

Cost Considerations with GeoFluxes

A Reproducible Framework for Subsurface Flow, Transport, and Reactive Modeling

Overview

GeoFluxes projects combine **physics-based subsurface simulation, custom scientific workflow development, reproducible computational execution, automated postprocessing, and audit-ready technical reporting**. Cost structures reflect not only model development, but also the **scientific expertise, risk management, and review readiness** required for high-stakes subsurface decision-making.

In the U.S. consulting and research-services market, pricing for work of this nature is driven primarily by:

- Technical and numerical complexity
- Domain expertise across flow, transport, and geochemistry
- Compliance, traceability, and reproducibility requirements
- Iterative scenario development and stakeholder review cycles

Pricing is therefore based on **effort, expertise, and risk mitigation**, rather than code volume alone.

Typical Independent Consultant Rate Bands (USD)

Indicative hourly rate ranges for comparable GeoFluxes-style work include:

- **Generalist scientific modelers / early-career developers:**
\$75–\$125 per hour
- **Senior subsurface modelers and scientific software developers**
(PFLOTRAN, FEHM, MODFLOW, reactive transport, uncertainty analysis):
\$150–\$250 per hour
- **Specialized boutique consultants or high-compliance, fast-turnaround projects:**
\$250–\$350+ per hour

Actual rates depend on project urgency, regulatory exposure, and review burden.

Common Fixed-Bid Cost Ranges

For projects similar in scope to GeoFluxes deliverables, fixed-bid engagements commonly fall within the following ranges:

Rapid Screening and Feasibility Studies

\$15k–\$40k

- Screening-scale flow and transport models
 - First-order plume and pressure response
 - Targeted sensitivity analysis
 - Concise, decision-focused technical report
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Site-Scale Conceptual and Operational Modeling

\$40k–\$120k

- Site-scale conceptual and numerical models
 - Multiple operational scenarios and constraint checks
 - Pressure envelopes, plume diagnostics, and containment metrics
 - Reproducible model package with standardized plots and tables
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Reactive Transport and Long-Term Performance Assessment

\$80k–\$250k+

- Coupled flow–transport–reaction simulations
 - Mineralization and transformation processes
 - Time-resolved partitioning and permanence indicators
 - Explicit uncertainty framing and assumption documentation
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MRV-Ready, Audit-Grade Modeling Frameworks

\$150k–\$400k+

- Versioned scenario libraries
 - Standardized QA/QC workflows
 - Monitoring and data-value assessment
 - Updateable, regulator-facing documentation packages
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Practical Pricing Approach

A defensible and transparent pricing strategy for GeoFluxes projects typically includes:

1. Effort estimation

- Commonly **150–400 hours** depending on scope, physics, and review cycles

2. Agreed hourly rate

- Based on expertise level and compliance expectations

3. Contingency allocation (15–30%)

- Numerical stability and solver tuning
- Scenario refinement and scope evolution
- Stakeholder feedback and review iterations
- Documentation and QA/QC refinement

4. Optional post-delivery support

- Typically **\$2k–\$8k per month**
 - Covers model updates, reruns, data assimilation, and technical support
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Cost Drivers and Scaling Factors

Key drivers influencing GeoFluxes project cost include:

- Number of modeled scenarios and operational strategies
- Dimensionality (2D vs 3D) and grid resolution
- Degree of heterogeneity and geologic complexity
- Coupling of flow, transport, and geochemistry
- Extent of sensitivity, calibration, and uncertainty analysis
- Frequency of sponsor review and revision cycles

Transparent cost scaling ensures sponsors understand how added rigor translates into added value.

Value Proposition

GeoFluxes pricing reflects more than simulation execution. It includes:

- **Deep domain expertise** across multiple subsurface simulators
- **Risk reduction** through reproducible, traceable, and auditable workflows
- **Decision-ready outputs** suitable for engineering, risk, and regulatory contexts
- **Consistency across scales and modeling approaches**

GeoFluxes delivers **defensible science**, not just model outputs.

Competitive Positioning

Compared to ad hoc modeling or solver-specific consulting, GeoFluxes offers:

- Integrated multi-physics workflows
- Consistent QA/QC across tools and scenarios
- Faster iteration with reduced rework
- Clear uncertainty communication

This reduces downstream decision risk and long-term project cost.

Summary

GeoFluxes enables sponsors to invest in **transparent, reproducible, and scientifically defensible subsurface modeling**. Funding scales naturally with project ambition, physics complexity, and uncertainty-management needs—allowing organizations to balance **cost, rigor, and decision confidence**.
