San Pedro River Wet/Dry Mapping
Monitoring Instruction Sheet 2011

Please read BEFORE you start out, even if you have attended a training session!!!

PROJECT OBJECTIVE: The main objective of this monitoring project is to create a map that shows where water is present in the San Pedro River Basin during the driest time of year, and where it is not. On June 18, 2011, local community members and volunteers will travel along the river on foot and on horseback using GPS units to mark the locations where water is present. GPS, or Global Positioning Systems, is a worldwide radio-navigation system that uses signals from satellites, and records your position.

TEAM PREPARATION: Teams will assemble at predetermined starting locations. Before starting out on the river, make sure that every member of the team has:

- Adequate supply of drinking water—2 quarts at a minimum
- At least one member of the group has a cell phone or radio (keep it turned on at all times)
- Bring lunch/snack & and wear shoes you don't mind getting muddy

COORDINATE SYSTEM:
We use the UTM (Universal Transverse Mercator) coordinate system which divides the surface of the earth into zones, and is recorded in meters. The San Pedro, like most of Arizona, is in Zone 12. We also use the map datum NAD83 (North American Datum 1983). Please check your GPS unit to be sure it is set to this coordinate system.

DATA COLLECTION:
Your mission is to record the GPS reading, accuracy estimate, waypoint number, time, and whether the water in the river starts or stops. Include both ponded water (stagnant pools) and flowing/ running water. Do not include wet sand or dirt, only the water surface itself. Note that you are recording data in two forms – hand-written on data sheets and maps and electronic data recorded in the GPS unit. Record ONLY the Wet/Dry observations in the GPS unit. Record BOTH the Wet/Dry observations and other observations on the hand-written data sheets.

Be careful to check out all of the river's channels. Sometimes the flow of the river will be divided (with islands in the middle). Your group may spread out as you move along the river to make sure that you don't miss "another" parallel channel.

MONITORING INSTRUCTION STEPS:

1. Place a wire flag at your starting point take the GPS reading (way point, time, accuracy number,12R & UTM points). Mark the reading in the unit *(see instructions below)* and record it on the 1st page of your data form. This will be used as the end point for the team. If your starting point is at a bridge, get about 20 feet away from the bridge to ensure access to satellite signals. *(note: If you are starting at the Mexico border within the US, do not place a flag, just mark and record your GPS readings)*

2. After that, data points (accuracy number, way point, 12R & UTM) will be marked in the unit and recorded on the rest of your data sheets, according to the instructions below--"What to Record".
3. Your final GPS reading should be taken at the wire start-flag placed by the adjacent (typically down-stream) team. Record this reading on the 1st *page* of your data form.

ADDITIONAL READINGS AND/OR DATA:

Please take notes of any **significant, fresh beaver sign** (dams, lodges, etc.) and **large trash piles if on BLM lands only.** To do this go to the "Other observations" form and write down the GPS reading (time, accuracy, 12R, UTM) note the type of observation. **DO NOT, DO NOT, DO NOT press the "Enter/Mark button on the unit!!!**

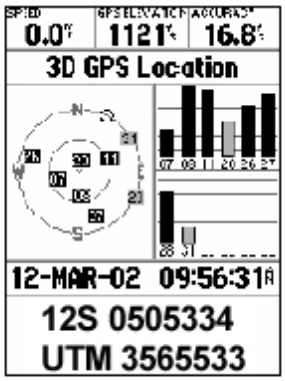
On private lands, you DO NOT have permission to collect ANY data other than start/stop locations of water. Please respect private landowner's privacy.

GPS UNIT BASICS:

1. The GPS acquires positional data from satellite transmissions. If your unit does not appear to be working, check for overhead interference and move slightly.

2. To turn the GPS unit on or off, press the "red light bulb" button.

3. The "Page" button is used to toggle between various screens. You will be using the "Satellite Information Page" almost exclusively. If the screen changes after the satellites are acquired, press "Page" until you return to this screen. Each bar on this screen represents a satellite signal; the length of the bar indicates the strength of the signal. The "Accuracy" in feet is given at the top right of the screen. First, ***record the accuracy number on your data sheet. Look for the time*** *noted just to the left of the Accuracy number. Second*, ***record the time on your sheet.*** Next, you will record the actual UTM reading given at the bottom of the screen, and will list two numbers: one that starts with "12R" or "12S" and a second that starts with "UTM". These numbers will look something like: 12R 0581500 and UTM 3890673. The time and date is shown just above the 12S and UTM readings. We will be recording our position in UTM meters, and using the NAD83 datum.



GPS Information Page

Recording Waypoints (data points)
You will be recording your waypoints in two ways: on your data sheets and in the GPS unit. First, you will note the accuracy estimate and time. If the accuracy is greater than 25 ft, wait or move slightly. Then, to record a waypoint, press and hold the "Enter" button on the GPS unit until the "Mark Waypoint" screen comes up automatically. Write down the "12R" or "12S" and "UTM" numbers on your data sheet, as well as the waypoint number still looking at the "Mark Waypoint" screen, check that the "OK" at the bottom right of the screen is highlighted. If it is not highlighted, use the center round black button to move the cursor until "OK" is highlighted. Press and release the "Enter" button again to enter the data point in the GPS memory. The screen will then automatically return to the satellite screen (same as "Satellite Information Page" we previously mentioned). Also mark your approximate location on your hardcopy map for future reference, using the waypoint number.

The 30 foot Rule.
Both wet segments and dry segments must be at least 30 feet long to be included, if they are shorter, we ignore them. You can determine this distance in the field by pacing it off.
Record both the starting and stopping points for water bodies that are more than 30 feet in length. If there is a break in the water (dry stretch) that is 30 feet or less, ignore it. For example, if the river flowed 60 feet then stopped for 10 feet, and then flowed for 100 feet, we would ignore that 10 foot break. We do not map both the start and stop points for any wet or dry segments that are less than 30 feet long because the accuracy of GPS measurements in this area is less than 30 feet.

Special Cases:

Note that we are measuring along the length of the channel, not width across the channel. For example, if a pool is 30 feet wide, and 15 feet long it would not be mapped (see"30 Foot Rule" sheet).

Be sure to check out all of the river's channels. Sometimes the flow of the river will be braided (divided, with islands in the middle). Your group may spread out as you move along the river to make sure you don't miss a parallel channel.

Other Observations:

When recording wildlife sign, large trash dumps, or other unusual sightings **DO NOT press the "Enter/ Mark"** button or record the information on regular data sheets. Use the separate "Other Observations" form to record the GPS data, circle the appropriate type of observation, and make any additional remarks. It is important that this information be kept separate from the water data and not entered in the GPS units.

Tips:

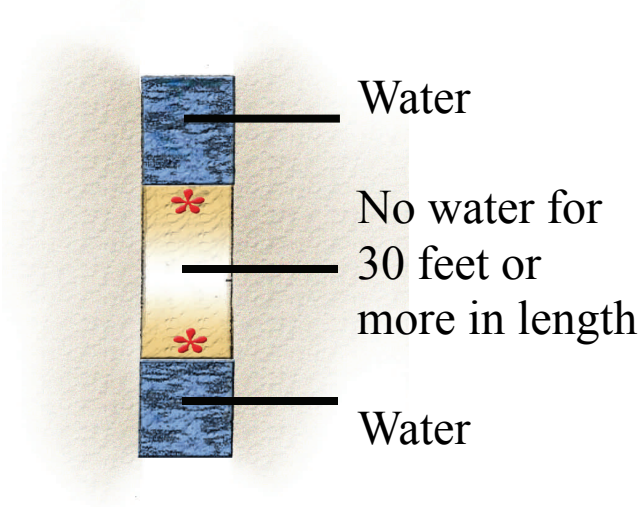
To obtain the most accurate reading, hold the GPS unit away from you with the "world logo" tilted up and away, and try to minimize shaking. Not waiting for an accurate GPS reading is the easiest mistake to make. If the GPS accuracy reading is greater than 25 ft., wait or move slightly until greater accuracy is reached. Ideally, the words "3-D GPS Location" will appear on the display. If your starting and/or ending points are at a bridge, move about 20 feet away from the bridge to ensure that your GPS unit has access to satellite signals.

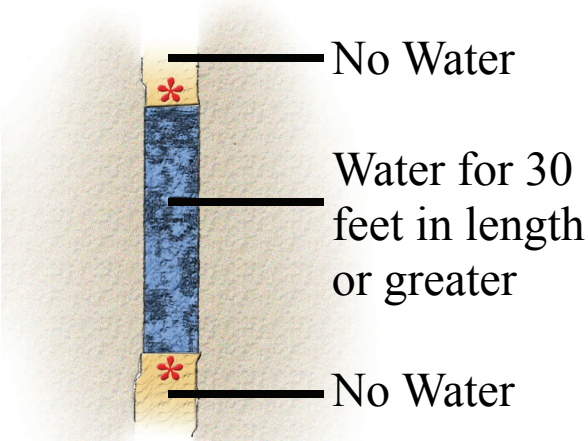
The GPS units are water resistant but not entirely waterproof. If it begins to rain, try to protect them as much as possible from water. You will be given a plastic zip lock bag to put the units in if it starts raining. Measurements can be made while the unit remains in the sealed bag. 4 Battery Check/Replacement

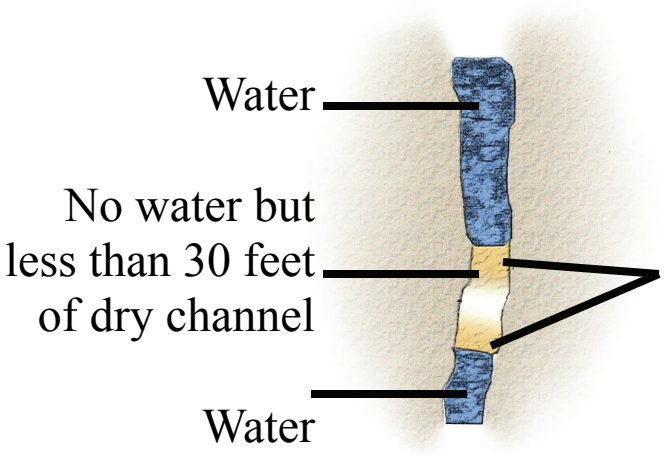
The batteries in your GPS unit should last a total of ten hours. To check on how much battery power you have left in your GPS when viewing the satellites page, press the "Menu" button twice and look at the battery icon at the bottom right of the screen. To return to the satellites page simply press "Menu" again. Check your battery power before you head out and replace the batteries if the battery icon shows that battery power is low. To change the batteries, power off the unit by pressing and holding the on/off (red light bulb) button, and turn the D-ring on the back to unlock the battery cover. Remove the back and replace the old batteries with new ones. After replacing and locking the battery cover, turn the unit back on and check to make sure that your readings are still in 12R and UTM units. If not, note this on the data sheets in LARGE print.

30 Foot Rule

TAKE GPS READINGS AT THESE LOCATIONS



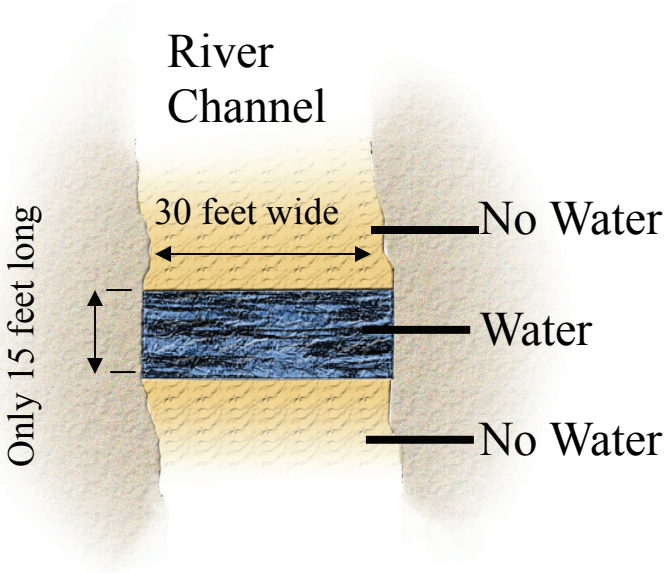




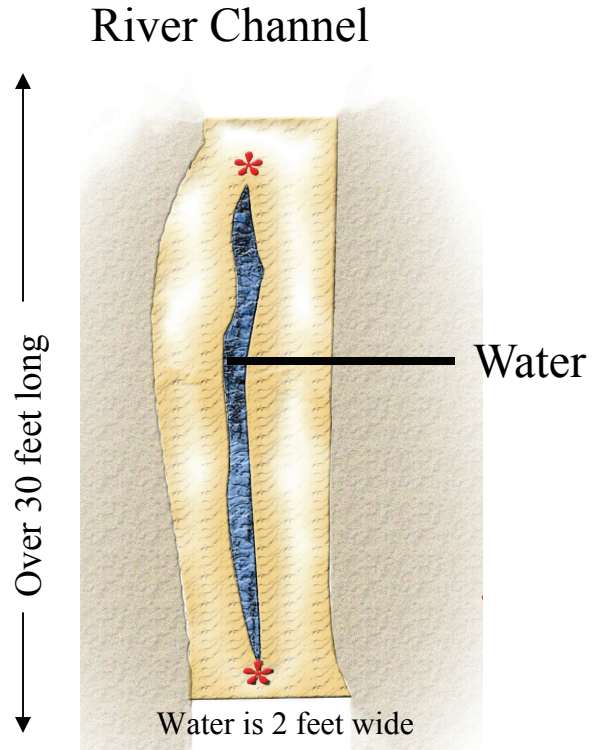
No need to take any GPS measurements at these locations

30 Foot Rule

TAKE GPS READINGS AT THESE LOCATIONS



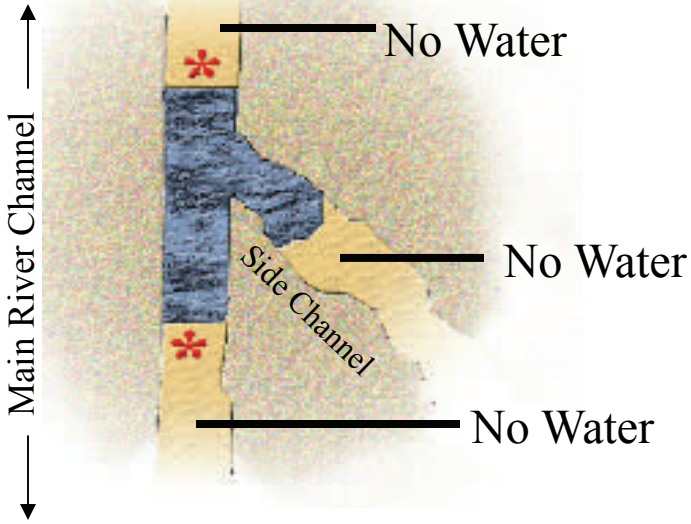
If water is less than 30 feet long, don't take GPS measurements. It does not matter how wide it is from side to side across the channel



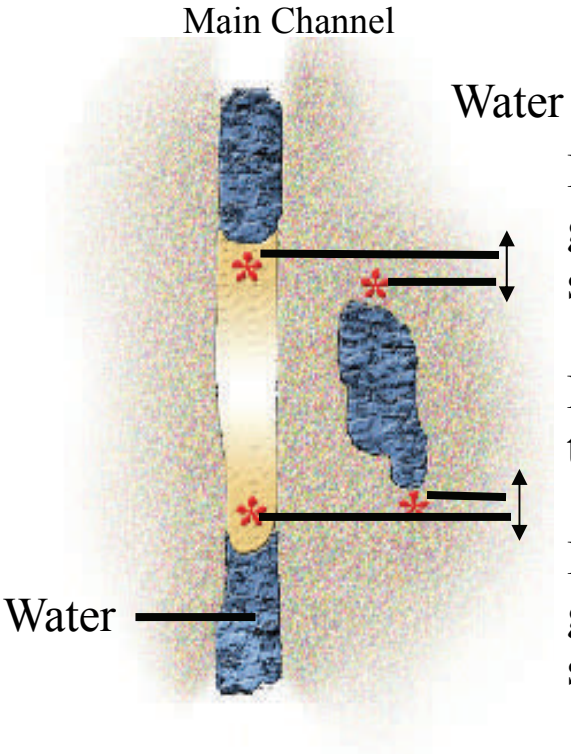
Here the water is over 30 feet long, but only two feet wide. You would take GPS measurements because it is the **length** that counts.

Tricky Situations

TAKE GPS READINGS AT THESE LOCATIONS



You would only need two measurements here since it is the **length** of the water that is important.



You may need four readings for this

If this distance between the red stars is greater than 30 ft, take a reading at each star.

Pool with water off the main channel

If this distance between the red stars is greater than 30 ft, take a reading at each star. If not, no readings are needed.