VIBES: Valuing Irish Blue Ecosystem Services

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Whitaker Institute

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Rationale for this Study

- Ecosystem services are the "the benefits humans derive from nature" (MEA, 2005)
- EU 2020 Biodiversity Strategy
  - Target 2 aims for the maintenance and restoration of ecosystems and their services by 2020
  - Action 5 of Target 2: each member state will map their ecosystems and their services by 2014 and assess the economic value of such services by 2020 known as Mapping and Assessment of Ecosystems and their Services (MAES)

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Rationale for this Study

- Marine Strategy Framework Directive (MSFD, 2008)
  - Aims to protect and restore, if needed, the marine environment by 2020
- Harnessing Our Ocean Wealth" (HOOW, 2012)
  - Action 15 is to "Promote further research into economic values of marine biodiversity and ecosystem services to ensure best practice planning and management of the ocean resource"

Previous Work

- Bullock et al. (2010) Benefits and costs of biodiversity in Ireland
- Hynes et al. (2013) used the value transfer methodology to estimate the value of ecosystem services in Galway Bay
- Ecosystem Services Assessment Frameworks
  - MEA (MEA, 2005)
  - UKNEA (NEA UK, 2011)
  - TEEB (Kumar, 2010)
  - CICES (Haines-Young and Potschin, 2010)

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CICES V4.3

- Common International Classification of Ecosystem Services (CICES) framework
- Originally proposed by Haines-Young and Potschin, 2010, and has been developed further by EEA and UN System of Environmental-Economic Accounting
- Using latest version, CICES V4.3 to identify, quantify, value and map where possible the significant coastal, marine and estuarine ecosystems in Ireland. Reference year: 2012

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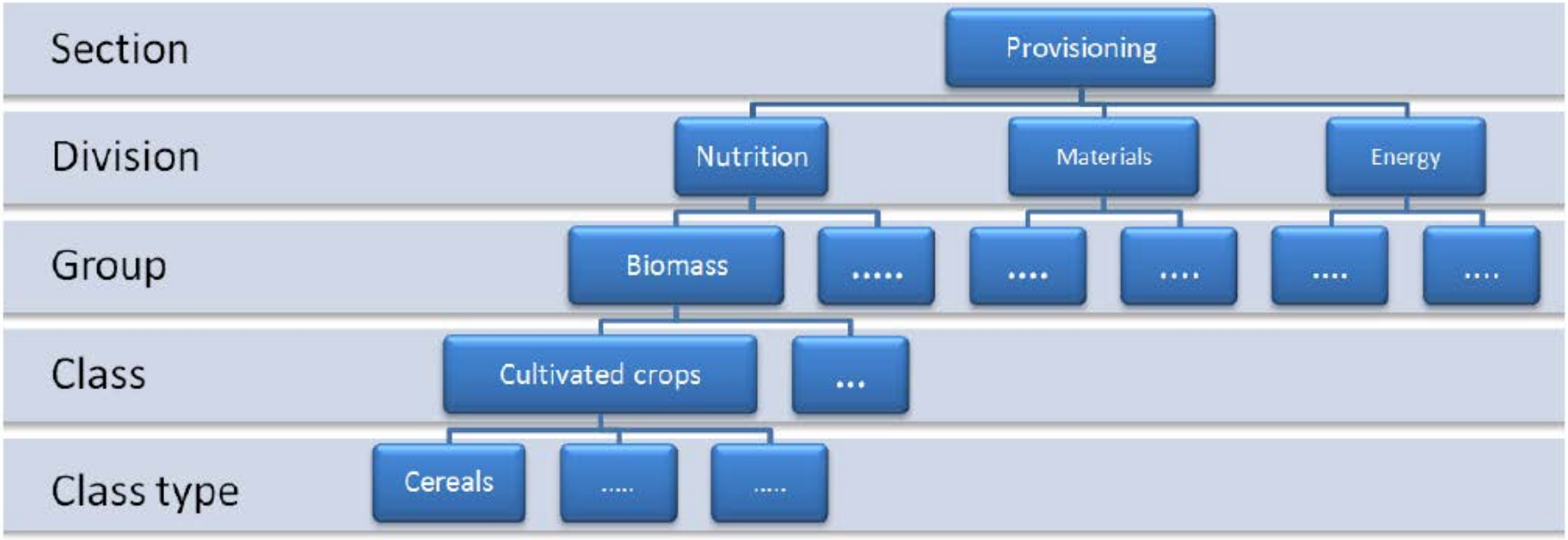
CICES V4.3

- Section ➡ Division ➡ Group ➡ Class



Haines-Young and Potschin (2013)

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CICES V4.3

CICES Framework		
Section	**Division**	**VIBES Examples**
Provisioning	Nutrition	Capture fisheries, aquaculture
	Materials	Seaweed, genetic material
Regulation & Maintenance	Mediation of waste	Wastewater treatment
	Mediation of flows	Storm and flood protection, erosion control
	Maintenance of physical, chemical, biological conditions	Habitat protection, carbon sequestration, pest and disease control
Cultural	Physical and intellectual interactions	Recreation, aesthetic views, education, science, heritage
	Spiritual, symbolic and other interactions	Symbolic, religious, existence, bequest values

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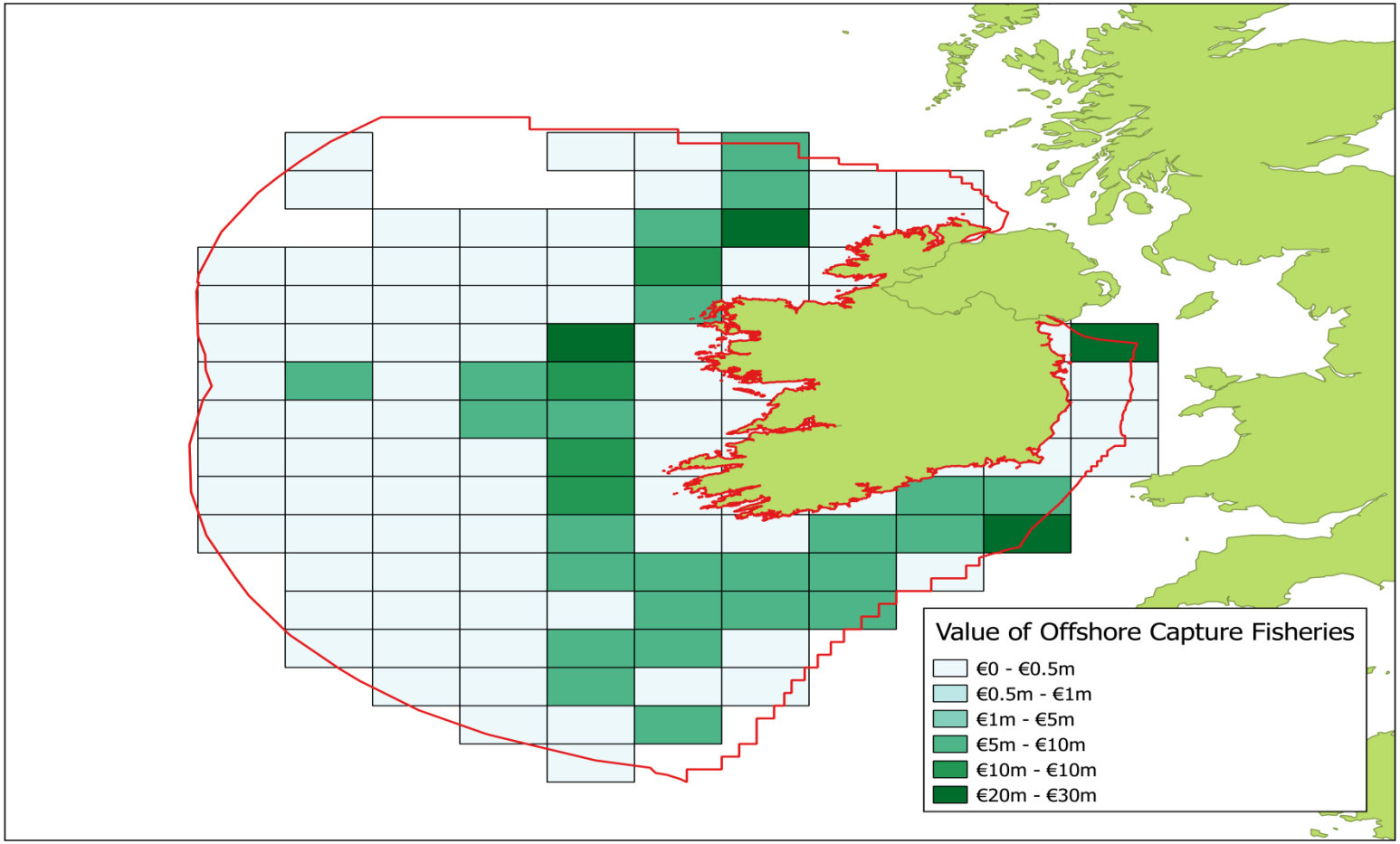
Capture Fisheries – Provisioning ES

- Followed the method used by Gerritsen & Lordan (2014) of using the Scientific, Technical and Economic Committee for Fisheries, (STECF) data for landings of capture fisheries
- Prices based on mean of those reported in Gerristan and Lordan (2014) and the Stock Book (2013)
- STECF data only for EU landings so used ICES data to identify non-EU landings. Blue whiting made up 95% of non-EU catch in ICES Areas VI & VII

Capture Fisheries – Provisioning ES

- STECF spatial data was available on spatial scale of ICES statistical rectangles (0.5° latitude by 1.0° longitude)
- Based on logbook and VMS data so only data from boats over 15 m was used
- Estimated landings from offshore capture fisheries was 449,848 tonnes valued at €405,991,000

Capture Fisheries – Provisioning ES



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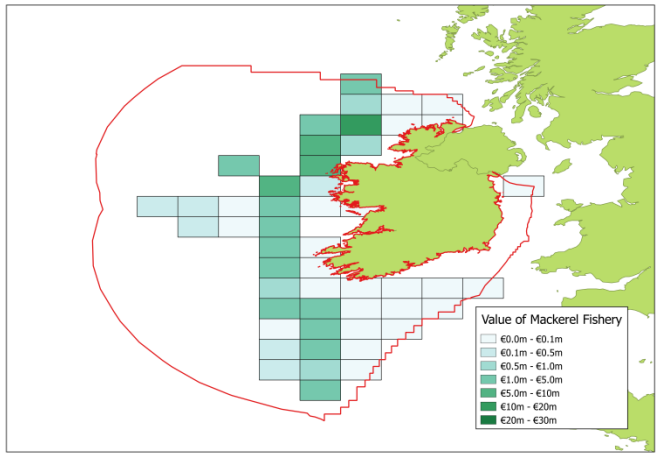
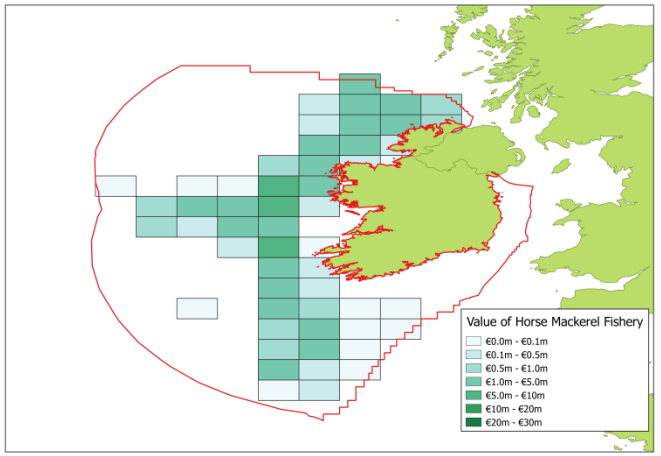
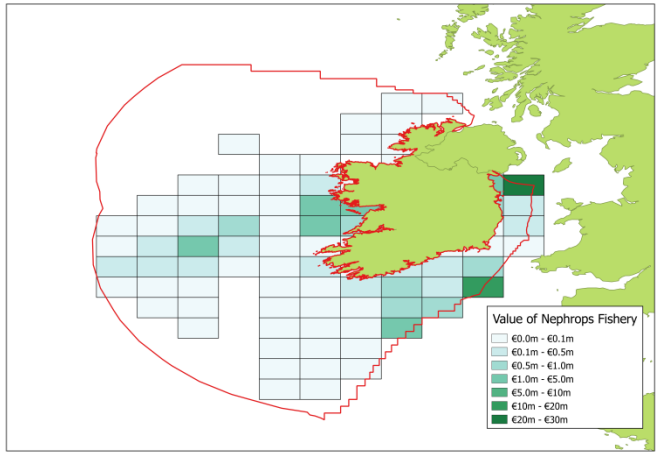
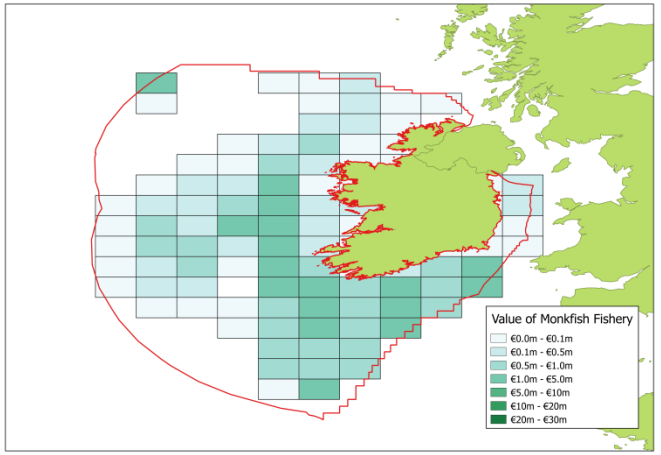
Capture Fisheries – Provisioning ES









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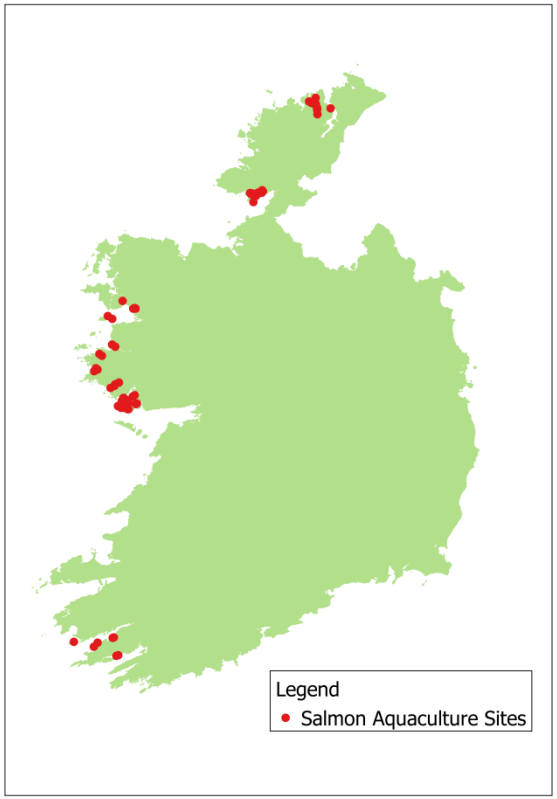
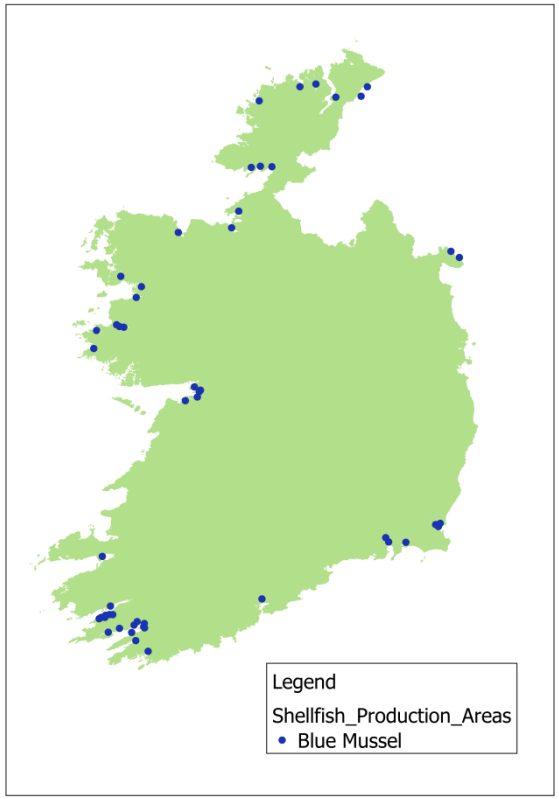
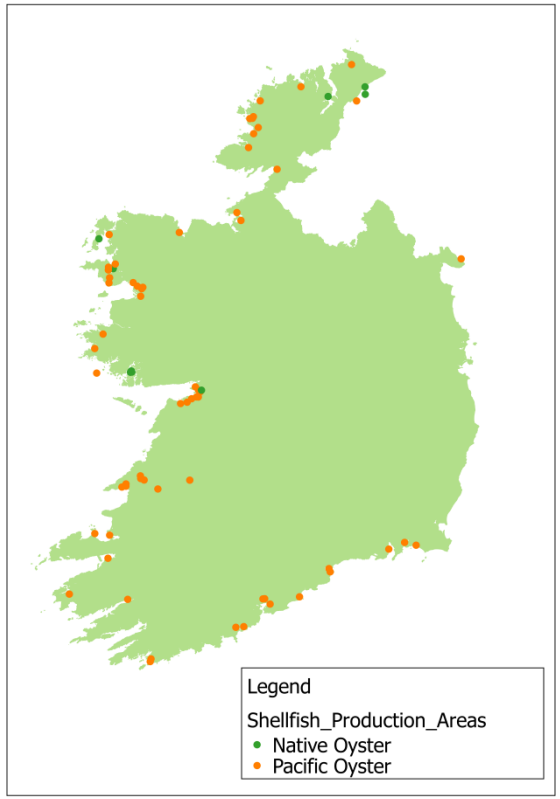
Aquaculture – Provisioning ES

- Three largest aquaculture sectors
  - Salmon (€81,387,560)
  - Oysters (€35,762,180)
  - Mussels (€11,132,440)
- Total value estimated at €128,711,470 for 35,627 tonnes production
- Data for quantities and values are taken from STECF data for aquaculture
- Mapping of ES based on SFPA production areas for shellfish and salmon farm licenses from DAFM

Aquaculture – Provisioning ES







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Wastewater – Regulating ES

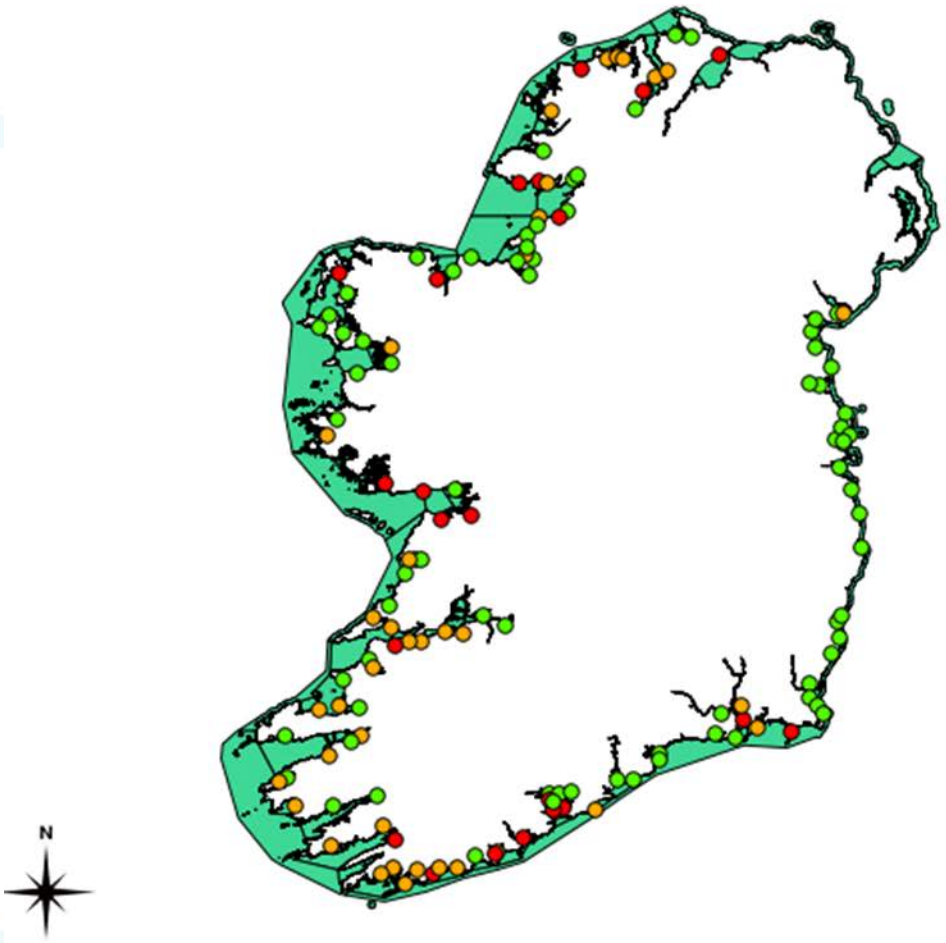
- Wastewater is treated to various levels (sometimes) before being discharged to the coastal environment

- Using data from EPA from both licensing files and annual environmental reports was able to estimate the discharge to coastal and estuarine waters for 140 agglomerations in Ireland

Wastewater – Regulating ES

- Hernández-Sancho et al. (2010) estimated the shadow prices for treatment of different constituents of wastewater (BOD, N and P) based on operational costs
- Prices per kg removed for water reuse (2012 prices)
  - €0.068/kg BOD
  - €30.81/kg Nitrogen
  - €93.28/kg Phosphorous
- Estimated value of waste treatment - €311m

Wastewater – Regulating ES



UWWTplant_Locations
- No Treatment
- Primary
- Secondary
- Teritary

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Future Work

- Cultural Services
  - Recreation meta-analysis
  - Aesthetic view (Hedonic Model)
  - Science/Education
- Undertake demonstrations of ES assessment at local and regional level
- Explore options for integrating ES assessments into current policy framework

Thank you for your attention

Any questions or ideas or comments?

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http://www.nuigalway.ie/semru/valuing_ecosystem_services.html

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