

Homework #1: Manage Tucson's Water Resources

Paper copy due Thursday, September 6th, 11am in class

Introduction. As you've read in Gelt et al., "Water In the Tucson Area: Seeking Sustainability", the management of Tucson's water resources is a balance between municipal, industrial, agricultural, and environmental stakeholders. A *stakeholder* is one who has an interest in the outcome of a management decision. Water management in the Tucson Basin is also a balance between using groundwater and surface water resources in a sustainable manner; that is, a balance between water supply and demand for now and the foreseeable future.

Task. As one of the stakeholders described below, you have been asked by the City of Tucson to submit a position paper describing how you would manage the Tucson Active Management Area's (TAMA) water resources. You will have to decide how to limit your water demand and that of other water users, as well the proportion of Central Arizona Project water each sector will use, in order to strike a balance between overall TAMA water supply and water demand. Whatever your plan, **your water budget must balance Total Demand with Total Supply.**

Assignment. Choose *one* of the following stakeholder roles:

- Mining Metallurgist at the Cypress Sierrita copper and molybdenum mine, located in TAMA south of Tucson and west of Green Valley. Your job is to maximize profits on the production of these two commodities.
- Cotton Farmer, Murphy Farms, Tucson. Your job is to maintain high quality and yield of cotton at your farm. Your farm has been selected to receive federal subsidized hookup to and provision of Central Arizona Project Water.
- President of the Tucson Developer's Association. Your business is home construction and sales in TAMA, including the booming southeastern side and "urban infill" projects within Tucson city limits.
- Representative of the Central Tucson Resident's Association. You have lived in Tucson for several decades and have watched its growth from medium-sized city to sprawling metropolitan area. You participated actively public discussions on water pricing, CAP, and infrastructure development.
- Citizen of the Tohono O'odham Nation, Sells, AZ. You have lived here all your life, and you would like to farm some land using traditional and modern agricultural methods. You are well aware the the Tohono O'odham Nation is entitled to its fair share of groundwater, CAP and reclaimed water based on the Southern Arizona Water Settlement Act of 1982.
- Least Grebe, Sweetwater Wetlands, Tucson. You're a small waterbird who likes her riparian habitat. You miss the perennial streams of legend, but this spot'll do.

How will you balance Tucson's water budget? Considering what you have learned in class and from your reading of "Seeking Sustainability", use the TAMA Water Budget Calculator provided by the University of Arizona's Water Resources Research Center (<http://ag.arizona.edu/AZWATER/publications/sustainability/balance.html>) to balance the water budget according to your stakeholder interests. Note that you can adjust two parameters for each of the usage sectors (Municipal, Agricultural, Industrial). These parameters are the sector **Demand** (as a percentage of 1997 demand), and the percentage of **Supply** which is filled by CAP water and Groundwater. Be aware that simply lowering Demand levels drastically is not a very practical or defensible proposition; some modification of Demand and of the source of Supply is in order here.

Assignment. Write a 500 word summary describing your balanced water budget and your stakeholder position. Your summary will begin with a title and a statement of your position in one concise sentence. The remainder of your paper should describe and justify your position. Your paper should include a titled table or figure which clearly shows your proposed *balanced* water budget. Explain why you chose the fractions of current water use and the proportion of CAP and groundwater that you show. If your budget requires that other stakeholders tighten their belts or use dramatically more CAP water than they currently do, briefly discuss your justification for asking them to do so. If you discuss ideas, facts and figures drawn from readings, lectures or other authoritative sources, *be sure to cite your references* and include a list of "Works Cited".

Grading. See the grading rubric for Homework Assignments (<http://ic.ltrr.arizona.edu/ic/nats101c/grubric.html>) for information on expectations for this assignment.

Assignment Help

I want to see you write concise, imaginative, well-argued and substantiated "A" papers. Need help? Please ask.

Writing resources. An excellent, witty guide to writing in general is "Elements of Style", by Strunk and White. See the course web pages for helpful writing links, especially The General Education Writing Skills Workshops (see <http://wsip.web.arizona.edu/> for upcoming events). A good guide to writing about science is Pechenik, "A Short Guide to Writing About Biology" – see link to Pechenik's "Ten Questions to Ask Yourself Before Completing a Written Assignment" in the course webpages (<http://ic.ltrr.arizona.edu/ic/nats101c-pechenik10.html>).

Paper draft review. I am available via email or during office hours (Tues/Thurs, 3-4pm, ILC/OSCR Underground Office 1) to answer questions, discuss ideas and read drafts. If you email me a draft, please do so as a PDF, Microsoft Word or text file attachment, and give me at least 24 hours to read and comment. I also encourage you to trade paper drafts for peer review with a classmate *who has chosen a different stakeholder position*. If you do so, be sure to complete the assignment on your own to ensure that the paper you hand in is your own work.