**Lesson Plan Summary for ‘Sinking Deltas and Global Sea level Rise’**

1. **Summary**

Students explore global sea-level rise and river delta subsidence process, with a focus on the global sea-level rise rates and the specific accelerated sea-level rise in delta systems. Besides, students will assess factors that determine the sinking of deltas and the various controls in different deltas. By doing this, students can learn more about the effects of current climate change that our society faces, and the important effects of subsidence of deltas on coastal risks and development and environments, furthermore, they will discuss some ideas about how to do to help slowing down this process. This assignment takes ~2-3 hours for students to complete, depending on how much literature is previously given.

**2 Learning Goals**

Topical Goals

Quantify global sea-level rise rate and its causes.

Play with simple linear thermal expansion equation. Estimation skills.

Learn the definition of relative sea level rise.

Discover the faster relative sea-level rise rates on deltas.

Gain understanding in the factors that control delta subsidence.

Explore the influence of delta subsidence on social development and environment, and methods to improve the situation.

Quantitative Skills Goals

Learn to quantify rates of change from a graph.

Use spreadsheets to plot data time series ands make simple calculations, learn to draw trendlines.

Try to improve the ability to look for results from online science literature sources (if literature is not provided beforehand).

**3 Context to use**

This activity works when assigned as a problem set and is set to be completed individually or in groups of 2 students. It provides a method for students to more broadly learn about the physical process, the current situation, and develop a sense of crisis and stimulate their responsibility to interrupt the global warming process. It can serve as a material to broader their horizon for students in oceanography, and coastal environment majors.

This activity could be assigned after students have developed a basic understanding of delta development, and global warming. The questions are set to make students think more deeply and look for reasons about some problems that are commonly known, and ways that they can do to help serving the problems.

**4 Teaching Notes and Tips**

Question 3 and 5 could be done as a classroom discussion. Make a matrix of factors that the students found. Instructor can tabelize the rates of the different components*.*

The CSDMSmovies on youtube, has a short movie on Sinking deltas.

http://www.youtube.com/watch?v=b-IjQ9Bjrvw&feature=mfu\_in\_order&list=UL

5 **Assessment**

Grading mainly includes checking for reasonable verbal explanations of different phenomena. The instructor can check students’ ability to make annotated graphs, to derive trendlines, and calculate a linear slope from a data time series.

In evaluating the reports, we place greater emphasis on demonstration of a reasonable thought process than on arrival at the correct answer.