

Sustain-FIT Secondment Concept Note

Global River Brain (GRB): AI for River Sustainability, Sediment and Microplastic Risk

Prepared for discussion with potential Irish Secondment Enterprise partners

Project at a glance

Call fit	Sustain-FIT / EU Green Deal: Eliminating Pollution, Biodiversity, Climate Action, Digitalisation for Sustainability.
Core idea	Develop an AI-enabled river intelligence framework to predict sediment movement and microplastic transport, improve monitoring decisions, and support practical environmental decision-making.
Company role	Host a funded postdoctoral Fellow for a 6–12 month secondment; provide mentorship, practical context, and access to relevant data, sites, facilities, or expertise.
Cost to company	The Fellow's salary and core research costs are funded through Sustain-FIT. The company contribution is mainly in-kind hosting, mentoring and domain input.
Expected value	Applied R&D, prototype tools, data insights, possible IP/commercialisation pathways, ESG/regulatory readiness, and stronger links with UL and Ireland's innovation ecosystem.

The sustainability challenge

Rivers are under growing pressure from sediment imbalance, land-use change, urbanisation, climate impacts and microplastic pollution. Many organisations already collect useful environmental, operational, sensor, survey or geospatial data, but it can be difficult to convert these data streams into predictive, decision-ready intelligence. Existing models are often local, expensive to calibrate, and difficult to transfer across catchments or operating contexts.

Proposed project

The proposed Global River Brain (GRB) will explore a practical AI framework that combines hydrological, environmental, remote-sensing and climate data with physics-aware modelling. The aim is to support better prediction of sediment and microplastic movement, identify where new monitoring would be most valuable, and provide a dashboard-style decision-support layer for scenario testing and uncertainty visualisation.

Possible 6–12 month secondment activities

- Map the company's relevant sustainability, water, monitoring, environmental, geospatial or operational challenge to a clear research use case.
- Review available company data, public datasets and potential pilot sites/catchments for feasibility.
- Develop or adapt prototype AI/ML models for risk prediction, anomaly detection, monitoring prioritisation or decision-support.
- Create a small demonstrator dashboard or analytical workflow that can be used by technical or sustainability teams.
- Define exploitation, validation and next-step opportunities, including possible IP, productisation, service improvement or follow-on funding.

Likely outputs for the company

Technical output	Business / sustainability value	Example use
AI risk model or workflow	Turns fragmented data into predictive insight	Sediment, turbidity, pollution or microplastic risk screening
Monitoring optimisation logic	Supports lower-cost, higher-impact monitoring	Prioritising sampling locations or sensor deployment
Dashboard / demonstrator	Makes results usable by technical and non-technical teams	Scenario testing, uncertainty maps, reporting support
Validation roadmap	Creates a credible path beyond research prototype	Pilot basin/site testing and follow-on funding

Why this may be attractive for a company

- The project is shaped around a real company challenge, not only academic curiosity.
- The funded Fellow brings focused research capacity without the company paying the Fellow's salary.
- The company can explore data-driven sustainability innovation with reduced R&D risk.
- The work can support ESG, compliance, environmental monitoring, product/service innovation, and future commercial exploitation.

What we are seeking now

We are seeking an Irish-based company willing to act as the Secondment Enterprise partner in a Sustain-FIT application.

At this stage, the main requirement is a short discussion to check fit, identify a practical company challenge, and confirm whether a 6–12 month secondment could be useful and realistic.

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