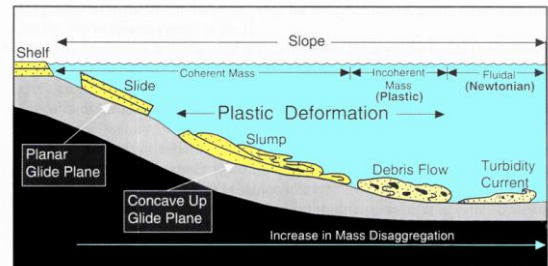


Evidence of rapid evolution of a submarine debris flow from a turbidity current on slope: an example from the Miocene Ushigiri Formation, Shimane, Japan

Sakai, T. and Maruyama, M.
(Dept. Geoscience,
Shimane Univ. Japan)

Submarine sediment gravity flows

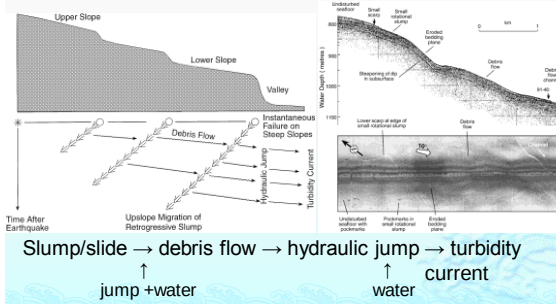


Shanmugam (2006)

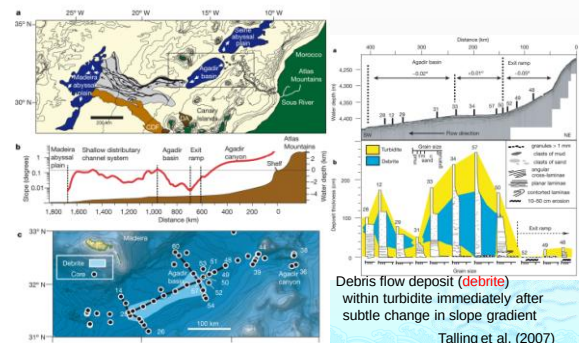
Evolution of the submarine sediment gravity flows

Dilution process of sediment gravity flows

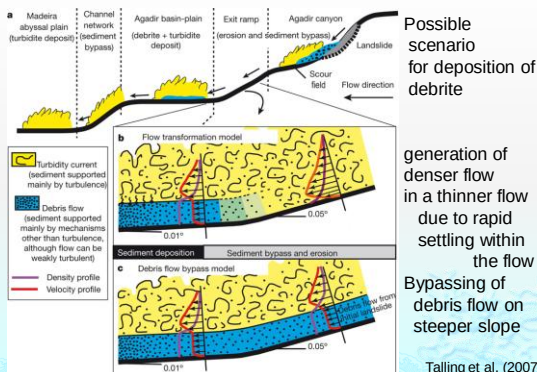
Piper et al. (1999)



Development of denser sediment gravity flow



Densification of flow



Background

Generation of denser sediment gravity flow in submarine environments:
→ causing the breakage of cables.

To understand generation process of denser flow
→ crucial for preventing or reducing damages of cable breakage by such denser flows

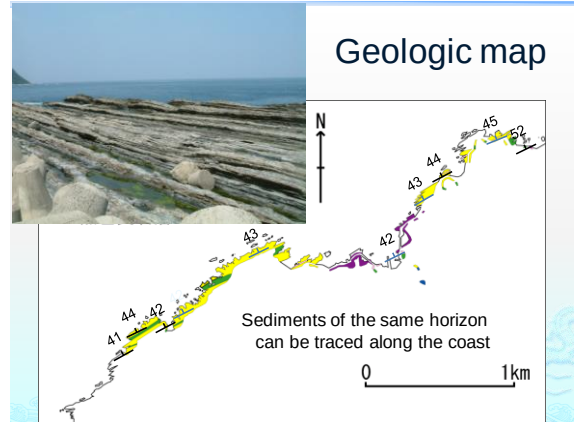
Geological record:
providing details of evolution of sediment gravity flows in the past

Purpose

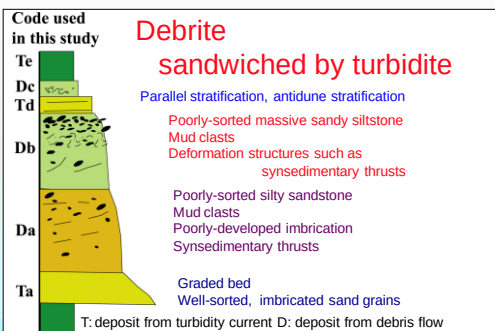
The Miocene Ushigiri Formation, Shimane (submarine slope deposit)

Downslope change from turbidite to debris flow deposit (debrite) within short distance (Sakai and Mishima, 2006)

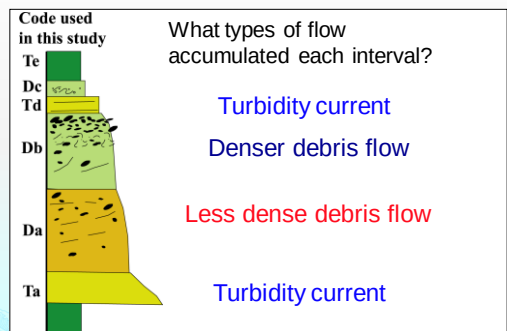
- To introduce the characteristics of the sediment gravity flow deposits of the Miocene Ushigiri Formation.
- To discuss flow evolution and its mechanism.



Sediment gravity flow deposit of the Ushigiri Formation



Interpretation

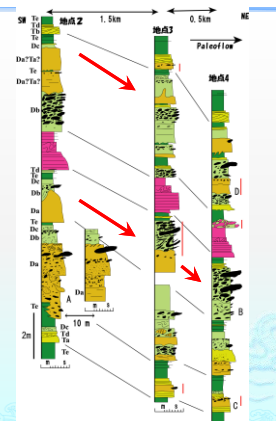


An example of sand bed

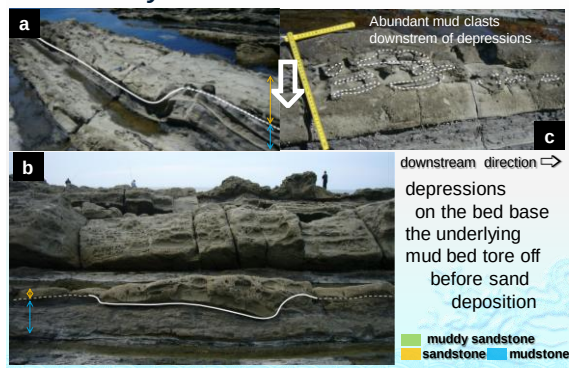


Tracing single bed along a tuff

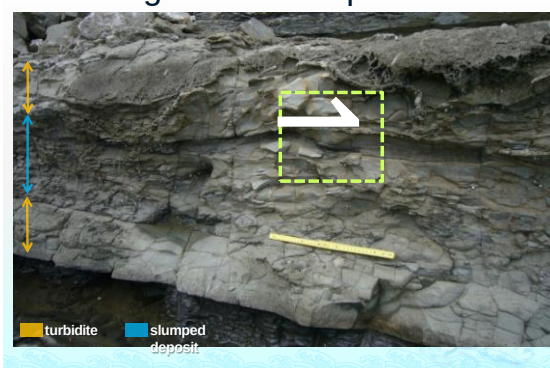
Downslope change
Ta or Da are dominant in the proximal sediments
To the downstream,
Db intervals become dominant within 2km
Sudden increase in mud clasts



Why mud clast increases?



What generated depressions?



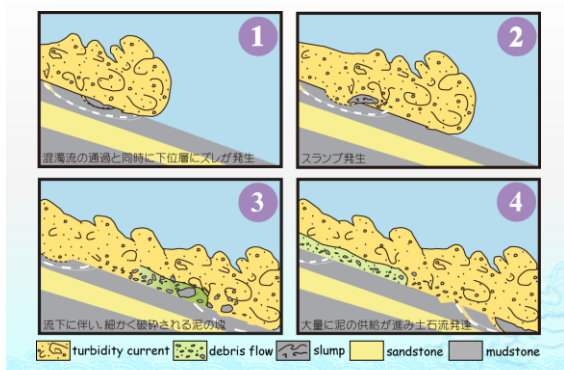
Slip faces just below sandstone beds



Sediment grains along slip faces



Debris flow evolution model



Conclusions

Denser sediment gravity flow formation in turbidity current was evidenced from the Miocene Ushigiri Fm

Denser flow generation must be contributed by mud clast supply to the flow

Slide of near surface mud when flow passed
 → tear-off of mud block from the underlying mud
 → leading to mud supply to the flow sufficient for generation of debris flow in the turbidity current