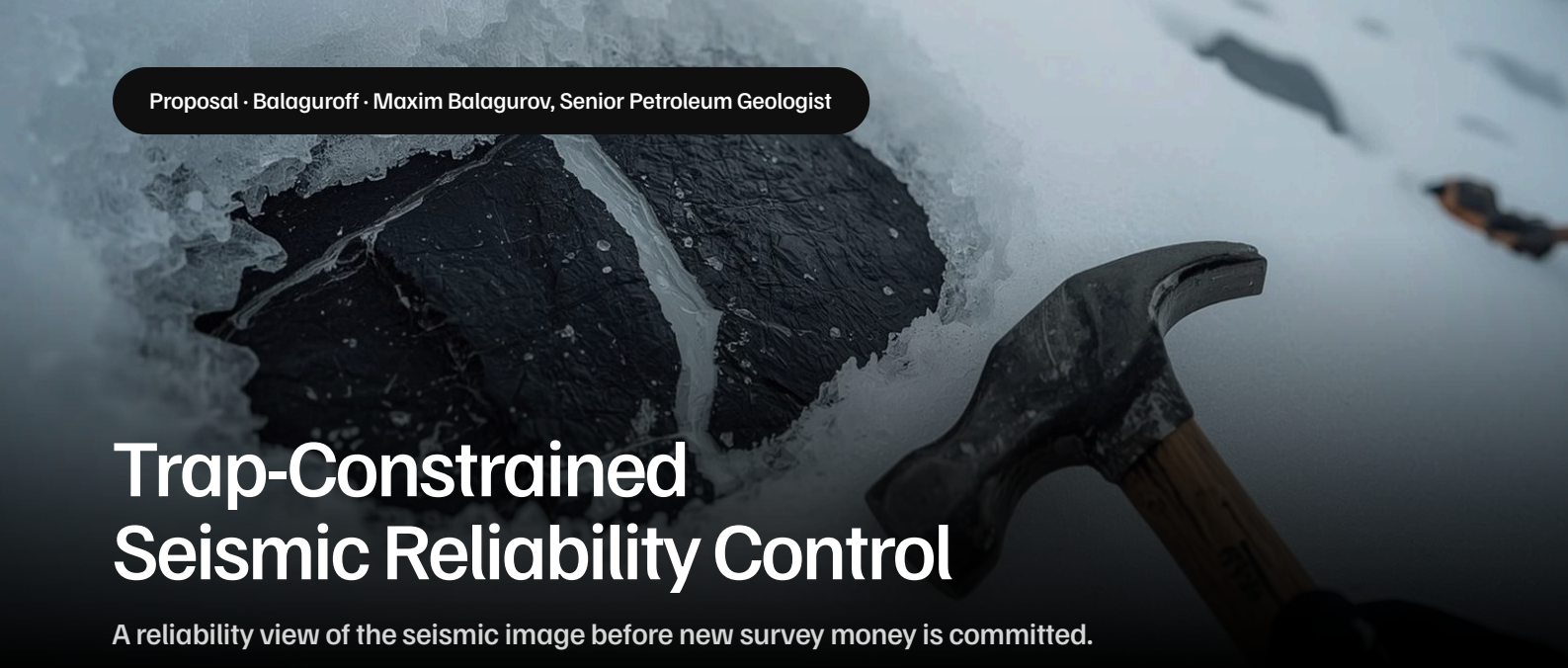


Trap-Constrained Seismic Reliability Control

A reliability view of the seismic image before new survey money is committed.

"Trap" here means igneous traps: sills and other intrusive bodies. It does not refer to hydrocarbon traps.

Your challenge

Igneous bodies and salt distort the seismic response, so a structure can look more certain than it is. A prospect map drawn on that image carries the distortion into the ranking and the well location.

The usual response is to shoot more seismic. Where the problem is physical, a new survey can cost a lot and change little. Before that money is committed, the team needs answers to three questions:

- Where is the seismic image reliable?
- Where is it not?
- Where would new data actually change the decision?

What I propose

A reliability assessment of your seismic image and the structural model built on it. I test the interpretation against independent evidence: gravity-magnetic data, wells and, where the geology is exposed, satellite-imagery interpretation of outcrops and faults tied to field data.

The result is a map of the area by reliability, with the reason for each zone, and a list of the places where new data would change the decision. Survey spending then follows the physics.

Detailed acquisition parameters, processing and field work stay with specialist contractors. Partners are selected for each project.

What this is based on

This is an applied-research approach, offered as a study defined around your block. I lead the geological side. Partner geophysicists, who have their own software and working experience in this area, carry out the gravity-magnetic forward modelling and joint inversion. The approach also draws on:

- Integrated geophysical interpretation of a structurally complex region influenced by salt tectonics and magmatism in Eastern Siberia, published in the IFEDC 2025 proceedings (Springer, 2026), https://doi.org/10.1007/978-981-95-9869-4_83
- North Kara Sea: satellite-imagery interpretation of Arctic island outcrops and faults, integrated with field expedition data, stratigraphic drilling and seismic.
- Seismic inversion, AVO, spectral decomposition and velocity modelling at CGG and Fugro Jason, including salt evolution studies through inversion.
- Experience with carbonate–evaporite platform systems analogous to Permian–Jurassic Gulf plays.

Stages and outputs	Work	Output
1. Framing	Review the area, the decision at stake and the existing data. Locate where igneous bodies or salt overlap the targets.	Short note: what is at risk and whether the study is worth doing
2. Cross-check	Test the seismic structure against well ties and surface geology, and against gravity-magnetic forward modelling and joint inversion run by the partner geophysicists. Record where the datasets agree and where they conflict.	Agreement and conflict table by zone
3. Reliability map	Classify the area by reliability and state the reason for each zone. Show how this affects the structural model and the targets.	Reliability map and list of affected targets
4. Survey recommendation	For each weak zone, test whether new data would change the decision and which type could resolve it: reprocessing, gravity-magnetics, targeted seismic, low-altitude drone magnetics or a stratigraphic well.	Prioritised list of data investments, with reasons

What I need from you

- The decision: the planned survey, well or ranking, and its date.
- Seismic volumes, velocity models and processing reports.
- Well data, including well ties and check-shots where available.
- Gravity-magnetic data.
- The existing structural model and any maps of intrusive bodies or salt.
- Outcrop, field and satellite data, where the area is exposed.
- Interpretation software: your licences, or licences acquired for the project period and included in the project cost.

How to start

Most projects start with a short technical conversation about the data and the decision that has to be made. The best moment is before the scope of the next survey is fixed. No confidential data is needed for this conversation.

Write to maxim@balaguroff.com with the basin, the survey or decision you are planning, and a short list of the data you hold. After that conversation you receive a short written offer with the scope, timetable and fee for each stage. Stage 1 can be ordered on its own. An NDA can be signed before any data is shared, and client data is never shown.

Projects run directly or together with research groups, institutes, industry teams and technology partners, depending on the task.

maxim@balaguroff.com

Maxim Balagurov, senior petroleum geologist with 15+ years in petroleum geoscience (since 2010). Author of 19 publications. Member of EAGE and SPE.