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Eawag Seminar Invitation

More Sustainable Food from the Oceans: Rethinking Ecosystem-Based Management

Speaker **Prof. Katja Enberg,** *University of Bergen, Norway*

When **November 26, 16.00 – 17.00**

Where **Online via Zoom, contact seminars@eawag.ch for access details.**

Abstract The ocean(s) cover 70% of the Earth's surface and half of the global primary production, but only 2% of food comes from the ocean. Terrestrial agriculture already occupies 40% of terrestrial land and consumes 70% of freshwater, making it a major driver of biodiversity loss. Nevertheless, within 2050 the humankind will need 25-70% more food than today – can the ocean help us? At the first sight, it might seem unlikely - capture fisheries stagnated in the 1980s, and traditional aquaculture has many negative environmental consequences. With the goal of rethinking ecosystem-based fisheries management, we compared food production in terrestrial and marine systems focusing on proteins (marine food produces virtually no carbohydrates). According to our numbers, oceans currently contribute only 6.7% of global proteins consumed by humans. The reason is the difference in trophic levels: in terrestrial food systems, trophic levels 1 and 2 dominate, whereas ¾ of seafood comes from trophic levels 3 and 4. A food systems approach that maximizes contribution to human nutrition would manage marine ecosystems for increased harvesting at lower trophic levels. This would entail fishing down predator populations at trophic levels 4 and 5 and maintaining them at levels well below MSY. The food these fished-out predators don't eat can then be fished for human consumption, and for each kg predator that doesn't eat we can fish 10 kg at the trophic level just below, or 100 kg two levels down. With advances in monitoring of wild stock and fisheries activities, we argue that the capacity for real-time assessment and management of rapidly fluctuating resources is near possible. This would imply more dynamic fisheries management, and likely a call for more flexible quotas across multiple fisheries to sustain economic efficiency of the fleets. Our redefinition of ecosystem-based fisheries management implies managing fisheries so that the ecosystem produces its combined maximum sustainable yield.