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**ECOCEP - Energy and Climate Economic Modeling**  
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# Large benefit transfer errors

- BT aims to transfer estimated welfare measures from a study site to a policy(-relevant) site.
- BT is an alternative when time and money constraints are in place.
- Many critiques and challenges (see Johnston and Rosenberger, 2010).
- Since the special issue in WRR in 1992, the focus is less on the feasibility of this extrapolation and more on how to obtain reliable transfers.
- Measured in absolute transfer errors, "benefit transfer remains at least somewhat unreliable" (Johnston and Rosenberger, 2010, p. 480).
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# (Re-)incorporate expert judgement into the BT protocol

- Given an estimated value from the study site, let's ask experts (on non-market valuation and the sites under consideration) about
  - their best guess of the values applicable to the policy site.
  - the factors they are considering when transferring values.
- It seems odd but expert judgment has always been at the core of BT
  - Late in the 1980s, expert judgement was considered the principal basis for the transferring exercise (Smith and Kaoru, 1990).
  - BT was considered "economic alchemy" (Smith, 1992) because of the lack of scientific basis for adjustment (Walsh et al., 1992).
- McConnell (1992) points out that
  - Experienced researchers use judgement in deriving welfare estimates in the study site.
  - Thus, they can use similar judgement when transferring benefits.
  - If researchers learn to manage uncertainty at both levels, then BT would be acceptable.



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# Contribution

- After 1992's special issue, references to expert judgement has almost disappeared from the BT literature (see Johnston and Rosenberger, 2010).
- Few studies have used BT and judgement together (e.g. Roman et al., 2012)
- Our work is closest to
  - Leon et al. (2003) train students on NMV and ask them to estimate the WTP to preserve two National Parks in Spain.
  - Strand et al. (2017) ask 200 NMV experts from 37 countries and 4 continents to predict the outcome of a CV survey eliciting the WTP for Amazon forest protection by their own's countries population.
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# Expert Elicitation

- “Increasingly, expert judgement is recognised as just another type of *scientific* data, and methods are developed to treating it as such” (Cooke and Goossens, 2000, p. 303).
- “[...] the method has been developed for three purposes: to forecast, to facilitate decision making, or to reach a consensus among stakeholders” (Evrard et al., 2013, p. 187).
- “[...] expert elicitation can make a valuable contribution to informed decision making” (Morgan, 2014, p. 7176).
- Fe applications of EE in stated preferences studies (mentioned plus Alberini et al., 2006; Van Houtven et al., 2014).
- Many more EE applications in energy-related topics (see Bosetti et al., 2016).

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# Our approach

- We have access to a international (9 countries) contingent valuation study.
- Large transfer errors observed when adjusting for income and distance (Ahtiainen et al., 2015).
- Non-market valuation experts (students) provide WTP in other countries based on the *true* WTP in their country (Finland).
- We keep socio-demographic characteristics fixed, and see whether experts can adjust for "unobservable" characteristics.
- We calculate EE transfer errors.
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# Original valuation study

- WTP to reduce eutrophication in the Baltic Sea (contingent valuation)
- Identical surveys in nine coastal countries
- Conducted in 2011 with internet surveys and face-to-face interviews
- WTP values vary widely across countries
- Further details in Ahtiainen et al. (2015).

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# Expert elicitation protocol

- Questionnaire
  - Background questions
    - Presentation of the study and environmental change
    - Scenario and WTP questions
    - Benefit transfer exercise and debriefing questions
  - Pilot testing.
  - Test with a small sample of students in the autumn 2015.
  - Soon to be implemented on non-market valuation experts. Internet survey with an email invitation.

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## Expert Benefit Transfer (explanation)

- Next we would like you to make a benefit transfer exercise. This means that we would like you to estimate the willingness to pay of a person in a given country based on the willingness to pay of a similar person in Finland.
- The individuals are identical in terms of their age, income, education and distance to the coast, but live in different countries.
- You may take into account any additional factors that you think will affect willingness to pay, for example differences in cultural issues, trust in government, environmental attitudes, availability of substitutes and use of the Baltic Sea.
- Please present the willingness to pay estimates in euros.

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## Expert Benefit Transfer (question)

- Assume a Finnish individual who is 51 year old, lives at a 60 kilometres distance from the coast, has 19000 euros annual net income and has a university level education. This individual's annual willingness to pay is 58 euros.
- Based on this information, what is the annual willingness to pay (euros) you would assign for an individual with identical age, distance, income and education in Sweden?

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## Expert Benefit Transfer (results)

Country (policy site)	Original WTP	Transferred WTP	Absolute transfer error
Denmark	26.7	65.8	148%
Germany	31.8	43.5	32%
Poland	29.1	29.3	4%
Sweden	99.7	65.8	31%

## Preliminary conclusions and discussion

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- Potential use a prior distribution in a Bayesian approach.
- Further elicitation strategies need to be researched (e.g. probabilities, distributions, elasticities)

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