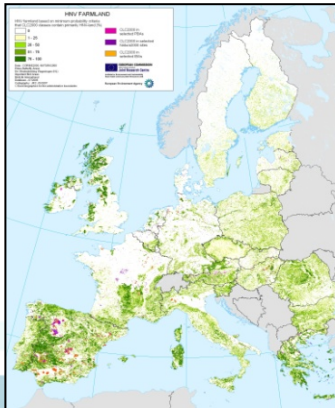




# Estimating the value of achieving GES for North East Atlantic Member States: A Value Transfer Approach

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# Outline of Presentation

- Marine Strategy Framework Directive
- Contingent Valuation
- Value Transfer
- Conclusion



# Valuing benefits of the MSFD

- The MSFD aims for all EU member states to protect or restore their marine and coastal waters to “good environmental status” (GES) by 2020
- Articles 8, 13 and 14 require that economic analysis and cost benefit analysis be undertaken on MSFD measures.
- Many of the benefits of the MSFD are either indirect or are non-use benefits (Bertram and Rehdanz, 2012).



# Valuing benefits of the MSFD

- Under the MSFD, GES is measured by 11 indicators
  - Biological diversity
  - Invasive species
  - Sustainable fisheries
  - Well functioning ecosystem and food webs
  - Eutrophication
  - Benthic integrity
  - Marine litter
  - Marine produce is safe to eat
  - Underwater noise and energy
  - Hydrographical conditions
  - Marine pollution



# Valuing benefits of the MSFD

- Only stated preference methods can value non-use value.
- This study used contingent valuation method (Arrow & Solow, 1993) via a payment card which followed a choice experiment
- CVM has been widely used for valuing changes to the marine environment.
  - Carson et al. (1992) Oil Spill
  - Loomis & Larson (1994) Gray Whales
  - Gelcich et al. (2013) MPA



# MSFD CVM

- What is the maximum amount that you would pay (via an increase in income tax) for each of the next 10 years towards achieving GES in Irish waters
- Should GES be aimed for? (Yes-91.5%, No-2%)
- Used 412 observations from 812 responses as the rest deemed to have been protest responses
- An interval regression model was used to estimate the WTP (Cameron & Huppert, 1989)



# Results from survey

## Characteristics of this survey versus Census 2011<sup>1</sup>

	This survey (n=812)	Census 2011
Average Age (Years)	44.6	44.8
Gender (% Male)	49.8	49
Nationality (% Irish)	90	86
Education (% To primary level)	10	16
Education (% To secondary level)	56	53
Education (% To third level)	34	31
Marital Status (% Single)	29	27
Marital Status (% Married)	53	51
Income <sup>2</sup> (€ per year)	33,300	36,138

1. Note that that values refer to population aged 18+.
2. Estimated income was only estimated for those working who reported their personal income (n=185) for the sample in order to make similar comparison to available national data which was based on average earnings for third quarter, 2012 (CSO, 2012).





# Interval regression model results

<i>WTP to achieve GES</i>	<i>Coefficient</i>	<i>Std. Error</i>
Income (€1,000's)	0.92	(0.16) ***
Married	-9.30	(4.63) **
Children in the house hold	6.65	(4.08) *
Has third level education	2.03	(3.92)
Male	5.90	(3.52) *
Age (years)	-0.02	(0.14)
Distance from the coast (km)	-0.33	(0.08) ***
Rated ocean health as important or very important	16.03	(4.36) ***
Log of population denisty (ED level)	2.63	(0.92) ***
Agreed or strongly agreed with Marine Protected Areas	6.33	(3.75) *
How competent is the government to manage and protect the marine waters	-2.61	(1.56) *
Constant	-3.80	(11.24)







# Value transfer of WTP for GES

- Value transfer is the valuing of a change in a non-market good or service of a policy site by using values estimated for similar changes at another study site and applying these values to the policy site (Brouwer, 2000)
- Brenner et al. (2010) & Hynes et al. (2013) have previously used unit value transfer in valuing marine ecosystems.
- This function VT approach is considered to have lower transfer errors than unit value transfer.

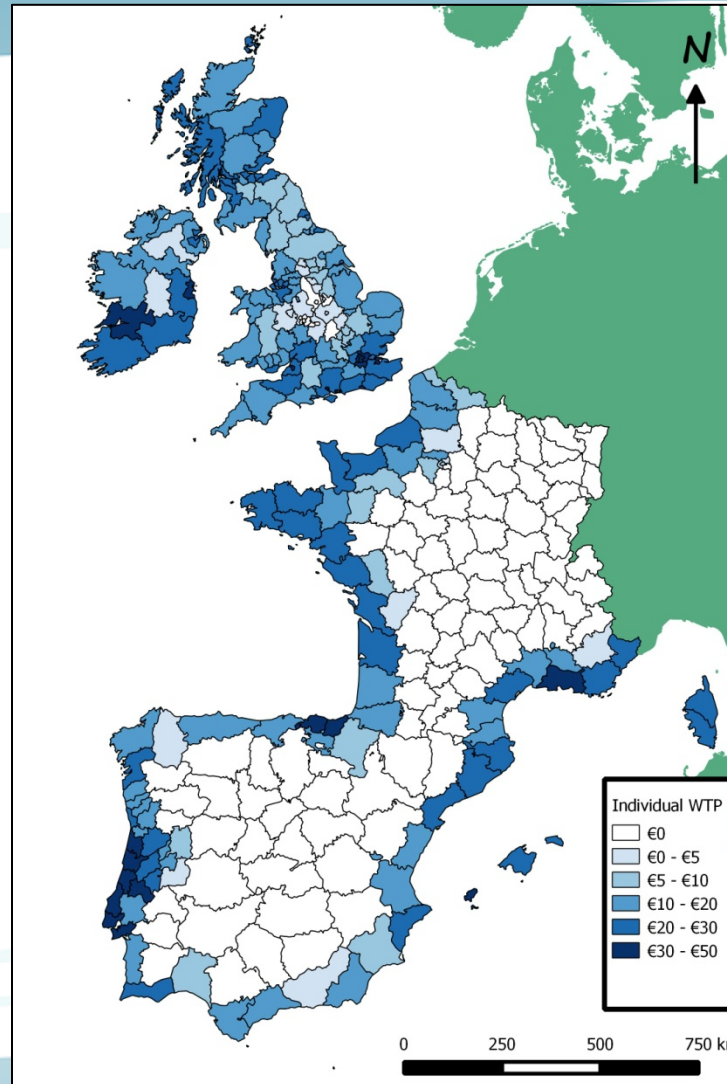


# Value transfer data sources

<i>Variable</i>	<i>Geo. Level</i>	<i>Source</i>
PPP Adjusted Income (€1,000's)	NUTS2	Eurostat (2011)
Married	NUTS3	CSO, INE (ES), INE (PT), INSEE, ONS (2011)
Children in the household	NUTS3	CSO, INE (ES), INE (PT), INSEE, ONS (2011)
Has third level education	NUTS2	Eurostat (2011)
Male	NUTS3	Eurostat (2011)
Age (years)	NUTS3	Eurostat (2011)
Distance from the coast	NUTS3	QGIS - Own calcs.
Rated ocean health as important or very important	Member State	Knowseas (2010-2011)
Log of population density (ED level)	NUTS3	Eurostat (2011)
Agreed or strongly agreed with Marine Protected Areas	Member State	Knowseas (2010-2011)
How competent is the government to manage and protect the marine waters	Member State	Knowseas (2010-2011)



# Value transfer results





# Value transfer results

Member State	Mean (Pop. Wt.)	Total (millions)
Ireland	€26.66	€91
UK	€18.08	€899
France	€8.55	€421
Spain	€11.69	€450
Portugal	€26.34	€228
		€2,089



# Transfer error results

	Interval Regression	Value Transfer	% Error
Ireland	€39.08	€26.66	-32%
Dublin	€51.00	€36.97	-28%
Mid-East	€33.79	€26.88	-20%
South-East	€38.42	€25.53	-34%
South-West	€40.10	€25.51	-36%
Mid-West	€27.07	€33.52	24%
West	€36.03	€16.52	-54%
Midland	€28.43	€2.05	-93%
Border	€33.90	€19.69	-42%



# Conclusion

- Income, distance and attitudes have largest effects on WTP to achieve GES
- Value transfer underestimates the aggregated WTP but gives a lower bound value
- Modifiable areal unit problem (MAUP) can be an issue for value transfer – Population Density



Thank you for your attention  
Any questions or ideas or comments?