

## ***Interactive comment on “Floodplain sediment from a 30-year-recurrence flood in 2005 of the Ping River in northern Thailand” by S. H. Wood and A. D. Ziegler***

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Authors response to referees Based on reviews by 2 referees and collection of additional precipitation and suspended-sediment concentration data, we have rewritten and revised much of the paper. All of the comments were taken into consideration as the manuscript and figures were revised.

Response to Anonymous Referee #3 General Comments: Referee indicates we did not adequately address the main stated goal of the paper: “identify flood layers in stratigraphy”. That “goal” was a motivation for the study, but we admit that this goal was not fully achieved. “An objective” is restated

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at the end of the introduction to describe sediment of a known flood;

We have added Section 6.3: Flood sediment layers as records of individual floods; in which we discuss observed sedimentological features, photo evidence, grain-size data, etc. as recommended by the referee. We acknowledge in that section that far more excavations and photo-documentation of the flood layer would have improved the study, and suggest that approach for the next opportunity to document a flood-sediment layer.

Referee refers to the secondary goal sedimentation processes and patterns;. We have eliminated that statement. Our discussion now focuses on observations in the 0.32 square km study area, That discussion is the slightly revised section 5.5.

Referee suggests a discussion of variable responses to different typhoon systems in N. Thailand. We do state in the introduction that the flood response depends upon the north-south position of the westward traveling storm track. Referee's suggestion is a worthy goal, but we do not have detailed information on previous tropical depression storms, except for news reports and a 2006 report by the ADPC (referenced). A purpose of our paper is to publish, we believe for the first time, collected information on one event in the region.

Referee questions duration of inundation: We added section 5.3, in which we explain our lack of reliable reports from villagers on inundation after the August event. We explain that we can only presume that continuing rains kept the sediment water covered, but have no observations until September 29.

Referee recommends discussion of variables controlling flood deposit thickness: available area, rainfall, river suspended sediment conc., gradient and catchment size:

We only surveyed one area for thickness, and give its relative elevation, and show map area. We discuss other factors relating to area; again;

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at the end of section 7 (Conclusions). We state in section 7 that we are aware of the spatial variables, but do not evaluate them, except for the study area. Rainfall data is presented, but flood response to rainfall is not a focus of the paper. Suspended sediment concentration is discussed in 5.1. Gradient and catchment size are stated in section 2 (study area), but we do not have data on flood layers of other river floods in the region for comparison.

Referee indicates Discussion/Results sections are confused: These sections have been reorganized and extensively rewritten to put most of the descriptive facts into the results section. In the discussion section (6.1) we have speculated on aspects of the mass sediment budget; because when presented at the 2007AGU meeting, this was the most common inquiry. We have kept section 6.2 pretty much as in the original. We have added section 6.3 (Flood sediment layers as records of individual floods). We have removed from 6.1 the speculative calculation using assumed velocities of flow through the tributary channel-both referees questioned its validity; and so do we.

Specific Comments: Abstract completely re-written. We have removed all statements on bioturbation and preservation, because we have no data. We have a hunch it is important for interpreting stratigraphy, but not a focus of the paper.

Confused dates: Rewritten with consistent dates: The dates of the storm (Sept 27-30) are clarified by new precipitation data we have added (Fig. 4), and dates of flood by the hydrographs (Sept. 29-Oct.2).

Locations mentioned in text: Fig.1 and 2 revised by adding place names mentioned in text. Petchabun (p.3842, line 4), Uttaradit and Sukhothai, line 8 are deleted and now referred to as north central Thailand;

Introduction: We have rearranged paragraphs as suggested. Floodplain area affects sediment thickness. Again, we describe the area of study, duration, etc., but do not believe we have comparative data to evaluate this parameter.

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Reference added to Moody and Troutman (2000) who have previously used duration of inundation and sediment concentration in a model (Introduction).

Abstract and introduction rewritten to emphasize nature of storms.

New precipitation data added to clarify that the storm did indeed occur before the flood (Fig. 4 and discussion in introduction).

Discussion of application of Mae Chaem paleoflood record to the Ping River is expanded (Section 3).

In Section 3, we state precision of GPS map location and laser-level accuracy.

Comment regarding storms, Oct, 2005-March 2006. Comment does not seem relevant to us. Storms would not have significantly changed elevation data done in March. Hydrograph has now been completed through March, and does not show any other floods.

Location of thickness measurements added to Figure 9.

How did authors verify the August flood depositional surface? We have added a long discussion of this problem, and our assumptions in Section 5.3.

Thickness on the huts? We explain more thoroughly in section 5.2 that we observed true thickness on the huts. Slats and gaps mentioned by referee were rare and avoided.

Evaluation of grain size: We explain that visual observations were confirmed or corrected by grain-size analyses (Section 3).

Section 5.1: Method of sediment concentration determination by us, and by Royal Irrigation Department explained.

Section 5.2 rewritten so it contains mostly description, Section 5.4 describes analyses used for calculation of sediment mass in the Discussion, Section 6.1.

Discussion p. 3846, lines 18-25 are deleted; as we agree now, it is unconvinc-

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Referee pointed out a valid alternate interpretation of the hut platform data; and we have included that interpretation at the end of Section 5.2. We have also put a long discussion of the hut data in Section 5.2, rather than in the discussion. Most of what we have to say, is explanation of validity of the data, and the interpretation seems to us better said here.

Section 5.3. End of section, deleted insects;, and called the unknown creature a microorganism;

Section 5.3 rewritten to discuss results of grain-size analyses formerly in Section 5.4. Towards the end of section 5.3 we give a possible explanation why sample E is fine, yet near the channel. Sample G is far from channel and fine, but right on the tributary channel as noted by the referee. We have eliminated the phrase grain size diminishes with distance from the tributary channel; because it is incorrect.

Section 6.1: We have eliminated this discussion that depends on an assumed velocity in the tributary channel, because we do not have data on velocity.

Section 6.2: Our main point in this section is that concentrations in these other rivers are less than in the Ping River flood (Powder River excepted). Certainly there are differences in gradient, spatial scale, duration, etc., which are mentioned but not compared to other river systems. That would go way beyond the scope of the paper. We have added a more complete description of the Ping River system in Section 2, and stated that the floodplain reach we consider is in an intermontane basin, and not the Central Plain.

Technical Corrections: All suggestions and corrections have been made to the new version.

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