Geomorphology and Archaeology: Case Studies from Western New York

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Geomorphology and Archaeology: Case Studies from Western New York
Closely Related Considerations:

1) Wetlands Testing
2) Geomorphology
   a) lowland, alluvial
   b) Upland
3) Deep Testing

Definitions:
NYAC, SHPO, NYSM, DEC, USDA
A Definition for Geomorphology: The branch of geology that studies characteristics, origins and development of landforms.
A Definition for Wetlands: Land areas with permanent or seasonal saturation that dominates the nature of:

1) soil development
2) plant types
3) animal types

that reside there
Problems and Potential: Diversity of the Landscape
For Each Case Study:
1) Location
2) Setting
3) Project type/stage
4) Field Methods
5) Results
6) Relevance/Lessons for...
   a) Wetlands testing
   b) Geomorphology
   c) Deep Testing
   d) Developing ‘Standards’
Case Study 1: Deep Testing
Dorothy Scott 1 Site (UB 3640)
1) Town of Concord, Erie County
2) Upland Setting
3) Phase 3 Data Recovery
4) 63 square meters excavated

-TU dug 80-120 cm bgs

Questions: Is this deep testing? Should there be Geomorph? In this setting...yes! and yes?
Scott 1 site (A02910.000065, NYSM 11338, UB 3640), facing northwest at site’s location on a well-drained knoll. Photo taken during Phase 2 excavations in 2003
Scott 1 site (A02910.000065, NYSM 11338, UB 3640) typical test unit wall profile
Scott 1 site (NYSM 11338, UB 3640) View of Feature 1 taken when first identified during the Phase 2 (left) and again during Phase 3 (right)
Scott 1 site (NYSM 11338, UB 3640) View facing north at Feature 1 showing profile

Scott 1 site (NYSM 11338, UB 3640) View facing northeast at Feature 1 showing profile
Scott 1 site (NYSM 11338, UB 3640), facing north at Feature 13 in north wall.

Scott 1 site (NYSM 11338, UB 3640), facing west at Feature 13 in north wall of TU 169.
Dorothy Scott 1 site projectile points, bifaces and selected utilized flakes
Distribution of plowzone artifacts from Phase 2 and 3 test unit excavations
Distribution of subsoil artifacts from Phase 2 and 3 test unit excavations
5) Results:
- Artifacts in plowzone as expected
- Also upper B-horizon as expected
* Artifacts clustered 50-60 cm bgs deeper in B-horizon subsoil (Not in features)

6) Relevance/Lessons for...
   a) Geomorphology - NO formal study conducted!
   b) Deep Testing - necessary here!
   c) Developing ‘Standards’ - Lessons Learned!
Case Study 2: Deep Testing/Geomorphology

Nine Mile Road Site (UB 2993)

1) Town of Allegany, Cattaraugus County
2) Lowland Setting - Allegheny River Bank
3) Phase 3 Data Recovery
4) ?? square meters excavated, Trenches

-TU dug 200-250 cm bgs
Location of the Ninemile Road site (A00934.000044, NYSM 10722, UB 2993) on 1961 Knapp Creek, NY USGS 7.5 Minute Series Quadrangle. Note the locations of Birch Run to the south of the site and Ninemile Creek on the opposite side of the river.
General view of Trench 2 during Phase 3 excavations of Ninemile Road site, facing northeast
General view of Trench 3 during Phase 3 excavations
General view of the location of Trench 4, facing southwest from the Cotton Road bridge over the Allegheny River
Ninemile Road site, Phase 3, Trench 2, TUs 2 and 3, Feature 2 plan view, facing south
Ninemile Road site, Phase 3, Trench 2, TUs 2 and 3, Feature 2 profile, facing west showing fire cracked rock cobbles in feature fill
Ninemile Road site, Phase 3, Trench 4, TU 24, Features 11A and 11B plan view, facing north. Note the ceramic sherds and the base of an early Late Woodland period Levanna projectile point.
5) Results:
- Artifacts in plowzone as expected
- Features in upper B-horizon on stable landform
*Artifacts and features stratified in A/B-horizon soil column to great depth, with C-horizon stream gravel/sand beneath

6) Relevance/Lessons for...
   a) Geomorphology - Formal study conducted!
   b) Deep Testing - necessary here!
   c) Developing ‘Standards’ - Lessons Learned!
Case Study 3: Deep Testing/Geomorphology
15 Mile Post Site (UB 309)
1) Town of Wheatfield, Niagara County
2) Lowland Setting – Niagara River tributary
3) Phase 3 Data Recovery
4) 20+ square meters excavated, Trenches

-TU dug 100-150 cm bgs

Question: Is this deep enough? In this setting, Geomorphology says yes!
5) Results:
- Artifacts in 2 buried A-horizons
- No Features in A or B-horizons
- Unstable landform?

*Artifacts in buried A-horizon at great depth, with C-horizon clay/cobble washed surface at base = dramatic erosion event

6) Relevance/Lessons for...
   a) Geomorphology - Formal study conducted!
   b) Deep Testing - necessary here with clear base
   c) Developing ‘Standards’ - Lessons Learned?
Case Study 4: Wetlands Margin Testing
US 219 Obenauer Site Cluster

1) Town of Ellicottville, Cattaraugus County
2) Lowland Setting - Mansfield/Great Valley Creek Headwatersara River tributary
3) Phase 1-2, Recon. and Site Exam
4) Few square meters excavated, TU only

-TU dug 50-60 cm bgs = hard clay sub

Question: Is this deep enough? Not sure
No Geomorphology
Figure 5. Location of Phase 2 Site Examinations in PIN 5101.53.121 Wetlands Mitigation Project Area shown on 1964 Ellicottville, New York USGS 7.5 Minute Series Quadrangle.
Photo 33. Obenaue 3 site (NYSM 11351, UB 3853), Phase 2, Test Unit 33 east wall profile.

Figure 46. Obenaue 3 site (NYSM 11351, UB 3853) Phase 2, Test Unit 33 east wall profile.
5) Results:

6) Relevance/Lessons for...
   a) Geomorphology - No Formal study conducted!
   b) Deep Testing - Difficult here!
   c) Developing ‘Standards’ - Lessons Learned = Wetland margins are sensitive for small sites
Questions for Consideration:

1) What is the role of Geomorph. in CRM
   a) Phase 1-3
   b) Project size/scope
   c) Qualifications

2) Is there a need for a Geomorph. Policy?
   a) Based on data, not assumptions
   b) Criteria that can be met
Needs:

1) More case studies/info from across NY
2) Examples of productive wetlands testing
   a) NYAC membership
   b) NYSOPRHP
   c) Universities and CRM companies
3) Examples of productive Geomorphology
   a) b) c)
4) Deep Testing
5) Case Studies of Unproductive Testing?