



IAIA21

VIRTUAL EVENT

#iaia21

Environmental Sensitivity Mapping WebTool

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Oifig an
Rialaitheora Pleanála
Office of the
Planning Regulator



SEA AND SPATIAL PLANNING



- Population and human health
- Biodiversity, flora, fauna
- Air and climate
- Soils and geology
- Water
- Landscape
- Cultural heritage
- Material assets
- Inter-relationships

Multiple considerations, spatial implications, consultation

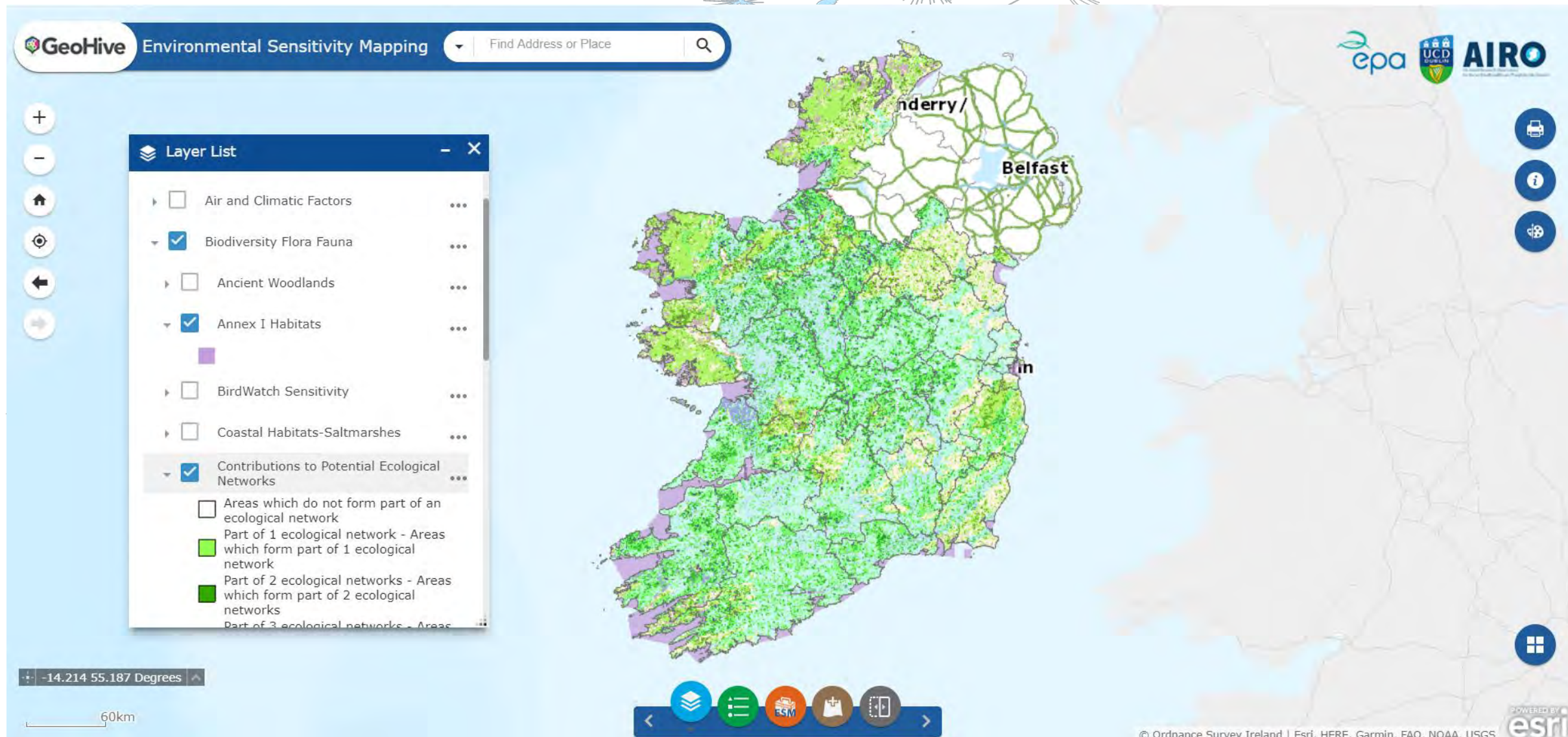
Spatial evidence-base for SEA and planning decisions

- ✓ Assessment consistency and transparency
- ✓ Intrinsic environmental conditions > susceptible to change
- ✓ Early-warning of potential land-use conflicts



DATA VIEWER

Access, Visualisation, Discovery





- Layer List
- ☐ Coastal Habitats-Saltmarshes
 - ☐ Contributions to Potential Ecological Networks
 - ☐ Dublin Bay Biosphere
 - ☐ Forest Inventory
 - ☐ Legally Protected and Policy Relevant Species
 - ☒ Margaritifera Sensitive Areas
 - Catchments of SAC populations listed in S.I. 296 of 2009
 - Catchments of other extant populations
 - Catchments with previous records of Margaritifera, but current status unknown
 - ☒ Natural Heritage Areas
 - ☒ Proposed Natural Heritage Areas
 - ☐ Salmonid Waters (S.I. 293 Only)

Layer Info

Source: National Parks and Wildlife Service
Data updated: August 2017
Download date: October 2017

The data displayed represent Margaritifera Sensitive Areas in the Republic of Ireland. The Freshwater Pearl Mussel (*Margaritifera margaritifera*) and Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*) are critically endangered species both listed in Annex II and Annex V of the EU Habitats Directive (92/43/EEC).

Freshwater Pearl Mussel species have suffered large population declines due to the deterioration of both water quality and riverine habitats.

Some of the larger populations of the Freshwater Pearl Mussel found in Ireland have been designated within Special Areas of Conservation. The

OK



SEA-RELEVANT GEOSPATIAL DATASETS

Air and Climate

- Air zones
- Coal restricted areas
- Historical flood extents
- Soil carbon (eco serv)
- Vegetation carbon (eco serv)
- Water retention (eco serv)
- Wind speeds

Biodiversity, Flora & Fauna

- Ancient woodlands
- Annex I habitats (Habitats Direct)
- Forest inventory
- Legally protected and policy relevant species (eco serv)
- Margaritifera sensitive areas
- Natural Heritage Areas (NHAs)
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- Terrestrial biodiversity (eco serv)
- Woodland habitats

Cultural Heritage

- Irish landmark trust
- Museums, collections and archives
- NIAH
- Sites and Monuments Record
- Walled towns
- World Heritage Sites

Landscape

- Landscape character areas

Material Assets

- Active quarries
- Airfields and airports
- Broadband access
- Current wind farms
- Discharge licences
- Extractive industries register
- Historic mine districts
- IPPC licences
- Landfill sites
- Licensed waste facilities
- Ports
- Railway network
- Road network
- Settlements
- Waste water treatment plants and status

Population and Human Health

- Disability
- General health
- Pobal HP Deprivation Index
- Housing stock (vacant & holiday homes)
- Travel to work >30min and >1hr
- Labour force unemployed
- Population change (percentage and total)
- Population density per Km²
- WFD RPA Drinking water (lakes, rivers and groundwater)

Soils and Geology

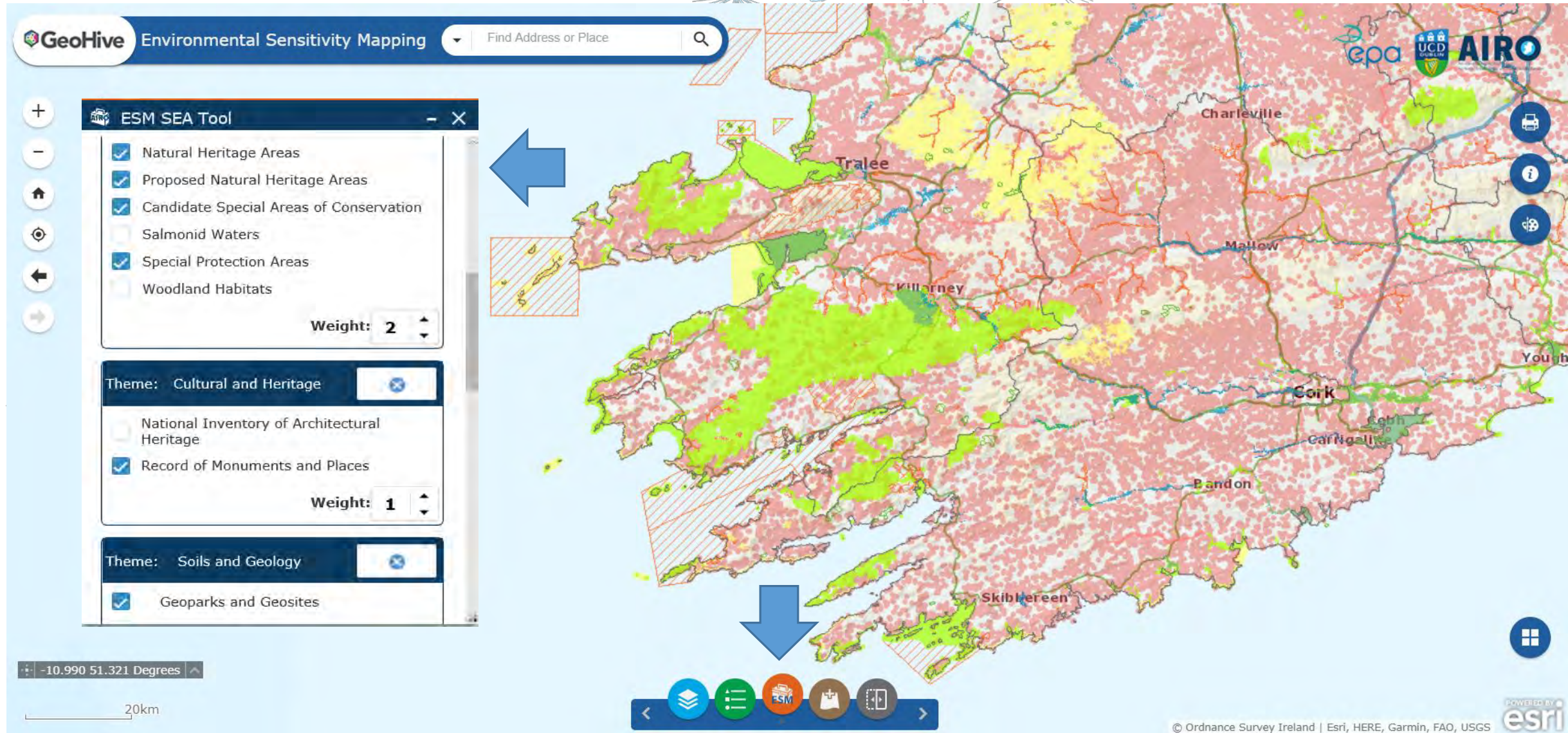
- Bedrock
- CORINE landcover
- Geoparks
- Geosites
- Landslide events and susceptibility
- Mineral locations
- Outcrops
- Peat bogs
- Soil permeability
- Soils

Water

- Aquifer vulnerability
- Bedrock aquifer
- Biological Q values
- Hydrometric areas
- Groundwater source protection areas
- Wetlands
- Water abstraction points
- WFD high status objectives
- WFD risk
- WFD status

ESM WIDGET

Bespoke geoprocessing tool



ESM WIDGET METHODOLOGY

Multi-criteria spatial analysis

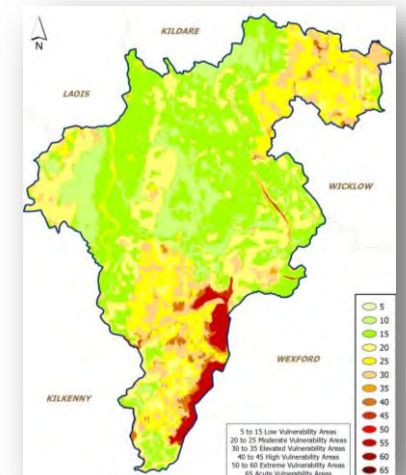
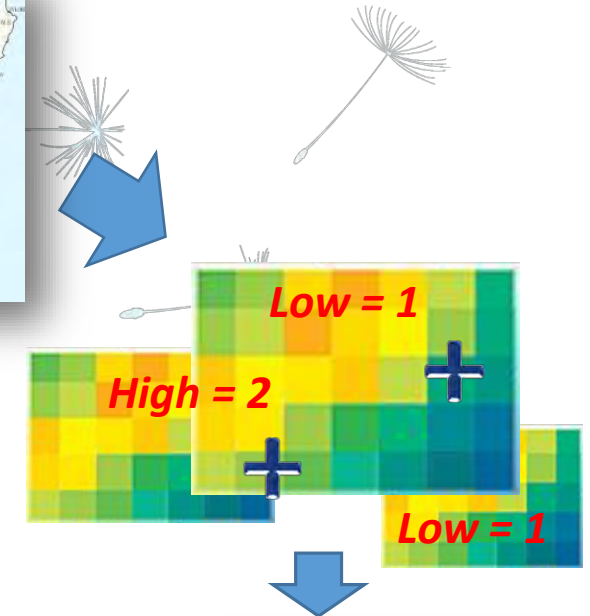
- Weighted linear algorithm
- Aggregation of multiple criteria
- Incorporation of stakeholders concerns or importance values in the form of weights

$$ES = \sum_{j=1}^n W_j V_j$$

where ES = Environmental Sensitivity

W_j = Environmental susceptibility of factor j according to scientific scores

V_j = Environmental significance of factor j according to public/stakeholder opinion



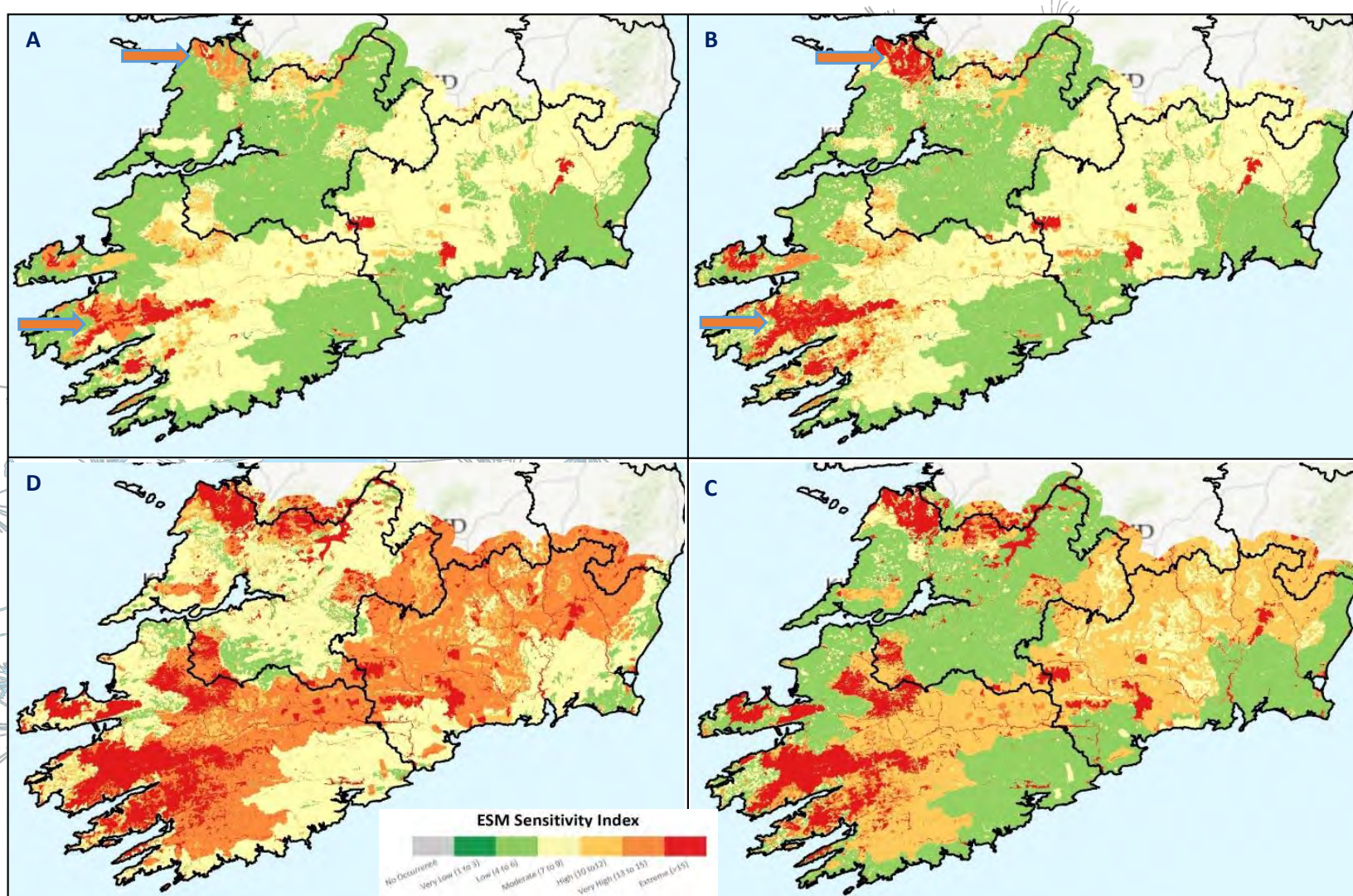
SCIENTIFIC SCORES

- Based on conservation status, quality and risk
- Extensive consultation
- 3 stakeholder workshops – development and testing of the webtool
- Over 40 stakeholders from government, local authorities, consultancies (Sustainable Energy Association of Ireland, National Parks and Wildlife Service, Northern Ireland Environment Agency)

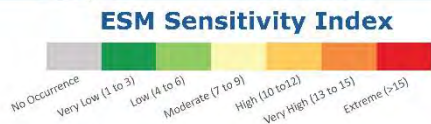


Sensitivity Scores 1=Low, 2=Medium, 3=High	1	2	3
Population and Human Health			
% Population change 2006-2011 EDs			
• Decreasing			
• Increasing			
Population density per sq km 2011 SAs			
• High			
• Low			
Total population 2011			
WFD RPA Groundwater drinking water			X
WFD RPA Surface water drinking water (Lakes)			X
WFD RPA Surface water drinking water (Rivers)			X
Biodiversity, Flora and Fauna			
Ancient woodlands			
• Ancient Woodland			X
• Possible Ancient Woodland			X
• Long-established Woodland (LEW I)		X	
• Long-established Woodland (LEW II)		X	
Habitat Directive Annex I Habitats			X
BirdWatch sensitivity (to wind energy dev.)			
Coastal habitats (Saltmarshes)		X	
Forest Inventory and Planning System			
• Deciduous	X	X	
• Coniferous			

CONTEXTUALISING SENSITIVITY



(a) biodiversity, flora and fauna and water sensitivities; (b) sensitivities associated biodiversity, water, cultural heritage and soils where all have the same weight/importance; (c) sensitivities associated with biodiversity, water, cultural heritage and soils where the biodiversity themes is given greater importance (i.e. a weight of 2); and d) sensitivities associated with biodiversity, water, cultural heritage and soils where the biodiversity and water themes are given greater importance (i.e. a weight of 2).



Date: 9/22/2019 Time: 2:16:21 PM Author: AIRO

*This map is an aggregate result based on the variables and user defined weights listed below.

Warning: Please note that weights are only to be used to emphasize the relative significance of an environmental aspect - applying weights to more than two themes would magnify, and possibly overstate, the overall sensitivity.

Air & Climatic Weight: 1 Variables: Air Zones, Historical Flood Extents

Biodiversity, flora and fauna Weight: 1 Variables: Ancient Woodlands, Annex I Habitats, Forest Inventory, Margaritifera Sensitive Areas, Natural Heritage Areas, Proposed Natural Heritage Areas, Special Areas of Conservation, Special Protection Areas

Cultural Heritage Weight: 1 Variables: National Inventory of Architectural Heritage (NIAH), Sites and Monuments Record

Population and Human Health Weight: 1 Variables: WFD RPA Groundwater Drinking Water, WFD RPA Surface Water Drinking Water (Lakes), WFD RPA Surface Water Drinking Water (Rivers)

Soils and Geology Weight: 1 Variables: Peat Bogs

Water Weight: 1 Variables: Aquifer Vulnerability, Groundwater Source Protection Areas, Wetlands, WFD RPA Recreational Waters (Coastal and Transitional Water Bodies), WFD RPA Recreational Waters (Lakes), WFD RPA Water Dependant Habitats (SACs), WFD RPA Water Dependant Habitats (SPAs)

ESM OUTPUT

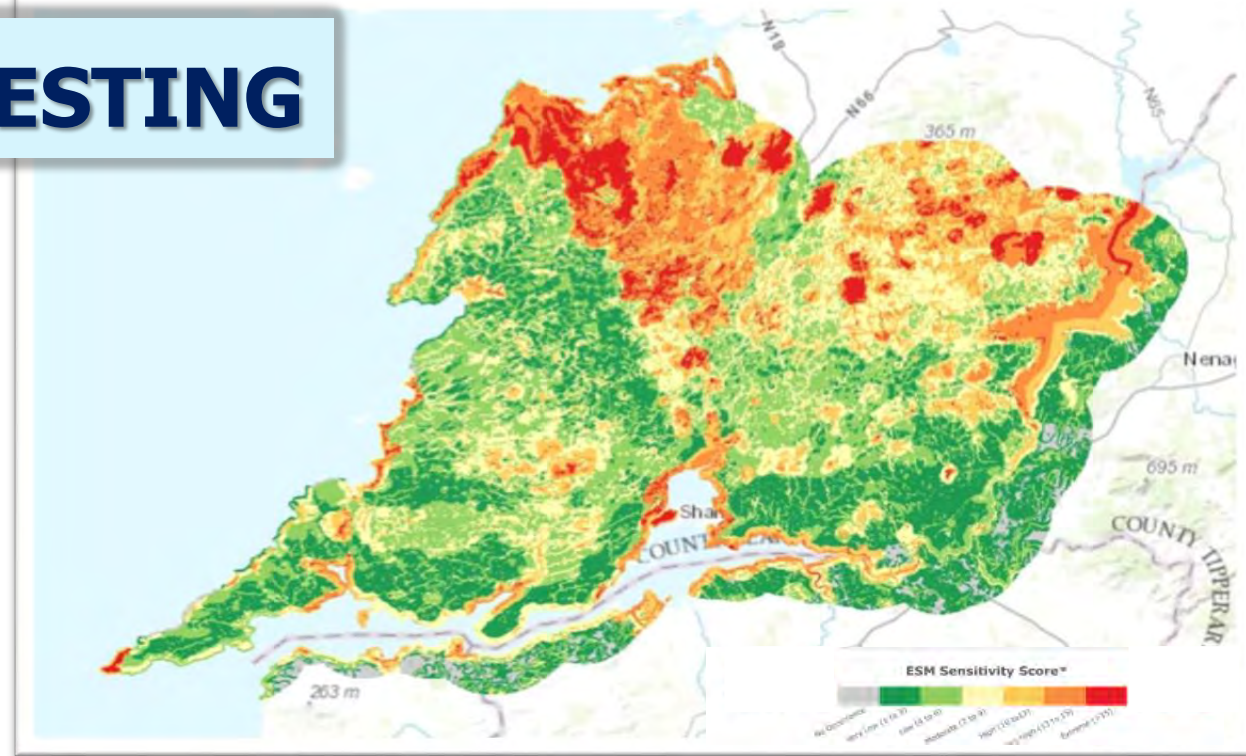
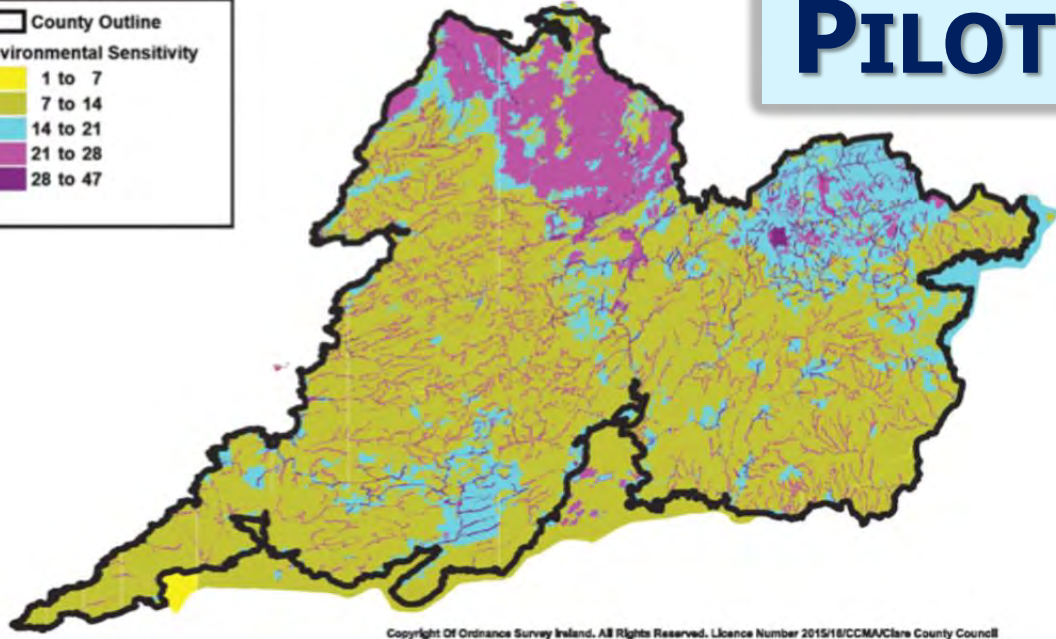
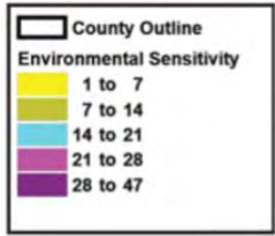
Transparency

- Map creator
- Date
- Selected datasets
- Applied weights

Comparability

- Transboundary
- When selecting same criteria and weights

PILOT TESTING



Quicker times
No GIS expertise needed
Better and comparable results
Easier to analyse outputs

“The ESM output compares well and may actually be better than the in-house process undertaken for the County Development Plan SEA.”

“The sensitivity identifies areas where development would need to be carefully considered and sensitively planned.”

“Access to multiple datasets all in one platform is an excellent resource.”

Data scale and availability (e.g. LCAs)
Double counting
Weight for full exclusion
Assessment scope

“Helpful tool for overall visual appreciation - really depends on the datasets.”

“(…) Scale and resolution would however remain issues.”

“I'm not sure it does anything more than what some local authorities do at this scale which is probably down to the detail of the datasets.”

REAL LIFE APPLICATION

Table 5.16 – Data Variables used in the ESM Mapping

Theme	Weight	Variables
Biodiversity, Flora and Fauna	2	Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Proposed Natural Heritage Areas, <i>Margaritifera</i> Sensitive Areas, Ancient Woodlands, Annex I Habitats, Coastal Habitats - Saltmarshes, Forest Inventory Planning System, Salmonid Waters, Woodland Habitats
Population and Human Health	1	WFD RPA Surface Water Drinking Water (Lakes), WFD RPA Surface Water Drinking Water (Rivers)
Soils and Geology	1	Geoparks and Geosites, Peat Bogs, Soil Permeability
Water	1	Aquifer Vulnerability, Bedrock Aquifer Susceptibility, Groundwater Source Protection Areas, Wetlands, WFD Groundwater Status, WFD Lake Status, WFD River Status, WFD RPA Nutrient Sensitive Areas (Lakes), WFD RPA Nutrient Sensitive Areas (Rivers), WFD RPA Recreational Waters Coastal, WFD RPA Recreational Waters Lakes, WFD RPA Water Dependant Habitats (SPAs), WFD RPA Water Dependant Habitats (SACs)
Air and Climate	1	Historical Flood Extents
Cultural Heritage	1	National Inventory of Architectural Heritage, Record of Monuments and Places

Source: AIRO ESM Webtool with user-selected input variables.

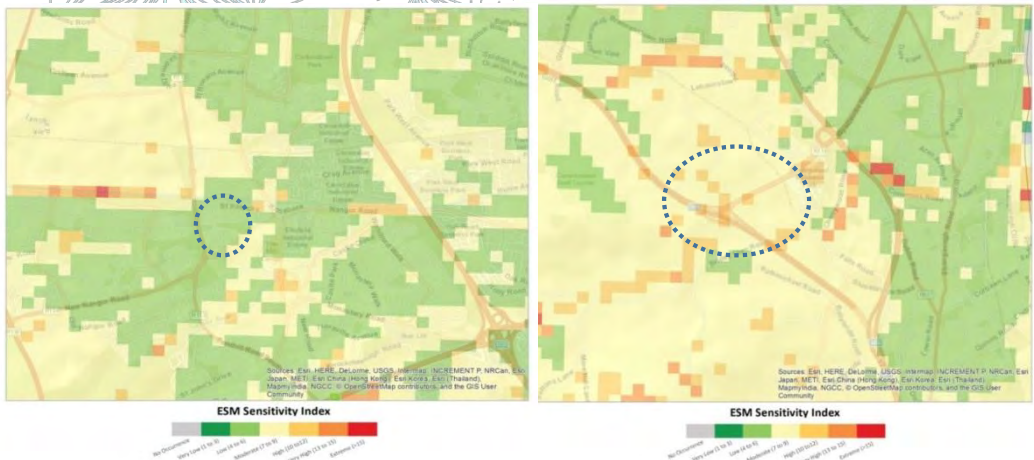
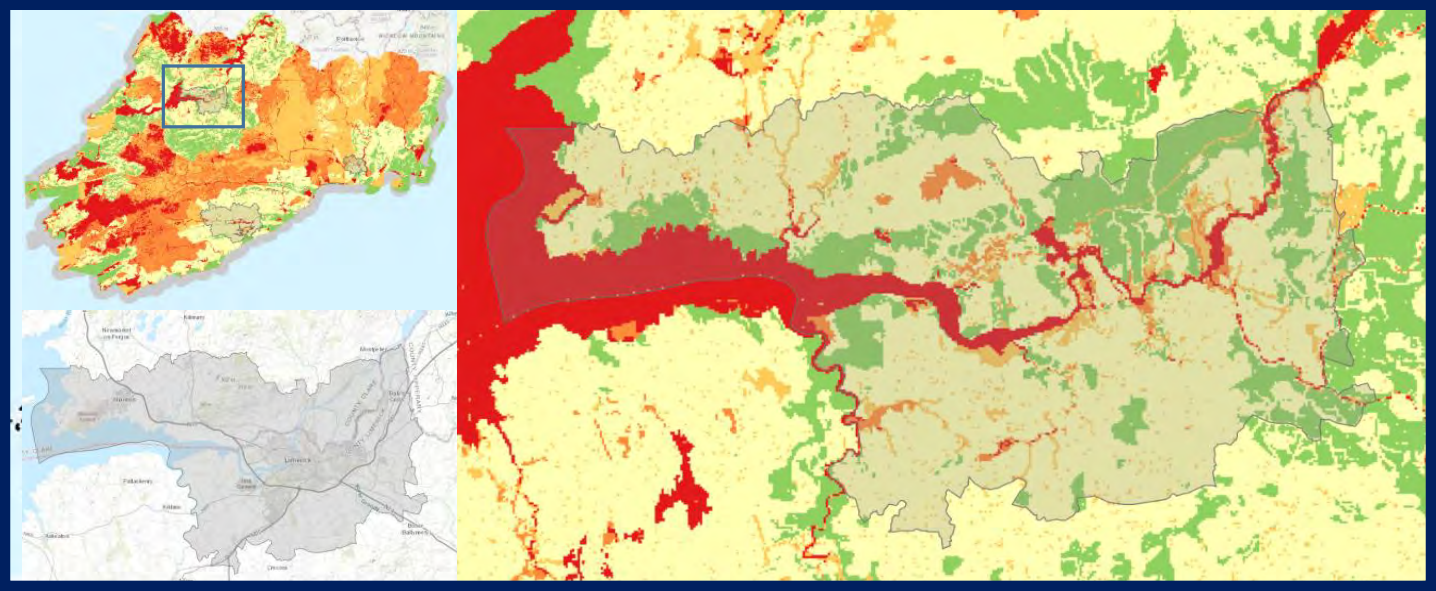
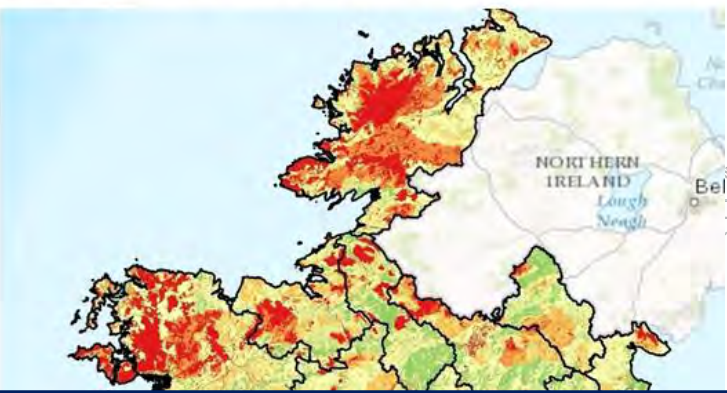


Figure 5.23 – ESM for Ireland



"In preparing the NPF, an Environmental Sensitivity Mapping (ESM) tool was used in the SEA and environmental assessments. ESM is a method for identifying at a strategic level, environmentally sensitive areas and to help inform cumulative and in-combination effects on the environment. It also provides a visual overview of the relative sensitivity of areas, particularly where they overlap, in order to provide a more strategic and informed approach to planning" (NPF, Chapter 11.1, p.15).

SEA AND PLANNING SUPPORT TOOL

- **Publicly available**
- **Evidence-based assessments and decisions**
- **Efficiency**...time and cost savings
- **Good governance - consistency, transparency, comparability**
- **Future developments**
 - Offshore (marine data)...Northern Ireland





Go raibh maith agaibh

Let's continue the conversation!

Post questions and comments via chat in the IAIA21 platform.



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