

such as hake recruitment in the real world. It would be valuable to incorporate more realistic environmental effects and feedbacks with industry.

HakeSim has therefore been designed in a way to facilitate linking it to an ecological (e.g. ecosystem) model in future.

Keywords: agent-based model, model development, hake trawl, fishery, economic-ecological system

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B7-81

Understanding investment in innovative fishing gears to improve the uptake of new technology

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The benthic ecosystem provides important ecosystem goods and services. It provides habitat, spawning grounds and food for bottom dwelling fish species which contribute about 50% of the landings in the North-East Atlantic. However, fishing, and particularly the towed bottom contact gears used on the continental shelf, have a major impact on benthic ecosystems. Therefore technical and management measures are being developed in an attempt to lower the impact of fishing on the sea bottom. In this study we look at the North Sea flatfish fishery. The traditional gears used in the fishery are beam trawls, gears that lay heavily on the bottom and are expensive to operate due to the associated high fuel consumption. In recent years, the Dutch part of the fishery underwent a deep transformation and alternative gears have been increasingly used. The transformation was initially driven by the increasing fuel prices worldwide: fishers choosing lighter trawls with better fuel efficiency. Being lighter, those alternative gears rest less on the bottom and therefore have a lower impact on the benthic ecosystem. To evaluate the adoption and economic viability of alternative gears, we investigated the investment behaviour in such gears with a model. The results of the study suggest that although the economic performance of alternative gears is important in the decision to invest, the uptake of innovative gears could not only be explained by a change in profitability. Thus additional drivers have played a role in the investment decisions. Knowing the expected change in profitability, investment barriers as well as incentives to invest can help implement management measures to stimulate investment in innovative gears.

Keywords: investment, model, interviews, drivers

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