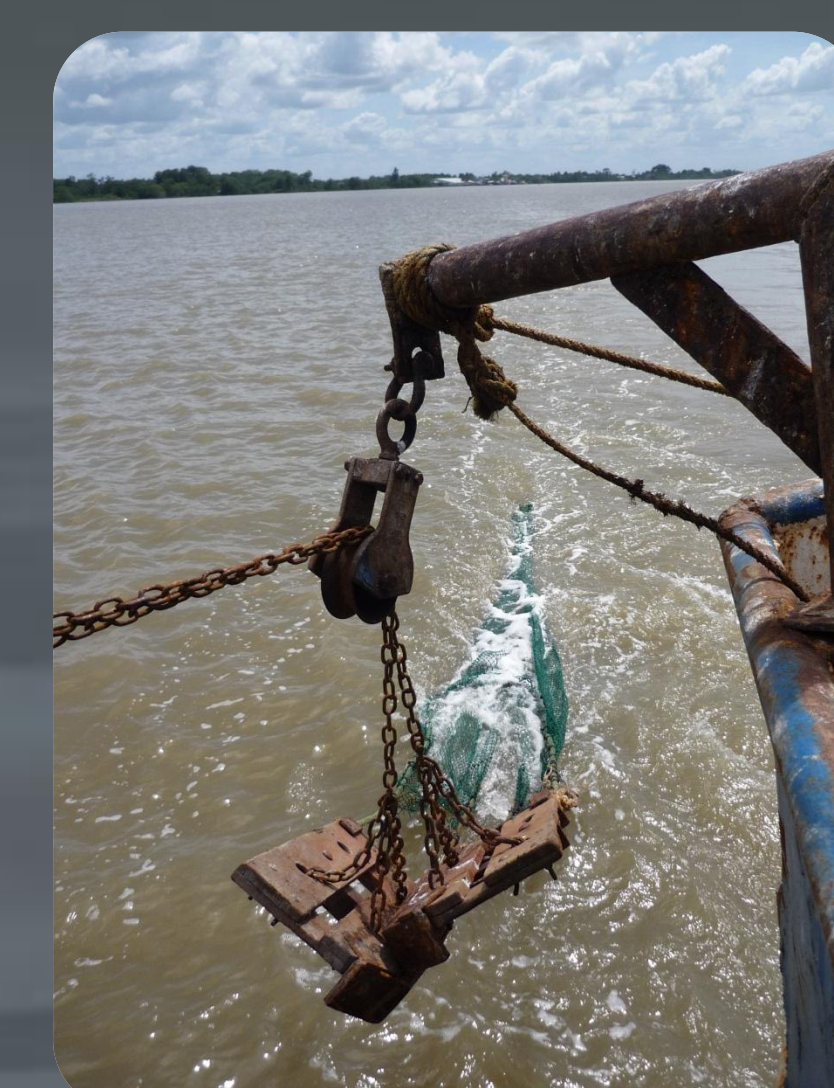
- Monthly sampling campaigns
- 18 locations between 5 and 40 meters depth
- Otter- trawling: spatio-temporal distribution of seabob
- Environmental parameters: CTD, Chl a, suspended organic matter, turbidity, sediment
- Foodweb analysis: fish stomachs and stable isotopes
- Macrobenthos samples

2013: Impact of fishing gear on benthic habitats

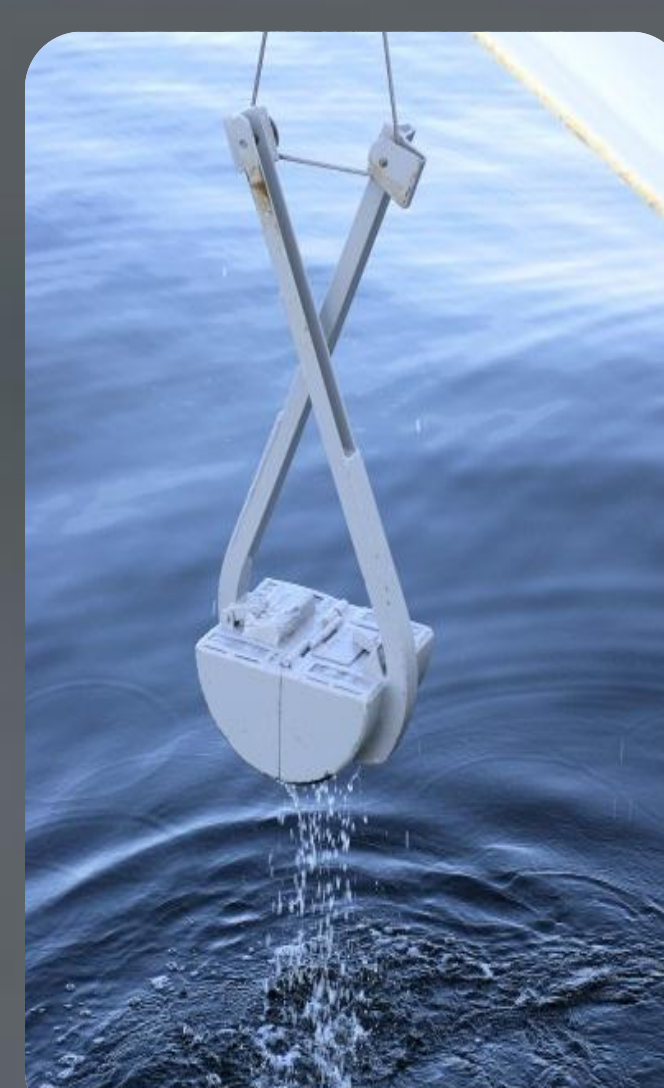
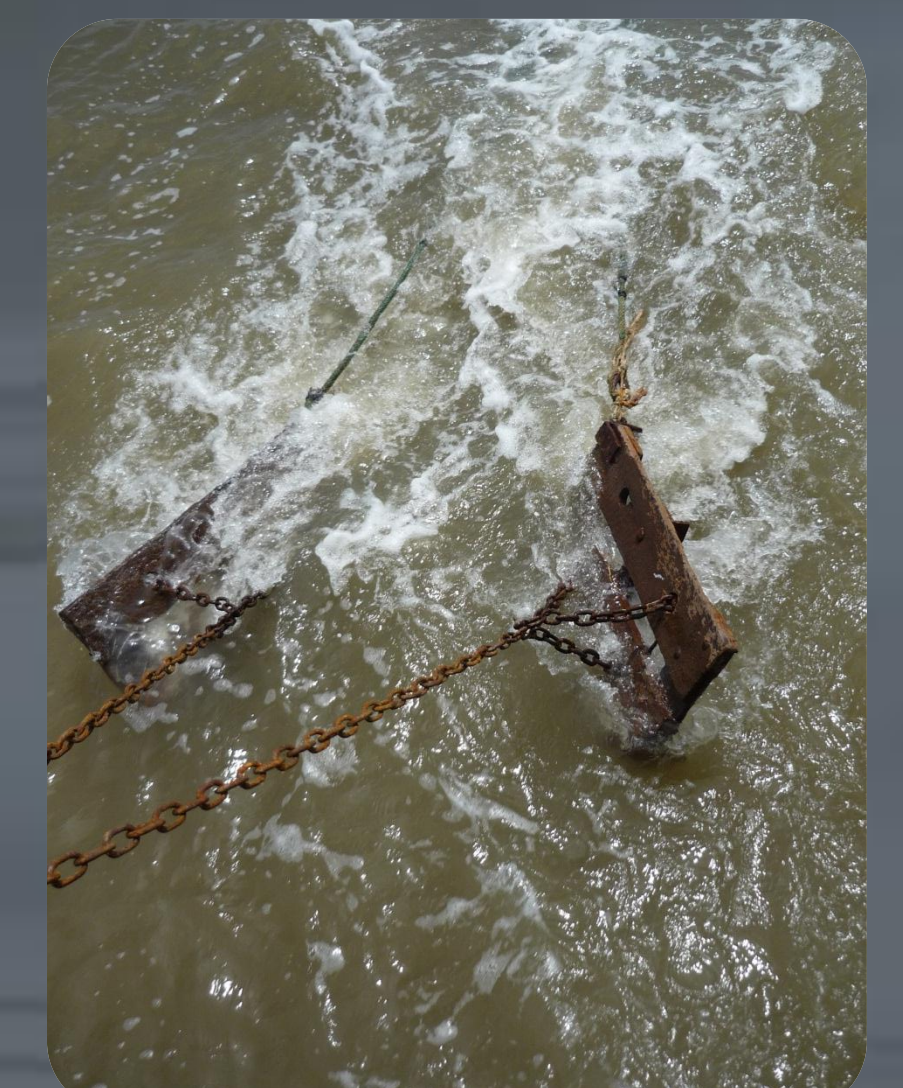
- Trawling experiments in untrawled areas
- Comparison of trawled versus untrawled areas, based on data from VMS-tracking (Vessel Monitoring by Satellite)



Sampling is conducted from a seabob trawler ©TW



An otter-trawl is used for seabob, fish and epibenthos sampling ©TW



Seabottom sampling with a van Veen grab ©HH

AIM

The fishery should remain operating, minimizing its environmental impact and ensuring its sustainability. Research results will be integrated in practical, but ecologically sound **management advices** to the fishing industry, which is, together with the local government authorities involved from the start in this project.