

Offset Validation, Classroom Exercise

Introduction:

Your participation in this exercise is **completely voluntary** and you may skip questions if you wish. Even if you are participating in this exercise as part of a classroom exercise you may withdraw at any time with no penalty. You must be 18 years of age or older to continue. Your responses will help quantify observational differences and ultimately help discern the reliability and objectivity of remotely determined offset measurements. This study is supported by the U.S. Geological Survey, the Southern California Earthquake Center, and the Working group on California Earthquake Probabilities.

The following pages contain examples of tectonically offset geomorphic features. All examples show right-lateral offset on northwest-trending faults. Each image consists of a combination of three Light Detection and Ranging-derived (LiDAR-derived) products: an opaque "hillshade," a transparent digital elevation model (DEM), and a contour map.

Please rate your prior experience level (circle): 1 / 2 / 3 / 4

- 1) I have no prior experience whatsoever.
- 2) I am familiar with the basic geologic principles and/or high-resolution topographic data.
- 3) I have measured offset geomorphic features in the field or with high-resolution topography/imagery.
- 4) I have extensive experience measuring offset features in the field or with high-resolution topography/imagery.

Please circle all that apply:

Have previously measured offset features in/on:

- a) the field b) aerial photography c) satellite photography d) topographic maps e) high-resolution DEM's

Have previously measured offset features using:

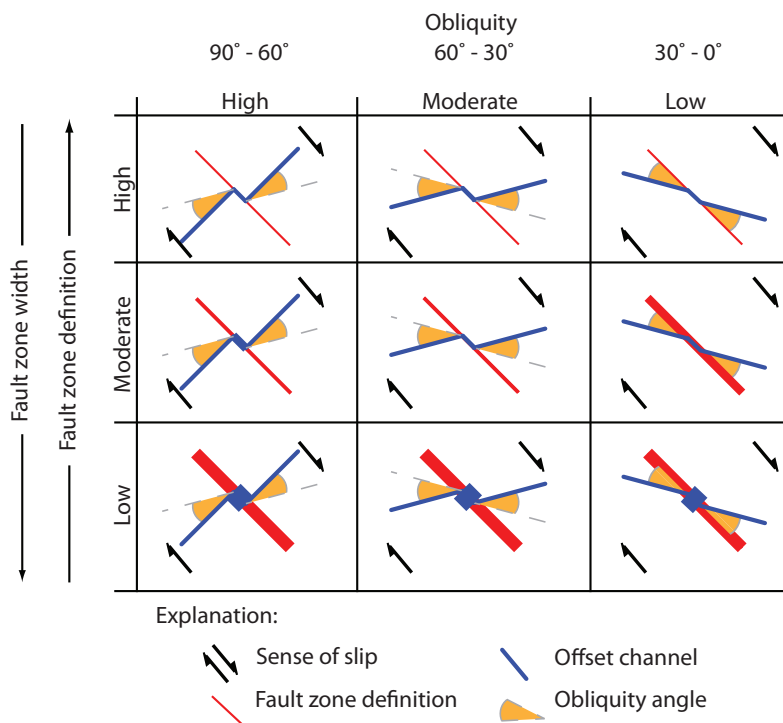
- a) tape measure/ruler b) total station c) Google Earth d) ArcGIS e) LaDiCaoz f) other _____

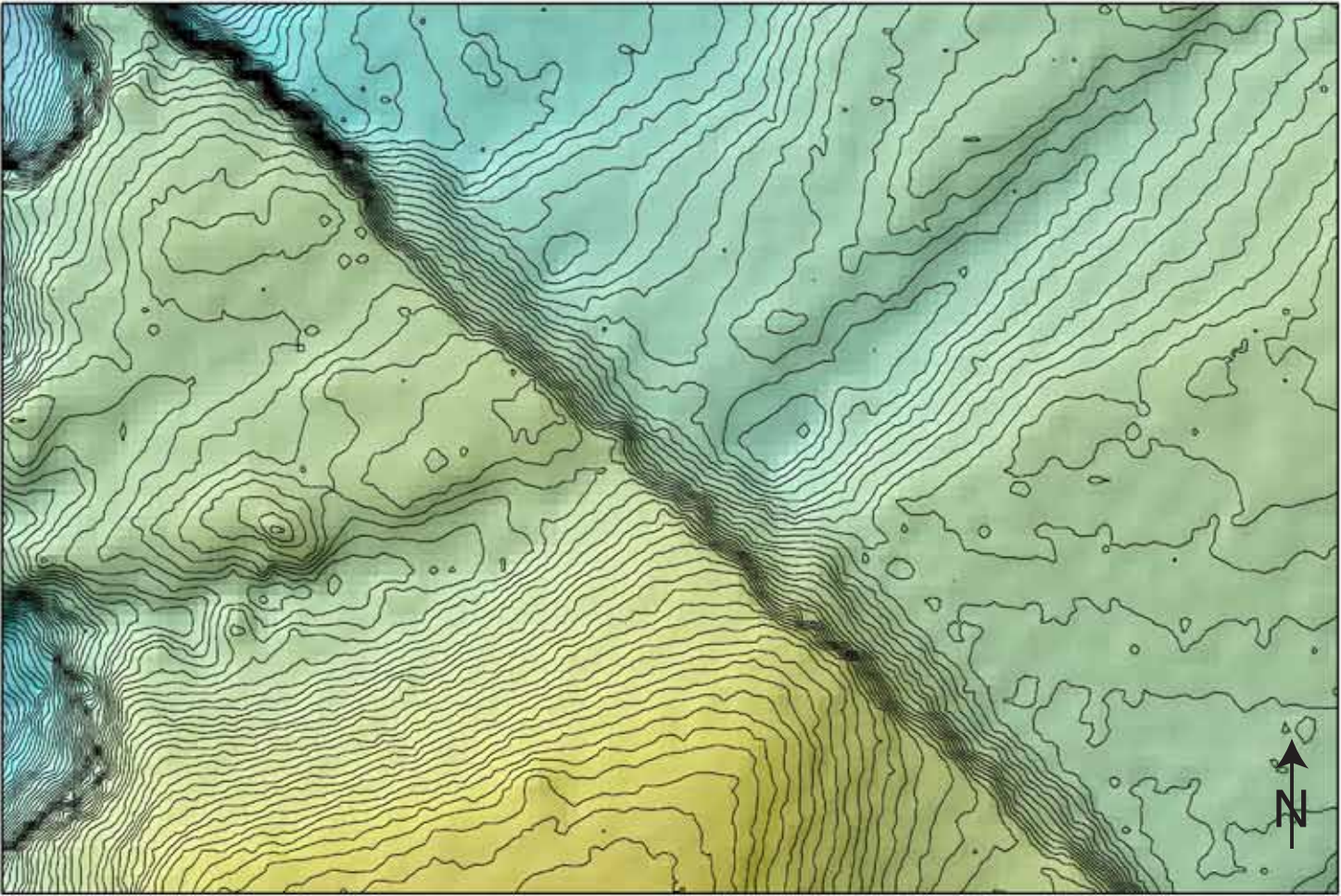
Have a) taken b) taught

- a) Field Geology b) Geomorphology c) Earthquake Geology d) Quat. Geo. e) Tectonic Geomorph. f) GIS

Instructions:

- 1) Sketch/trace the fault and geomorphic feature(s) (e.g. channel thalweg, channel margins, bar crest) that you will use to estimate tectonic offset. Some images contain multiple offsets and/or features.
- 2) Tear off the scale bar in the bottom right corner of each page for your measurement on that page.
- 3) Estimate measurement uncertainty (e.g. +/- 1.5 m) so that your offset measurement can be expressed as a range in meters. For example, a 12 m +/- 1.5 m measurement is a 10.5 - 13.5 m offset.
- 4) Rate the overall quality of the offset feature using the provided rubric*. List x-axis first, then the y-axis. (e.g. for a channel at 25° to a well-defined, narrow fault trace: "low-high") *Image courtesy of David Haddad



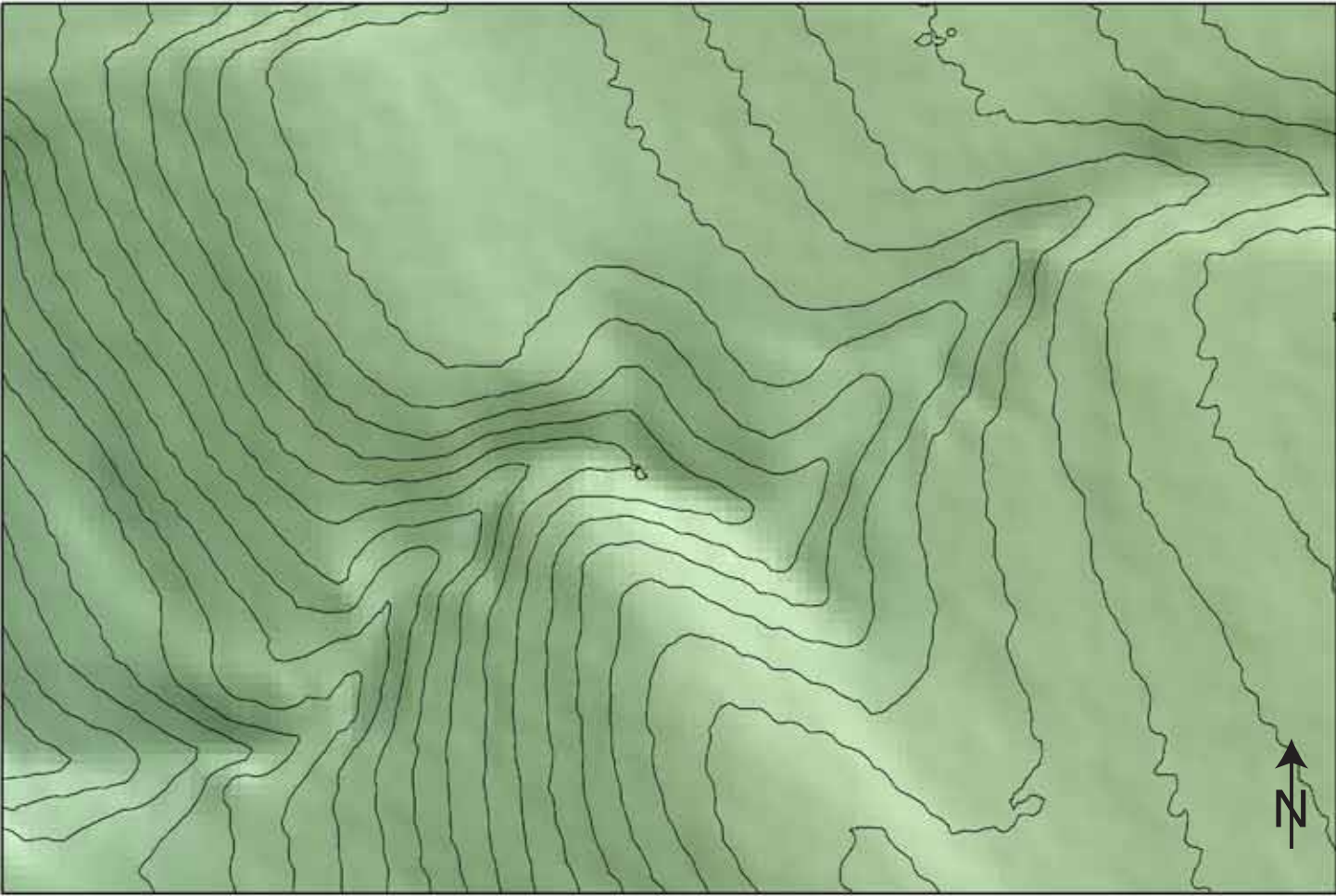


1:175, 10 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____



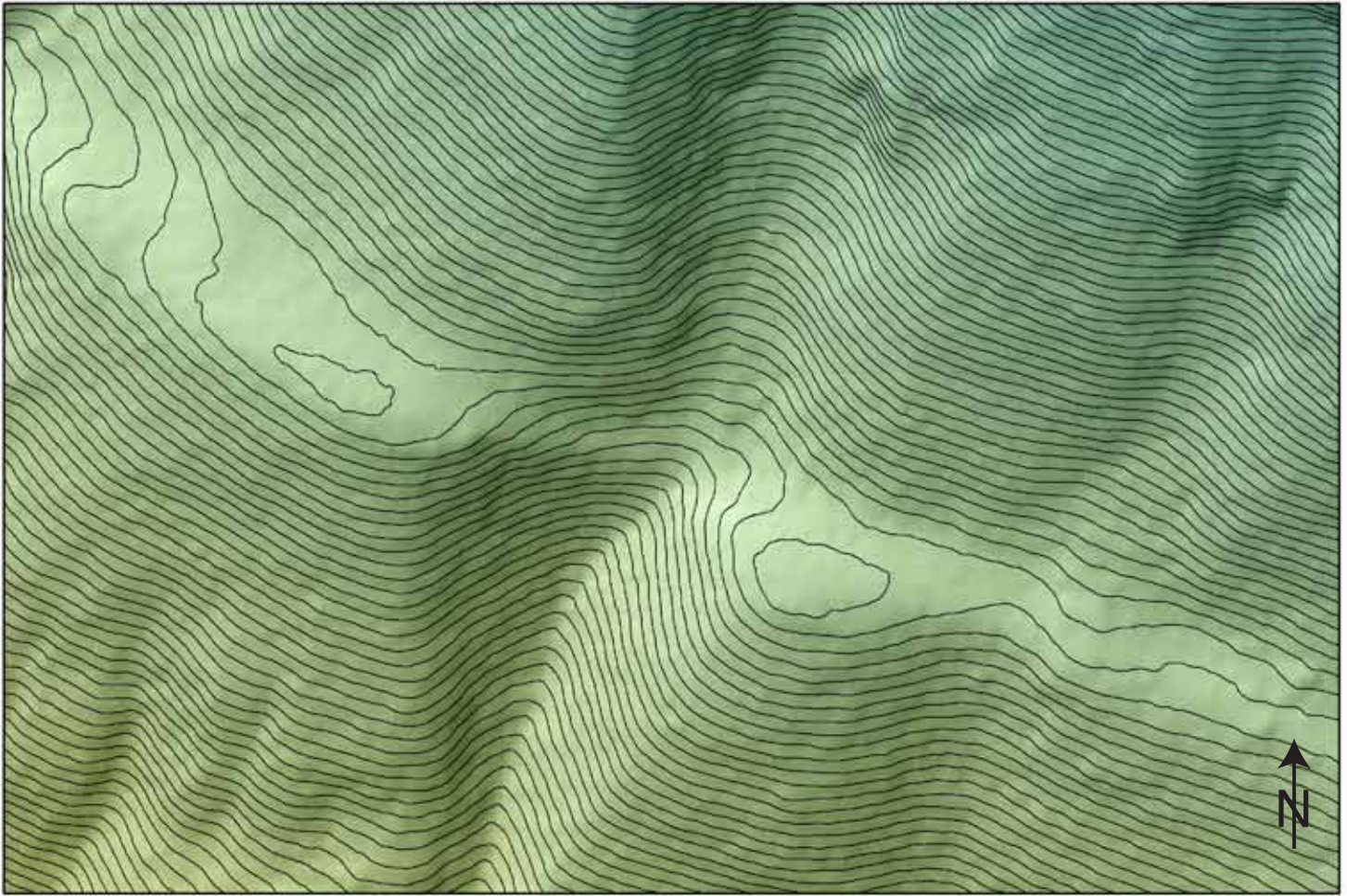


1:400, 50 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____



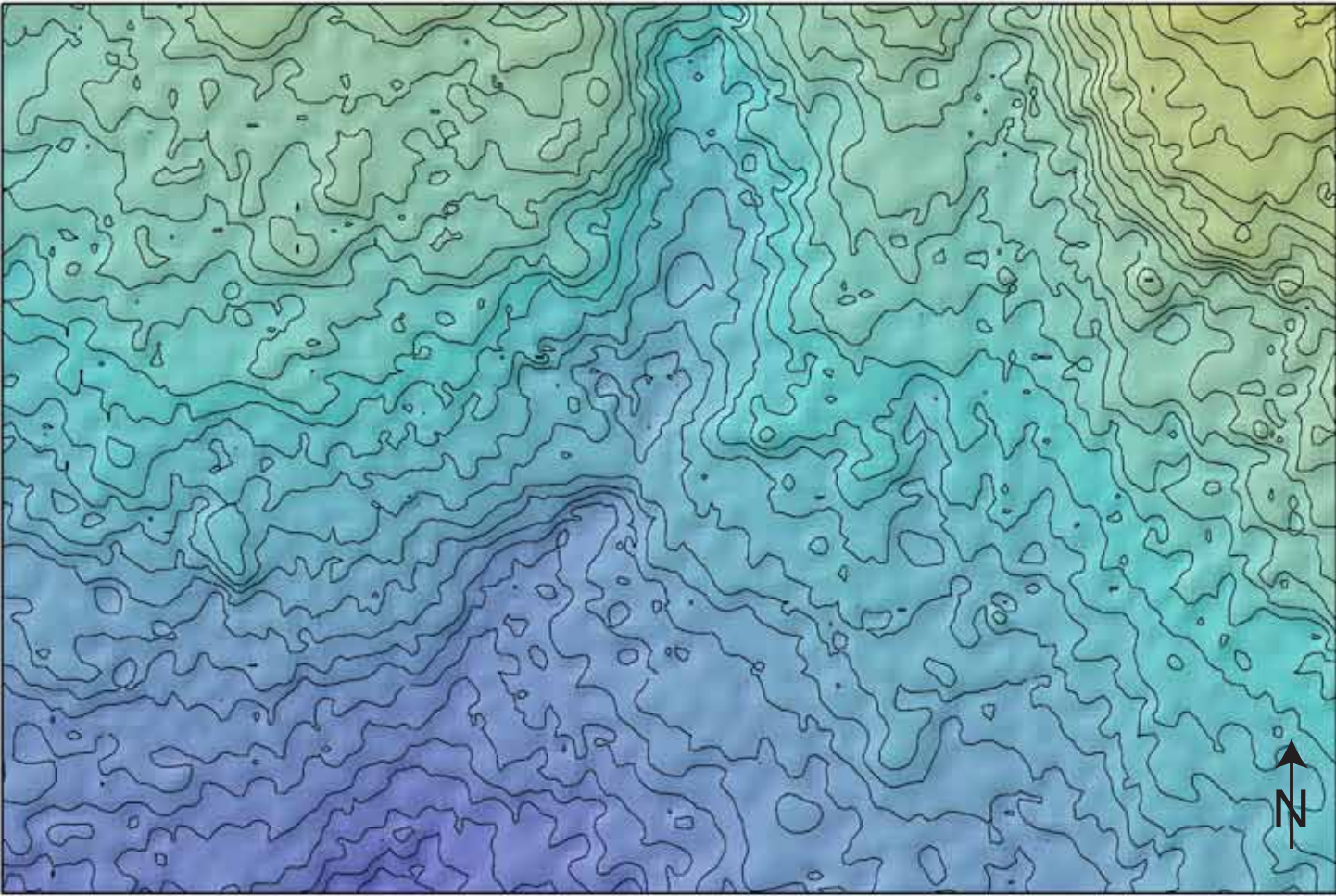


1:800, 100 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____

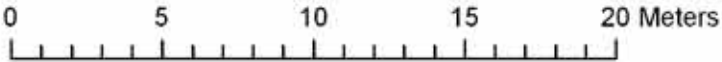


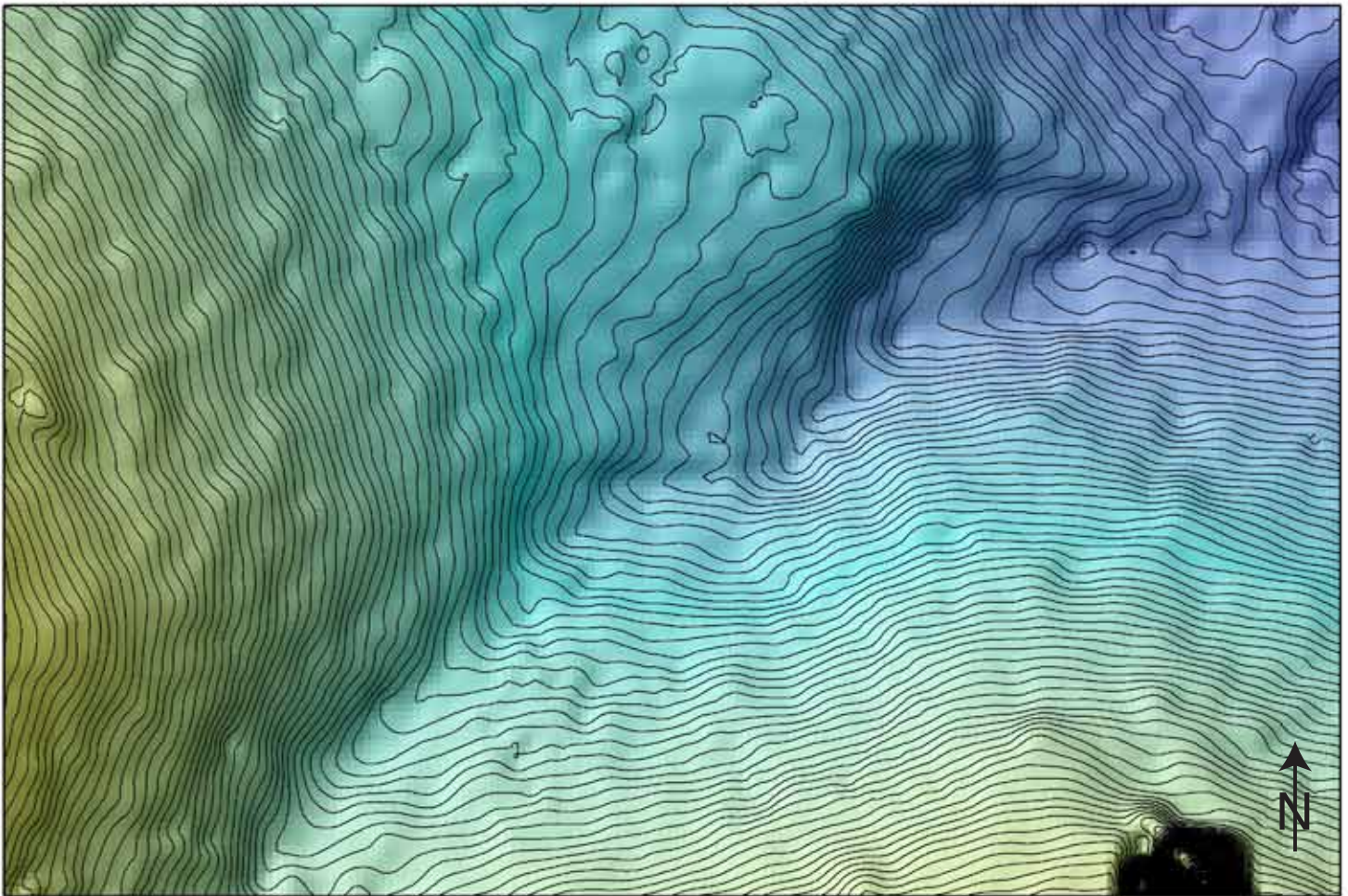


1:250, 10 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____





1:250, 25 cm contour interval

Please answer the following:

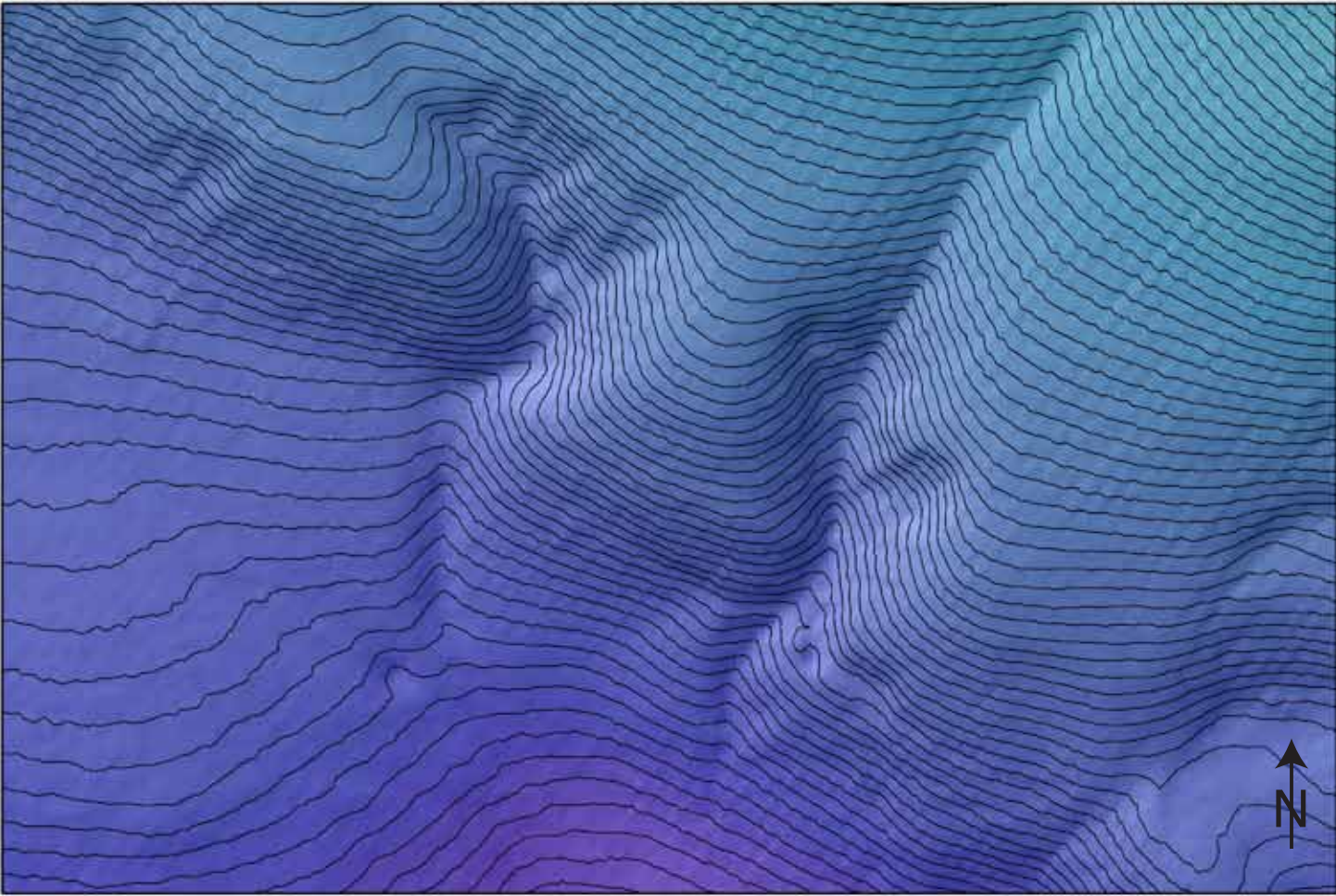
1) What is the magnitude of the offset(s) (in meters)? _____

2) What is the uncertainty of the offset(s) (+/- in meters)? _____

3) What is the quality of the offset(s)? _____

4) Additional comments? (optional) _____



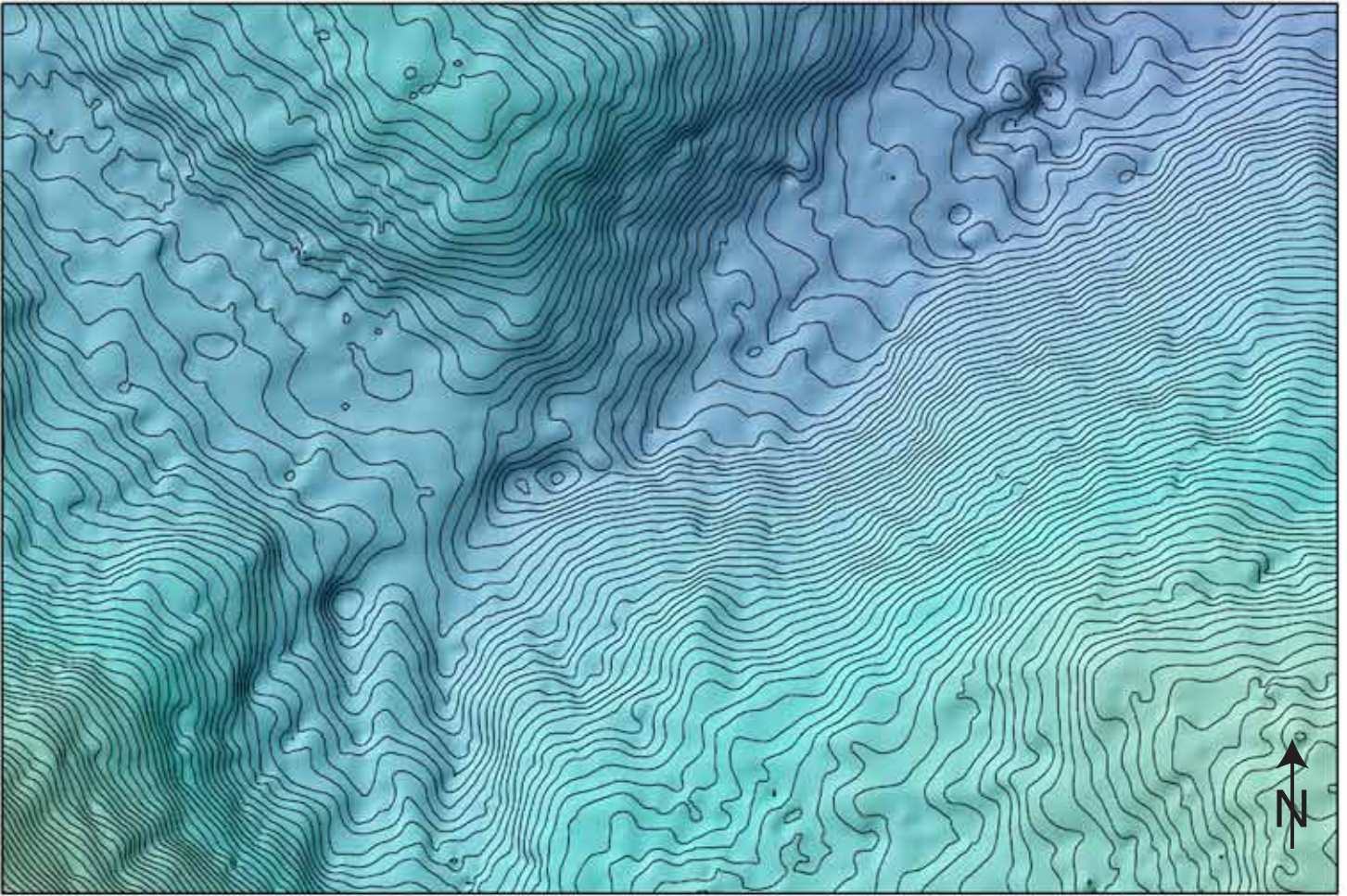


1:650, 50 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____



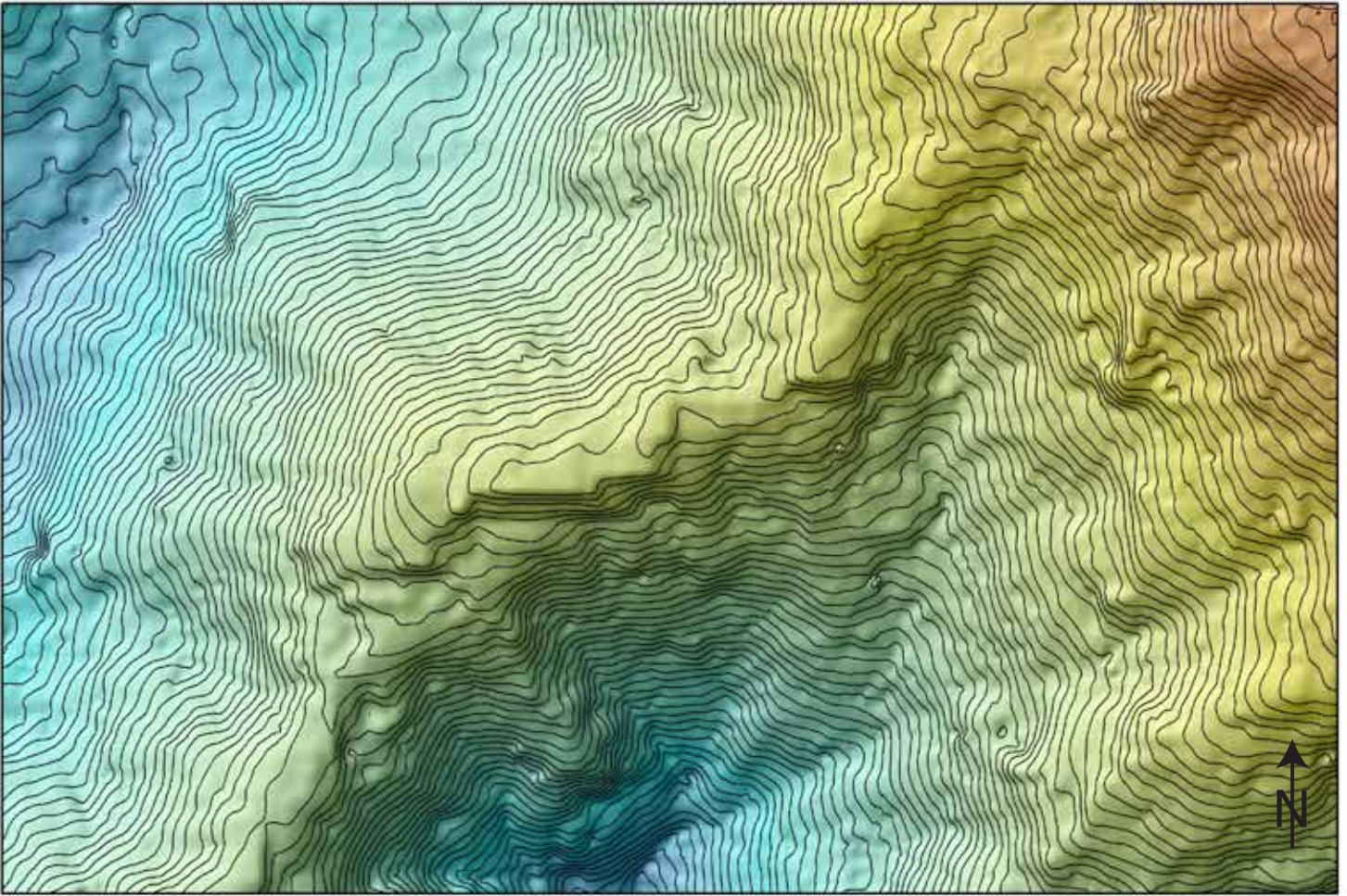


1:400, 25 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____



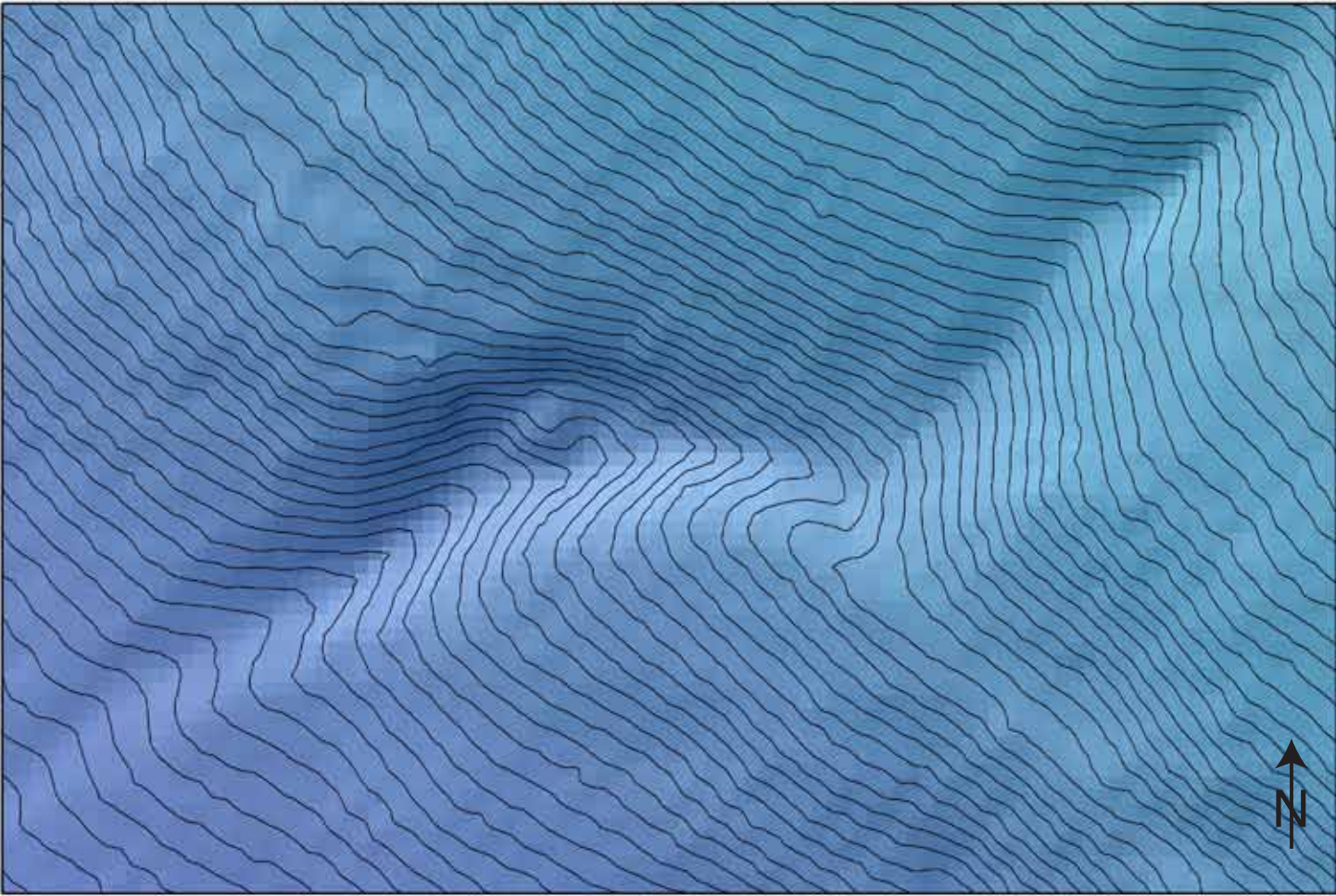


1:500, 50 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____

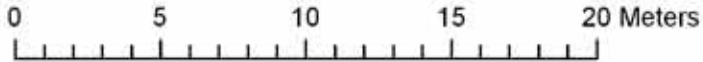




1:300, 25 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____





1:600, 50 cm contour interval

Please answer the following:

- 1) What is the magnitude of the offset(s) (in meters)? _____
- 2) What is the uncertainty of the offset(s) (+/- in meters)? _____
- 3) What is the quality of the offset(s)? _____
- 4) Additional comments? (optional) _____

