

Decision Support, Climate and Weather, Ecological Impact and Other Information on the Internet:

1) Water Lease Rate Calculator – an Excel Spreadsheet Decision Support Tool

Developed by Dr. Jeffrey Tranel, Agricultural and Business Management Economist, Colorado State University, Cooperative Extension and Department of Agricultural and Resource Economics

The tool is available from Dr. Tranel's website: <http://www.coopext.colostate.edu/tranel/> -- user is responsible for any risks.

On the left side, click on "decision tools" and then "water lease rate calculator v 3".

This is a draft decision support tool which applies farm-specific information to the problem of determining the minimum acceptable price for a water lease. Please note that the tool DOES NOT SPECIFY THE WATER BY VOLUME – it uses the information about farming on acres as described. A user would determine the number for the acres in question. The rate for a given lease would have to meet or beat that AFTER CONVERSION OF THE VOLUME OF WATER TO BE LEASED into the amount applied to those acres. There may be additional things to consider, if the ditch company needs to retain flows for sand management or other needs. And, the WATER FOLLOWING expenses would include whatever expense is needed to achieve goals such as erosion control, planting a "fallowing crop", and perhaps herbicides or pesticides, as well as ditch assessments and management. So, it will probably be critical to develop the "fallowing plan" before making a final decision and final use of this tool. Working it without these expenses might help to get some idea of what could be considered in the "fallowing plan", but would probably not be the starting point for making a deal. Read the cover sheet carefully; there is a lot here!

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See also websites for Kansas State and University of Nebraska Co-Operative Extension services for more decision support tools, being careful about what applies to your situation and how well your conditions match those specifications in a given model. Nebraska's "Water Optimizer" allocation tool for crop choice is now serving all Nebraska counties.

2) **Weather and Climate Information:** There have been terrific advances in information available, such as "point-and-click" spot weather forecasts out seven days for wherever in the US you want (try it!), as well as improved formatting and easier access to a lot of other weather and climate information, all centralized: <www.weather.gov>. The Climate Change in Colorado Report is available, along with the current Intermountain West Climate Summary and a lot of other materials from the Western Water Assessment Project, at <<http://wwa.colorado.edu/>>.

3) **The Drought Monitor** and associated products: <www.drought.gov> and National Drought Information System. This is the new portal for a wide range of excellent sources on drought (including recent past drought maps). See the "FORECASTING" section, including several kinds of soil moisture forecasts. In forecasting you can get to a daily-updated West-wide memo on hydrologic conditions from U. of Washington, in Hydrology, as well as NRCS information, and a great deal more. See "Current Drought" for some eye-opening remote sensing products. This is a great resource for all things related to US Drought; the portal home page even has news story links.

4) Don't forget the **Co-Operative Extension Services!** Colorado's has a range of products, such as CropFlex for irrigation scheduling, as well as dozens of informational one-pagers on farm and ranch topics. Neighboring states also provide a huge range of materials to everyone, so don't hesitate to look around. The High Plains Journal, for example, recently ran a story on farmland lease rates, based in part on the U of Nebraska's [Land] Lease Rate Calculator. Colorado Extension people are able to help with how to use such things here; some products are not instantly transferable, such as the "Water Optimizer", also from Nebraska (<<http://real.unl.edu/h20/>>). It is now supporting all 93 Nebraska Counties, but in Colorado and Kansas things are a bit different, so this might be interesting but not sufficient for seeing what happens with the important choices modeled. A great source on irrigation technologies and their use: Central Plains Irrigation Association – their website posts the proceedings from the annual short course, given by excellent regional researchers from Extension.

5) **Climate and Climate Change:** Two resources contain enormous expertise and resources, with free downloads and some paper copies as well. The US Global Change Research Program was merged and redirected into the Climate Change Science Program, now issuing Synthesis and Assessment Products; see especially **Weather and Climate Extremes** No. 3.3, and **Decision Support Experiments... Focus on Water Resources** No. 5.3 (there are 21), at <www.climatechange.gov> for these and some older reports (especially recommended: Ojima, D.S. and J.M. Lackett, et al., 2002, *Report of the Central Great Plains Regional Assessment Group*, also available from <http://www.nrel.colostate.edu/projects/gpa/gpa_report.pdf>).

The other essential resource on internet is the Intergovernmental Panel on Climate Change clearinghouse for access to all IPCC reports (be careful downloading, some of these reports are enormous) <www.ipcc.ch>. The IPCC uses the best science to get the strongest understanding possible, in an enormous and laborious process checking of every sentence and statement. The most recent full set of reports was Assessment Four, 2007. There is also Technical Report VI, **Climate Change and Water**. Each report and chapter has a short summary. This information is readable, though it contains the full technical information.

For Colorado, NOAA scientists produced **Climate Change in Colorado**, at <<http://cwcb.state.co.us/Home/ClimateChange/>>, which is very clear about what is known or not, at the intermediate level. There is a **Citizens' Guide** to Climate Change, from the Colorado Foundation for Water Education, suitable for everyone. New from U.S. National Research Council (2008): **Ecological Impacts of Climate Change**. Download from <www.nap.edu/catalog/12491.html>; suitable for everyone. For hunting and fishing specifics, see **Seasons' End**, from Ducks Unlimited and 10 other groups <<http://www.seasonsend.org/>>.