



# AMERICA'S GREAT LOSS

## The depletion of the Ogallala



### Background

The Ogallala Aquifer, the important natural water resource for the United States of America is in process of depletion. Agricultural production within eight Central Western states where the aquifer is located is worth \$20 billion per year. It is important to highlight the relevance of this water source as the area above it is very dry and there is no other nearby water source.

In the 1940s, the United States' government supported strongly the aquifer's exploitation to boost the areas' development. Soon the area over the Ogallala experienced rapid agricultural growth. Nowadays, huge crops have transformed the region; that has been since one of the most productive areas of the country. It is estimated that one fifth of the wheat, corn, cotton and 40% [1] of USA's cattle depend on the aquifer. In image 1, it is possible to observe the change from 1972 to 2011 in the use of the soil in a fraction of land above the Ogallala in Kansas. The red circles indicate the presence of crops irrigated with groundwater.

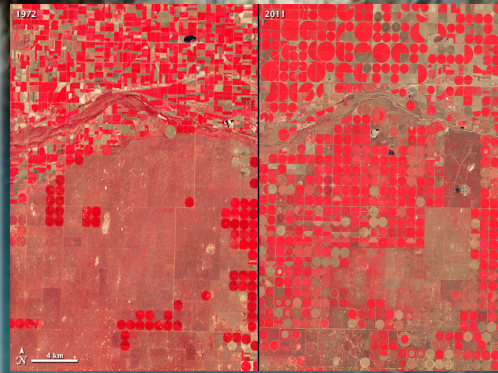


Image 1: satellite image, Kansas, Garden City 1972 vs. 2011 [2]

### The imminent loss

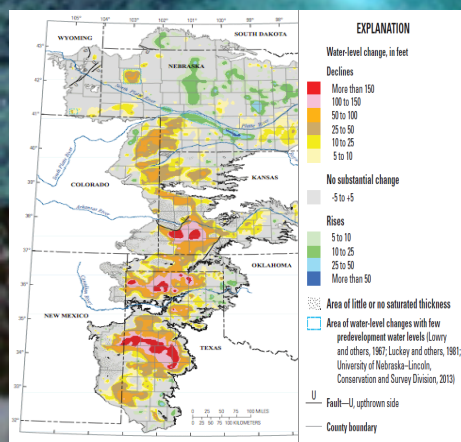


Image 2: Satellite image, Ogallala change in water levels [4]

In image 2 it is clearly seen that the water levels in the Ogallala have decreased notoriously. The areas that have experienced an increase in its depth are almost none. Meanwhile over a third of the Ogallala has suffered in 60 years a loss of between 50 and 150 feet of depth, the water loss is so extensive that the complete depletion of the aquifer seems to be imminent.

Despite knowing that the aquifer is a non-renewable water source, due to the fact that it was created by the accumulation of underground waters from thousands of years ago, it has been exploited as if it were a renewable resource.

The overuse of the aquifer is evidenced in the reduction of its water levels. Approximately for every 6 feet of liquid that are extracted from the aquifer only 0.4 feet are recovered annually. It is predicted that if the extraction continues without changing the current usage patterns, the aquifer will reach its maximum production in the year 2040 [3]. Afterwards, the area's capacity of agricultural and cattle production will suffer a downfall caused by water scarcity. Ultimately, the depletion of the Ogallala would represent the complete loss of crops and cattle that depend on its waters.

### What can be done?

Even though it is known that there is no chance of using the aquifer for extensive production for a boundless period of time, studies suggest that it is possible to extend its productive life. If a 20% reduction of water consumption in the region is achieved, it is estimated that the life of the aquifer could be prolonged to the year 2070 [3], 30 years longer than the projection if current usage patterns are not changed. Some of the proposed initiatives to extend the life of the Ogallala are listed in table 1.

Action	Description
<b>Change of crops</b>	Switch to crops that are able to survive with little or no water, like wheat and sorghum.
<b>Diminution of water use</b>	Measure through electronic monitoring the crop's temperatures so that crops are only irrigated when necessary.
<b>Water loss downgrading</b>	1.Irrigate crops only when atmospheric conditions are favorable, in order to reduce evapotranspiration. 2.Change from sprinkle irrigation systems to drip irrigation system.
<b>Return to grasslands</b>	Let the original grasslands regrow over certain areas above the Ogallala, and benefit from tourism.

Table 1: Action to prolong the aquifer's life and descriptions

### Disagreement

Nevertheless, a common agreement has not been reached to apply massively any of the methods to lessen the use of water in the Ogallala region. Furthermore, currently various governmental programs grant subsidies to both the return to grasslands and to corn production (One of the highest water consuming crops). Besides, in the past few years, the growth on the demand of biofuel has also encouraged farmers to increase water use to intensify biomass production. This leaves the future of the Ogallala groundwater source and the highly valuable industry that relies on it at a level of uncertainty. Coordinated actions in the United States should be implemented right away; awareness should be raised among the population. Changing crop species has shown encouraging results that indicate it is a very attainable option to prolong the aquifer's life. What is clear is that for now, if no measures are taken, the days of the Ogallala are numbered.

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- Background. Agua Viva. Image courtesy of Agua Viva.