From: Don Hooper <dhooper@cnwra.swri.edu>
To: "Roland Benke" <RBENKE@cnwra.swri.edu>,"Brittain Hill" <BEH1@nrc.gov>,"Andy Campbell" <ACC@nrc.gov>,"Bret Leslie" <BWL@nrc.gov>,"Christopher Grossman" <CJG2@nrc.gov>,"John Trapp" <JST@nrc.gov>,"James Rubenstone" <JXR5@nrc.gov>,"Keith Compton" <KLC@nrc.gov>,"Richard Codell" <RBC@nrc.gov>,"Timothy McCartin" <TJM3@nrc.gov>
Date: 10/25/2005 10:20:42 PM
Subject: First response to redistribution action item 4
cc: "Nathan Franklin" <NFRANKLIN@cnwra.swri.edu>

Note to: Attendees, volcanic redistribution meeting, Sept 29, 2005
Response from: Donald Hooper
Subject: Action item 4

We met on September 29 to discuss several issues regarding possible changes to the TPA 5 code with regard to the volcanic ash redistribution model.

Item 4 - "Address need for strengthened technical basis or revised model to address lack of decay related to fluvial remobilization."

The model assumption on the initially deposited tephra is that the source remains approximately constant, releasing the same amount of contaminated tephra at each flood event, except for radioactive decay. This assumption could be partially supported by the observation that the mass of tephra from Cerro Negro hasn't changed significantly during 4 years of observation .Keith Compton asked if there should be negative correlation between mass load and the arrival time of the redeposited ash in the alluvial fan. Roland suggested that the model should calculate a time-dependent reduction in the mass load between flow events that also accounts for the thickness of the deposits covering older deposits.

It is not clear that mass is being conserved in the redeposition model. I don't think there is an actual accounting for the mass lost because of the loss of mass load in the air. There was a question about the degradation of tephra by soil-forming processes leading to a lessening of the suspendibility of the tephra in air, but evidence from Lathrop Wells does not seem to support alteration of tephra by soil formation. A process that might limit the resuspension of tephra are covering by wind-borne carbonate (non-contaminated) dust in flatter areas that armors the surface. However, only the steeper unstable slopes greater than 5 degrees of the depositional basin are considered for remobilization anyway. It isn't clear that the area of the steeper slopes is represented in the current model. Also, the tephra deposition covers only the area in the depositional basin up to 20 km from the volcanic vent. The reason for this limitation is that contribution for remobilization would be small from areas of the basin farther away, and

keeping the depositional area small is with keeping with the lumped-parameter nature of the model for the depositional and fan regions.

ACTION: Don Hooper will check that deposition in the distal regions of the depositional basin is small by sampling at several points with the TEPHRA model. Additional discussions are needed to review the technical basis for time-dependent processes in the redistribution model.

RESPONSE: Three files have been placed on the shared drive in the subdirectory "Hooper_Redistribution":

1. fmw_slope-map_jan05_v2.JPG -- This is the slope map for the Fortymile Wash catchment basin as generated by standard GIS techniques. It is the same one that is in the Redistribution Report (Fig. 4-2). Please note that slope angle bins are based on an equal number of samples rather than equal bin intervals. The cell size is 30 x 30 m.

2. cdf_onepoint_NF_7oct05.xls (Excel file) -- Nathan Franklin created a cdf for a point on the fringe of the fluvial basin used in the TEPHRA code. Recall that the fluvial basin used in TEPHRA is smaller than the entire Fortymile Wash catchment basin. Therefore, this provides input for judging whether deposition in the distal regions of the catchment basin is small by sampling at a key location with the TEPHRA model. This model run was selected because it has the highest concentration of ash recorded in the distal region (margin of TEPHRA modeling grid).

3. cdf-results_NF-pt_oct05.jpg -- image file only of plots seen in the excel file (i.e., the spreadsheet has been removed).

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From: Don Hooper <dhooper@cnwra.swri.edu>

Created By: DHOOPER@cnwra.swri.edu

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