ENERGY PIPELINE

COVERING THE ENERGY INDUSTRY IN THE ROCKY MOUNTAIN REGION

Raymond's Folly

Meet the pioneer, the man who discovered and broke the code to the Codell formation

STATE OF OIL AND GAS

US official hopeful with the country's new role as global oil leader

HYDROGEN DRILLING

Hydrogen drilling? In Weld? A Greeley man has a working theory.

PLUGGED UP

Oil, gas producers increasingly plug old verticals to make way for the future.

APRIL | VOL 4 | ISSUE 3

$4.99

8 52667 72435 1

New tool reveals regional patterns in environmental status of reclamation at closed oil, gas wells

BY GARY BEERS • FOR ENERGY PIPELINE

The lack of progress in environmental reclamation of decommissioned oil/gas well pads is contributing to a legacy problem for oil/gas and environmental interests. Recent scientific and newspaper articles provide example perspectives of this problem.

- "Ecosystem services lost to oil and gas in North America," Science 348:401-402, April 2015, B.W. Allred et al.
- "Colorado land impact of oil and gas boom: scars spread and stay." Denver Post, Feb. 2 2015, B. Finley.

Limited inspections and self-reporting by oil/gas companies are the backbone of the information base on reclamation progress at closed well pads. This time-worn approach is an unsatisfactory oversight of progress on a local and regional basis and leads to insufficient information for evaluating and improving environmental elements in reclamation regulations.

USGS's Southwest Biological Sciences Center (Moab, Utah) developed a new tool for rapid assessment of the status of reclamation at decommissioned oil/gas well pads which will allow for improved, timely information and decision-making. For example, two key findings from a pilot application of this tool to 1,866 closed well-pad locations in a three-state area of the Colorado Plateau are:

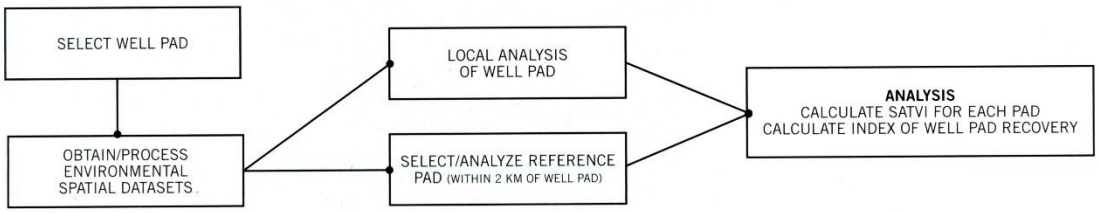
- Relatively poor recovery at over half the well-pads plugged from 1997 to 2005.
- Significantly less recovery for decommissioned well pads on state lands than for well-pads on federal or private lands.

NEW TOOL

Disturbance Automated Reference Toolset, or DART, is a method to monitor spatial and temporal patterns of well pad reclamation in an automated fashion using remote sensing and soil-eco-geomorphic ecological potential mapping strategies ("Disturbance automated reference toolset (DART): Assessing patterns in ecological recovery from energy development on the Colorado Plateau," Science of the Total Environment, 2017, T.W. Nauman et al, in press). The basic steps in this approach are shown in Figure 1. The core approach in DART for development of environmental spatial datasets for comparison of disturbed and undisturbed sites was developed earlier by the same USGS scientists (The automated reference

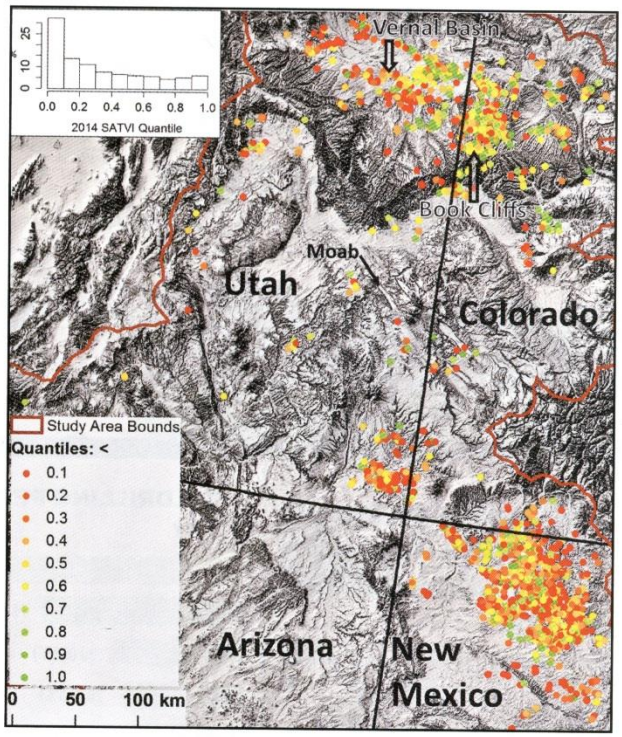
For over 50 years, **GARY BEERS**, has worked in numerous fields of environmental science as a consultant, regulator and educator. This career included senior management position with major consulting, nonprofit and public organizations. He has founded several successful firms to capture emerging resource management markets. One of his latest ventures, EnviroScienceINFO, provides content for public media.

FIGURE 1



Environmental Spacial Databases: Soil texture, DED/DEM topography, and Landsat 8/geology ratios.
Index of Well: Well pad SATVI • **Pad Recovery:** Reference pad SATVI

FIGURE 2



toolset: A soil-geomorphic ecological potential matching algorithm. Soil Science Society of America Journal 80(5):1317-1328, T.W. Nauman et al, 2016). The Soil Adjusted Total Vegetation Index (SATVI) is a mid- and shortwave-infrared-based measure that reflects to live and senescent vegetation cover and is effective for semi-arid rangeland environments (Remote sensing for grassland management in arid southwest. Rangeland Ecology Management 59(5):530-540, R.C. Marsett et al, 2006).

The results of the initial application of DART to decommissioned well pads in a portion of the Colorado Plateau are shown (Figure 2). Over half of the well pads show poor recovery: that is, the index of well pad recovery is less than 23 percent. Recovery patterns appear to be better along the Utah-Colorado border on the Book Cliffs Plateau as reflected in the higher numbers of yellow and green dots. Lesser levels of recovery are in New Mexico, southern Utah, and Vernal Basin (west of Book Cliffs) as reflected in the higher numbers of red and orange dots. In the paper on DART, the USGS scientists offer an opinion that the well pads in grasslands, canyon complexes, and shale badlands are not recovering as well as other areas in the Colorado Plateau. And, they conclude –"without DART, these regional-scale patterns in well pad recovery amongst vegetation types, climate, and land-ownership might have gone unnoticed – demonstrating the value of DART to help monitor broad land use trends.'" ♠