Fuel tax concessions in Nordic fisheries

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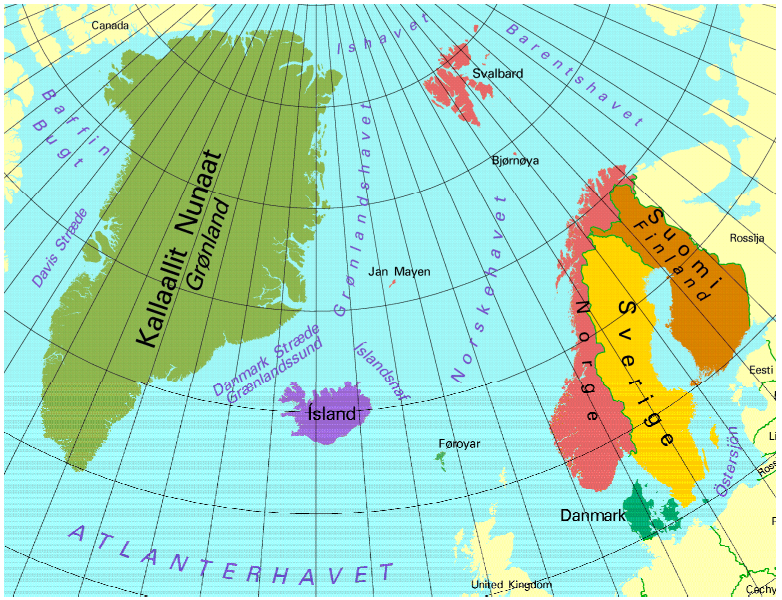
Outline

- Background and project members/countries
- Fisheries and models
- Fuel scenarios
- Results

Fuel tax concessions in Nordic fisheries

- Financed by the Nordic Council



- Denmark
  - Max Nielsen, Frank Jensen
- Iceland
  - Daði Már Kristófersson
- Finland
  - Marko Lindroos, Fredrik Salenius
- Greenland
  - Daniel Schütt
- Faroese Islands
  - Hans Ellefsen
- Sweden
  - Staffan Waldo, Cecilia Hammarlund, Anton Paulrud
- Norway
  - Ola Flaaten, John Isaksen, Øystein Hermansen

- Final report: November 2013

Background – Fuel subsidies

- Initiative from Swedish Ministry for Rural Affairs
- Climate change
  - Fisheries account for about 1.2 % of global oil consumption (Tyedmers et. al. 2005)
- Subsidies increase fishing activity
- Fuel tax exemptions are regarded as a fisheries subsidy by both WTO and OECD definitions
- NGO, etc.: Why give fuel subsidies? (WWF, 2007)
- 15-30 % of global fisheries subsidies consists of fuel subsidies (Sumaila et. al., 2010)

Project approach

- Research question: How would an abolishment of fuel subsidies affect the fishery?
- Each country selects fisheries with high and low fuel intensity
- Each country chooses a modelling framework that fits the selected fishery
- Each country analyse four fuel scenarios specified within the project

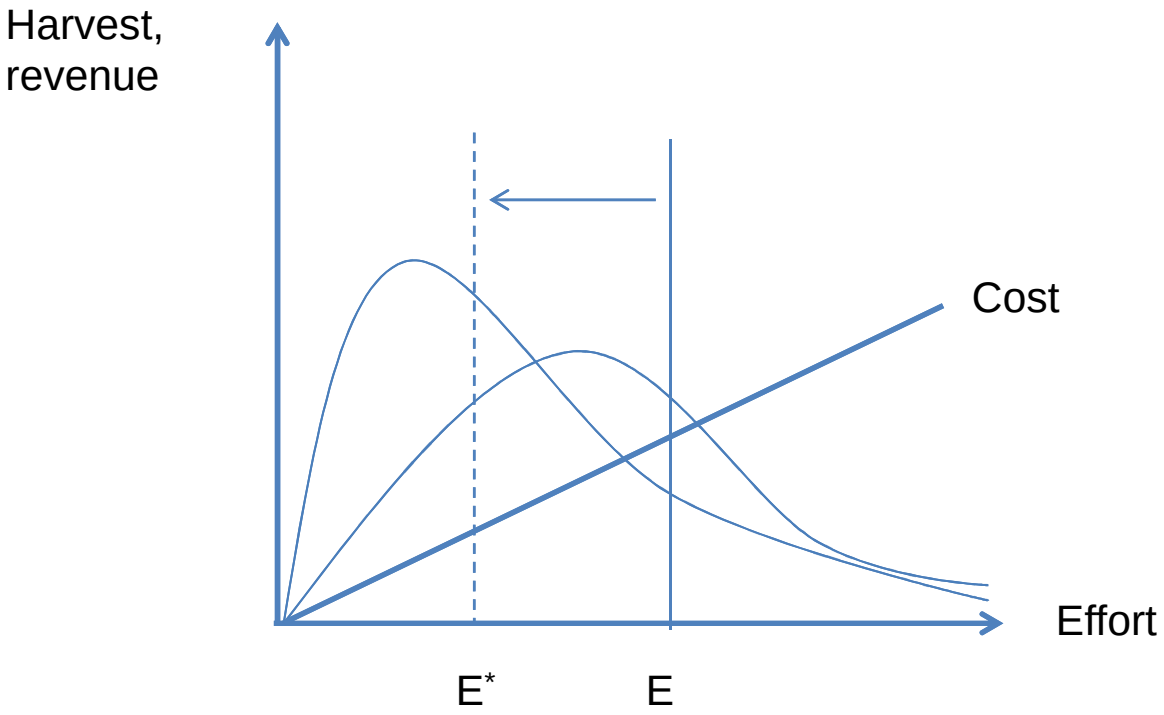
Models and fisheries

Country	Fisheries	Model
Sweden	All Demersal: trawling / passive gear	SRRMCF Nielsen et. al. (2012)
Denmark	Demersal: trawling / passive gear	Nielsen et. al. (2012)
Norway	Demersal: trawling / passive gear	Nielsen et. al. (2012)
Iceland	-	Nielsen et. al. (2012)
Finland	Salmon: Trap-net	Age structured population model
Greenland	Shrimp: Inshore and offshore trawling	Nielsen et. al. (2012)
Faroese Island	Demersal: trawling / passive gear	Nielsen et. al. (2012)

Nielsen et. al. (2012) model 1(2)

- All countries except Finland
- Excel model that is developed to (quite) easily be applied on national cases
- Multifleet
- Multistock
- Cost = Effort*unit cost of effort
- Revenue = catch*price
- Change effort to maximize economic outcome
  - Including reallocation of effort among fleets
- Fleets have fixed effort allocation between stocks

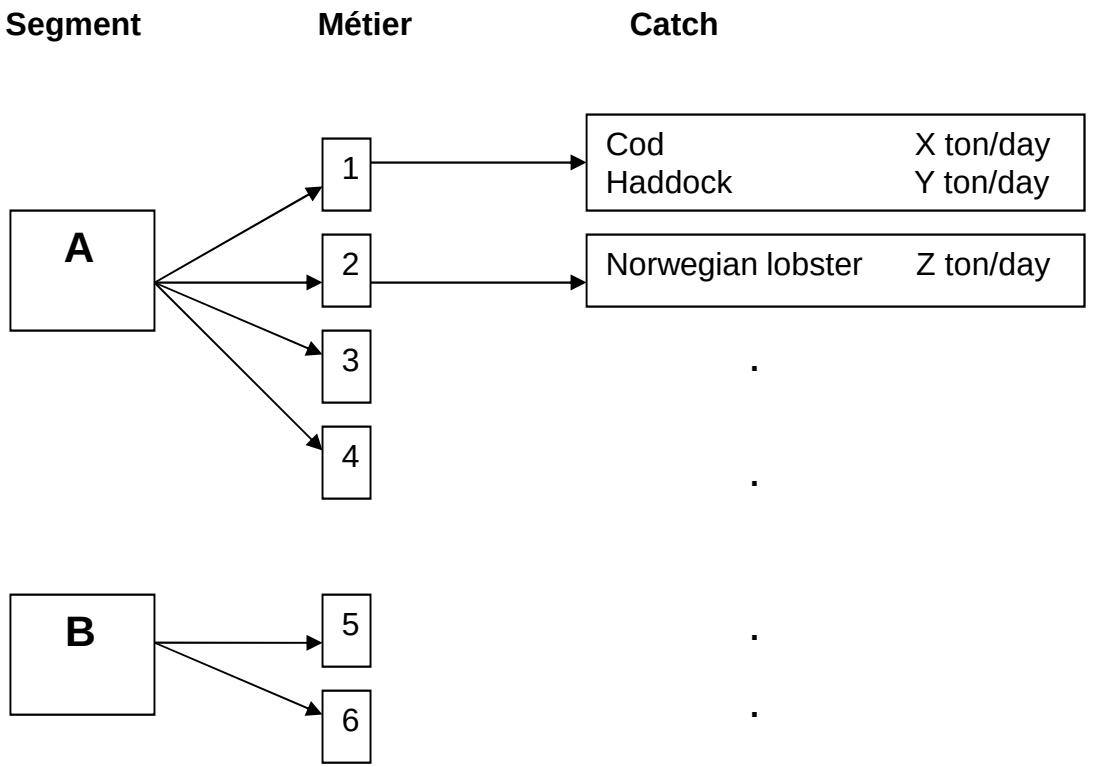
Nielsen et. al. (2012) model 2(2)



Swedish Resource Rent Model for the Commercial Fishery (SRRMCF)

- Swedish case study
- Constrained optimization model
- Static model using 2009 data
  - Biology = Swedish quota
- Optimizing resource rent by allocating effort among fishing metiers
- Optimization is restricted by catch quotas, effort restrictions, fishing seasons, quota allocations, etc.
- 24 segments, 180 métiers, 40 species

Graphical representation of SRRMCF



Finnish salmon model

- Finnish case study
- Agre structured model for river Torne salmon stock
- Detailed biology
- Optimize the Net Present Value

Kulmala et al, 2008

Scenarios

1. Baseline – no fuel taxes/trading system

2. Emission price corresponding to spot price in the EU - € 34 per m3 diesel in 2009

3. The external cost of CO2 emissions presented by the Stern report - € 159 per m3 diesel

4. Fuel taxes according to national legislation
   - Ranging from €13 to €422

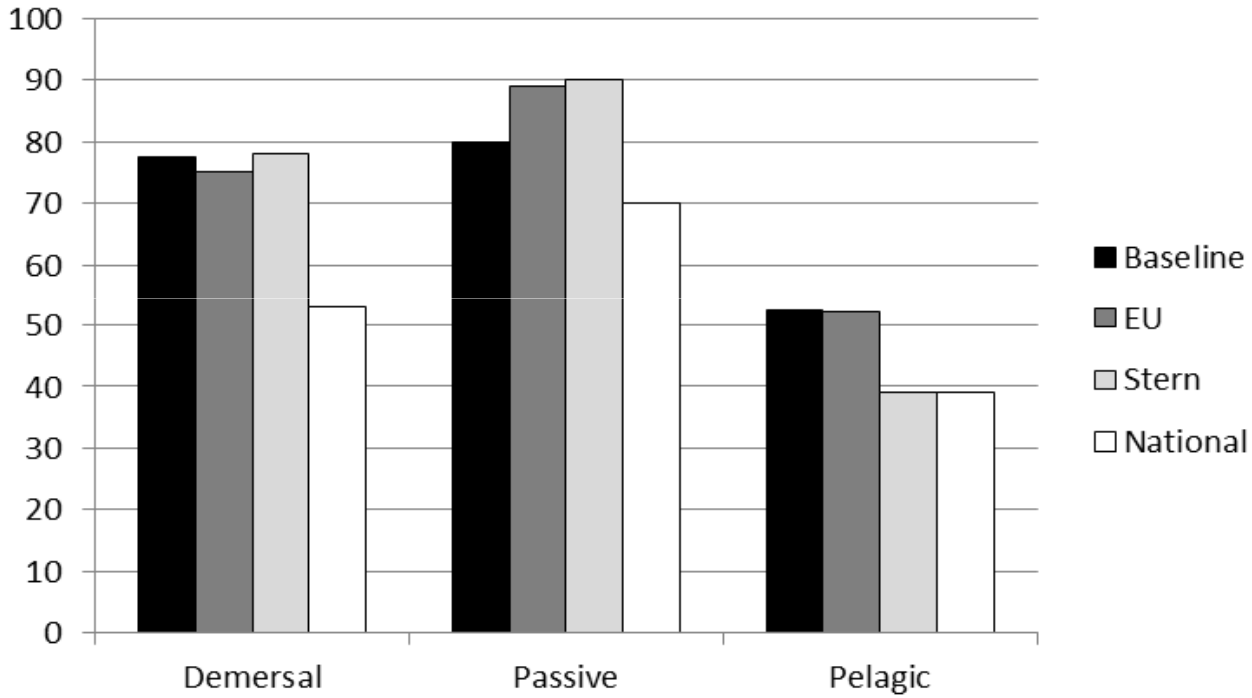
Preliminary results for ”Nielsen” model

	Definition	Number of vessels					
		Sweden	Norway	Denmark	Iceland	Faroese Island	Greenland
0. No model optimization (2010 statistics)	No tax	250	386	319		46	40
1. Baseline	No tax	94	198	131		17	9
2. EU CO2	CO2 cost	94	199	131		15	9
3. Stern	CO2 cost	93	199	128		15	9
4. National tax	Energy and CO2 taxes	79	205	122		15	9

Preliminary results for SRRMCF (Sweden)

		Vessels	FTE employment	CO2 1000ton	Economic Performance (mSEK)
0. No model optimization (2009 statistics)	No tax	690	900	125	33
1. Baseline	No tax	210	603	87	354
2. EU CO2	CO2 cost	216	607	87	341
3. Stern	CO2 cost	208	471	54	303
4. National tax	Energy and CO2 taxes	163	316	34	252

Sweden (SRRMCF), vessels



Preliminary results for Finland

	Definition	Effort in ”trapnet days”
0. No model optimization (2010 statistics)	No tax	17 342
1. Baseline	No tax	12 397
2. EU CO2	CO2 cost	12 336
3. Stern	CO2 cost	12 101
4. National tax	Energy and CO2 taxes	11 068

Sweden – Resource rent with no model optimization, mSEK

	Demersal	Passive	Pelagic	Total
Baseline	-12	-45	90	33
EU	-20	-46	82	16
Stern	-49	-52	53	-48
National	-110	-64	-10	-184

Mid-term hypothesis

- Present fisheries are sensitive to increased fuel costs
- Optimized fisheries are robust to increased fuel costs
- Results from
  - 3 models
  - 7 countries
  - 40 (?) fleet segments
  - Demersal, salmon, pelagic