

advice, and the user could link through to the actual advice or the Advice drafting group report if they wanted more information.

## (11) Understanding vessel ownership and firm organization in French Atlantic fisheries: a typology

Arne Kinds<sup>1,2,3</sup>, Olivier Guyader<sup>1</sup>, Pascal Le Floc<sup>h</sup><sup>1</sup>

<sup>1</sup> Unité d'Economie Maritime, UMR 6308, CNRS, IUEM, Ifremer, Univ Brest, Plouzané, France. E-mail: arne.kinds@univ-brest.fr

<sup>2</sup> Faculty of Bioscience Engineering, Ghent University, Belgium

<sup>3</sup> Instituut voor Landbouw- en Voedingsonderzoek (ILVO), Ostend, Belgium

E-mail: arne.kinds@ilvo.vlaanderen.be

The European fishing industry is largely perceived as existing of a multitude of individually owned, locally operated fishing vessels, despite growing evidence of concentration through vertical integration and companies owning fishing vessels across multiple Member States. The drivers behind capital accumulation and concentration in the fishing sector remain poorly understood, however. Most studies on investment behaviour have looked at entry and exit of vessels from two angles. First, they consider that investment decisions depend on current economic incentives (e.g., anticipated levels of returns, current profits, stock-dependent costs of harvesting). Second, they consider that changes in the regulatory environment may shift these economic incentives, causing new investment patterns. Widely studied examples of such changes are government interventions aimed at reducing excess capacity: subsidies, buyback programs and access regulations. However, reducing this question to a matter of investment behaviour is limiting, and it has been suggested that the organizational structure of fishing firms must be taken into account to better understand the strategies behind vertical integration and the investment in multiple fishing vessels. In this paper, we analyse multi-ownership in the light of the characteristics and strategies that lie at the basis of the organizational structure of French Atlantic fishing firms (i.e., fishing strategy, firm management, vessel maintenance, marketing strategy, ownership structure, etc.). Research questions include: (1) which organizational forms exist (and co-exist) today in the French Atlantic fishing sector (2) what defines them, (3) how did they emerge and (4) what can be expected from them in the future (in terms of their evolution and persistence). A typology was constructed based on 80 semi-structured interviews with vessel owners along the French Atlantic coast, in which both qualitative and quantitative information was collected. Multiple Correspondence Analysis (MCA) in combination with hierarchical clustering was used to construct the typology.

Work related to ICES via WGECON (Working Group on Economics)

## (12) Genetic structure of sole in the Irish and Celtic Sea

Sophie Delerue-Ricard<sup>1,2</sup>, Loes Van de Castele<sup>2</sup>, Gregory Maes<sup>1,3</sup>, Henrik Christiansen<sup>1</sup>, Hans Polet<sup>2</sup> and **Filip A.M. Volckaert**<sup>1</sup>

<sup>1</sup> Laboratory of Biodiversity and Evolutionary Genomics (LBEG), KU Leuven, Ch. Deberiotstraat 32 box 2439, B-3000 Leuven, Belgium

<sup>2</sup> Research Institute for Agriculture, Fisheries and Food (ILVO), Ankerstraat 1, B-8400 Oostende, Belgium

<sup>3</sup> Laboratory for Cytogenetics and Genome Research, Center for Human Genetics, Genomics Core, KU Leuven, Herestraat 49, B-3000 Leuven, Belgium

E-mail: filip.volckaert@kuleuven.be

Sole (*Solea solea*) is a species with a complex life cycle evolving between the spawning grounds where adults release gametes, nursery grounds where juveniles settle and metamorphose, and feeding grounds where (sub)adults feed. Spawning stock biomass in the Irish Sea (ICES area 7a) and Celtic Sea-Bristol Channel (ICES area 7g) has reached an all time low leading to concerns for its recruitment and future viability. We address here the connectivity of adult and juvenile sole based on an intensive sampling campaign between 2003 to 2009 (adults) and 2016 (juveniles). Fish were genotyped either with 426 gene-linked single nucleotide polymorphisms or with 5000 Single Nucleotide Polymorphisms (SNPS) obtained through ddRAD (double digest Restriction site Associated DNA markers) sequencing. Irish and Celtic Sea sole represent a distinct genetic group, identifiable at specific loci. The results point to limited connectivity between the area and adjacent waters. It allows to trace Irish and Celtic Sea sole with molecular markers. In addition, juveniles of Liverpool Bay, Cardigan Bay and Bristol Channel represent distinct subpopulations, again pointing to restricted gene flow within the area, linked to