

Figure 24. K/T boundary sections in Alabama and Texas, interpreting the K/T sandstone complex in a sequence stratigraphic context (after Mancini and Tew, 1993). We infer that the K/T sandstone complex occurs in a regressive sequence in all the outcrops, between a phosphatic lag-bed indicating a high stand and incised low-stand valleys and a transgressive surface. The channelized sands at Mussel Creek probably belong to incised channels from the early Danian sea-level fall but are not part of the tsunami deposits (Savrda, 1993). The conspicuous bored hard ground can be traced all over the U.S. Gulf coastal plain and is basal Danian (*M. pseudobulloides* Zone) in age. A similar hard ground occurs in the shallow water K/T sequences in Holland (Curffs quarry) and Denmark (Stevns Klint) at about the same biostratigraphic level. The K/T sea-level low stand was formerly considered to be K/T or latest Maastrichtian in age (Mancini et al., 1993). Only at the Brazos River has the sea-level low stand not removed (part of) the K/T boundary tsunami deposits.

the passage of large tsunami waves or were moved downslope by mass-flows (Beloc, Coxquihui). These channels loaded into the (?seismic-softened) seafloor sediments (Unit I).

- 4. Subsequent tsunami waves, possibly assisted by massflows, transported terrigenous sand, plant debris, and shallowwater fossils from nearshore areas into deeper basins, where they deposited a sequence of thick lenticular sandstone beds, showing evidence for currents from opposite directions, consistent with the water movements—upsurge and return-flow caused by large waves (Unit II).
- 5. The final waning tsunami waves only transported fine sand in the next deposits (Unit III), but fine mud was now allowed to settle that contained the first enrichments of iridium.
- 6. After the deposition of the last fine sandstone flaserlike layers, the suspended cloud of fine material settled out between a few hours and days, to form a graded mudstone deposit. The

bulk of the iridium was deposited in this graded interval. Apparently, this extraterrestrial material was fine grained, because it arrived more slowly than the coarse tektite ejecta. Based on the settling time of the fine muds in the Brazos River and the duration of several passages of the tsunami waves and their travel times across the Gulf of Mexico (1 to 6 hs), we estimate that the iridium settled between a few days and a week.

7. The first background sediments, deposited on top of the K/T sandstone complex, are greatly depleted in planktic foraminifers. This shows that the mass extinction coincided closely with the deposition of the K/T sandstone complex and thus most likely was caused by the consequences of the Chicxulub impact.

Placement of the K/T boundary sandstone complex in the top Cretaceous, below the K/T boundary (Stinnesbeck et al., this volume), is based on the use of the wrong criteria for correlation to the K/T boundary type-locality in El Kef, Tunisia.