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Geomorphology Intern Final Report, 1999

Eastern Korinthia Archaeological Survey

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At all stages of the season the field director and team leaders were very willing to adapt to the new types of demands that the geomorphology component made on the field aspects of the survey. It worked, success! We hashed out a lot of the nitty gritty details this season as the idea of the geomorphology and archaeology interface became an actuality in the field. The following report is a combination of comments on this past season and suggestions for future seasons.

Communication in the field

As GIs we needed to communicate with Tom, Andrew, Carol, Jay and each other frequently. The assignment of one GI to each team allowed us to define our different mapping responsibilities and also enabled us to develop solid field relationships with the individual team leaders. We often functioned as go-betweens in the field for Tom, Andrew and Carol. During our roving, we tried to anticipate when the teams would need to consult about the GU/DU boundaries and returned to the teams often. While frequent checking-in worked well, walkie talkies might have made the process more efficient.

Geomorphology intern role

The roles and interactions among the GIs, the field director and the team leaders need to be more clearly defined to improve and expedite decision making in the field. It makes sense to use the GIs as scouts and messengers, since we are in constant communication with the field director, the team leaders and each other. The team leaders should also be communicating with one another (along with the Tom and others) about issues such as the location, direction and boundary of their teams' transects. At times we were put in positions in which we felt we were asked to speak for a team leader, for Tom or for Jay. Is this appropriate? If so, this component of the GI role needs to be made explicit. On the flip side we were sometimes left out of the loop when information, decisions and questions did not reach both GIs. Since both GIs are roving in the area, one might have insight to something that the other does not. This communication can be difficult since many discussions happen informally during meal times or quickly in the field.

We found it useful and important to stay in close contact with each other in all stages. We discussed the big picture with the aerials and topo maps, compared field notes, and made sure that our GU boundaries made sense in light of the other GI's work. In addition, it was useful to bounce ideas off each other: looking at the field area together helped us interpret it better, and a second opinion enabled us to make our decisions more confidently. Perhaps in upcoming seasons the GIs can do more scouting of the geomorphology together in the afternoon field times. It was good to go out to the field with Jay to talk about the big picture, and very helpful to ask specific questions about tricky areas before they were surveyed. Having discussed the areas

with Jay we were then better able to work with the field director and the team leaders to come to a solution for how to survey the area (we'd be more likely to hold our ground).

Afternoon Field Time

This season, afternoon field time was in a constant process of metamorphosis as we struggled to make best use of this time. It was very helpful for GIs to have a few afternoons a week for uninterrupted independent scouting. However, given a limited number of vehicles, afternoons were always much to short to do much (1.5 hours in the field maximum). Going out twice a week with team leaders worked well, but it was a challenge to juggle different agendas. It is important to discuss boundaries with team leaders during this time so as to not lose survey time, always staying well in advance of the team's progress. However, to do this, the GIs must be able to scout far ahead of the team in preparation. All too often this season, GIs found teams on their heels. A balance during this time period needs to be reached because while the GIs and team leaders need to work together they also need to take care of individual tasks. The GIs do not need to be present for measuring and laying out the DUs within a big GUs. The GIs could use the time to explore further to understand where the geomorphic boundaries lie before discussing them to the team leaders. In reality the teams did not have enough time to lay out all their DUs in the afternoons. And if it is expected that the units are laid out we need to modify the current system.

We have a suggestion for an approach to clarify boundaries and better coordinate the mapping and digitizing of the DUs and GUs: GIs could daily provide the team leaders with reference copy of the GUs. Each GI (with the aid of a range finder) would make a tentative GU map that would be drawn on a separate print-out and used as a guide by the team leader. As DUs are mapped and the GU boundaries become more clear, the GI will update the team leader's GU map. It makes most sense for these lines to be drawn by hand to avoid constant digitizing and multiple print-outs.

The team leader could use this map as a basis for orientation and mapping DUs, streamlining the mapping process in the field. At the same time, this system would reduce confusion when plotting both types of units on the GIS. On this map the GI might also label the morphostrat unit in plain language to give the survey teams a better idea of what is happening geomorphologically on a larger scale. With the GU boundaries labeled on a map the team leaders will have a hard copy for reference in the field as they come across GU boundaries. This would not replace the frequent in-the-field communication between team leader and GI but it will enable some questions to be answered in situations when the GI is not close by. For such a system to work, the GI must remain well ahead of the survey teams and have ample independent scouting time several afternoons a week.

GU operational definition

The operational definition of a GU still needs to be more explicit. It needs to be clear that the GUs are not sub-sections of a geomorphic map. As we understand it the boundaries between units are divisions that primarily consider the effect of the natural and human processes on artifact movement and location with respect to the needs of the archaeological survey. Where the geomorphic distinctions are more critical, the GU boundaries are less negotiable. In cases where GU placement is incompatible with field boundaries, the teams record subtract data in lieu

of splitting the field into smaller DUs. It would be very helpful for next year to clearly lay out the protocols for crossing a GU boundary. What are the standards and procedures for collecting and processing subtract data? What is the flexibility of the GU boundary? When do we make the GU conform to the DU? When do we hold tight to the GU boundary and have the team leader make the decision whether or not to conform the DU to the GU? What are the criteria for taking pass counts, recording the tracts of different walkers lines, or crossing the GU boundary?

Suggestions

-Just as the GIs try to keep the teams current with the geomorphology of the area, it would be helpful if there could be a play-by-play reports of sort for the finds. This does not need to be done on a field by field basis but perhaps at the end of the day. Hopefully this would promote more conversation and exchange instead of just collecting data and reporting it to one another. Our capacity to make observations in the field will be improved if we can draw on each others insights/thoughts.

- It would be helpful for the GIs to receive two print-outs of the aerial photos, one to plot the GU boundaries and another to mark with the geomorphic boundaries, in order to compare Jay's lines to what we see in the field.

-If the 1:5000 topo maps of the survey area were digitized, we could print the contour lines on the aerial photographs. This would greatly enhance the mapping procedure and the ultimate compatibility with the geomorhphic maps. If Jay's geomorphic map needs to be digitized eventually then it makes sense to digitize it now (if only bit by bit as the survey needs). If this is not possible, it would be useful to photocopy that part of the topo map which is being surveyed. A single sheet could easily be carried in the field.

- We might show the team leaders Jay's geomorphic maps so they too get a sense of the big picture. Perhaps this might communicate the abundance and the significance of the geomorphic boundaries and explain why we make such a fuss over a change in slope or soil color.

- We could easily set up a system for taking down flagging in the field once it is no longer needed.

- It makes sense to digitize the DUs and GUs one after the other (with respect to each other). Could we just copy the theme onto a disk and work off of it? Although digitizing them separately might serve as a good check, it might also save time to input one once the other is already digitized.

-It would be great to find a way to reduce wasted time in the afternoon. There is a lot of preparation work that needs to be done but cannot be done at Isthmia due to limitations in the computer availability for GIS work and also the fact that the aerials, the stereoscope and Jay's maps live in Ancient Korinth. Perhaps the GIs could go back to AK so we can rest and stay out in the field in the later evening? (4:30-7:30 or thereabouts)

-The numbering system worked well assigning a set to each GI (G1000s and G2000s). Might it become confusing later in the survey with the DU numbering system, the only distinction being a G prefix?

Equipment wish list

-plastic sheets for the actual aerial photographs so that we may bring them out into the field and/or better print-outs of the aerial photographs and ability to print out our own (the team leaders may also find reference to the originals helpful for plotting DUs)
-vehicle (vespas or bikes even!)
-range finder(s)
-walkie talkies to communicate with each other and with the team leaders
-geomorph flagging tape that is a different color from the flags used by the processing and walking teams (we prefer flagging tape to flags)
-better computer and GIS inputting availability (perhaps this could be done with reworking the inputting time)

Summary of Geomorphology Intern Activities for 1999

Week 1
The survey began at the base of Mount Oneion along Corinth Fault, southeast of Xilokeriza. A series of lobe-shaped alluvial fans are separated by deep gullies that originate from gorges cutting through the limestone cliffs above and to the south. The fans are indicative of alluvial processes (driven by water flow) whereas colluvial processes (driven by gravity) would have a sheet-like linear form. The slopes have a high concentration of limestone gravel.

The area is depositional rather than erosional. From the shallow depth and vegetation on the side walls we see that the deeper gullies are not actively incising. In addition, sediment is accumulating so quickly that soils have little time to form. Soils of the units we examined are poorly developed and lack the calcium carbonate which accumulates with time in this climatic region. Although all of the features are Holocene in age, dating to the last 11,000 years, the lobes themselves have a relative chronology. Since the newer lobes are deposited on top the older ones, perhaps more artifacts can be expected on the older lobes whereas artifacts might be buried underneath the younger lobes. It will be interesting to compare artifact density with alluvial fan age.

The interface between the geomorphs and the team went well this week. There have been some frustrations in plotting units on older aerial photographs that do not mark many recent features such as roads and field boundaries. Closely measuring both DU's and the geomorph units has proved useful. Since geomorphology units need not be limited by changes in land use, they can be bigger. This will enable a number of DU's to fit within one geomorph unit and give the team leaders more flexibility in transect layout.

Week 2
As we continued to move north this week, we descended to flatter areas at the toes of alluvial fan lobes and moved into an active floodplain. Water and sediment are transported from the west and southwest, draining near Kenchreai. Very fine reddish clayey sediments accumulate in this valley, washed in from marine terraces to the north and alluvial fans to the south as well as from upstream. We found two channels in our field area, apparently a main and a tributary channel.

The new geomorphologic setting this week brought about much discussion and a change in procedure. River terrace sequences record changing depositional and erosional processes over time due to both natural and anthropogenic factors (sea level, climate, agriculture, etc.). Because different terraces are formed at different times, artifact distributions and ages on them are expected to differ. Thus, they are very important for deciphering changes in the river and human land use over time. Yet these geomorphological features are narrow and often much smaller than would be practical for DU's. Keeping in mind the time constraints of the survey, the group agreed to modify contraints on DU's. Formerly, a single DU could not include several geomorph units. Now, a DU can contain different geomorph units and cross their boundaries if artifact density data can be teased out in other ways (a record of which

walkers pass where or artifact count subtotals within the DU). A few well situated DU's will conform to geomorphological boundaries, allowing for extrapolation across many other units. In addition, because no artifacts are moved in the course of the survey, it will be possible to return to problematic or interesting areas in future seasons if needed.

Following survey in the active floodplain, the teams began to move up onto the gentle slope leading up Rachi Boska.

Week 3 (July 19-25)

During the third week of the survey, survey teams moved uphill onto rockier, steeper colluvial deposits and out of the last of the floodplain deposits. A topic of much discussion was a long linear feature which is well-defined on aerial photographs. This 20 to 25 m wide feature crosses the field area from NW to SE and continues beyond on either side. It is defined by changes in soil color and topography: it is generally a flat area cut into the hillslope and exposes the whiter, more calcium carbonate rich subsurface soil. Whereas the feature is easily picked out on aerial photographs, its boundaries on the ground are often less clearly defined. However, the archaeologists agreed to survey it separately from the surroundings and we are labeling it as a separate feature geomorphologically.

Another area of note lay just south of the top of Rachi Boska, where a shallow drainage has been filled with soil to create a level field. This fill is much whiter and rockier than the surrounding soil but is identical to that on top of Rachi Boska. Geomorphological suspicions were confirmed when we were told that the source of the fill is a bulldozed cut on the top of Rachi Boska and that it happened very recently. As anticipated, artifacts counts and dating are similar to those from where the soil came. This is an excellent example of the need to consider the soils and geomorphology of an area during survey and to be aware of the context of finds. While artifact locations alone would indicate a focus of activity at the base of Rachi Boska in addition to the top, this is only an illusion created by modern anthropogenic soil transport. When processes are older or less well defined, it is equally important to be aware of the forces that have acted on artifacts.

Week 4 (July 26-29)

The fourth week of the survey started on the top of Rachi Boska and moved down the terraced slopes to the north, into the floodplain below and up the next slope towards the Ayios Dimitrios and Kromnia ridges. Pliocene marine bedrock is exposed on the northern edge of the rachi. The north slope of Rachi Boska contains terraces of different ages and conditions, some of which are cut into bedrock. It possible that the upper parts of the slope have been quarried. The terraces vary in width and perhaps some of the broader treads were built by cutting upslope and filling downslope. We divided the slope into different geomorphic units from east to west according to changes in aspect, accounting for differences in fall line and potentially in artifact movement.

The colluvium from the rachi extends across the asphalt road into the Perdikaria area where it quickly reaches an eastward sloping floodplain. A large pit dug near a garbage dump nicely demonstrates the active depositional nature of the floodplain and its extensive fine red clayey

deposits. On the north side of the floodplain is a long high terrace running parallel to the floodplain. This linear feature was not formed by natural processes and it is supported by a wall containing large stone blocks. The riser and the very flat tread above it are continuous across and beyond the survey area although the amount and size of the stones in the wall vary. The slope upward toward Kromnia Ridge transitions from alluvium to colluvium and contains many terraces with small risers and very broad treads. The survey swath up Ayios Dimitrios, in contrast, rises steeply up to marine terrace cliffs.