DIGITISATION IN THE SERVICE OF ARCHAEOLOGY – DIGITAL TECHNOLOGIES, GIS AND IMAGING OF RESEARCH PROGRESS AND RESULTS (2023–2025) FROM THE ATICO VALLEY PROJECT, PERU

DIGITAL TECHNOLOGIES PLAY A CRUCIAL ROLE IN CONTEMPORARY ARCHAEOLOGICAL RESEARCH. THEY SUPPORT BOTH EXCAVATION WORK AND THE PROCESSING OF MATERIALS RECOVERED DURING FIELD INVESTIGATIONS. THE INTEGRATION OF SURVEYING INSTRUMENTS, GIS SYSTEMS, PHOTOGRAMMETRY, AND DIGITAL PHOTOGRAPHY ENABLES THE CREATION OF A COHERENT DATABASE AND OPENS NEW PERSPECTIVES FOR RESEARCH, DATA ANALYSIS, AND PUBLICATION.

FIELDWORK AND GEODETIC MEASUREMENTS

DURING FIELDWORK, PRECISION SURVEYING INSTRUMENTS ARE OF FUNDAMENTAL IMPORTANCE:

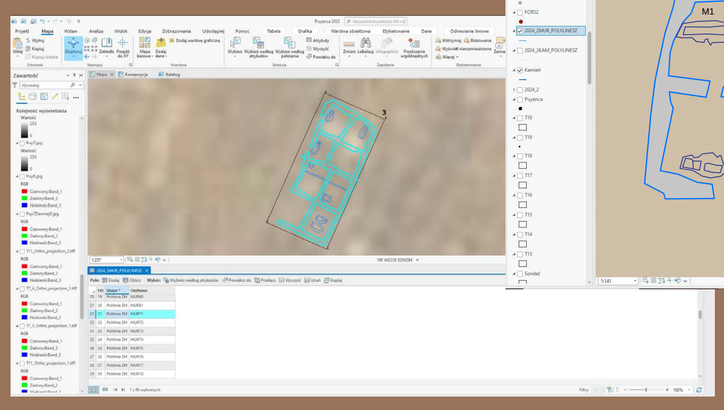
- MOTORIZED TOTAL STATIONS AND GPS RTK (BASE–ROVER) – ALLOW FOR THREE-DIMENSIONAL MEASUREMENTS, ESTABLISHMENT OF CONTROL NETWORKS, AND STABILIZATION OF REFERENCE POINTS.
- THE DATA COLLECTED IN THIS WAY FORMS A SPATIAL DATABASE OF ARTIFACTS, WHICH – ONCE INTEGRATED INTO GIS SYSTEMS – BECOMES THE FOUNDATION FOR DOCUMENTATION AND SPATIAL ANALYSIS.

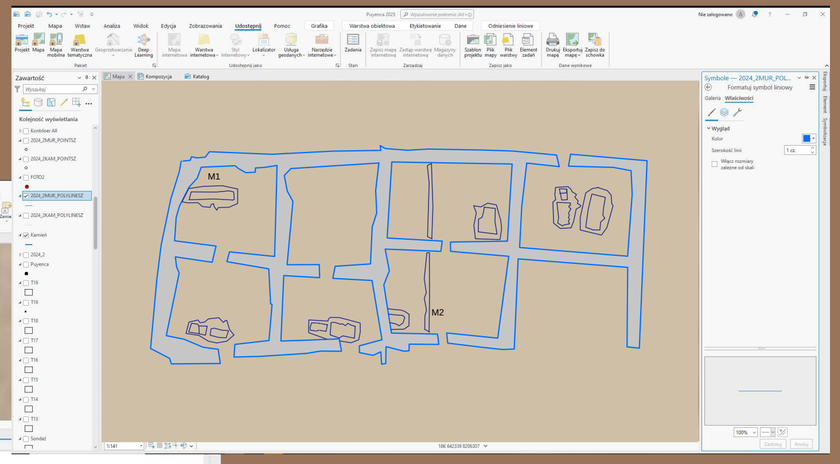
Figures: Total station and GPS RTK measurements (establishing and stabilizing control points).

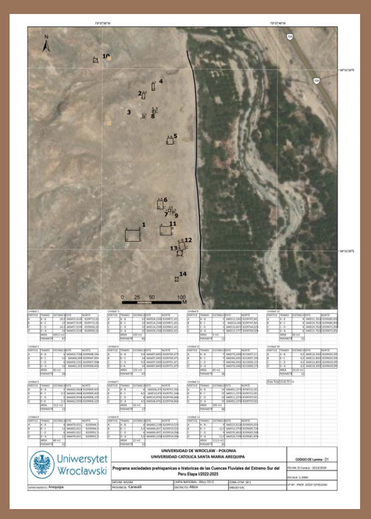
GIS SYSTEMS

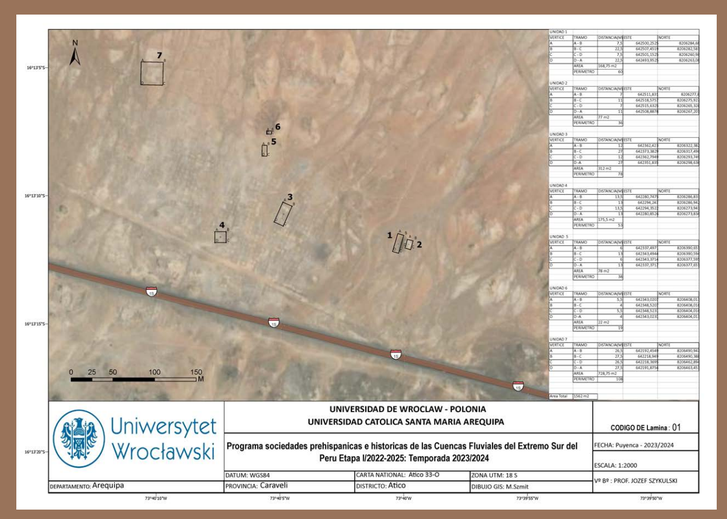
GIS SOFTWARE (E.G., ARCGIS PRO, AUTOCAD) ENABLES:

- COLLECTION AND VISUALIZATION OF SURVEY DATA,
- CREATION OF MAPS AND ORTHOPHOTOS,
- GENERATION OF STATISTICS AND RELATIONAL METADATA DATABASES,
- VERIFICATION AND CROSS-CHECKING OF RESULTS.







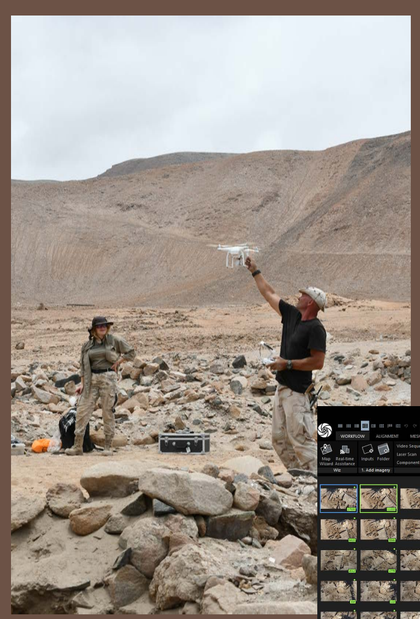


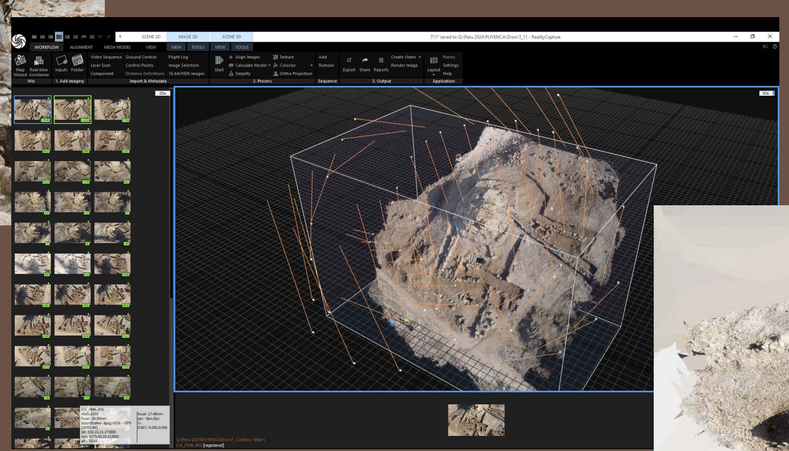
Figures: Survey data in GIS and maps of archaeological sites

AERIAL PHOTOGRAPHY AND PHOTOGRAMMETRY

AERIAL PHOTOGRAPHY (UAV/DRONE) PROVIDES A TOOL FOR DOCUMENTATION AND CONTROL OF SURVEY DATA. IT ENABLES THE CREATION OF:

- 3D MODELS OF EXCAVATION SITES,
- ORTHOPHOTOS,
- PHOTOGRAMMETRIC 3D VOLUMES FOR LARGE-SCALE VISUAL ANALYSIS.





Figures: Aerial photography, 3D models, and orthophotogrammetric plans.

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PHOTOGRAPHIC RECORDING OF ARTIFACTS

HIGH-RESOLUTION DIGITAL PHOTOGRAPHY, CARRIED OUT UNDER CONTROLLED STUDIO CONDITIONS, ENSURES FAITHFUL REPRESENTATION OF ARCHAEOLOGICAL ARTIFACTS. BY APPLYING DIGITIZATION STANDARDS (LIGHT CONTROL, COLOR MANAGEMENT, RAW FILES WITH EXIF METADATA), IT IS POSSIBLE TO OBTAIN:

- ACCURATE DIGITAL IMAGES OF OBJECTS,
- ARCHIVAL MATERIAL OF DOCUMENTARY AND RESEARCH VALUE.

Figures: Studio setup, controlled conditions, and 2D recording of artifacts.

Figures: Examples of artifacts from excavation work

DIGITAL TECHNOLOGIES – FROM GEODESY AND GIS TO PHOTOGRAMMETRY AND DIGITAL PHOTOGRAPHY – ALLOW FOR:

- INTEGRATION OF SPATIAL AND VISUAL DATA,
- DEEPER UNDERSTANDING OF CULTURAL PROCESSES,
- EFFICIENT DISSEMINATION OF RESEARCH RESULTS.

THE ATICO VALLEY PROJECT ILLUSTRATES THE SYNERGY BETWEEN ARCHAEOLOGY AND MODERN DIGITAL TOOLS, OPENING NEW POSSIBILITIES FOR THE ANALYSIS AND PRESENTATION OF ARCHAEOLOGICAL HERITAGE.

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