SEAGLASS FOUNDRY

Forged For Speed. Refined by Craft.

DEFENSE · INTELLIGENCE

ForgeGIS™

Mission-Ready Geospatial Compute — Without the GDAL Native Dependency Burden

As of May 2026, the only commercially-supported GPU-accelerated geospatial library with a native MCP server that ships as pure-Java Maven artifacts — no first-party native code, no GDAL native bindings, no separate native install step. 220 operations spanning the working surface of professional GIS analysis. Designed from the start for regulated deployment and AI-agent-driven workflows on the same auditable codebase.

220

user-facing operations

across 11 categories

935 / 935

validation records passing verdict gate

May 2026 run · same-JVM byte-identical re-execution verified

14×–40×

multi-stage pipeline speedup vs. GDAL CLI

commodity laptop · RTX 5070

Built for regulated deployment

ForgeGIS contains no first-party native code and no GDAL native bindings. The runtime is a single shaded Java jar that drops into existing JVM environments — including air-gapped, classified, and ITAR-relevant deployments — without coordinating separate native library distribution, multi-source GLIBC validation, or shared-library signing for ForgeGIS itself. GPU dispatch goes through the JOCL OpenCL bindings, whose JNI bridge ships bundled inside the JOCL jar; the system OpenCL runtime required for GPU access is standard system software bundled with GPU drivers. JDK, GPU driver, and OpenCL runtime all have established procurement paths.

Deterministic across surfaces

The MCP server dispatches to the same compute implementations exposed through the direct Java API — a parameter-marshaling shim, not a parallel implementation. Numerical outputs are verified deterministic across repeated runs in the validation harness, so audit and reproducibility guarantees that scripted workflows depend on remain intact when the same operations are invoked by an AI agent. Adopt agentic workflows incrementally without giving up scripted control where regulations require it.

Validated against the right oracles

JTS for Cartesian predicates and topology. PostGIS for spheroidal computations on the WGS84 ellipsoid. GDAL CLI through a tolerance-tiered framework (bit-exact, floating-point strict, structural-similarity) for raster operations. Analytic numerical fixtures where no external oracle exists. The May 2026 validation run executed 935 records across the 220-operation catalog.

CONTINUED ON REVERSE →

WHO THIS IS FOR

Prime integrators and SI shops

Building geospatial pipelines into operational mission systems. ForgeGIS drops into existing Java services without replatforming on CUDA or pulling in GDAL native bindings. Pure-Java deployment removes the most procurement-painful class of dependencies from your delivery artifact.

Mission systems contractors with regulated-deployment requirements

Air-gapped, classified, ITAR-relevant. A pure-Java Maven distribution with no first-party native code and no GDAL native bindings eliminates the multi-vendor native library coordination that historically dominates deployment cycles in restricted environments. Final license terms are being finalized; organizations with specific licensing requirements are invited to contact directly.

C2, ISR, GEOINT, and analytical platforms

Looking to embed agent-driven geospatial analysis with the deterministic, audit-friendly guarantees regulated mission systems require. The dual-surface architecture lets you ship agentic capability where it adds value and keep deterministic scripted control where the audit posture demands it — same library, same operations, same numerical outputs.

PERFORMANCE HIGHLIGHTS

6.88×

geometric mean across 143 catalog comparison records vs. GDAL CLI

(127 wins of 143; op × scale measurements; methodology in full Technical Brief)

14.46×–39.75×

multi-stage GPU-resident pipelines at 2048²–4096² rasters

(TerrainPipeline, WarpPipeline, AlgebraPipeline)

935 records

May 2026 validation run, full catalog

all reporting verdict-pass against documented oracles

Topological completeness

Spatial Geometry covers the full DE-9IM surface: the 8 OGC SFS named predicates (*Intersects*, *Disjoint*, *Within*, *Contains*, *Equals*, *Touches*, *Crosses*, *Overlaps*), the 3 JTS extensions (*Covers*, *CoveredBy*, *ContainsProperly*), *Relate* for user-supplied DE-9IM mask matching, and the raw 9-character intersection matrix exposed per geometry-type pair — meaning callers can derive any topological relationship a named predicate doesn't express. Validated for parity against JTS on every shipped predicate.

Evaluation and commercial licensing

A 21-page Technical Brief with complete operation catalog, validation methodology, per-category benchmark breakdowns, and architectural deep-dive is available on request. Final license terms are being finalized; organizations with specific licensing requirements are invited to contact directly.

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