D8 – Domain-Side Model Validation and Downstream Demonstration Feedback Report v1

Deliverable Overview

Lead(s)	GFZ
Contributor(s)	
Work Package	WP6.1 (Demonstration of first downstream tasks, regional model)
Stage	Foundation Stage (I)
Duration	PM 3 (07/2024) – PM 12 (04/2025; planned), PM 24 (04/2026; revised)
Dependencies	No direct dependencies
Outcome (Type)	Report
Link	
Status	☐ To be done ☐ In progress ☒ **Completed**

Executive Summary

This deliverable presents the domain-side model validation and downstream demonstration feedback report for the 3D-ABC project. It defines a validation framework for downstream task products, including vegetation height and above-ground carbon stocks for the Amazon region. The report describes validation objectives, reference datasets, statistical metrics, spatial pattern assessment methods, and relevant satellite-derived products for intercomparison. As the 3D-ABC products are still under development, a prototype validation workflow is demonstrated using existing vegetation height and above-ground biomass products.

Results

Deliverable 8 presents progress on the development of a domain-side validation framework for 3D-ABC vegetation height and above-ground carbon stock products. A comprehensive reference and comparison database has been compiled for the Amazon region, including ALS-derived canopy height and biomass estimates, Brazilian NFI data, and published satellite-derived vegetation height and AGB products. Since the 3D-ABC products are not yet available, the framework was prototyped using existing products. The prototype demonstrates how vegetation height and AGB maps can be validated against independent ALS and NFI reference data, including assessments of bias, RMSE, regression performance, and errors across structural and environmental gradients. Spatial pattern preservation was also evaluated using structural similarity metrics. Once available, the 3D-ABC products will be validated using this framework, first over the Amazon and subsequently over the Arctic-Boreal region.