

**Paleogeography of the Miocene tectonostratigraphy and basin  
geometry of the East Java region.**

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### **Summary of thesis:**

Geologic mapping of the East Java region will focus on tectonostratigraphic relationships, and regional implications for plate tectonics. Using the GeoMapper software package and Fujitsu tablet computers, the project will provide a better understanding of the overall tectonic/paleogeographic picture of the East Java region, while simultaneously demonstrating the effectiveness of using real-time technology while in the field performing geological research.

### **Abstract:**

The focus of this paper will be to provide an overview of the tectonics in the East Java region while demonstrating the utilization of computer technology to enhance the mapping procedure. With the advancements in technology surrounding mobile/wireless data transmission, the applications for this technology in the field of geologic research is unlimited. In conjunction with Gadjah Mada University, SDSU team members will be gathering mapping data in the Kendeng zone area of East Java. The GeoMapper software package and Fujitsu tablet computers, along with digital imaging will be used to illustrate the plate tectonic development. In order to reconstruct the past positions of the Eastern Java region it is necessary to understand how the development of the plate tectonic boundaries occurred. Only by understanding the regional geological and tectonic evolution of the area can the location and timing of rifting, subduction, basin formation, collision and other major plate tectonic events be determined.

### **Key areas of research/Goals**

- Understanding the plate-tectonic setting of the Southeast Asia region as described by many authors with divergent opinions; synthesizing the main areas of agreement and disagreement about the plate-tectonic development during mid Miocene and younger time.
- Study the basin geometry of the East Java region to determine source terranes and geometries of basin thickening and growth.
- Study the basin geometry of the East Java region to examine the development of pervasive folding in the tectonic and stratigraphic history of the basin.
- Gather sedimentologic data to provide timing for depositional and deformation histories and the successive overprinting of tectonic events on each other.
- Study the geospatial and geometric history of arc development to determine the tectonic setting (fore-arc, intra-arc, back-arc, foreland) setting of the deformational episodes and their superposition.
- Study the Paleogeography of the East Java region focusing on the micropaleotologic zones n12-N14 planktonic Foraminifera to understand key transitions, unconformities, and depositional setting of mid-Miocene sediments.
- Explore possible relationships of strike-slip faults and accommodation zones to deformation and fold development.
- Evaluate the geometric, kinematic and dynamic setting and cause of the regional developed fold systems throughout the East Java area. Evaluate the hypotheses of Van Bemellan inferring body forces produced by gravity versus deformation by rigid body motion, as in regional thrust belt.

- Evaluate the implementation of mapping software and communication systems to establish their future applications in the field of geological study and exploration. Evaluate whether hardware and software increase effectiveness of personnel, improve accuracy, and assist geologic mapping by using real-time geologic research.

**Method:**

Under the direction of Tom Heidrick and in collaboration with Gadjah Mada University, and SDSU, real time geological mapping techniques will be implemented. A variety of software will be used to gather data including arc pad, arc view, Rockware , ER Mapper and, GeoMapper, to demonstrate its future applications in the field of geological mapping. Hardware will include the Fujitsu tablet computer, Garmin Rino 130, Digital cameras and video equipment.

**Sources:**