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Descent into 'The Abyss' of Least-Squares Linear Regression. Preliminary report.

We teach a freshman course Introduction to Lab Data to freshman science students. Our emphasis is on developing an appreciation for harnessing the power of mathematics when doing science. In this paper, we present an activity on linear regression. We wanted to create an activity based on an engaging and interesting application while keeping the data collection process fast and simple. Our activity is based on a 7-minute clip from the James Cameron film *The Abyss*. In this clip, oil driller Bud descends into an undersea trench with depths reported by the other characters. Time is recorded from the video player. The time-depth relation is roughly linear. Using their data, students can produce a scatter plot, estimate linear model parameters, assess the goodness-of-fit, physically interpret the slope as Bud's speed and answer questions based on interpolation and extrapolation. The activity also reinforces the use of spreadsheet software to summarize and manipulate data. We found that audiovisual nature of the application appealed to our students. We think that this activity would be suitable for any linear algebra or statistics course that covers linear regression. We also present a similar activity based on a shorter clip from the same film. (Received September 22, 2011)