

INSIGHTS INTO EVA DESIGN: COMPARISONS WITH FIELD WORK AT McCARTYS FLOW, NM



JE Bleacher, WB Garry



INTRODUCTION

- OSEWG Surface Scenarios Working Group examining:
 - 1) Science at an outpost
 - 2) Science at an outpost + sorties
- Thus far OSEWG and Cx have conducted scenario studies for:
 - Tsiolkovskiy & Alphonsus Craters
 - South Pole Aitken Basin
 - Marius Hills
 - Nectaris Basin
 - Olivine Hill
 - Aristarchus Plateau
 - Shackleton Rim
 - Independent studies
- Task: Identify site-specific surface science objectives, then design a site exploration strategy
- Results presented to OSEWG members
- Recommendations, discussion, reanalysis
- Conducted by lunar scientists, planetary mappers, and field geologists

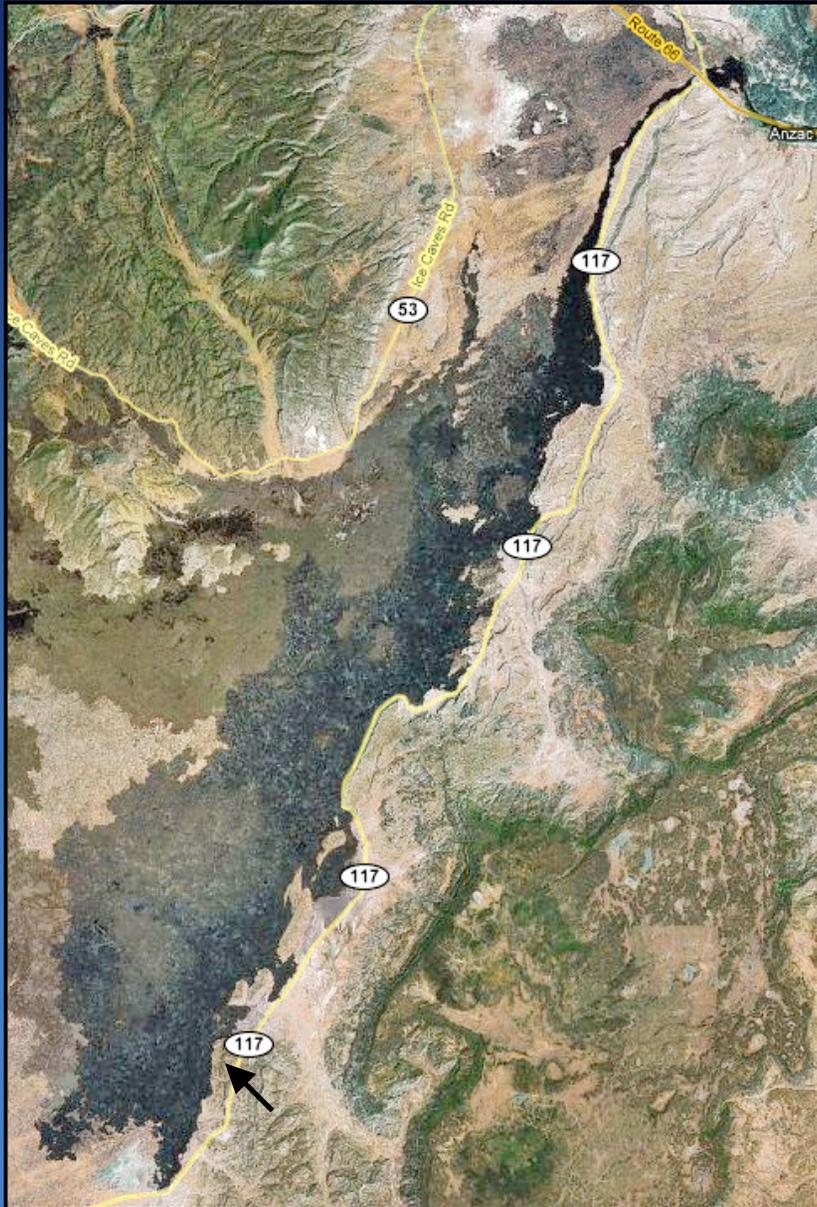
TRAVERSE DESIGN

- **Requires experience with:**
 - **Mapping (recon)**
 - **Science/Mission operations**
 - **Field science**



- **Attempting to demonstrate how field geologists maximize science**
- **Inherent to field scientists, but not always easy to explain**
- **Increasing field experience**

PROJECT OVERVIEW



Project Objectives

- Understand sheet flow processes
- Characterize development
 - Local unit relationships
 - Remote sensing
- Field work: McCartys





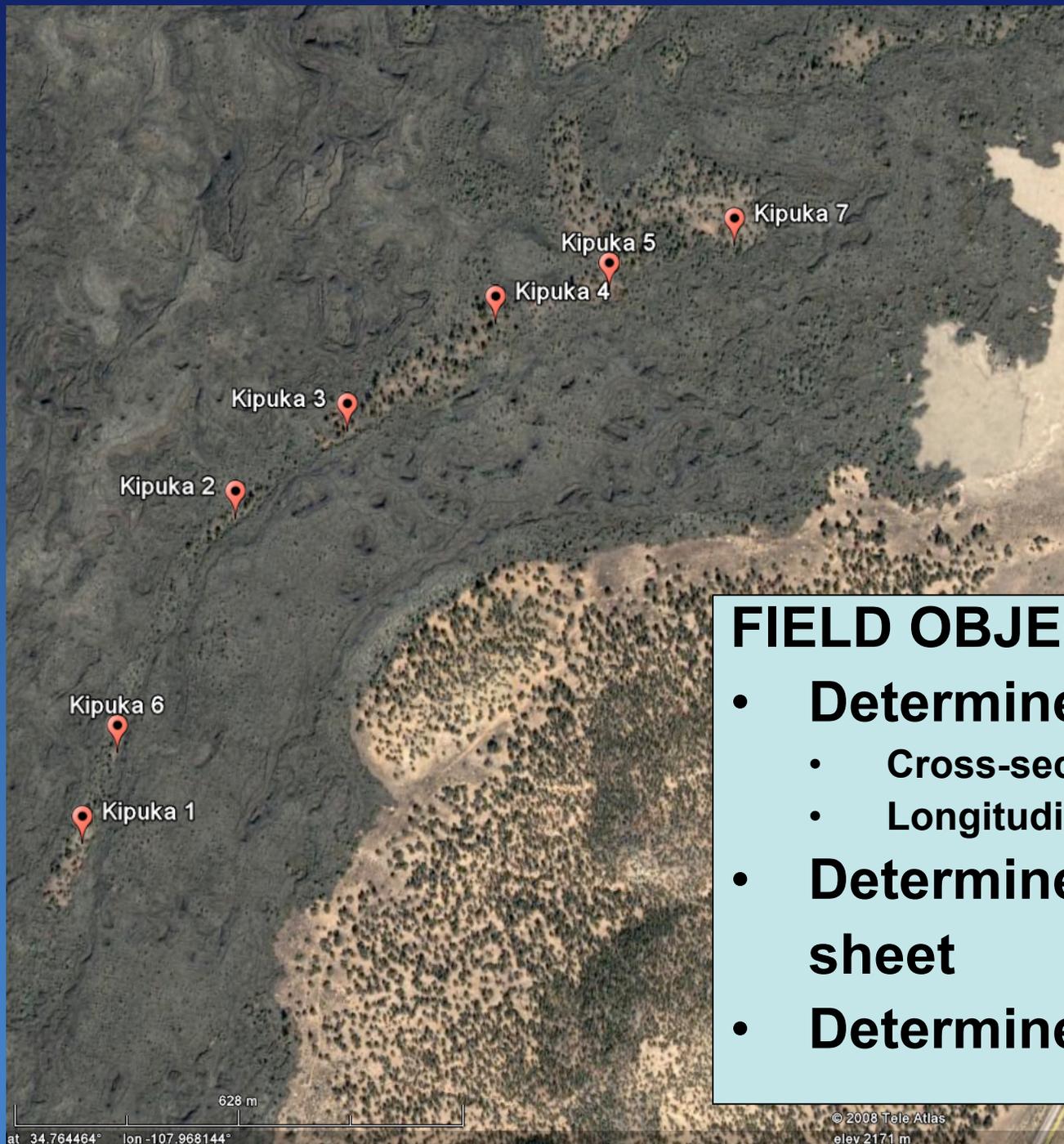
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FIELD OBJECTIVES (9-23-08)

- Determine lobe thickness
- Determine pit depth within sheet
- Determine flow direction

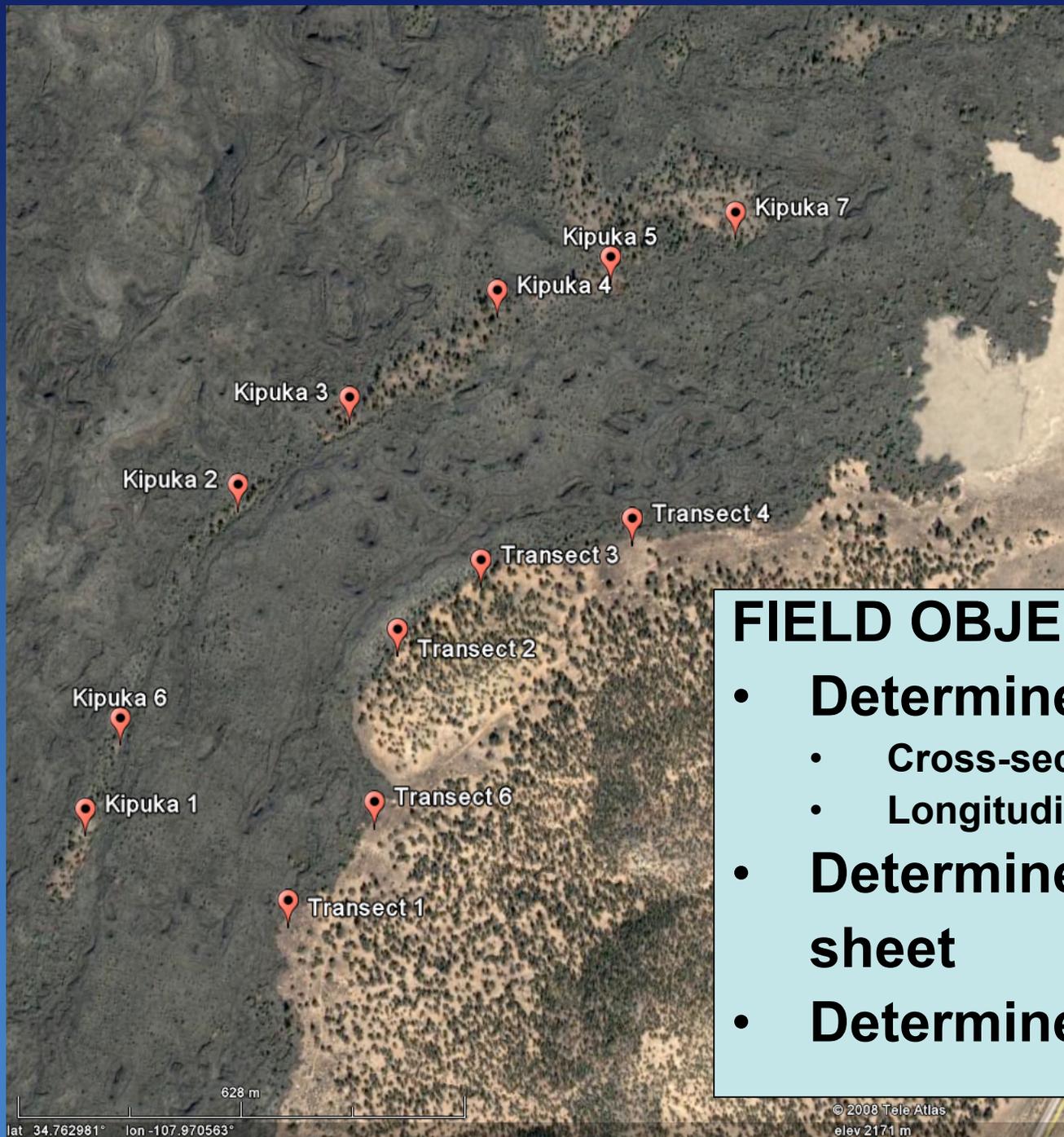
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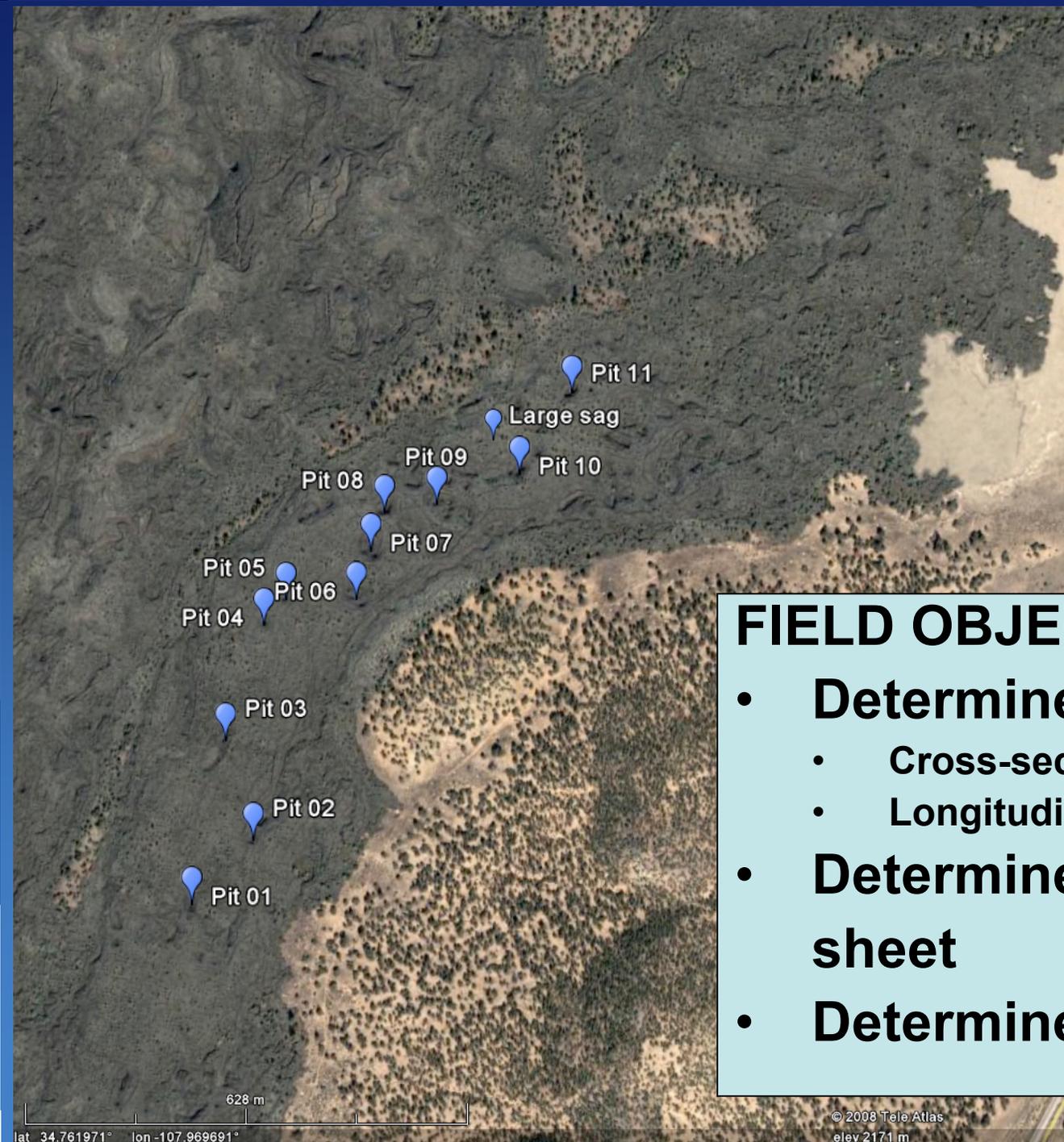
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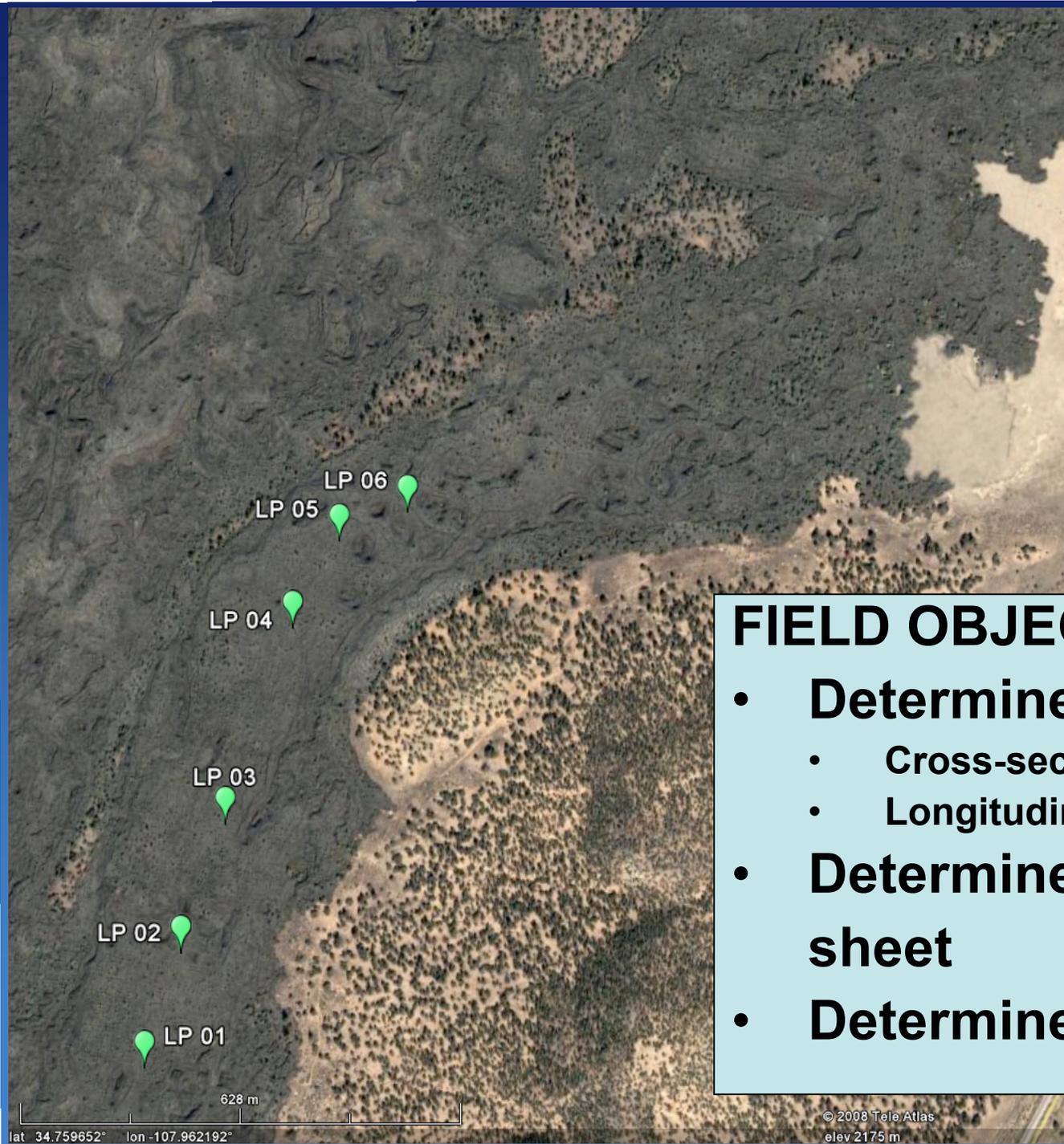
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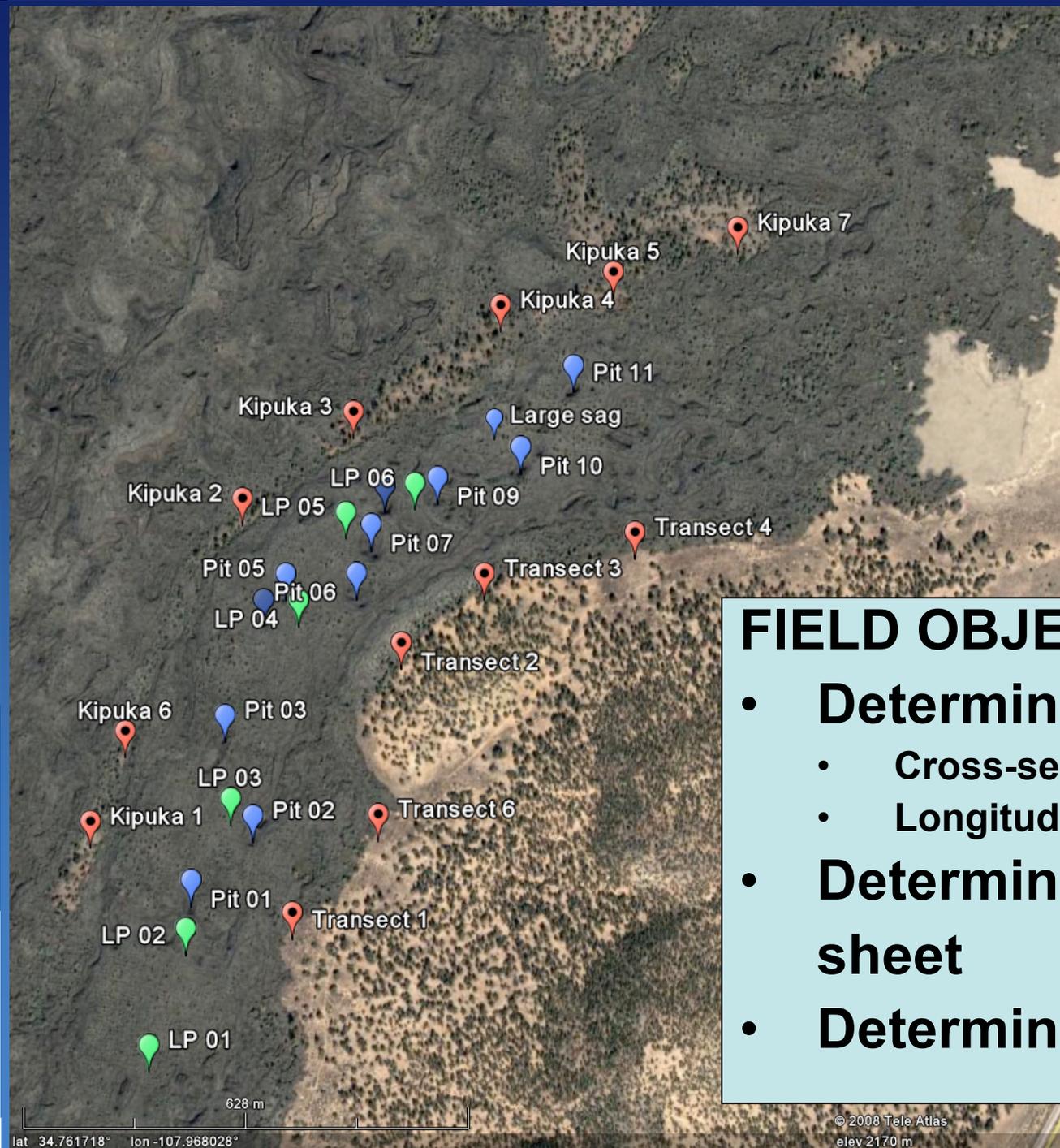
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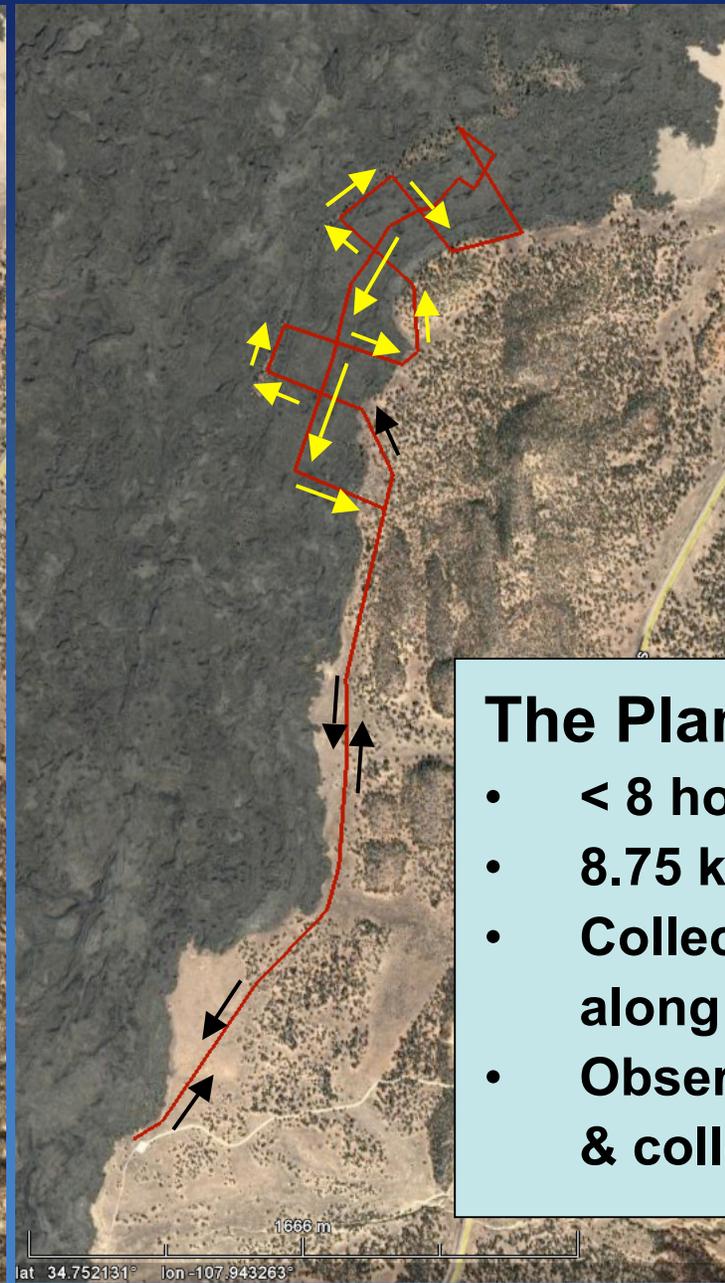
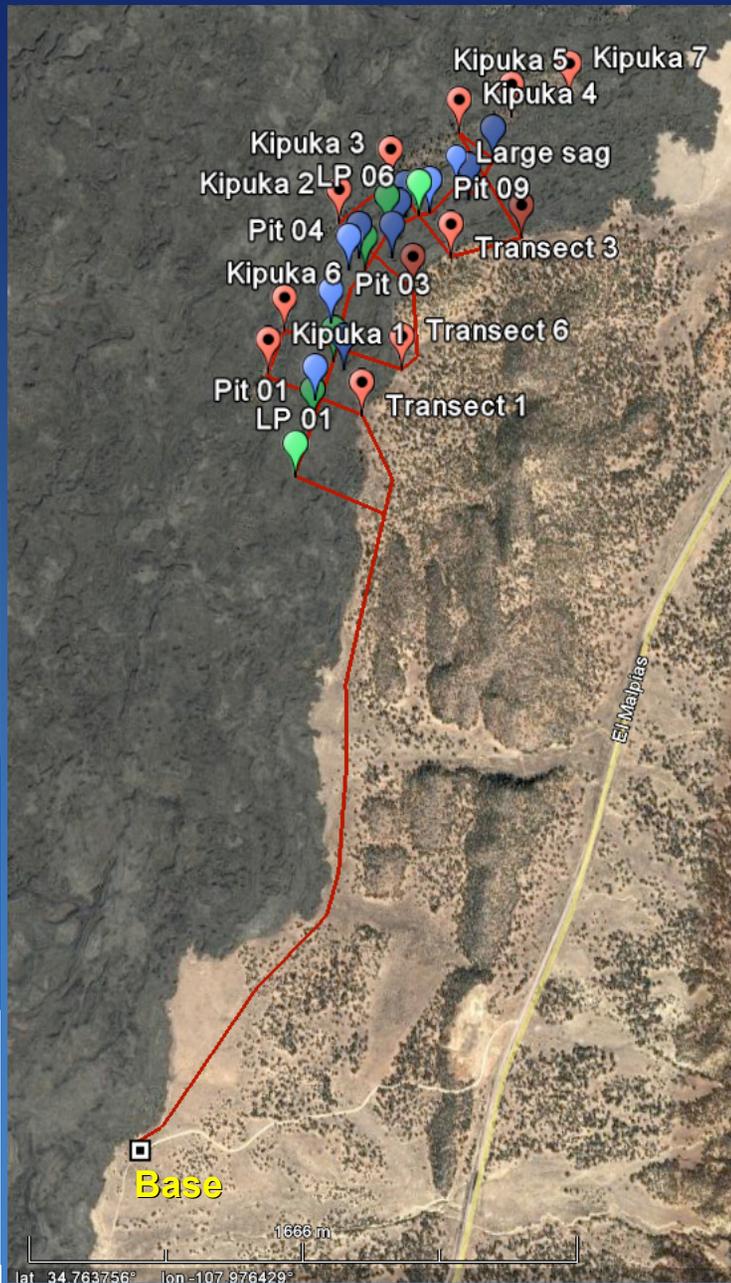


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- The Plan:**
- < 8 hours “EVA”
 - 8.75 km (5.4 miles)
 - Collect DGPS data along traverse
 - Observe flow textures & collect samples

Garry



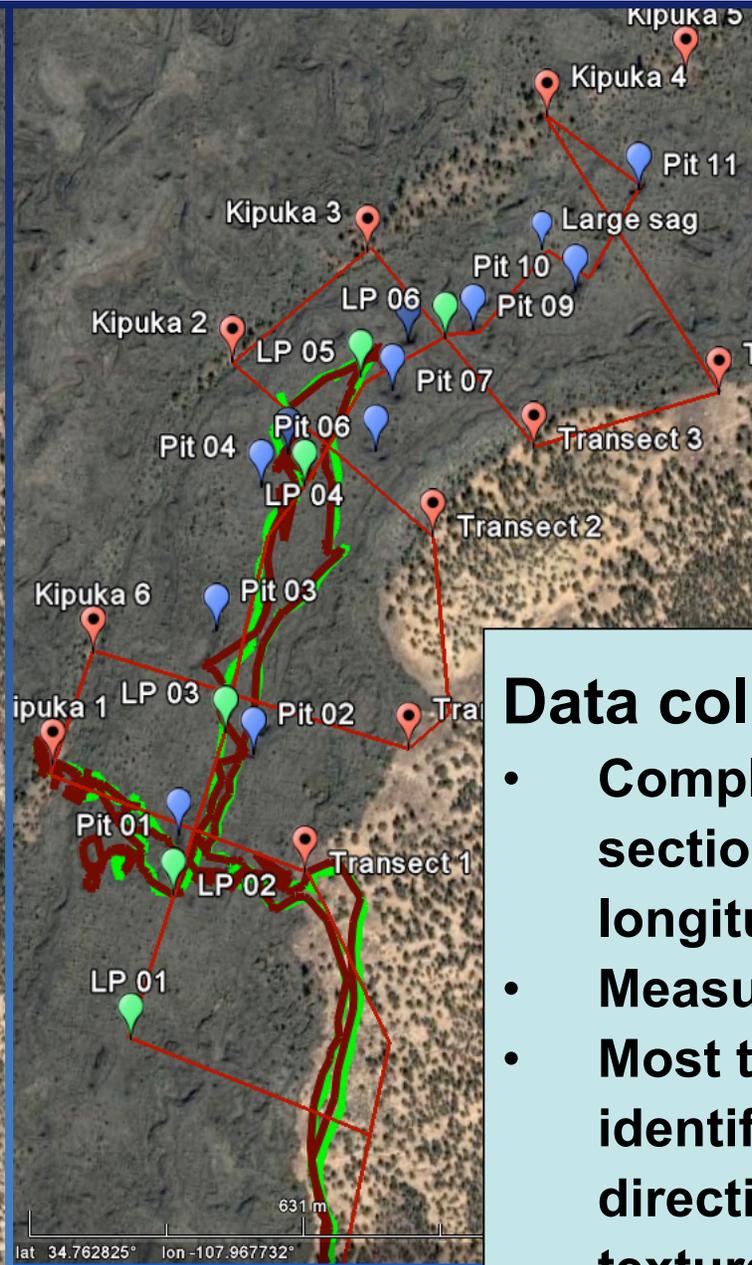
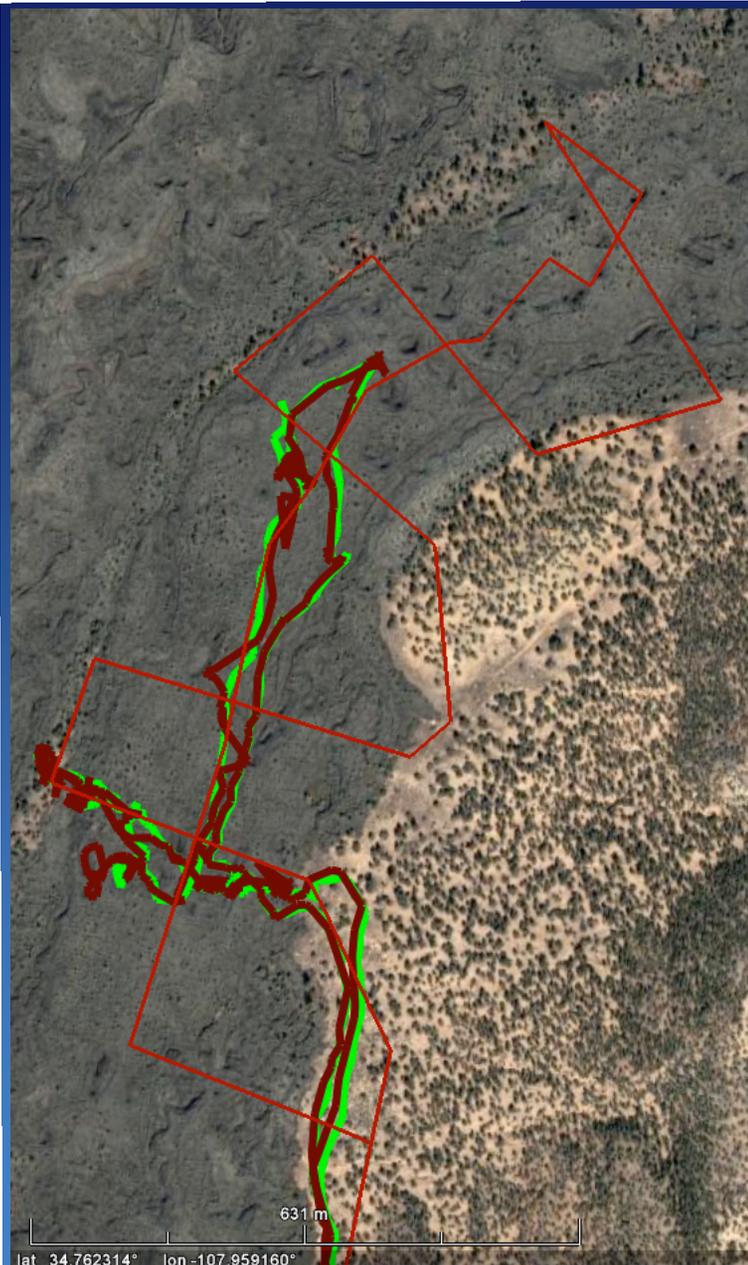
Bleacher





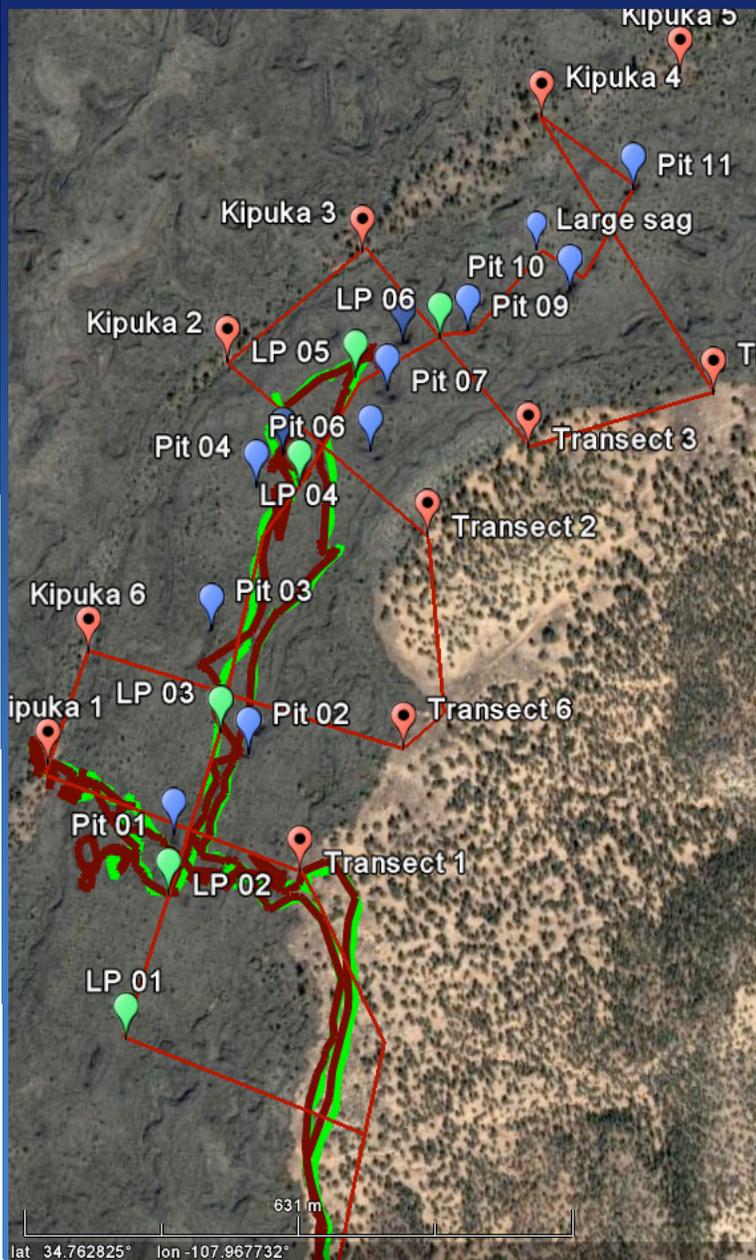
The hike in:

- Planned path not the easiest path
- 2 unexpected data collection points
- Unexpected data contributed to “Project Objectives”, opposed to the day’s objectives



- Data collection:**
- Completed 1 cross-section & longitudinal traverse
 - Measured 1 pit
 - Most time spent identifying flow direction and textural information
 - Project Objectives

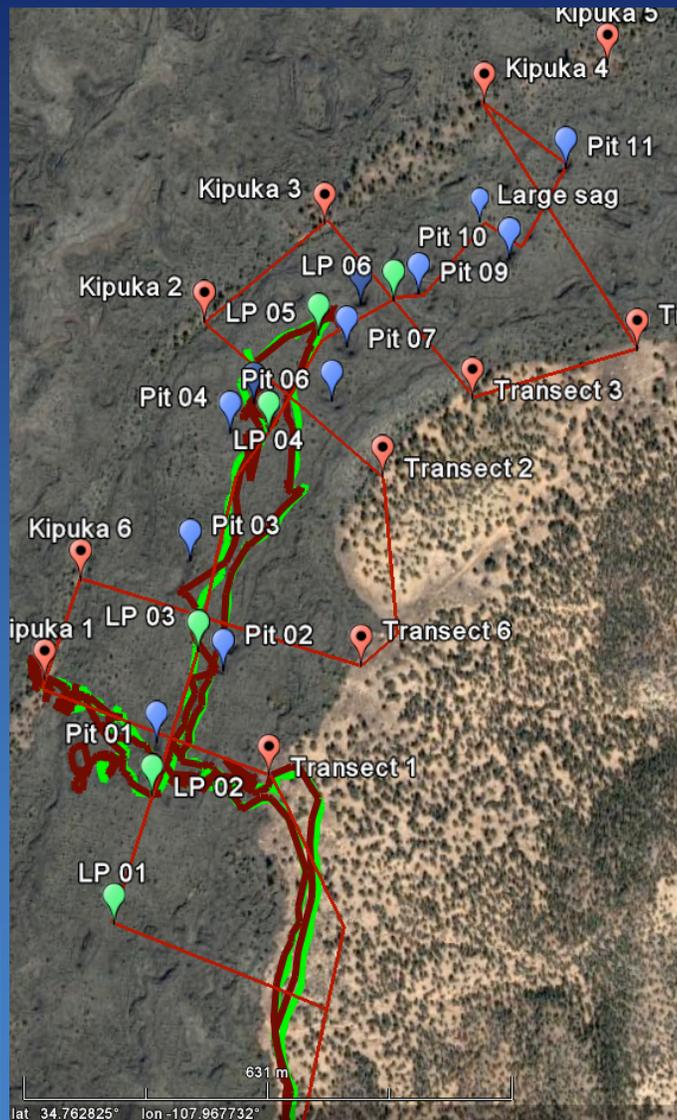
RESULTS



• Distance

- Actual distances: Average 9.1 km
 - Garry 8.4 km
 - Bleacher 9.8 km
- Planned Path 8.75 km (~ 5.5 miles)
- Actual ground covered if drawn as a plan: 6.7 km
- As planned on remote sensing data
 - Covered ~ 24 % less than expected
- Walked vs. Drawn Plan
 - Walked ~ 26 % more than expected
- This study suggests 25 % is the magic number
 - Will walk 25% longer than a planned line
 - Will cover 25% less total ground than expected

CONCLUSIONS



- Continue mapping, science ops, and field science studies
- We always produce overly optimistic plans
- Achievement of goals not always clear until initial field work completed
 - *Competing, evolving hypotheses*
- Goal is to achieve objectives, not walk over every line
 - *Hierarchy of objectives*
- Plans simply designed to maximize likelihood of encountering important sites
- Plans must be flexible in real time
- *Field training is critical*
 - *Crew, Backroom, Engineers, Scientists*
- No one site satisfies Campaign objectives

