Fish Behaviour At Navigation Locks

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Anthropogenic hydraulic structures such as ship locks, pumping stations and hydropower plants play an important role in navigation, flood control and sustainable energy production. However, despite their obvious benefits, these structures may severely impact the aquatic ecosystem and freshwater fish in particular. More specifically, they create a barrier for upstream and downstream migration of fish species, significantly alter the physical habitat and even might wound fish during passage. In Flanders (Belgium), the Albert Canal connecting the river Scheldt to river Meuse, is an important migration route for two critically endangered species: European eel (Anguilla anguilla) and Atlantic salmon (Salmo salar). Both species have a downstream migrating phase in their lifecycle (respectively silver eels and salmon smolts), during which they are hampered by hydraulic structures. In the coming years, Archimedes screws are to be installed at the navigation lock complexes present in the canal, which can function both as pumping stations and hydropower generators. A first installation is already present at the navigation lock complex of Ham. Before fish mitigation measures can be implemented, it is important to gain understanding of the swimming behaviour of downstream migrating fish around the navigation complex. In this project, we tagged 62 silver eels and 71 salmon smolts with acoustic VPS-transmitters (Vemco Positioning System). This paper presents the resulting swimming tracks in relation to CFD (Computational Fluid Dynamic) simulations of the hydrodynamics around the sluice complex and the pumping/hydropower station.