CoastLens

AI agents working with a deterministic coastal engine

Team Sunny SouthEast · TechIreland National AI Challenge 2026



Courtown, 1971 · Source: RTÉ News, 4 July 2025



Courtown today

Co. Wexford

LAND LOST OVER 40 YEARS

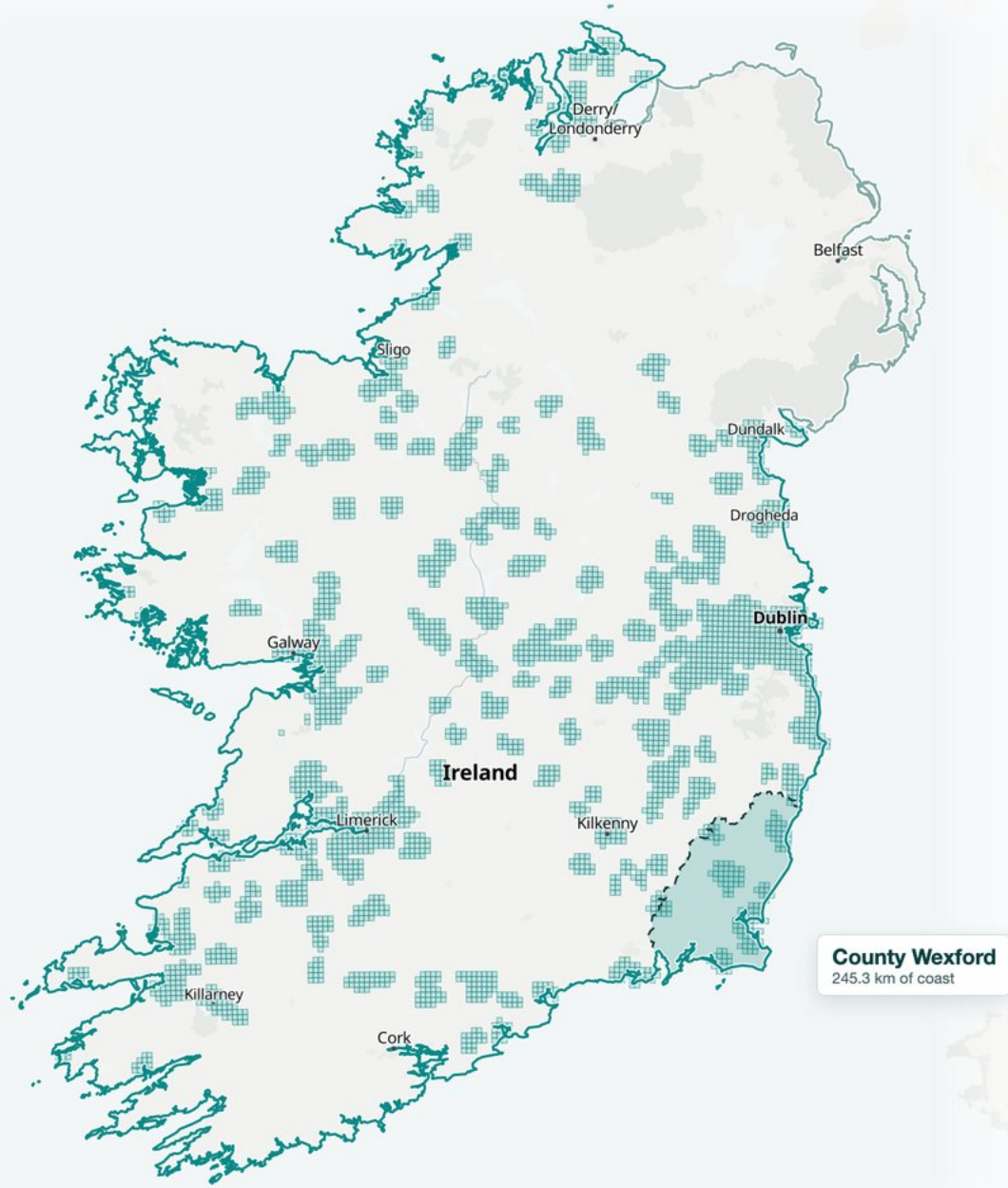
18 football pitches

Reported by RTÉ News · 4 July 2025

COUNTY WEXFORD

4.2%*

of Ireland's coastline



* ROI coastline only · Island map includes Northern Ireland. Display simplified from retained source geometry.

IRELAND'S COAST · THE NATIONAL PICTURE

1 in 5*

of Ireland's coastline at very high exposure

VERY LOW — VERY HIGH

Wexford: 37 km very high, 86 km high, 15,200 people within 500 m of the coast.



* UCC Coastal Exposure Index, Walsh, De Oliveira, Keenahan and Lim 2026, Nat Hazards 122:627 · 8,575 km at 250 m · drawn on the CoastLens map with permission for non-commercial use, attributed · reported by The Irish Times, 8 September 2026

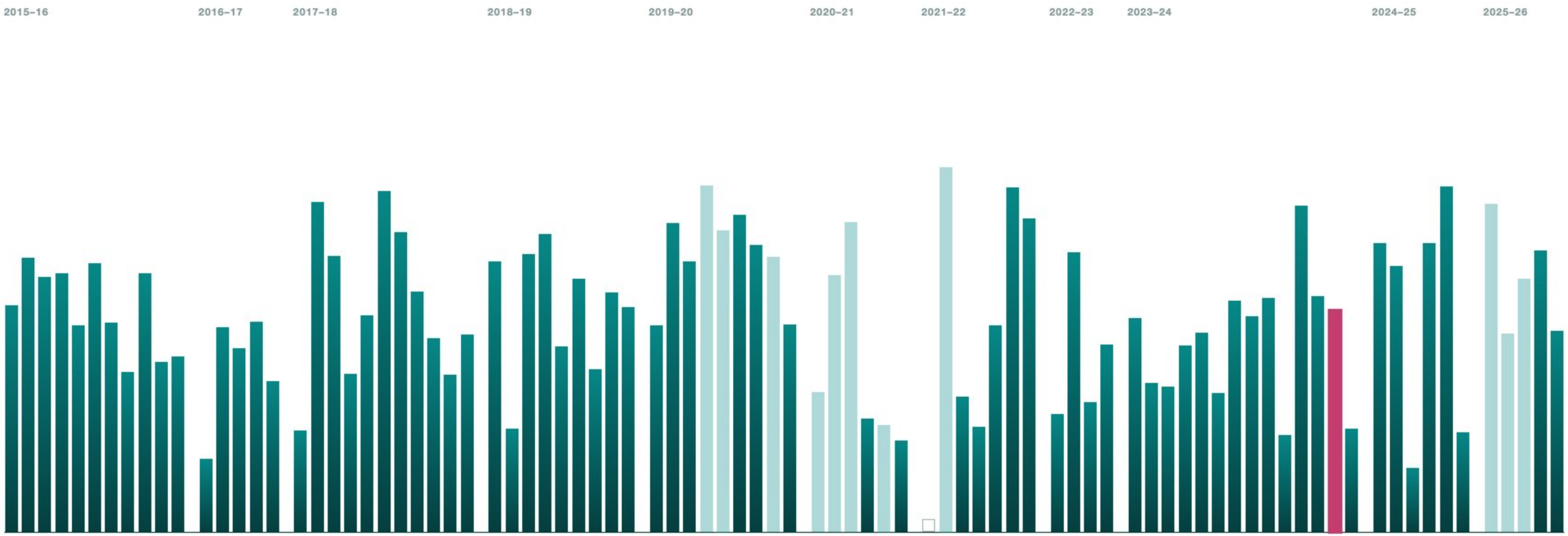
IRELAND'S NAMED-STORM RECORD

87 storms since 2015

BENCHMARK EVENT

Storm Kathleen

6 April 2024 · Wexford



National presentation index using observed extrema. **Not a local impact score.**

THE COASTLENS EVIDENCE STACK

Twelve data families. One coastal picture.

RESEARCH ACCELERATED WITH manus

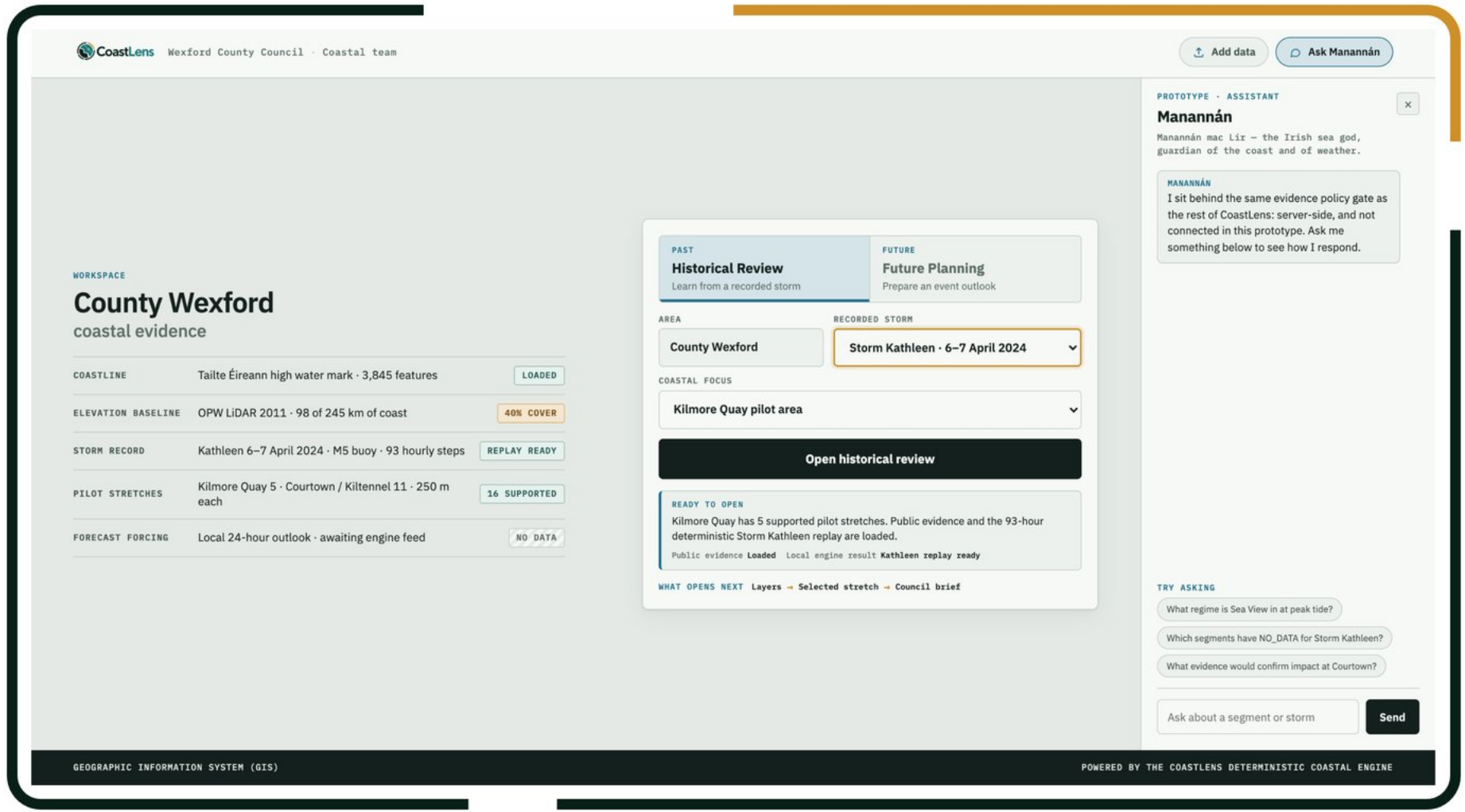
PROPOSED AGENT WORKFLOW



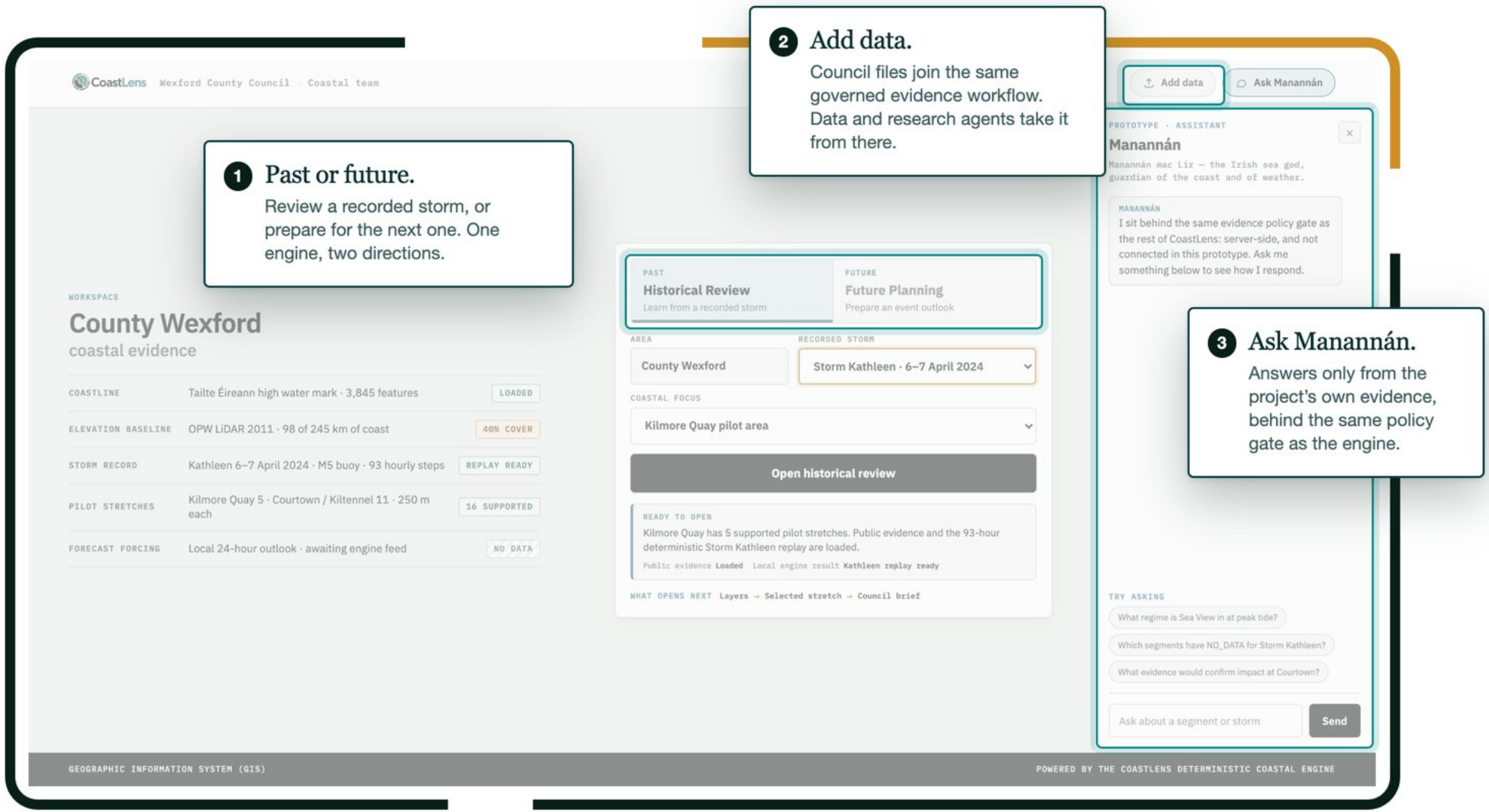
AI prepares evidence. Accepted numerical inputs feed the engine; contextual evidence also supports review and briefing.

Introducing CoastLens

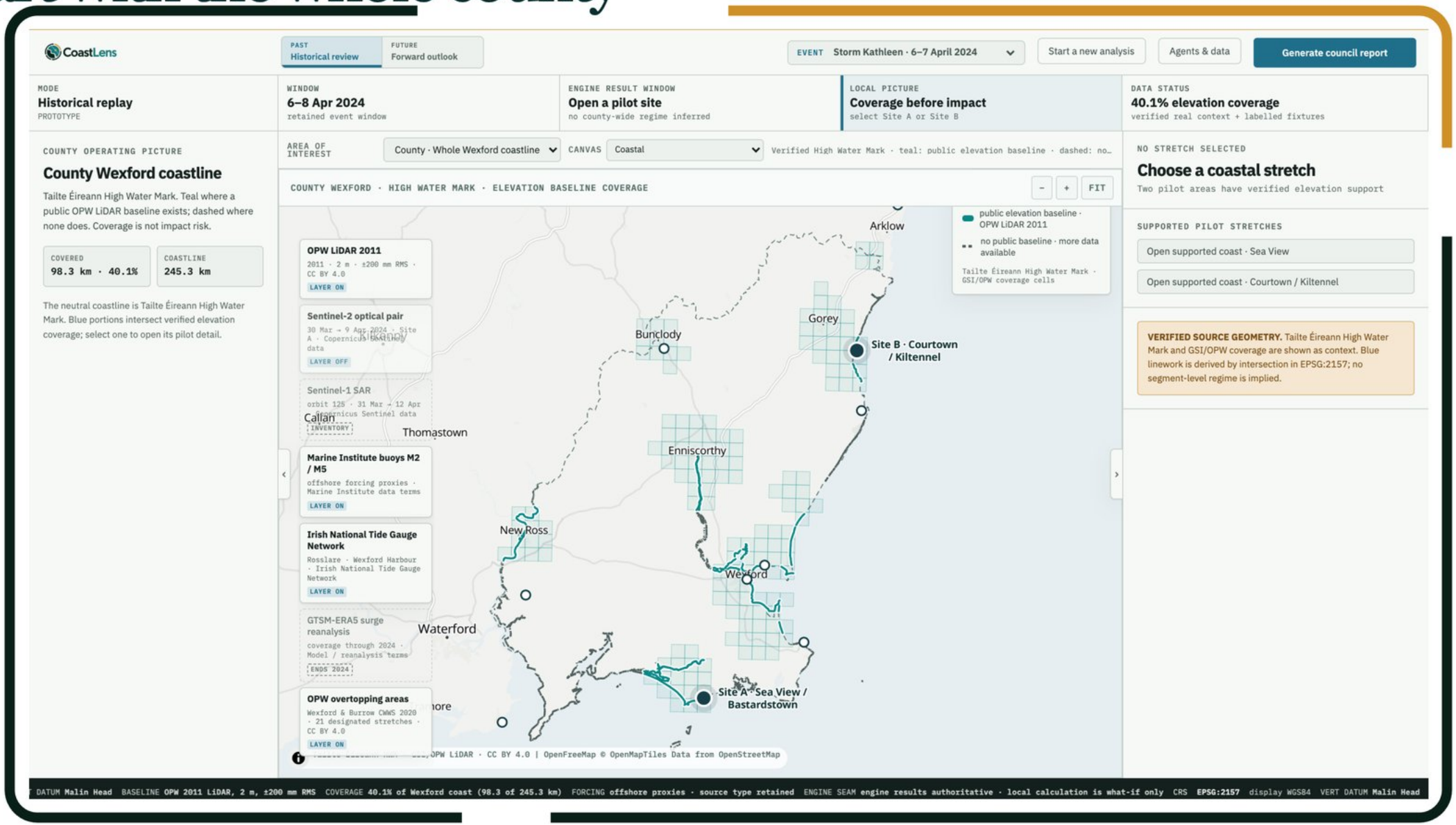
A Geographic Information System (GIS)



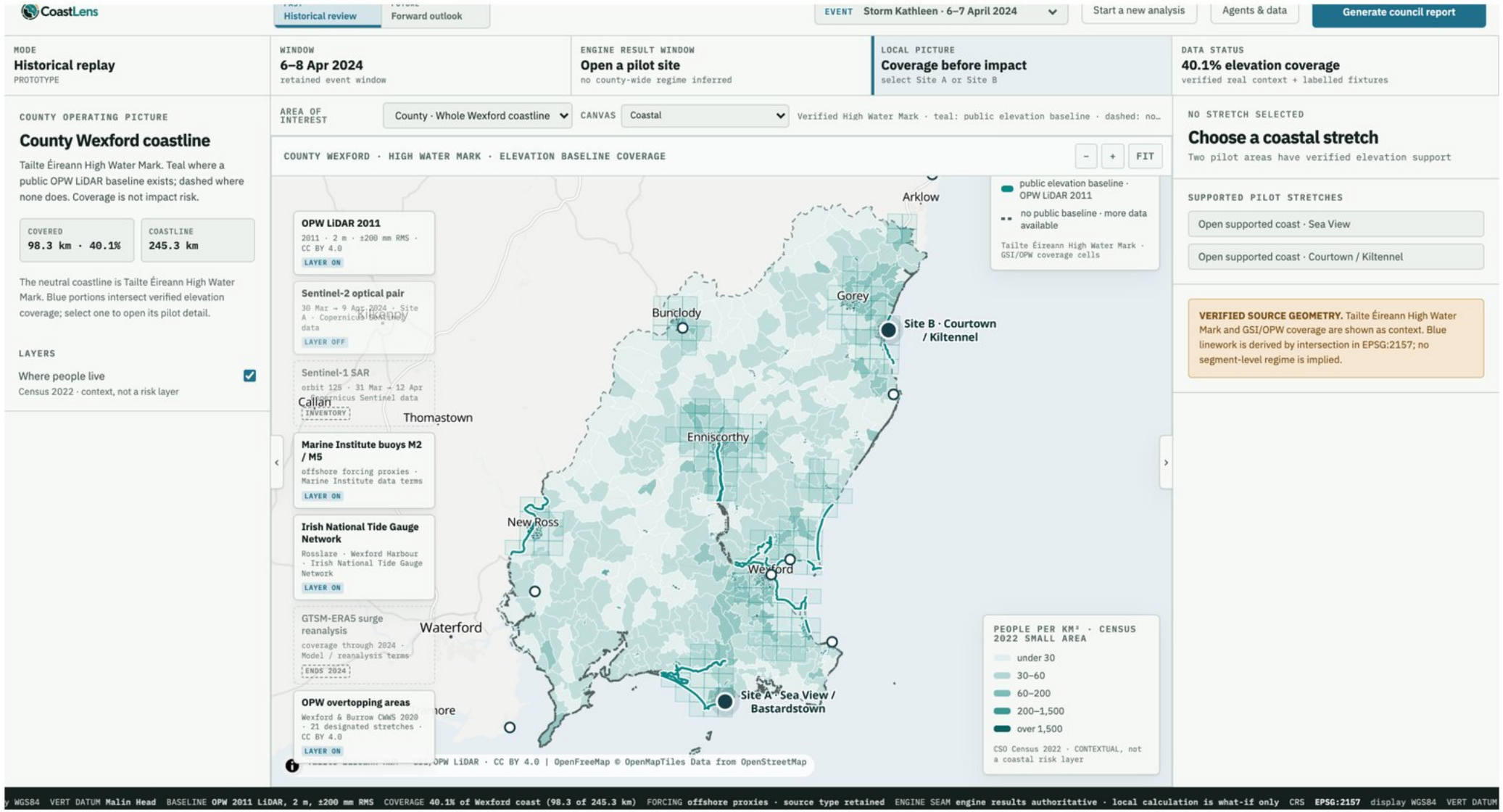
Introducing CoastLens



Start with the whole county

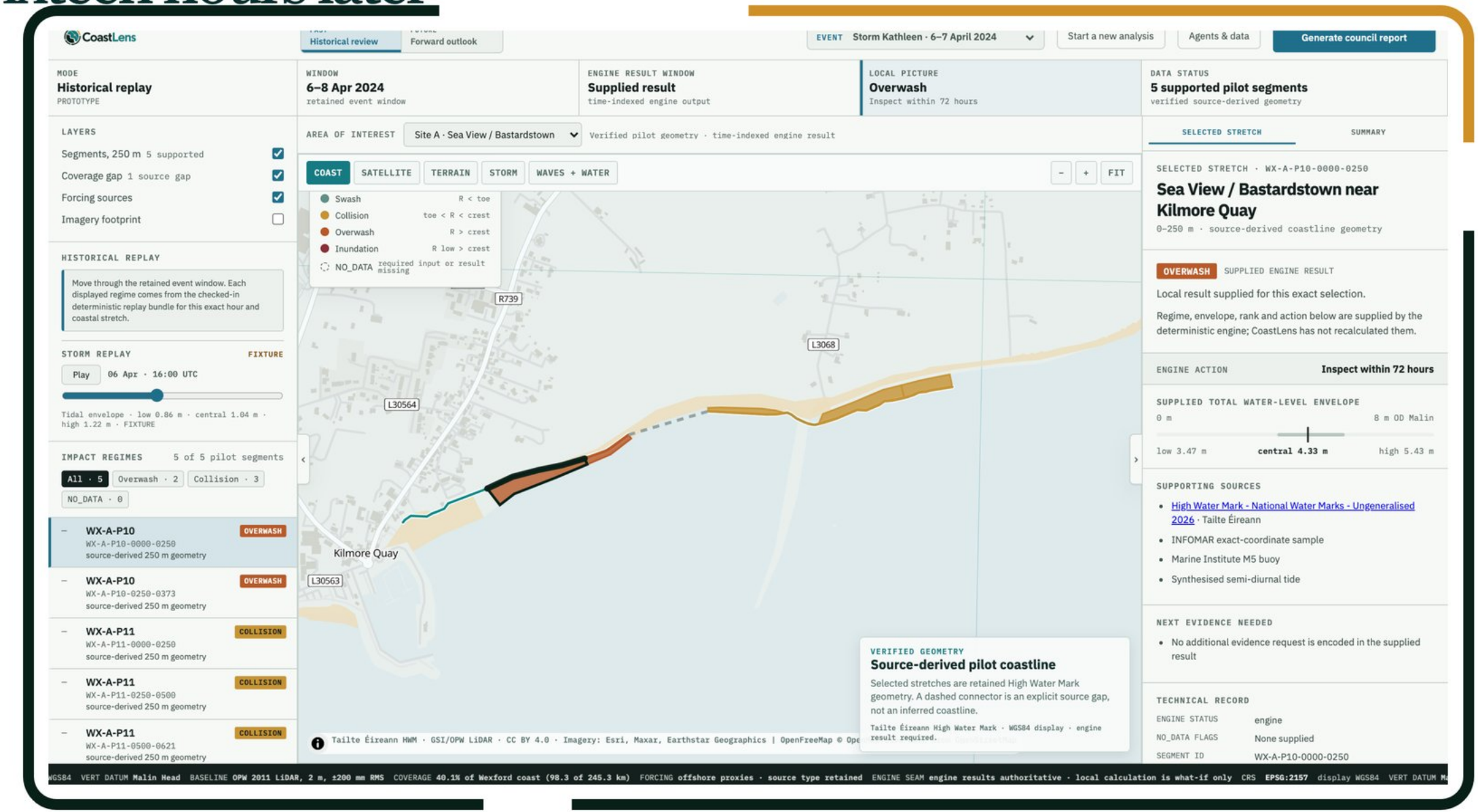


Where people live



Sixteen hours later

Two stretches in Overwash, three in Collision.

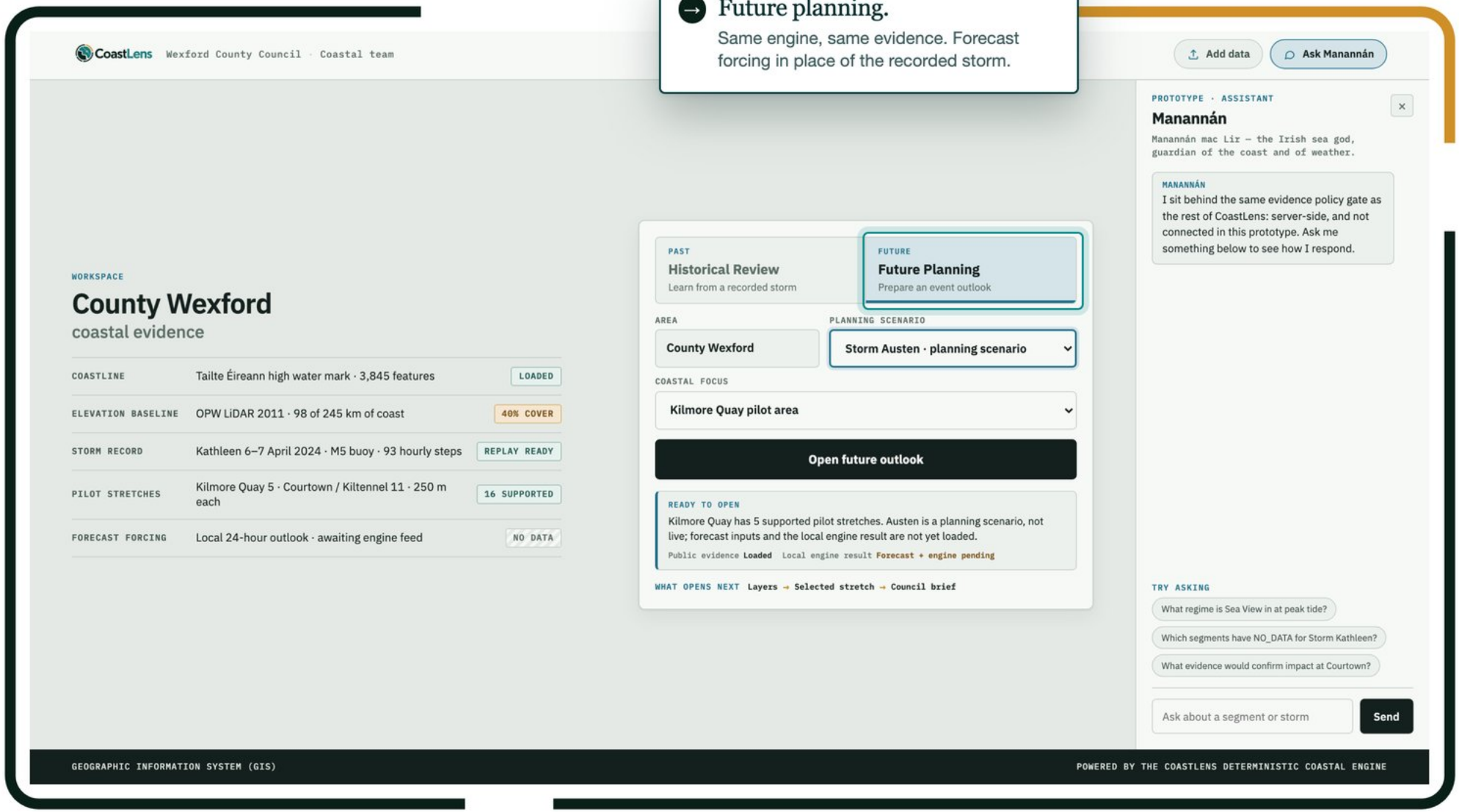


FUTURE PLANNING · 01

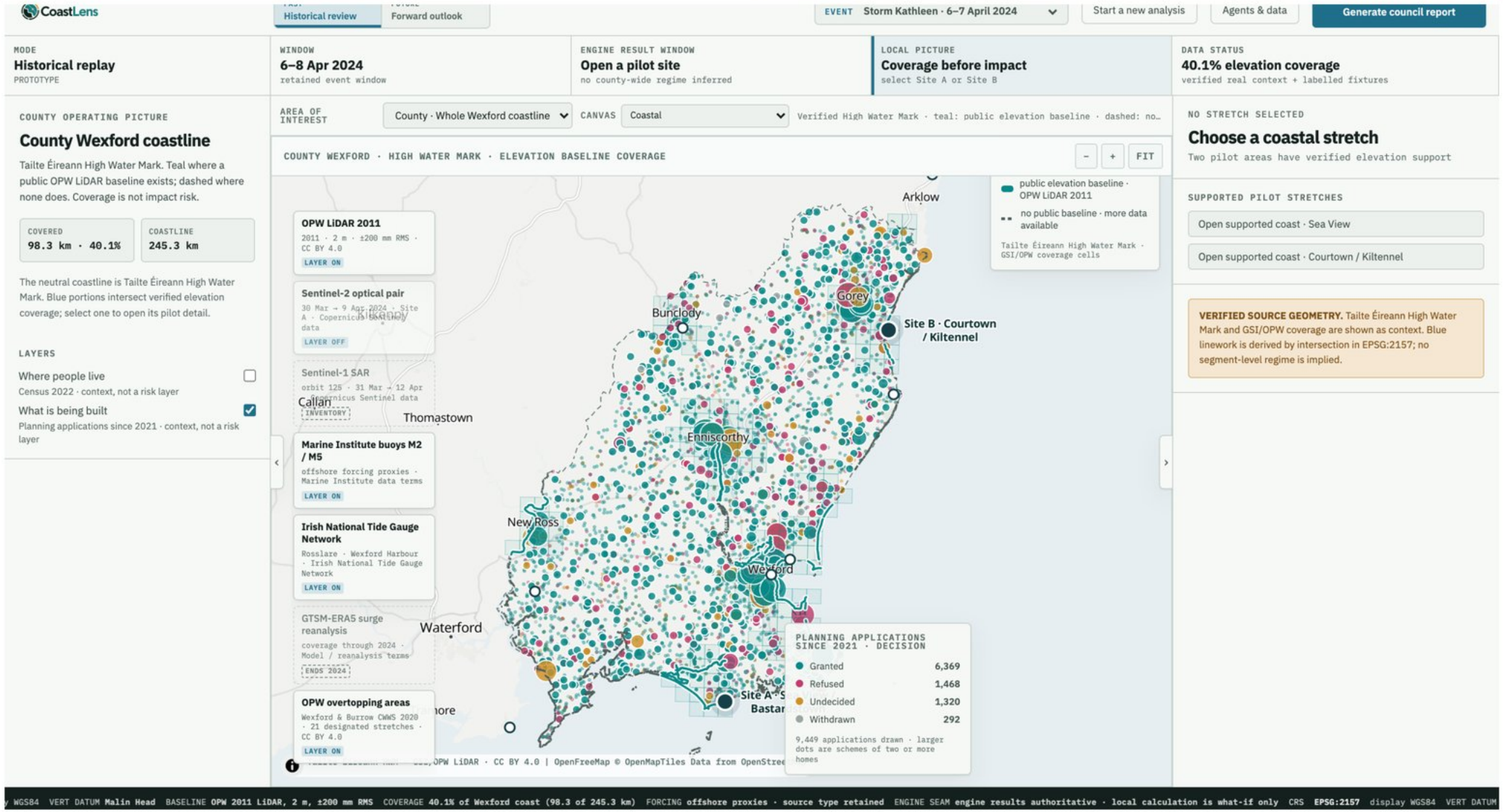
A storm is coming.

Start a 24-hour local outlook the moment the forecast is issued

Future planning.
Same engine, same evidence. Forecast forcing in place of the recorded storm.



Building continues



THE INTELLIGENCE LAYER · AGENT RUNS, 11–12 SEPTEMBER 2026

Agents feed the picture.

Coastline geometry
Tailte Éireann HWM · 3,845 features

Elevation & terrain
OPW LiDAR 2011 · 98 of 245 km

Waves
M5 buoy · 93 hourly steps

Tides & surge
Synthesised semi-diurnal tide · proxy

Weather & warnings
Met Éireann archive

Satellite imagery
Sentinel-2 · 30 Mar → 9 Apr 2024

Shoreline change
Historical observations

Coastal habitats
Dunes · marsh · seagrass

Assets & population
CSO Census 2022 · 620 small areas

Schemes & planning
DHLGH · 9,449 applications

Flood extents
OPW CFRAM 2021 · CC BY-NC-ND

Exposure index
UCC CEI 2026 · presentation licence

Discover — Parse — Check — Assemble — Engine — Approved · John Robinson

Supervised jobs a person starts and reviews, not a daemon. Every run keeps its source, licence and commit. A refusal on licence stays NO_DATA.

11 Sep 18:57 **Gap Resolver** CHECK
County coastline was 60% missing. Tailte Éireann HWM service caps at 2,000 records; the 1 Sept pull took one page. Pull re-run with paging, every raw page retained. 3,845 features, was 1,047.

THE INTELLIGENCE LAYER · THE FLEET

Six agents. One loop.

SC

Source Scout

DISCOVER

Finds public services and pages them in full.

Never keeps a source without a licence and a date.

4 runs · Assets & population, Flood extents, Exposure index

EP

Evidence Parser

PARSE

Reprojects, trims, attaches provenance.

Never changes a value. It converts units and records the step.

2 runs · Assets & population, Schemes & planning

PV

Provenance Validator

CHECK

Reads licence, source and datum before anything is kept.

Never lets a missing field be filled by a guess.

3 runs · Flood extents, Exposure index

GR

Gap Resolver

CHECK

Matches a missing input to a source, or records NO_DATA.

Never bridges a gap. A gap stays a gap.

1 run · Coastline geometry

LB

Layer Builder

ASSEMBLE

Wires accepted data into the GIS and verifies it headless.

Never draws geometry that is not in a source.

2 runs · Coastline geometry, Assets & population, Schemes & planning

MM

Marine Monitor

DISCOVER

Refreshes wave and water-level feeds.

Never passes off a proxy as an observation.

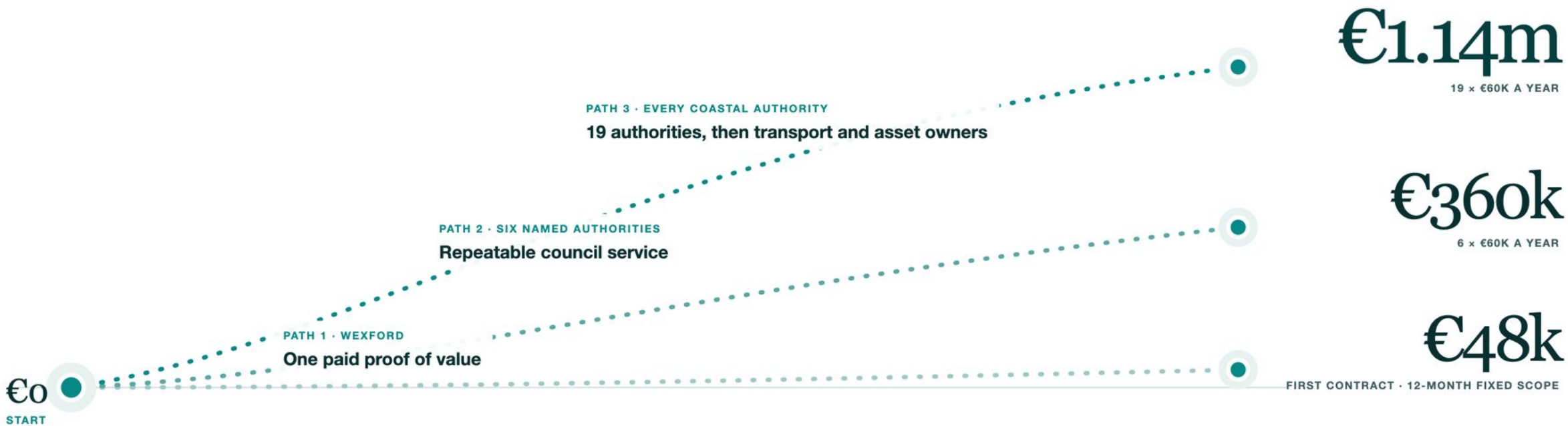
No run this window

Each agent is a supervised job with one role. It prepares; the engine calculates; a named person approves. Runs shown are 11–12 September 2026.

THE COMMERCIAL MODEL

Three commercial paths from one Wexford test

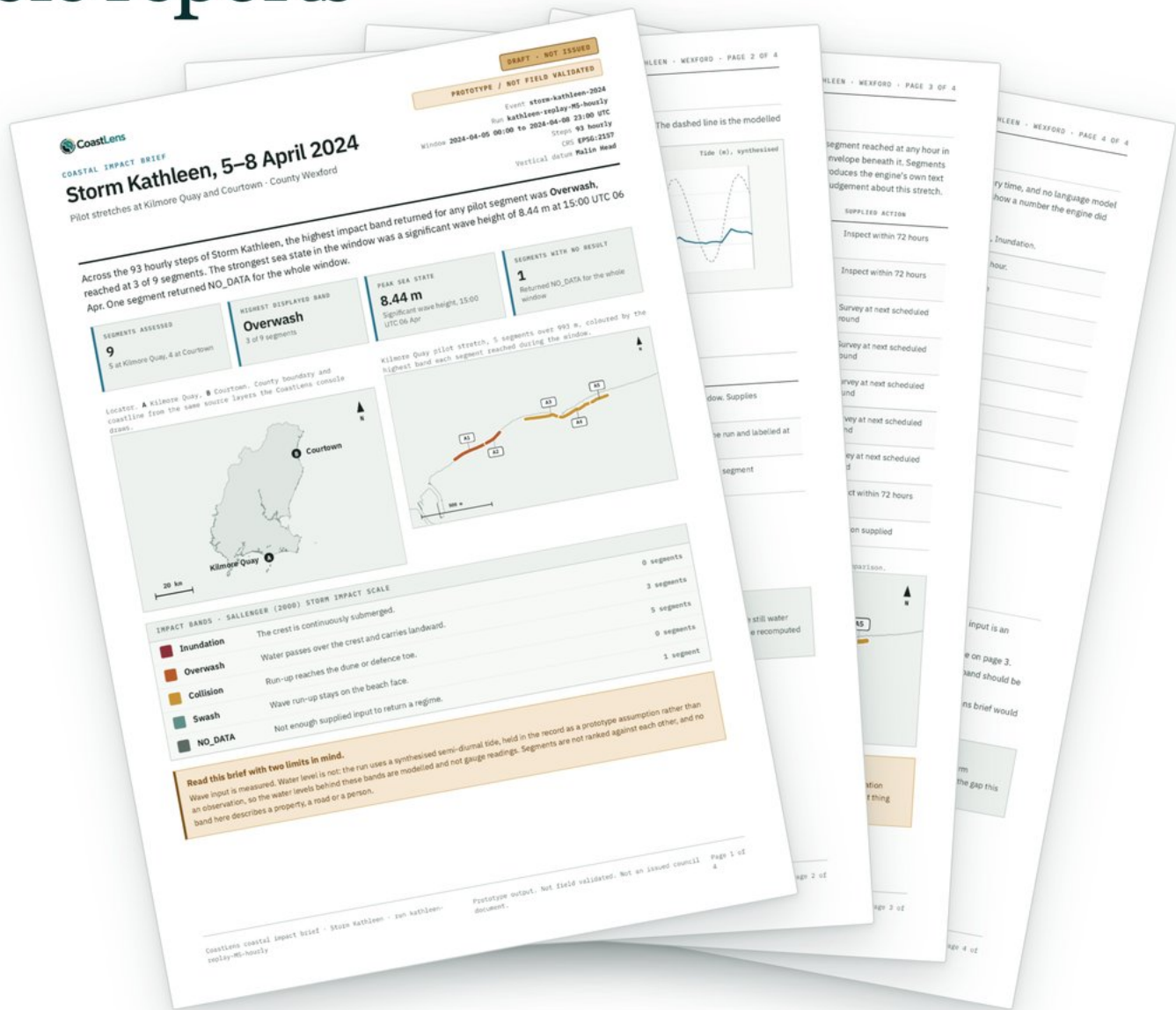
The State already buys this evidence: OPW coastal survey contracts of about €80k a year in 2024 and 2025.



Sea View, Kilmore Quay: €2.5m of OPW-approved protection since 2021, a fourth access road lost in 2024. CoastLens shows a council where to look first.

THE COUNCIL OUTPUT

Downloadable reports



CoastLens

Q&A