A new method for quantifying post-tagging behaviour and stress response in fish

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Stock Metrics
- **states** (e.g., biomass, distribution)
- **rates** (e.g., consumption, energy expenditure)

Stock Status
(size, habitat, ecosystem)

Fisheries Management
- fishing pressure suitable for sustainable fishing
- Habitat protection

Conventional & electronic fish tags
- Floy Tags, Petersen disks
- Acoustic tags
- PSAT tags

Stress
- Tag Load
  - Increase in energy expenditure
  - Physical damage
- Handling stress

Study Overview:
Can tag load associated stress be quantified using accelerometer tags in Atlantic Cod (*Gadus Morhua*)?
Tag and Tag load related stress in Atlantic Cod

Experiment Design

- Atlantic Cod (n = 26)
- Accelerometer tags (19.7 g vs. 6.1 g) temporarily attached externally
- Animals exhibit tag-load redacting behavior, where they ‘scrub’ their sides along the bottom of the tank until tags are dislodged

Accelerometer Signal Processing

Developed extraction algorithm that identifies tag-load redacting behaviour

Diagram:

- Magnitude of Acceleration
  - While $\sigma < \sigma_{\text{threshold}}$
  - While $\sigma > \sigma_{\text{threshold}}$

- Normal Behaviour
- Aberrant Behaviour

Identification Algorithm

Statistical Analyses

- Scouring behaviour
- Other HF movement
Tag and Tag load related stress in Atlantic Cod

- No effect of fish size
- Diurnal: % day > % night scouring
- Effect of Tag Load
  - Lateral $A_{max}$ larger tag > smaller tags
  - % time scouring does not differ
  - High variation among individuals