

**Seminar September 22, 4:00 PM in 604 SCEN
Refreshments at 3:30 PM in 502 SCEN**

Environmental estrogens and their impact on the salmon life cycle

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For 20 years a hot buzzword to incorporate in applications to environmental and health science research foundations has been "endocrine disruption". For obvious reasons, research in this field has overwhelmingly focused on the adverse effects that may be induced on the reproductive axis by certain xenobiotics in a range of vertebrate species ranging from fish to mammals. The declines in sperm quality among European men as well as increased instances of genital defects in newborns are some of the most remarkable observations linked to such chemicals. In the aquatic environment, endocrine disruption may result from chronic as well as pulsatile exposure to chemical compounds from sewage treatment plants, farmland manure applications, industrial activities as well as application of pesticides in forestry management. Big efforts and investments are made in screening programs in order to classify chemicals as being estrogenic, androgenic, anti-estrogenic and anti-androgenic. In fish, a large range of studies have described in detail how quite diverse chemicals may disrupt the estrogenic axis in female as well as male fish, thereby causing a vitellogenic response, sex reversal, hermaphroditism and other deformities with decline in the reproductive success as the ultimate endpoint. There has, however, been much less focus on how xenobiotics may affect additional physiological processes in animals. Due to the strong decline in salmon populations in the Northern hemisphere, we have been interested in the role of endocrine disruptors from a different perspective: how do estrogenic compounds affect juvenile salmon migration and survival in the marine environment. The original setting of this research was "the New Brunswick case" of spruce budworm suppression using formulated aerial insecticides and its apparent correlation with major declines of year-classes of salmon both at sea and when returning to their native rivers. Through a series of experiments in both laboratory and natural scenarios, we have been able to show that alkylphenolic compounds, commonly found in industrial sewage treatment effluents, may adversely set back the natural transformation of juvenile Atlantic salmon which transforms the freshwater *parr*- stage to the migratory seawater *smolt*- stage. This may ultimately delay migration and oceanic survival of this species. The lecture will present some of the experimental evidence that has led to this conclusion.

