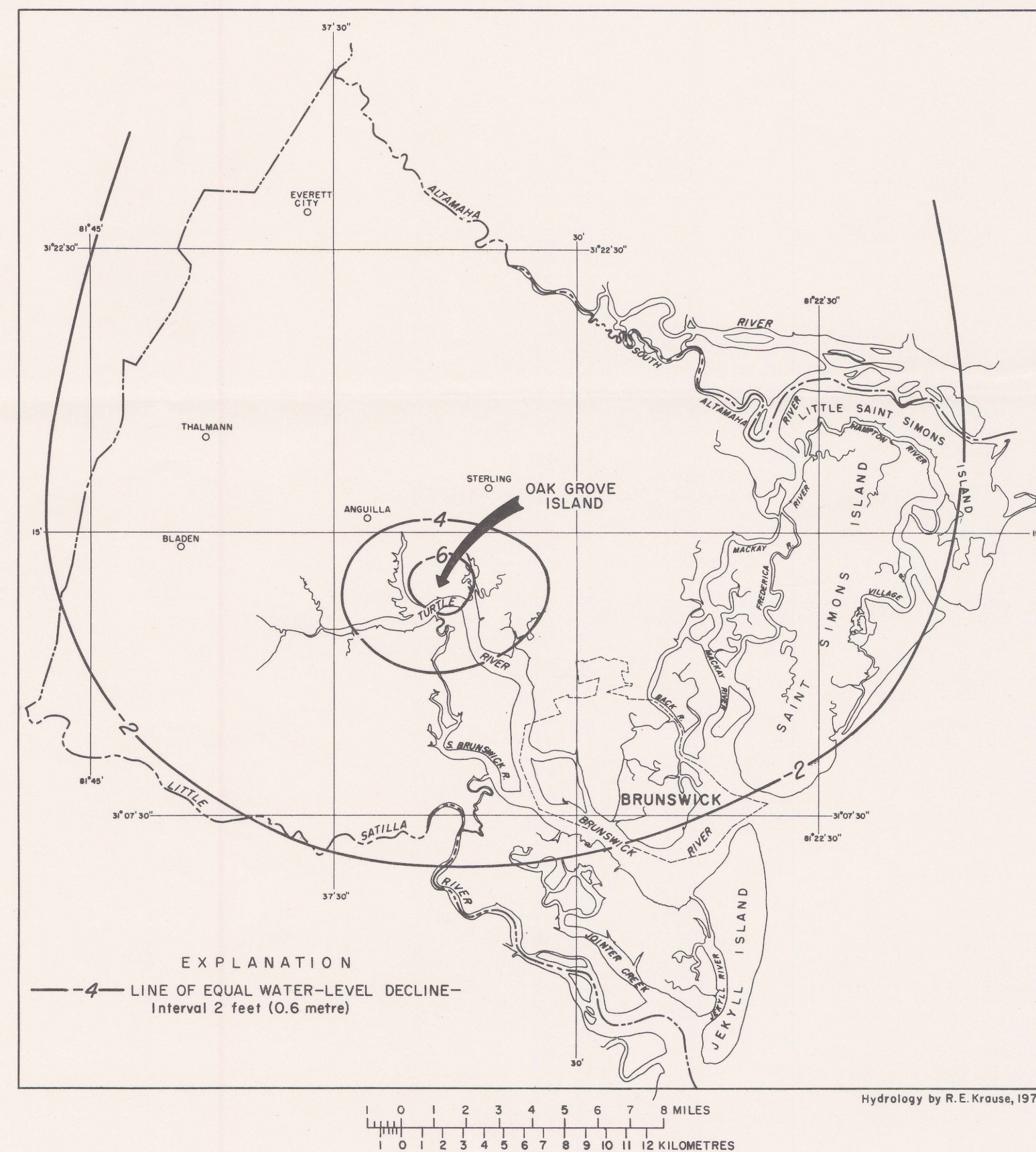


TRANSIENT MODEL PROJECTIONS



MAP SHOWING WATER-LEVEL DIFFERENCE, YEAR 2000, BETWEEN EFFECTS OF CURRENT PUMPAGE AND AN ADDITIONAL 10 MILLION GALLONS PER DAY (440 LITRES PER SECOND) HYPOTHETICAL PUMPAGE AT COLONELS ISLAND.

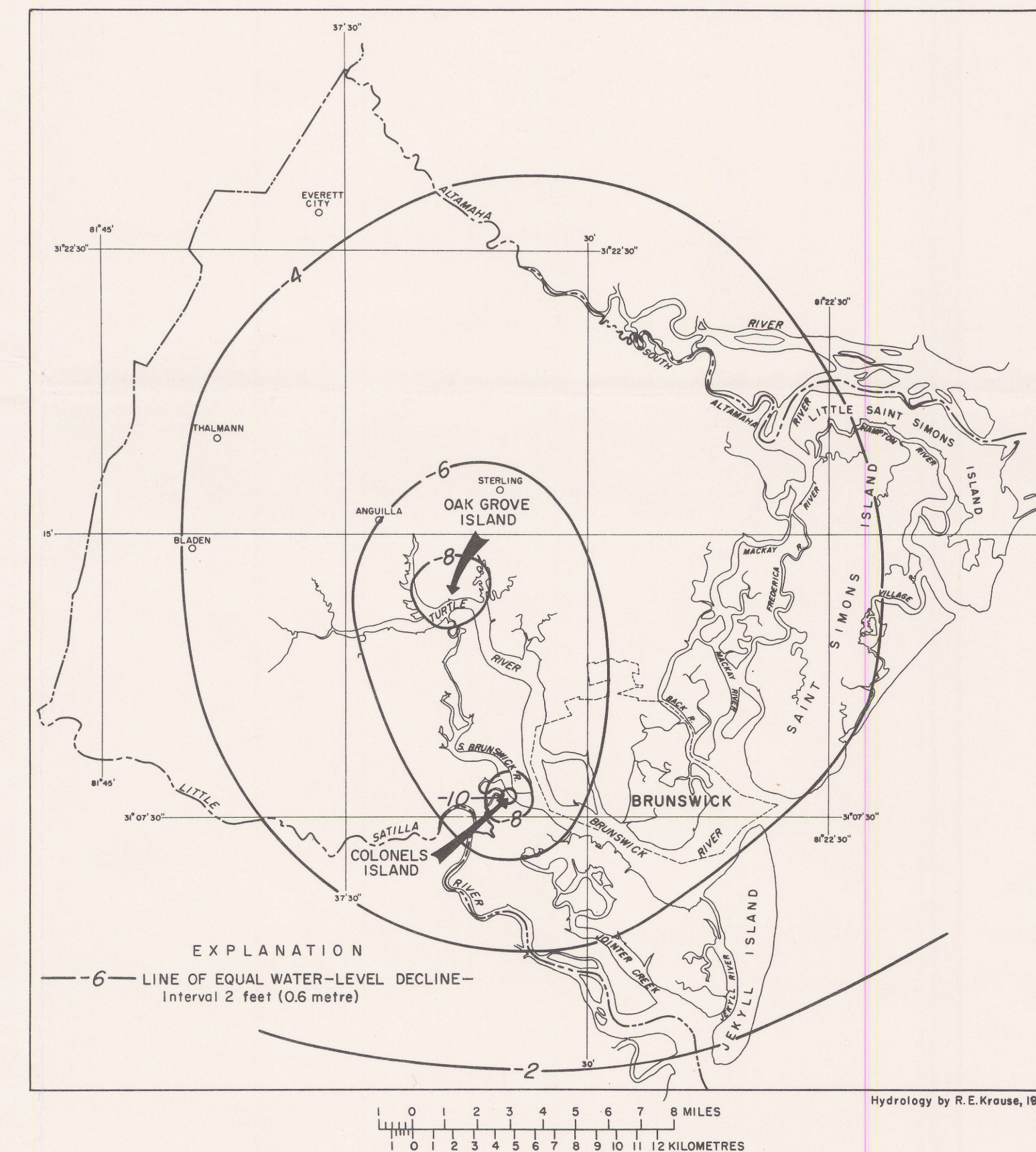
The transient model was extended from 1970 to the year 2000. Data used for this run were the 1970 water-level values computed by the model, and the 1963-70 pumpage. This projection assumes that the pumping rate for 1970-2000 will be the same rate as in the 1963-70 period, and that all other hydrologic parameters used in the model remain unchanged. If steady-state conditions are reached in any model run, the run terminates to save computer costs. The criterion used for terminating a run was that steady-state conditions were reached when the change in head between time steps at every node was less than 0.1 ft (0.03 m). Steady-state conditions were reached after only one time step of less than an hour. This was expected, as it had been reached at the end of the previous run for 1963-70, and measured water levels support this. Therefore, the 2000 water level is virtually the same as for 1970. Any added discharge from the aquifer, however, will lower the water level, and by use of the transient model, this lowering and new water level may be calculated.



MAP SHOWING WATER-LEVEL DIFFERENCE, YEAR 2000, BETWEEN EFFECTS OF CURRENT PUMPAGE AND AN ADDITIONAL 10 MILLION GALLONS PER DAY (440 LITRES PER SECOND) HYPOTHETICAL PUMPAGE AT OAK GROVE ISLAND.

In the above projections, pumpage was held at the 1970 level. If future management programs include added pumpage by a new or expanding industry for example, the proposed increase can be incorporated into the model by including the amount and starting date of withdrawal for the proposed site, or sites. Computations are then made with this new added pumpage, resulting in a water level that should reasonably match that produced if the pumpage were actually added. Several model runs incorporating hypothetical pumping changes were made to the year 2000.

The water-level is computed and maps are produced for the year 2000 showing the new water level expected as a result of incorporating the hypothetical pumping changes. However, the water-level maps produced are very similar to the water-level map for the year 2000 using current pumpage. Therefore, water-level differences are computed and maps are drawn, which clearly illustrate the effects of the hypothetical pumping changes. These maps show the difference in the water level in the year 2000 between pumping at the 1970 rate and the new rate with the hypothetical pumping changes.



MAP SHOWING WATER-LEVEL DIFFERENCE, YEAR 2000, BETWEEN EFFECTS OF CURRENT PUMPAGE AND AN ADDITIONAL HYPOTHETICAL PUMPAGE OF 10 MILLION GALLONS PER DAY (440 LITRES PER SECOND) AT COLONELS ISLAND AND 10 MILLION GALLONS PER DAY (440 LITRES PER SECOND) AT OAK GROVE ISLAND.

The first map above shows the difference in the water level in the year 2000 between pumpage at the current rate, and an additional pumpage of 10 Mgal/d (440 l/s) on Colonels Island. Lines of change below -6 ft (-2 m) are not shown to avoid clutter, but the greatest difference is -8.2 ft (-2.5 m) in the node that includes the hypothetical pumpage. The second map above is similar to the first map except that the additional pumpage is on Oak Grove Island and the greatest difference is -7.4 ft (-2.3 m). The third map above shows the difference using an additional pumpage of 20 Mgal/d (880 l/s): 10 Mgal/d (440 l/s) at Colonels Island and 10 Mgal/d (440 l/s) at Oak Grove Island. The greatest difference at Colonels Island is -10.7 ft (-3.3 m) and -9.9 ft (-3.0 m) at Oak Grove Island.

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Cartography by W. G. Hester

DIGITAL MODEL ANALYSIS OF THE PRINCIPAL ARTESIAN AQUIFER, GLYNN COUNTY, GEORGIA

By
R. E. Krause and H. B. Counts

1975

Georgia (Glynn Co.). Ground water. 1:250,000. 1975.
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