

EMWoG Telephone Conference Call
Thursday May 10, 2007, 4.00-5.00 pm EDT
Minutes and Action Items

Present: Phil Wannamaker, Shane Ingate, Dean Livelybrooks, Gary Egbert, Kevin Mickus, Adam Schultz, Martyn Unsworth
Apologies: Rob Evans, Steve Park

Preparation for USAAC & NSF/EMT review of USArray - Backbone recovery plan
Key questions to be addressed at the USAAC and NSF/EMT meetings include:

How are future (2009+) transportable experiments planned?

Group discussed that EMWoG and EMSOC have both endorsed Oregon Pilot, CascadiaEM and the extension into YSHP in 2008, and advocate that this be the prime forum for discussion. The role of Geoswath is marginal, given that the scale of targets of interest to Geoswath are upper crust which is not well imaged by EarthScope MT. The best vehicle for the MT within Geoswath is via separate EarthScope proposals requesting the use of EMSOC broadband systems.

"The (MREFC) magnetotellurics effort continues to run large variances. Please present a recovery plan that leads to successful completion of this effort."

Given that hardware procurement is now complete, the one remaining task is the completion of the Backbone array. Schultz provided a synopsis of the Backbone history, plan and challenges (attached).

The following statement will be used:

The magnetotellurics effort will achieve success if annual deployments of transportable instruments are conducted, starting in EarthScope Year 3 and if 7 Backbone stations are completed and made operational.

Both the transportable and backbone elements of the magnetotellurics effort have been impeded by the unavailability of instruments. The instruments were to have been delivered in December 2006. Unfortunately, the manufactured instruments were unable to meet the required specifications due to the unavailability of low-noise magnetic core materials and delivery was delayed pending resolution.

Extensive noise tests conducted in March determined that the systems constructed with alternative magnetic core material were suitable for transportable science. Delivery of the 20 transportable systems began in March and was completed in May. The systems will be available to support a planned deployment in Cascadia this summer. This will be the second transportable deployment; a pilot experiment was conducted during the fall of 2006 using systems borrowed from EMSOC.

Unavailability of systems caused the magnetotelluric effort to miss milestones for deployment of backbone stations. As of May, issues with the backbone systems have been resolved. The systems should be delivered by July 2007 enabling the 7 stations to be completed by the end of the EarthScope MRE phase. 4 of these 7 sites have been constructed and are ready for system installation; one additional site has received a permit.

The schedule to complete the backbone is:

- September 2007 - systems installed at 2 backbone stations
- March 2008 – Obtain a permit for the 6th site
- June 2008 – systems installed at 4 backbone stations, construct and install systems at 5th backbone station
- September 2008 – construct and install 6th (and 7th backbone station if funds allow)

The above plan can achieve the goals adopted for magnetotellurics in USArray change order 0015. However, the additional testing and delays due to failure of the systems to meet specifications have consumed resources. Within the current funding limit, only 6 backbone stations can be completed. An additional \$46,000 will be required to complete the 7th backbone station, and \$70,000 for telemetry to the other 6 sites.

Preparation for CascadiaEM

Group discussed when the GSY training will take place and where. Given Schultz' time window in Corvallis May 28 – Jun 10, it was decided to hold the “MT Lovefest” in early June, before June 6. Training for “scientific oversight” will be included, with Livelybrooks and Wannamaker to attend. Mickus has expressed his interest for overseeing operations in the east when he is in Spokane during late June-July.

- Action: Ingate to arrange and coordinate “MT Lovefest 2007”.

2007 Calendar

- [CascadiaEM, commence Jun]
- [CascadiaEM end, Oct?]

Next telecon (second Thursday of the month)

Thu 14 Jun 2007 4-5 pm EDT.

Action Item Status from 4/10/07

- **Action:** Ingate to provide funds for a EMWoG member (Wannamaker or as nominated) to travel to meetings, commencing with USAAC in Seattle on May 14.
- **Resolution:** Wannamaker will be attending both USAAC and NSF Review meetings.
- **Action:** Egbert to prepare a brief proposal to complete higher-level data products for the DMC through the end of the MREFC (Sep 2008).

- **Resolution:** Pending.
- **Action:** Ingate to raise to USAAC level EMWoG recommendations for new spares and telemetry development as items for the soft landing.
- **Resolution:** Wannamaker/Ingate will propose the following 3 items:
 - 5 spare systems (~\$80K)
 - Develop and install telemetry for backbone (~\$75K)
 - Recover, restore and archive legacy MT data in the US, e.g. EMSLAB, (~\$30K).

Action Item Status from 3/12/07

- **Action:** Ingate to contact GSY to see if the availability of 40 systems (requiring 2 crews) would reduce the station cost relative to using 20 systems.
- **Resolution:** GSY have provided a quote for 60- and 80-station experiments, both at a considerable saving (per-station) compared with the Oregon Pilot Project. This was possible because of the efficient use of 2 crews.

Action Item Status from 12/11/06

- Schultz to contact M. Kitchens (GSY-USA) about privately-owned 80 acres in Michigan as a potential Backbone site.
- **Resolution:** *On-going*. Discussion with Kitchens have commenced, as well as with the ANSS operator in WI.
- Egbert to provide to GSY-USA Matlab routines for plotting uploaded NIMS data when in the field. Egbert and GSY-USA to agree on a format for meta-data collected in the field.
- **Resolution:** *On-going*. GSY have indicated they want a single operating system for use in the field, and do not wish to toggle between DOS for communicating with the NIMS, and Linux for Matlab. Schultz has converted *NIMSread* to run under Mac OS X.

EarthScope MT: MREFC Recovery Plan

Major MREFC tasks completed:

1. Completed procurement of 20 transportable systems;
2. Completed procurement of 7 backbone systems;
3. Siting, permitting and major installation of backbone (BB) station at Soap Creek Oregon including leasing and installation of long-dipole telephone lines, trenching of all long lines, installation of remote electrodes, installation of instrument vaults, cattle fencing, and solar panel stand. Collection of variety of short-period MT datasets for siting and noise characterization;
4. Siting, permitting and major installation of BB station at Parkfield California including short dipole electric field installations (completed), all cable trenching, all vaults;
5. Same as 4) in Braden Missouri, but with longer dipole electric field array;
6. Same as 4) and 5) at Socorro New Mexico, but with very long dipole electric field arrays, plus completion of cattle fence and solar panel stand;
7. Permitting completed at LASA Array Site, Montana.

Unplanned MREFC costs and schedule delays incurred:

- Rise in \$US:\$CAN (from 0.836 in 11/05 to 0.907 in 5/07, or 8%)
- USArray Change-order 0016;
- Late delivery of Narod systems;
- Testing adequacy of Narod cores;
- Backbone station installations not conducted due to unavailability of equipment;
- Testing impact of MT systems on seismic TA system.

Major MRE-specific tasks remaining:

1. Re-installation of instrument vaults at Soap Creek Oregon, to accommodate difficulties related to extremely high winter-time water table; Installation of permanent MT magnetometer and NIMS DAQ and solar panel array; installation of two near-field electrodes adjacent to vaults and final validation of BB system performance;
2. Installation of permanent MT magnetometer and NIMS DAQ at Parkfield California; installation of cattle fence and solar panel stand/solar panel array; and final validation of BB system performance;
3. Same as 2) in Braden Missouri;
4. Installation of permanent MT magnetometer and NIMS DAQ at Socorro New Mexico; final validation of BB system performance;
5. Major installation of instrument vaults, electrode vaults, trenching, laying and burial of two 400-500 m long horizontal electric dipole receivers in Montana, construction of cattle fence and solar panel stand, installation of permanent MT magnetometer and NIMS DAW and solar panel array; final validation of BB system performance;
6. Siting, permitting of Wisconsin or Michigan BB site;
7. As 5) but for WI or MI site;
8. If funds permit (unlikely) siting, permitting of VA site;

9. As 7) (funds permitting) but for VA site.

Time-line for MRE completion:

- By end CY Q3 '07 complete tasks (1) (2)
- By end CY Q1 '08 complete task (6)
- By end CY Q2 '08 complete tasks (3), (4), (5)
- By end FY '08 complete tasks (6), (7) - and if funding permits (unlikely) tasks (8), (9)

Risks:

There are some uncertainties about time-availability of Adam Schultz (PI, OSU, BB construction), related to his NSF assignment and possible changes in responsibilities (these will be resolved soon); and there are risks to the time-line from not having dedicated 1.0 FTE technician assigned to project to deal with day-to-day operations, and to guarantee tech time availability that is now provided through short-term contract or ad hoc staffing arrangements.

Recommendations:

By combining staffing needs of MREFC activities stated here, plus those related to OSU TA operations support, plus potentially data-handling functions (by Gary Egbert, OSU), and also factoring in future tech support for telemetry-related issues, it might be possible with EarthScope support to provide 1 person-year at 1.0-FTE for a technician assigned full-time to the overall Earthscope MT project. This would have a very substantial impact on reducing risk to the objective of meeting project time-lines. This has been necessitated by the requirement imposed on the OSU activity to shift emphasis from originally-agreed goals which were limited to MRE-BB installations, to also include substantial hitherto unbudgeted involvement in TA instrument depot, acceptance testing, TA instrument noise floor evaluation, and related issues. Additional and substantial external project delays are attributed to failure of instrument vendor to deliver instruments on-time and on-spec, which has placed our project milestones into a time period that extends past the original contracts for our Earthscope project staff at OSU. This has led to increased staff costs, and the lack of a one-year minimum funding window for tech time has led us to fill the requirements with short-term staff, leading to the elevated project risk. This could be solved by provision of 1.0 FTE for one year for a dedicated staff member.