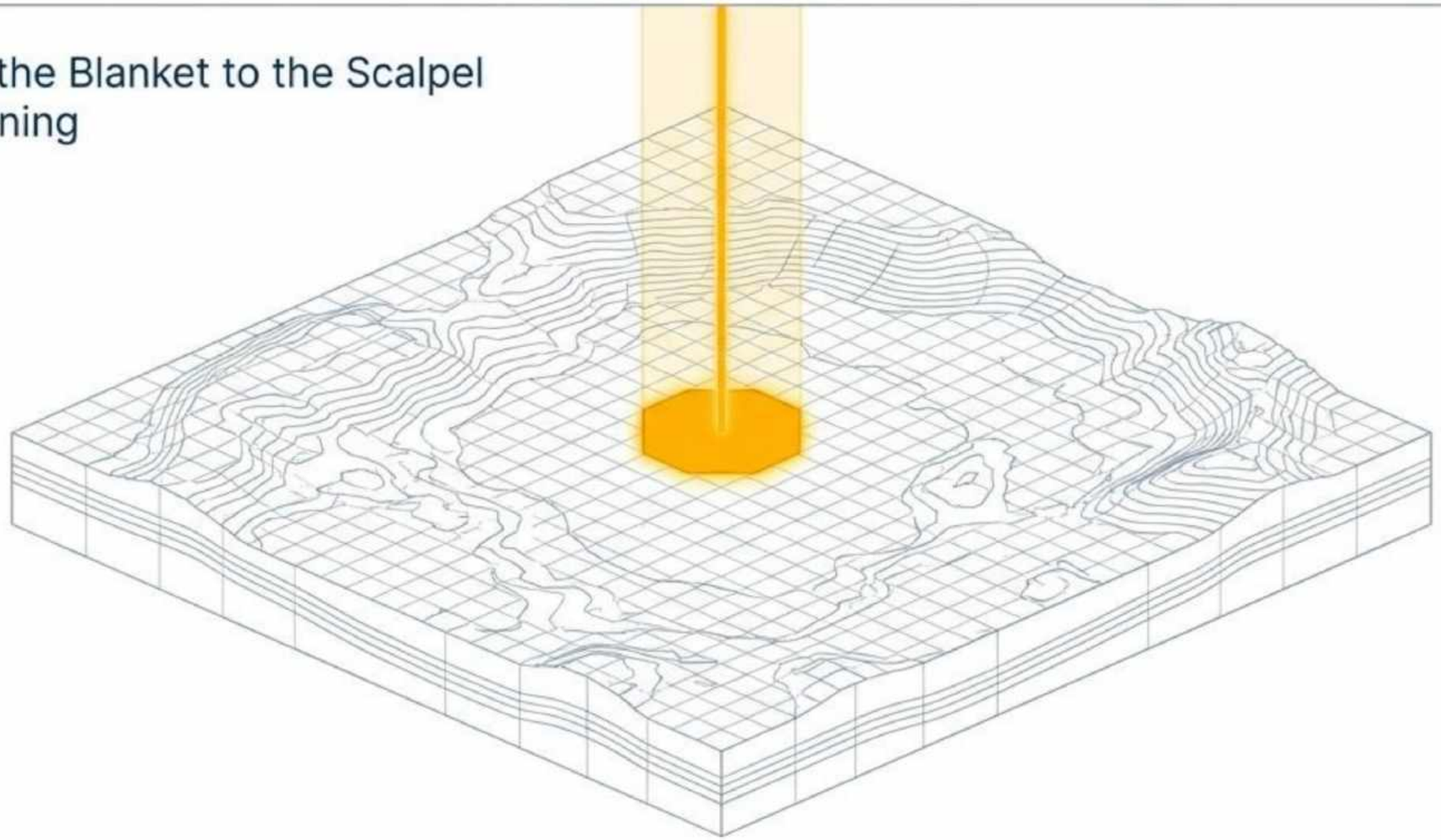
The Blueprint of Modern Exploration

Solving the Seismic Scheduling Problem with Direct Detection

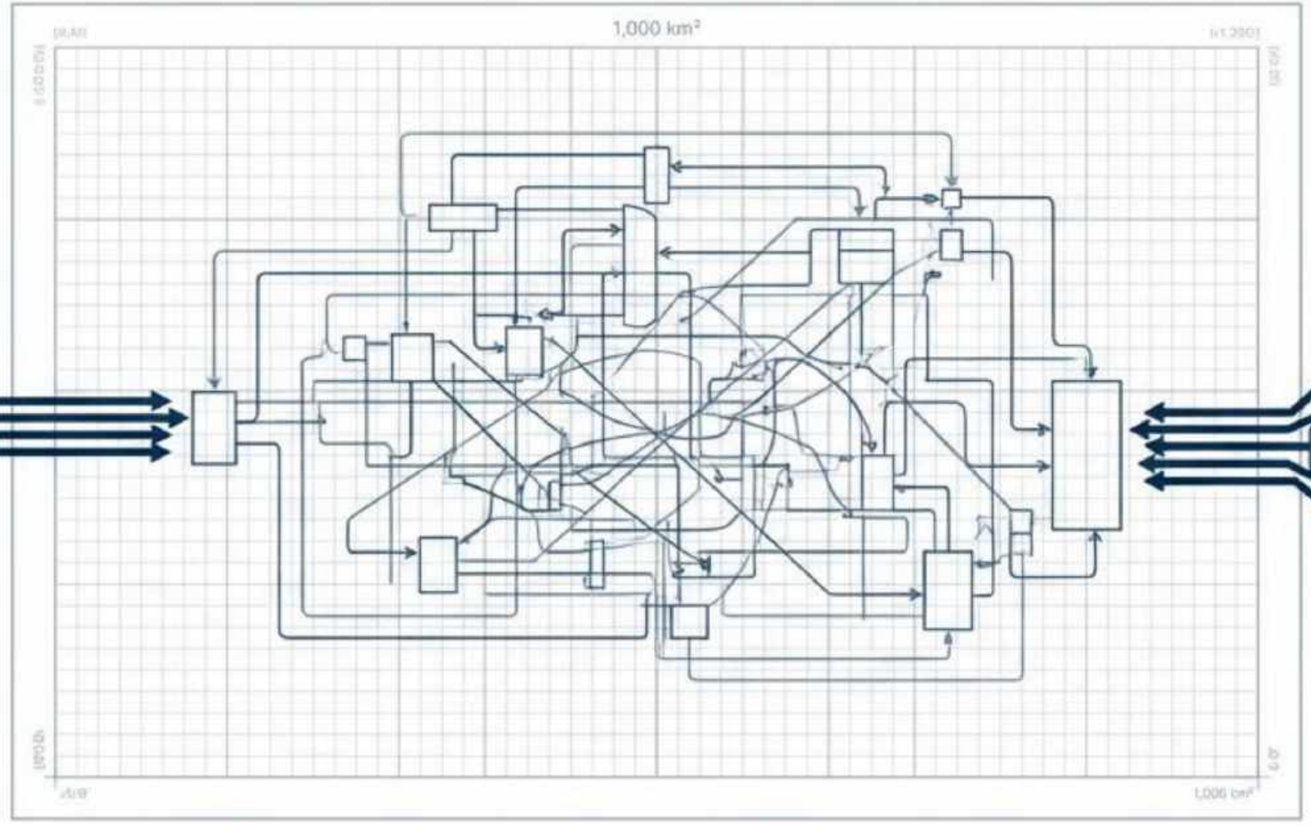
Shifting from the Blanket to the Scalpel
in E&P and Mining



THE CRUSHING WEIGHT OF THE ‘BLANKET’ APPROACH

THE TRADITIONAL SEISMIC SCHEDULING PROBLEM (SSP)

The Flaw: Committing millions in operational resources to a 100% geographic footprint based entirely on indirect data.



HIGH CAPEX HARDWARE

OCEAN BOTTOM NODES

STREAMER VESSELS

VIBROSEIS TRUCKS

DENSE LAND ARRAYS

SEVERE CONSTRAINTS

WEATHER WINDOWS

SEA STATES

SEASONAL ENVIRONMENTAL BANS

FISHING SEASONS

PERMITTING DELAYS

THE DILEMMA: Planning when, where, and with what crews across massive unproven grids, where hydrocarbons or ore veins only occupy a tiny fraction of the total area.

YOU WOULDN'T USE A 1930s TELEPHONE. WHY USE 1930s GRID LOGIC?

THE EVOLUTIONARY IMPERATIVE OF EXPLORATION

EVERYDAY & MEDICAL TECH EVOLUTION

CARRIER PIGEON

Manual, low-bandwidth communication

1930s ROTARY PHONE

Fixed-point voice transmission. Limited range.

1980s ANALOG MOBILE

Portable, expensive. Voice only.

TODAY: SMARTPHONE + BUTTERFLY MOBILE ULTRASOUND

Immediate, high-fidelity diagnostics. Non-invasive, on-site, multi-function.

EXPLORATION TECH EVOLUTION

DIVINING ROD

Manual, subjective surveying

1920s DYNAMITE SEISMOGRAPH

Destructive source. Low-resolution 2D data. High-risk, slow.

1980s CABLED GEOPHONES

Large-scale land arrays. Time-consuming deployment. Weather-dependent.

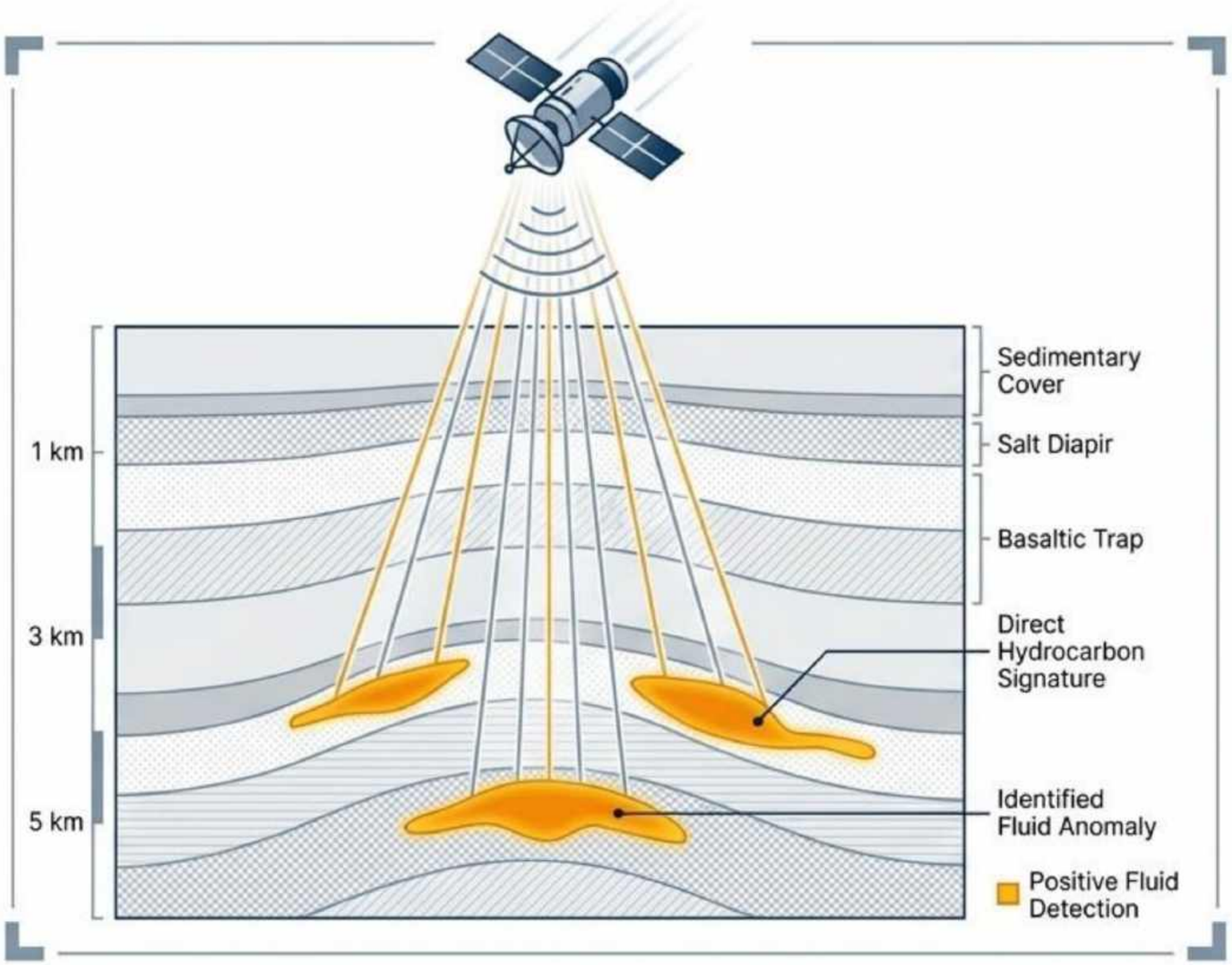
TODAY: RSS-NMR SATELLITE DIRECT DETECTION

Direct subsurface detection. Non-invasive, rapid, targeted. Precision scalpel for anomalies.

JUST AS MEDICAL DIAGNOSTICS EVOLVED FROM MASSIVE HOSPITAL MACHINES TO IMMEDIATE, NON-INVASIVE SMARTPHONE SCANS, RSS-NMR BRINGS DIRECT SUBSURFACE DETECTION OUT OF THE BLIND GRID AND INTO THE DIGITAL COMMAND CENTER.

RSS-NMR: Direct Physics-Based Proof from Space

Remote Sensing Survey + Nuclear Magnetic Resonance



DIRECT FLUID MEASUREMENT

Measures fluid hydrogen in pores, differentiating between free and bound fluids. Delivers a signature of actual fluid presence, not merely structural geometry.

DEPTH & PENETRATION

Penetrates up to several kilometers deep through complex geological layers (including salt and basalt) without acoustic scattering.

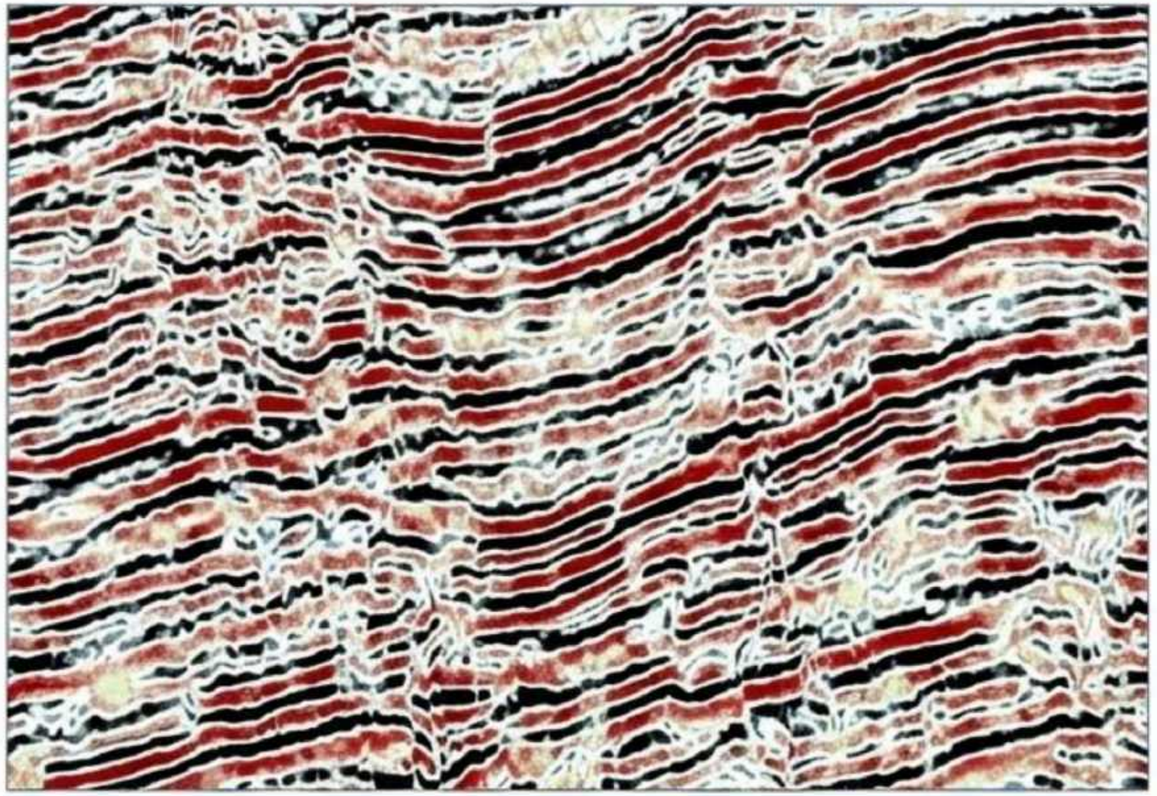
VALIDATED RELIABILITY

Achieves 60–80% target reliability strictly through remote laboratory analysis, increasing to ≈90% following targeted field validation.

The End of "Geometric Guesswork"

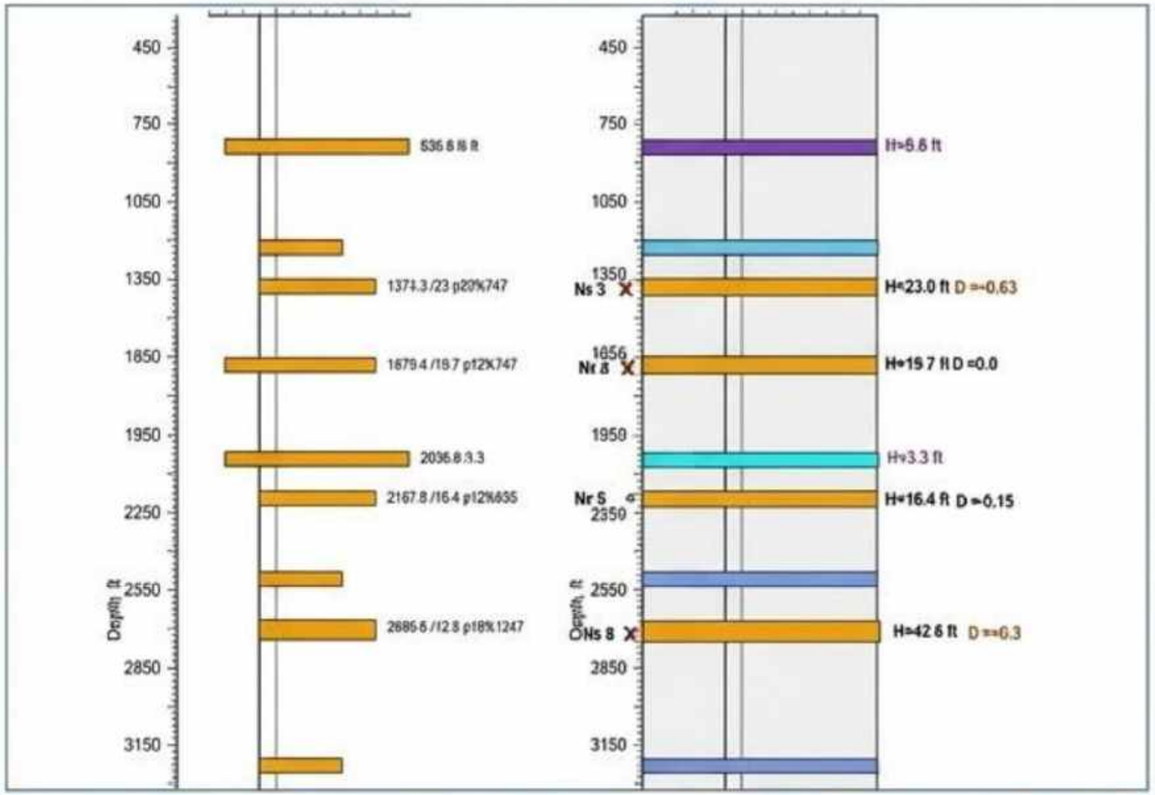
Shifting from structural interpretation to direct fluid identification.

The Old Way: Indirect Geometric Guessing



Requires heavy human interpretation. Reveals structural containers, but provides zero physical proof of the fluids inside them.

The New Way: Direct Physics-Based Proof



No structural guessing required. Delivers direct fluid identification (Oil, Gas, Water) with exact depth and thickness quantification.

The “Stealth Mode” Advantage

Zero ground footprint. Total strategic anonymity.

The Remote Lab

Zero Ground Footprint: Develop full technical projects and CAPEX/OPEX projections entirely from the laboratory.

Executive Freedom: Top management makes unpressured **“Go/No-Go” decisions** before public commitment.

The Anonymity Barrier

The Chaotic Ground Reality

Competitor Tipping: Prevent rivals from discovering block interest before auctions.

Early Permitting: Avoid approaching authorities for master permits prematurely.

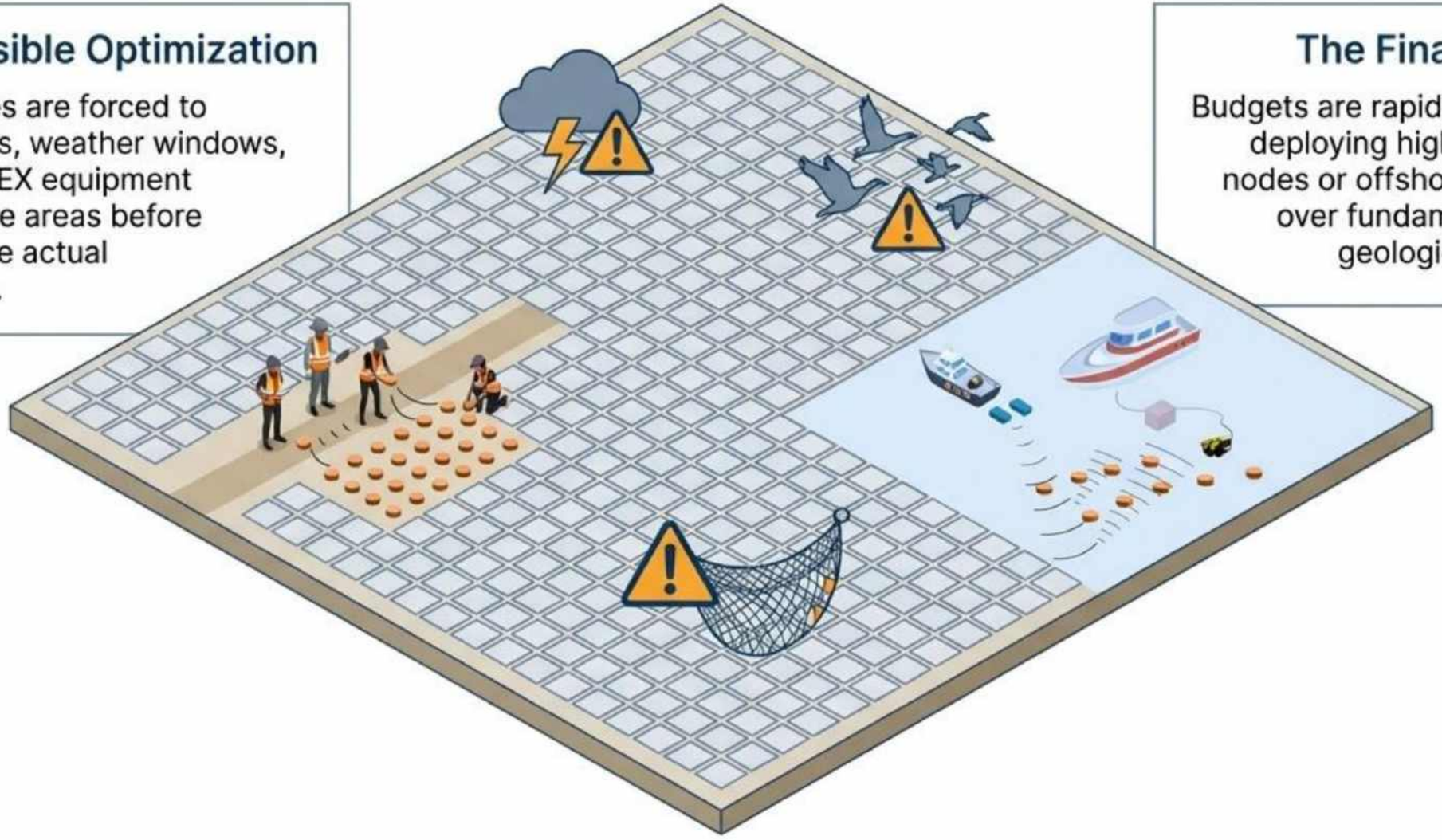
Local Subsidies & False Hopes: Eliminate the need to establish local physical subsidiaries during initial feasibility phases.

The Traditional SSP: How to Do Everything Everywhere?

The financial drain of deploying heavy geophysics across 100% unproven acreage.

The Impossible Optimization

E&P companies are forced to optimize crews, weather windows, and high-CAPEX equipment across massive areas before knowing where actual targets reside.

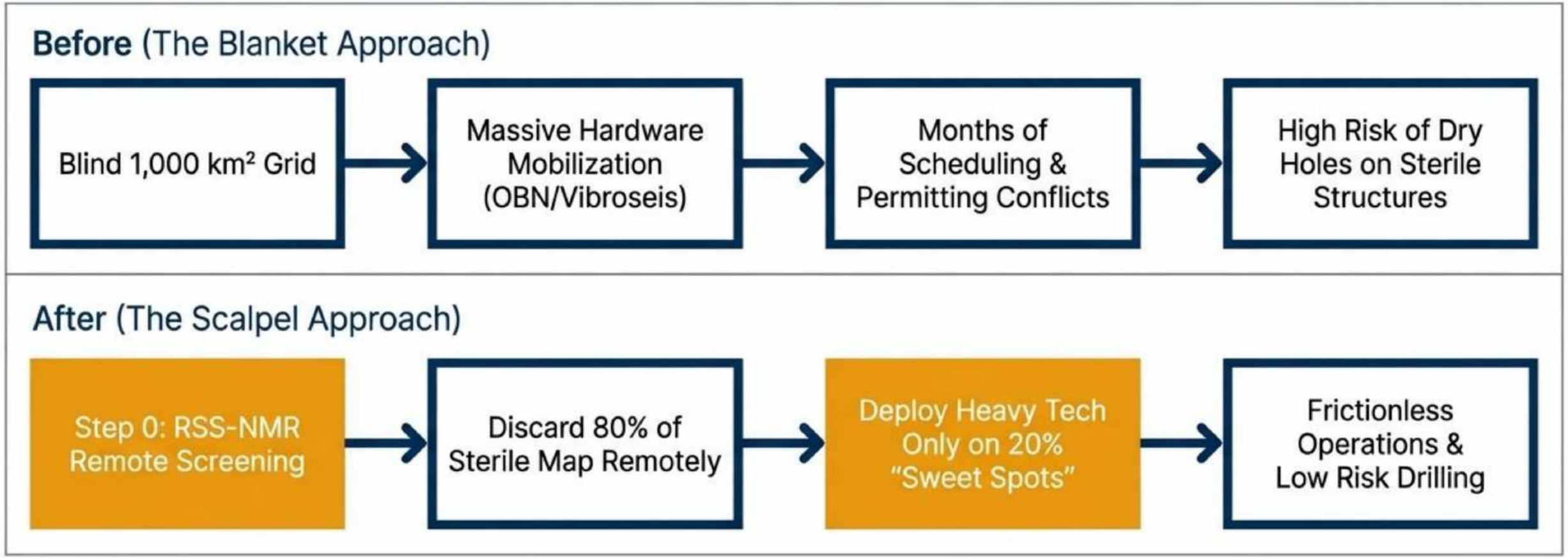


The Financial Drain

Budgets are rapidly depleted by deploying high-density land nodes or offshore OBN arrays over fundamentally sterile geological structures.

The Modern SSP: Focusing Heavy Tech on the 20% That Matters

Inserting RSS-NMR as “Step 0” re-architects the scheduling workflow.



The Seismic Scheduling Problem is transformed from “how to deploy everywhere” to “how to surgically attack validated hotspots.” Scheduling becomes a focused, linear path.

The Seismic Arsenal Matrix

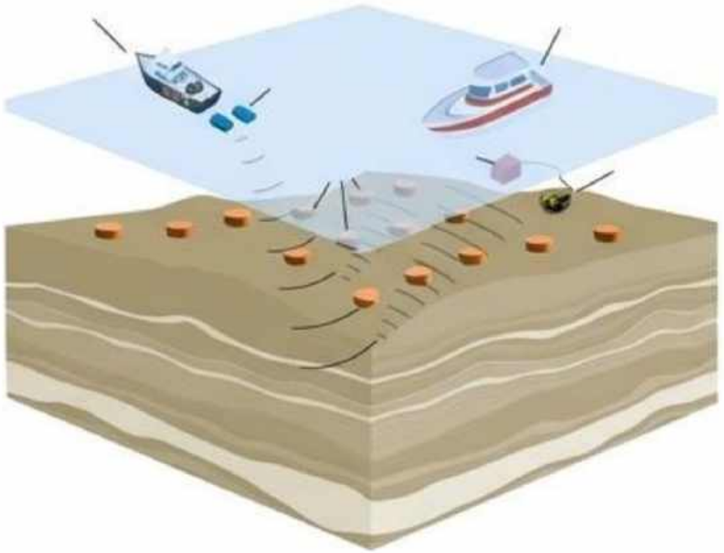
RSS-NMR is not a replacement; it is the ultimate Step 0 optimizer for heavy geophysics.

Methodology	RSS-NMR	Vibroseis / Dynamite	OBN (Ocean Bottom Nodes)	MT (Magnetotellurics)
Primary Role	Step 0 Pre-screening Filter	Shallow/Mid structural imaging	Complex offshore/salt imaging	Deep crustal calibration (up to 200km)
Fluid Identification	Direct Physics-Based Proof	Indirect (Structural)	Indirect (Structural)	Indirect (Resistivity)
Cost Footprint	< 1% of total program	High	Very High	Moderate
Logistics Timeline	Days (100% Remote)	Months (Ground Crew)	Months (Vessels & Nodes)	Weeks (Ground Setup)

Unleashing Heavy Geophysics in the Sweet Spots

When the deployment footprint shrinks, hardware efficiency skyrockets.

OBN (Ocean Bottom Nodes)

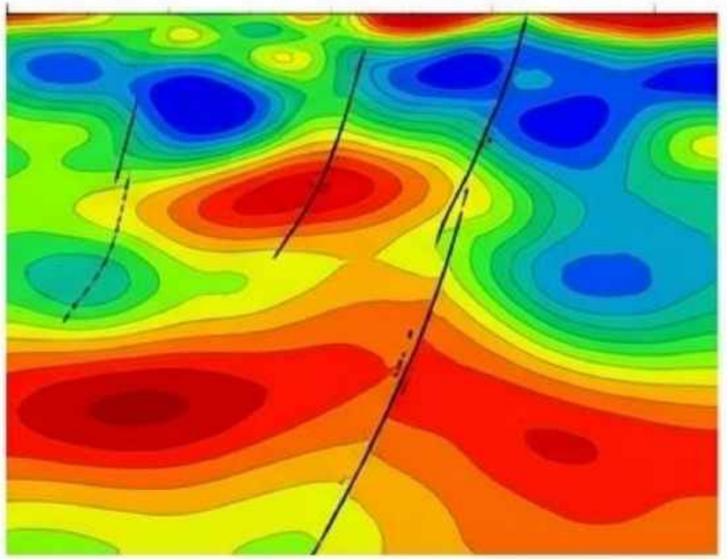


Third-generation autonomous nodes provide unmatched full-azimuth data in complex offshore areas. RSS-NMR **slashes their deployment time by** isolating specific marine drop zones.

Compact Onshore Nodes

High-density onshore nodes boost recovery in mature fields. RSS-NMR directs them precisely to bypassed terrestrial 'sweet spots', drastically reducing required line cutting.

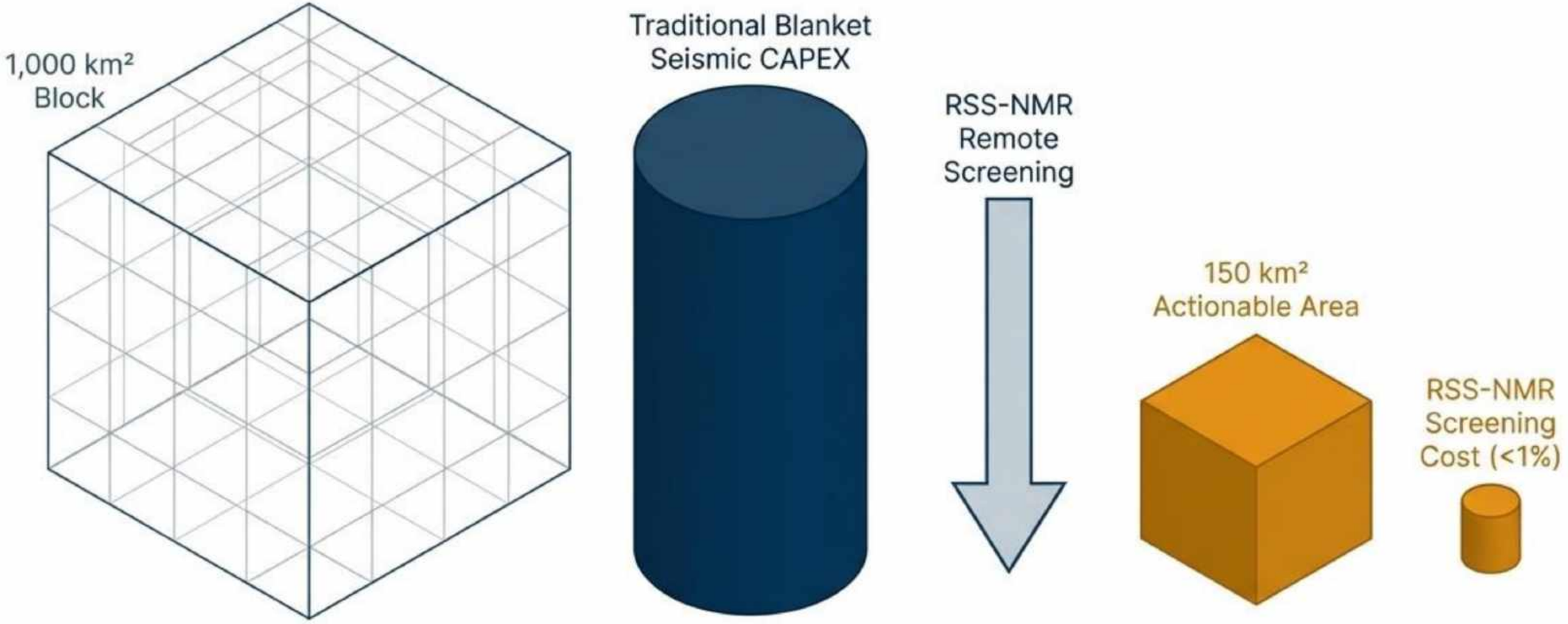
Magnetotellurics (MT)



Deep-sensing MT complements seismic under high-velocity basalt. RSS-NMR ensures MT transects are positioned perfectly over favorable structures rather than blind grids.

The 1% CAPEX ‘Shrink-Ray’

De-risking 99% of your budget before boots hit the ground.



For a typical 1000 km² block, an RSS-NMR campaign costs less than 1% of a full geophysical program. Spending that 1% upfront physically shrinks the actionable area, entirely de-risking the massive hardware budgets required for the remaining acreage.

Frictionless Operations: Securing the Social License

Surgical exploration eliminates negative ESG externalities

Zero Deforestation

Eliminates mass line cutting. No deforestation or massive land-clearing required for dense grid access.

Zero Protected Area Incursions

Heavy vibroseis trucks and crews are kept completely out of national parks and sensitive mountain ranges.

Zero Seasonal Constraints

Removes the friction of scheduling around fishing seasons, community bans, or wildlife breeding windows.

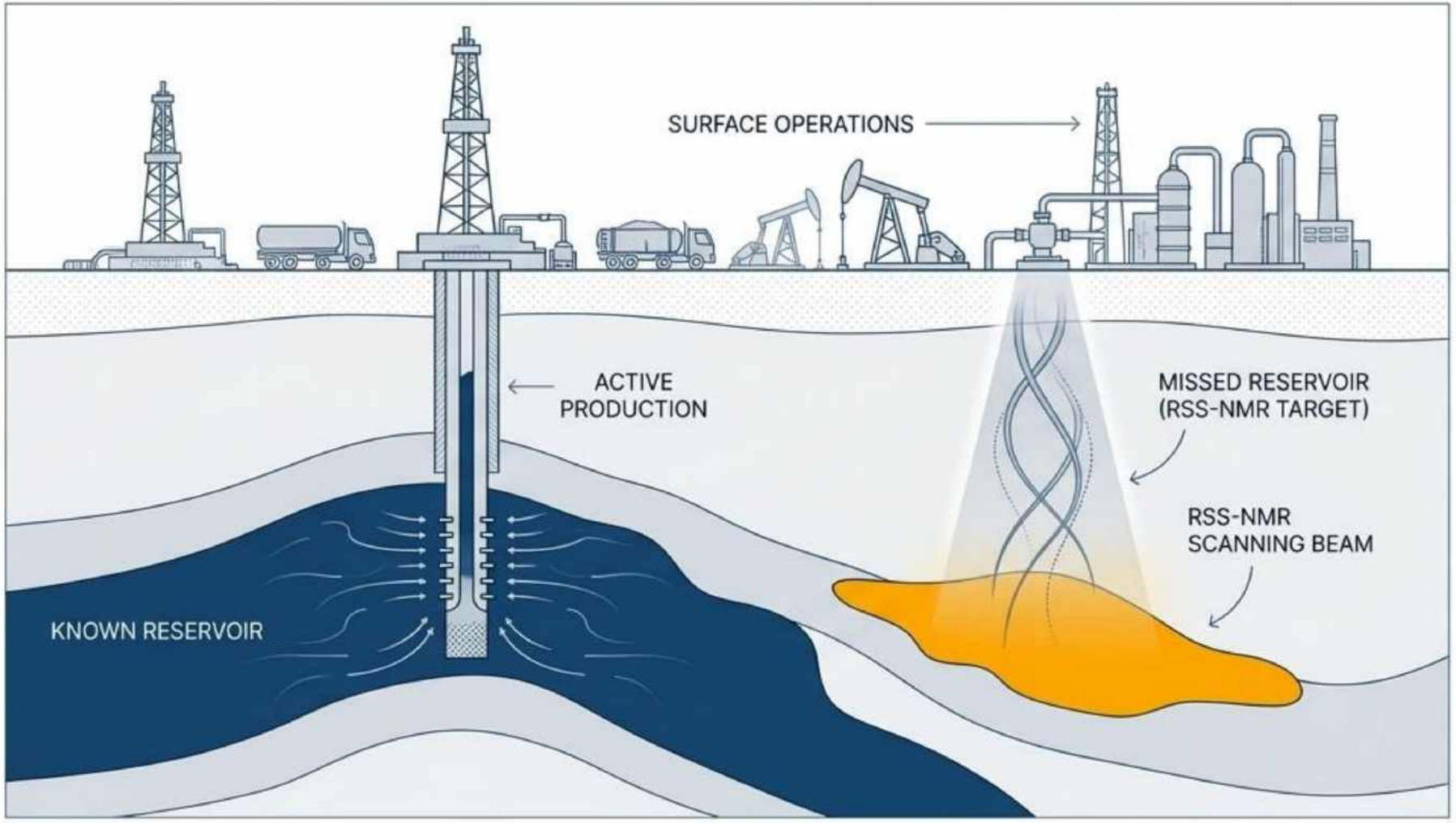
Dramatically Lower Carbon Footprint

Surgically targeted hardware drastically reduces vessel deployment days and terrestrial crew mobilizations.

By limiting the ground footprint strictly to confirmed "hot spots," **RSS-NMR satisfies strict ESG mandates** while preventing costly project stoppages.

Brownfields & Mining: Re-Exploration Without Interruption

Finding bypassed reserves while utilizing existing master permits.



Oil & Gas Assets

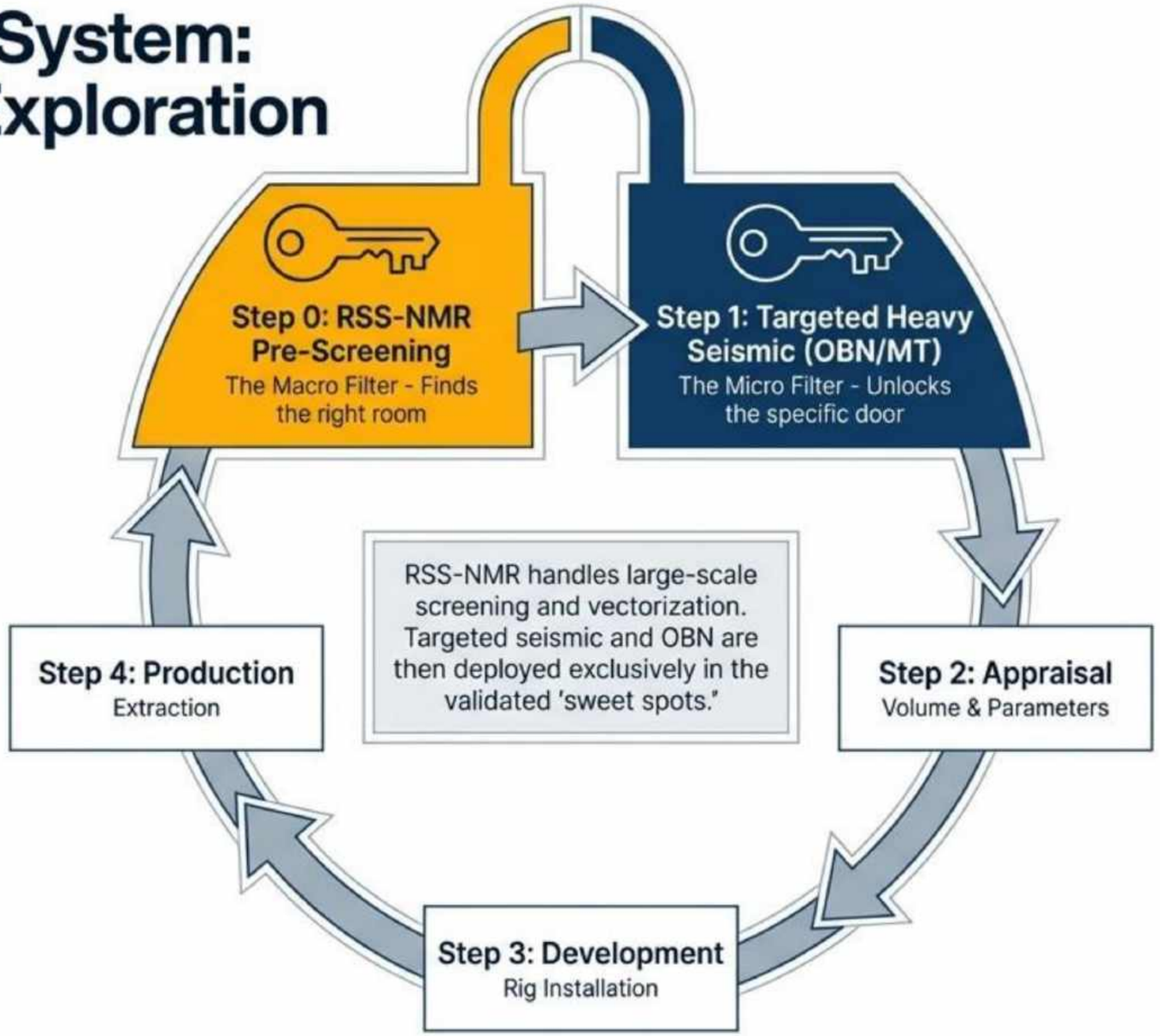
Scan producing brownfield blocks without halting current operations to locate missed reservoirs or optimize secondary recovery. Immediate action is possible under existing master permits.

Mining & Minerals

Directly map key alteration zones across vast districts. Trace bedrock and vector into ore-bearing systems remotely, radically reducing the number of blind boreholes required to constrain a deposit model.

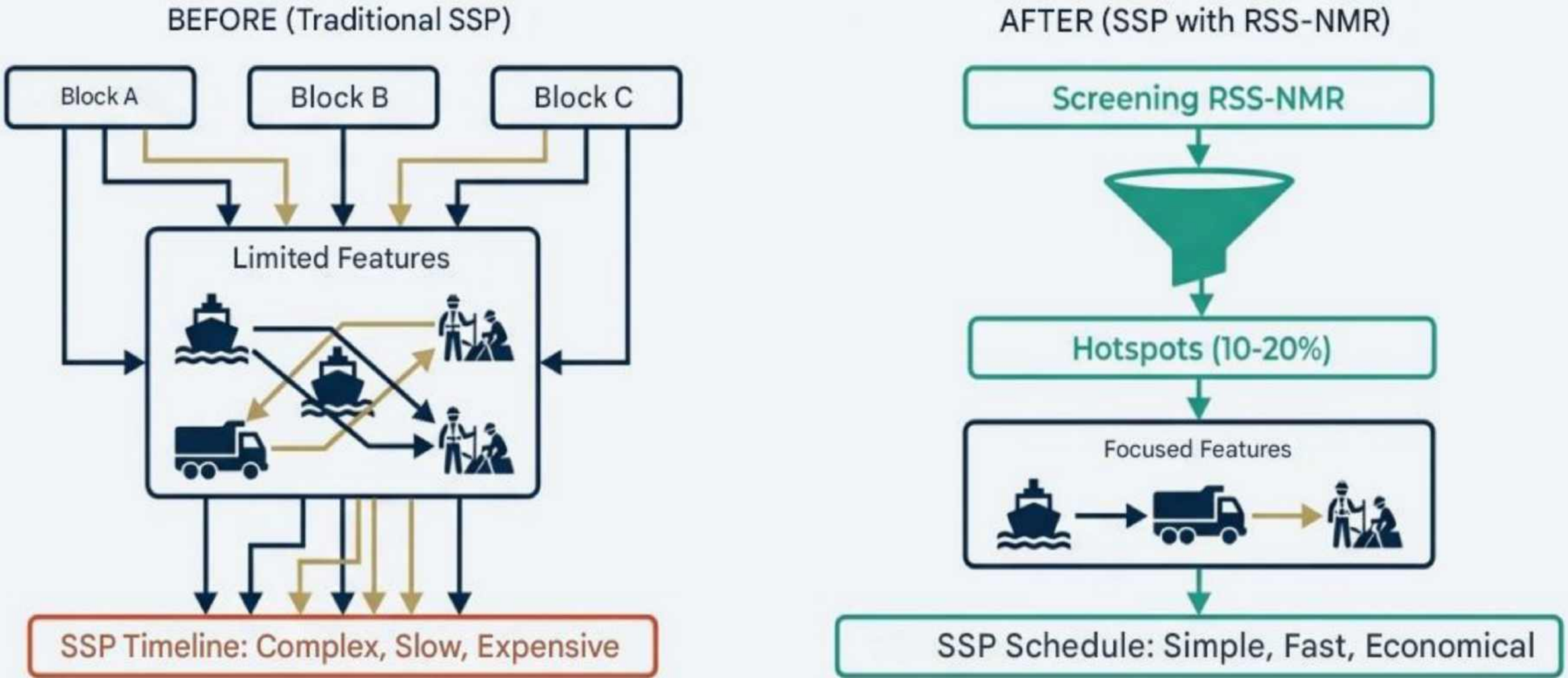
The Two-Key System: The Modern Exploration Lifecycle

The definitive end of the blind grid.



Transforming the Seismic Scheduling Program (SSP)

Traditional SSP is a complex problem of optimizing resources, costs, and operational windows. RSS-NMR acts as a strategic filter before SSP, radically simplifying the process.



The RSS-NMR Advantage: From Technical Edge to Financial Outcome

Dramatically Increase Success Rate

Move beyond the 30-35% industry average by drilling only where hydrocarbons are confirmed to be present.

Substantially Reduce Exploration Costs

Minimize or eliminate the need for broad, speculative seismic campaigns. Focus expensive seismic surveys only on confirmed areas of interest.

Mitigate Risk & Uncertainty

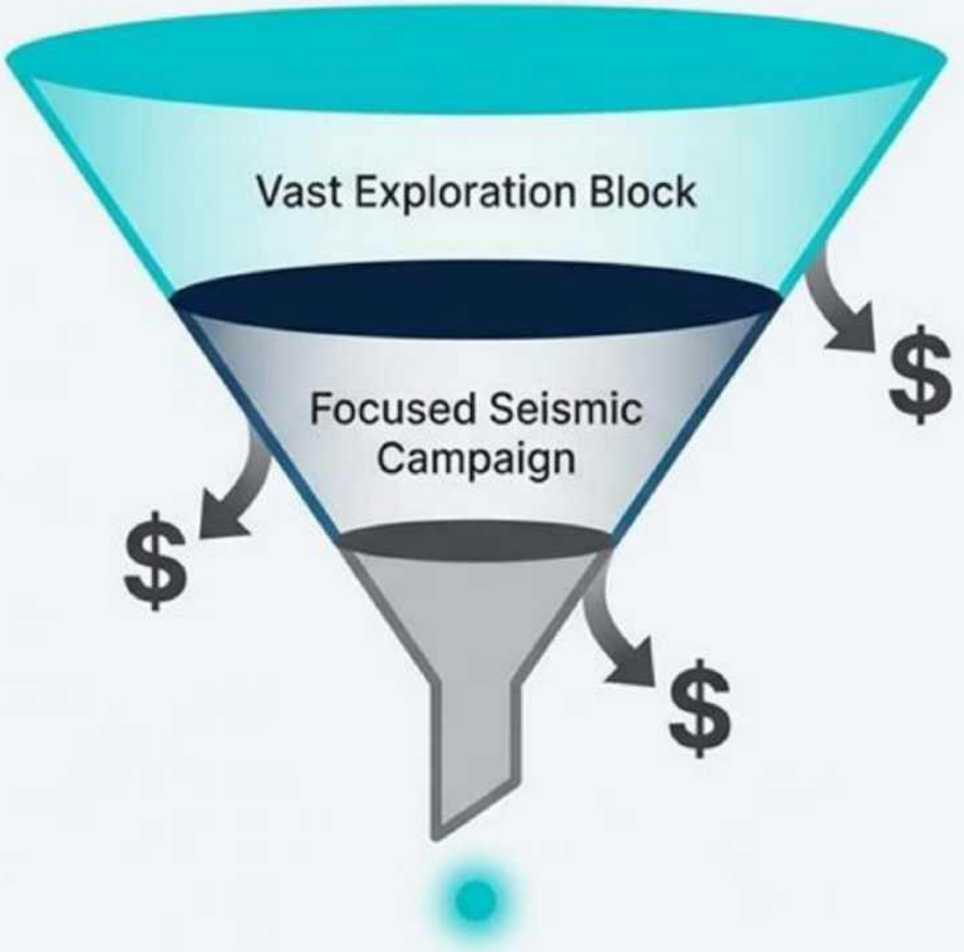
Make go/no-go decisions on acreage with direct evidence, not just geological inference.

Accelerate Prospect Prioritization

Rapidly screen vast areas to identify and rank the most promising prospects based on direct data.

Gain a Competitive Edge

Leverage a disruptive toolset to succeed in challenging regions where competitors using conventional methods fail.



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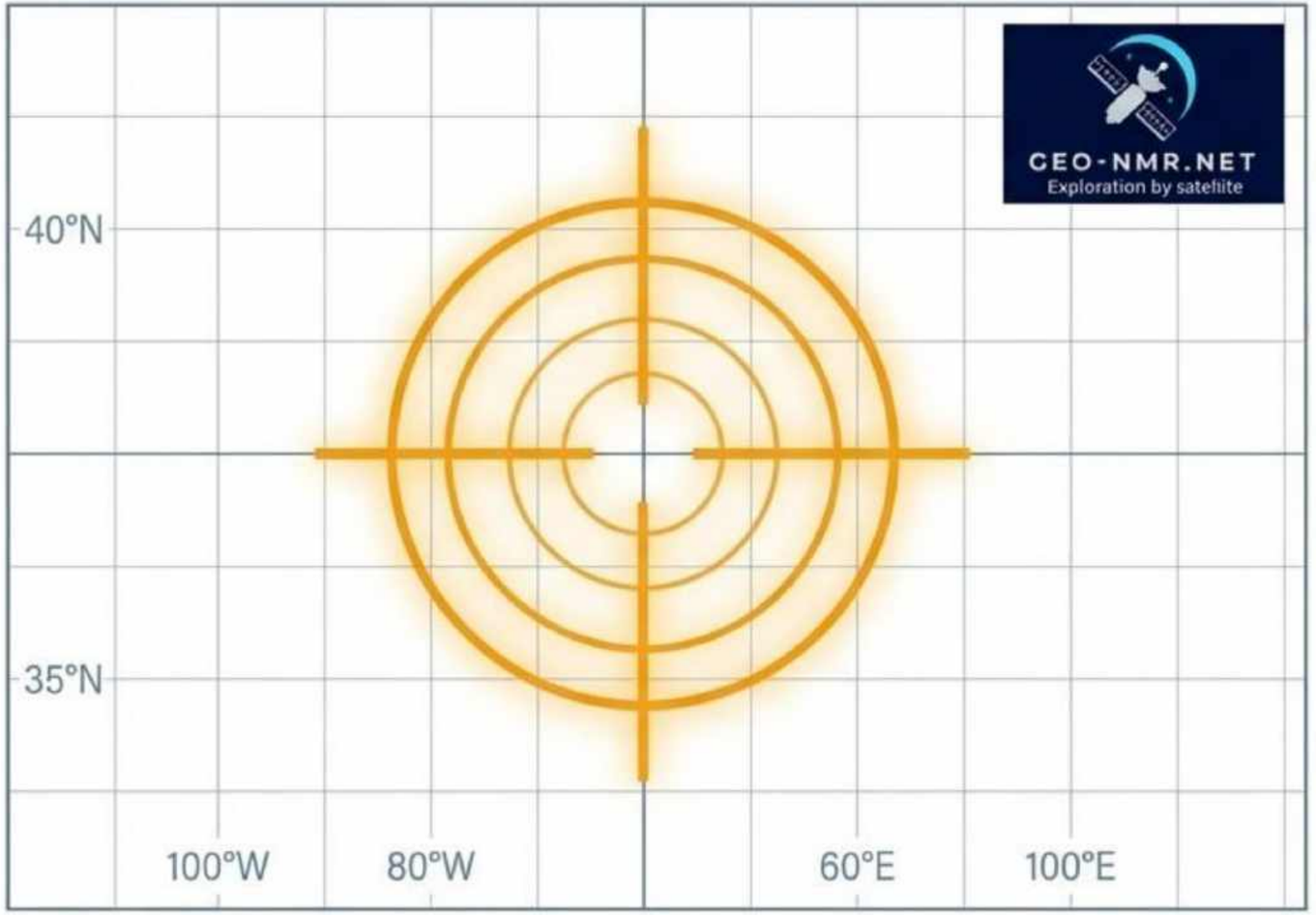
Simulate Your Next Block

Run a stealth RSS-NMR simulation before committing millions.



Simulated target acquisition.

The Challenge:

Classify blocks, rank prospects, and project true CAPEX/OPEX—with absolute anonymity and zero ground footprint.

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