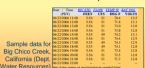
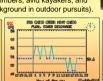
# Attempts at Integrating Quantitative Activities in "Rivers and Streams" Lab for Introductory Geology at CSU Chico Rachel Teasdale, Department of Geological & Environmental Sciences, CSU Chico

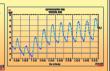
The Need

The Introduction to Physical Geology laboratory exercises are in the midst of a "redesign" phase. New and revised activities must comply with a variety of factors including scheduling, multiple sections (up to 18 separate lab sessions), multiple instructors (graduate student TA's), a variety of skill levels in science and math (Freshman-Senior grade level students. including some with college level math, and some without) and a wide range of experiences in geology (e.g. rock climbers, avid kayakers, and urbanites without interest or experiential background in outdoor pursuits).









## The Set-up

The Rivers and Streams activities are among the first to be redesigned with overarching goals for content and ancillary goals for skills building

#### Overarching Goals for Content:

- Students collect and synthesize data from a local stream
- Students use quantitative reasoning skills to synthesize and compare data sets collected from different locations and in different seasons.

### **Ancillary Goals for Skills:**

- Students collect, complete algebraic calculations and graph data
- Students build quantitative reasoning
- Students collaborate in data collection & making interpretations

The wide range of student quantitative skills can be addressed in a series of three activities associated with stream flow that are shown below. The set of activities reinforce the use of calculations and graphs and also provides the opportunity to compare data sets collected approximately 12 weeks apart. By using data sets collected over the course of several semesters, these activities will be useful for

considering seasonal stream variations and in distinguishing normal vs. extreme flow

## The Attempt

- Three activities shown below were designed with the following considerations:
- 1. Students need more experience using quantitative methods (multiple activities)
- 2. Students need to understand data collection techniques and limitations 3. Students need to synthesize data in tables and graphs to understand the significance of data sets
  - Week 1: The first data collection activities introduce the idea of collecting and using

data & set the stage for quantitative activities in the course. Students use pace a distance and determine stream velocity of Big Chico Creek, on campus.

Week 9: Students go on a fieldtrip upstream of campus to examine the geology and collect stream flow data

Week 12: Students complete pre-work to preview the types of calculations to be completed in the "Rivers & Streams" lab activities. Pre-work gives students the opportunity to seek extra help prior to the lab activity.

Week 13: Students return to Big Chico Creek to collect stream flow data.

## Week 1: Campus Walk

The Campus Walk introduces a variety of topics in a "preview" format for future labs. This lab is graded, but is general enough that students who add the course late are able to survive later topics. The activities also gives students the sense of the rigor of the course and the first set of

(simple!) quantitative experiences. Measurements | Sitep 2: Big Chico Creek at Bidrell Bridge (Mark this as "Stop 2" on your map) are collected for Big Chico Creek, on campus (dashed square on map at right).

As an introduction to the diverse field of geology you will be taking a geologic tour of the campus. Your instructor will guide you along the way as you collect important data. Fill in the data tables and answer the oscotions is not recommended.

Students use their pace to determine the distance (in this case students use a measuring tape to check), then find the average time it takes the object (orange/stick/pinecone) to

one of few equations one must know! | a=r,



float that distance.

