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Colorado River Water Resources Vulnerability: Project for Hill Country Conservancy:

The objective of this project is to look specifically at the Colorado River Watershed within the Hill Country, and develop a tool based on geographical information that is useful in determining which water resources are more vulnerable to development. In other words, which parts or parcels of land are more valuable in terms water management in order for conservancy efforts to focus on maintaining and preserving them.

Some concepts that should be part of the vulnerability analysis are: physical form, basin function, assimilative capacity, ecosystem integrity, and the uniqueness of the specific area.[1] The idea is to take into account different data, both geological and hydrological to classify areas, and determine ground water and surface water areas that are more vulnerable, both to development and pollution, and therefore have a greater effect in maintaining the quality and quantity of the watershed.

The project outcome would be an analysis tool which can be used by Hill Country Conservancy as part of their "strategic conservation analysis", thus helping them in the decision making of which areas of the watershed they should address and protect from unsustainable development. An additional interesting approach would be to link this vulnerability analysis to historical data to determine the resiliency of the water resources in the area of study, this is, the ability of the watershed to recover from failure or severe conditions[2].

Project outline:

- Define the criteria for this "vulnerability" analyses.
- Focus both, on groundwater and surface water vulnerability
- Cave density analysis (Raster analysis tools embedded in ArcGIS).
- Slope analysis.
- Soil and vegetation analysis.
- Mapping of historical land use land change historical data.
- As part of vulnerability to ground water pollution, map the DRASTIC[3] EPA index.
- Historical data to map resiliency of water resources.

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[1] Sinleton T., *et al.*, Assesing Water Resource Vulnerability: A Planning Tool for Community Decisions. http://palmm.fcla.edu/lfnh/related/Singletonpaper.htm, accessed September 2011.

[2] Hashimoto, T., Stedinger, J., Loucks, D., 1982. Reliability, Resiliency, and Vulnerability Criteria For Water Resource System Performance Evaluation. Water Resources Research, 18 (1), 14 – 20.

[3] DRASTIC Index: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydro geologic Settings. EPA, http://yosemite.epa.gov/water/owrcCatalog.nsf/SingleKeyword?Openview&Keyword=Drastic+Index&count=2000, accessed September 2011.