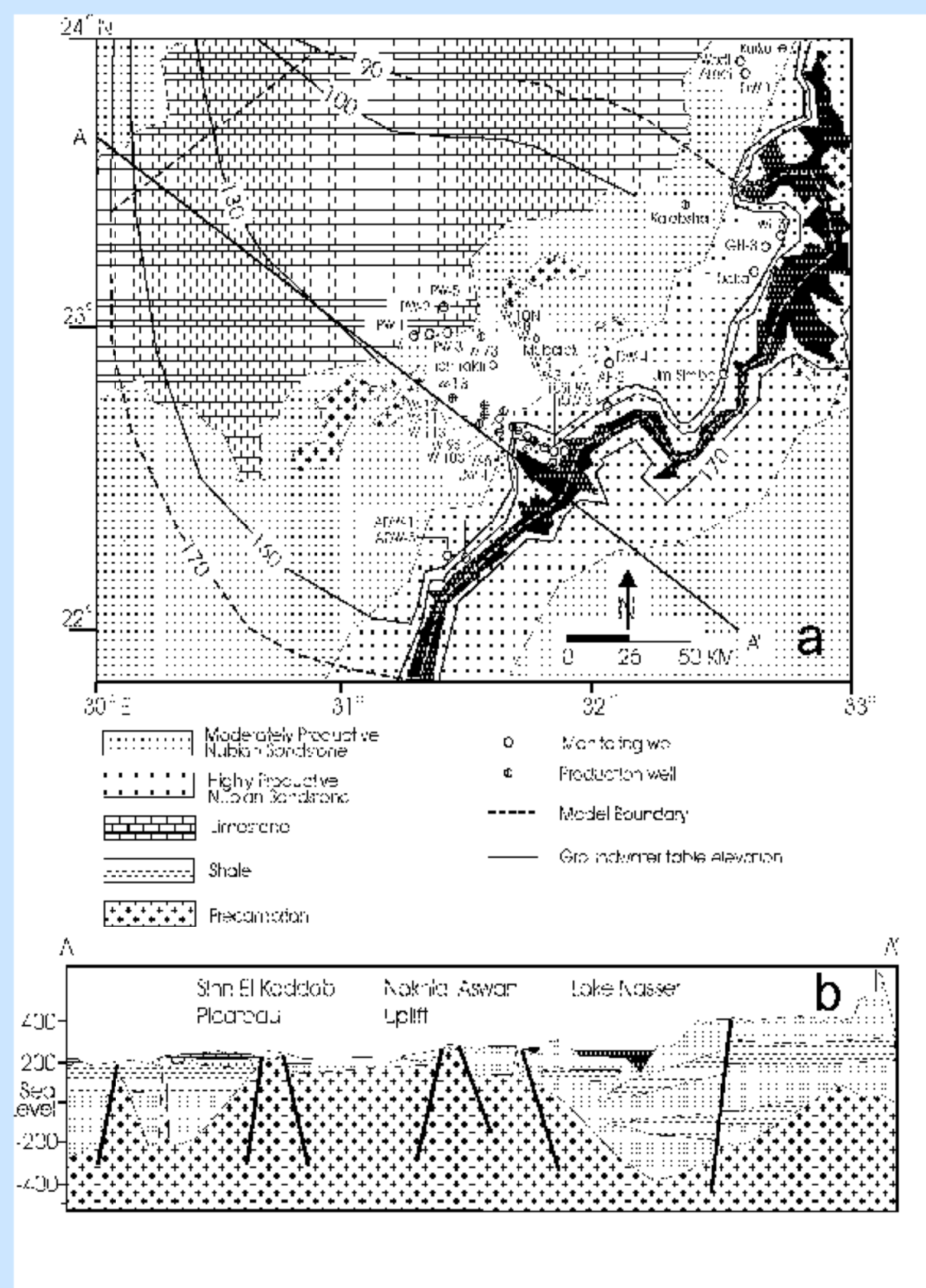# Construct a Ground Water Flow Model for Area "A"
# (Build on Earlier Results for Area "B")

Site Description

Simplified hydrogeologic map for the study area:
(a) Major hydrogeologic units, model boundaries, and locations of pumping and piezometric wells.
(b) Northwest-southeast-trending schematic cross section along line A-A' in panel (a).

Aquifer thickness

Surface elevation


Initial Conditions (1970)
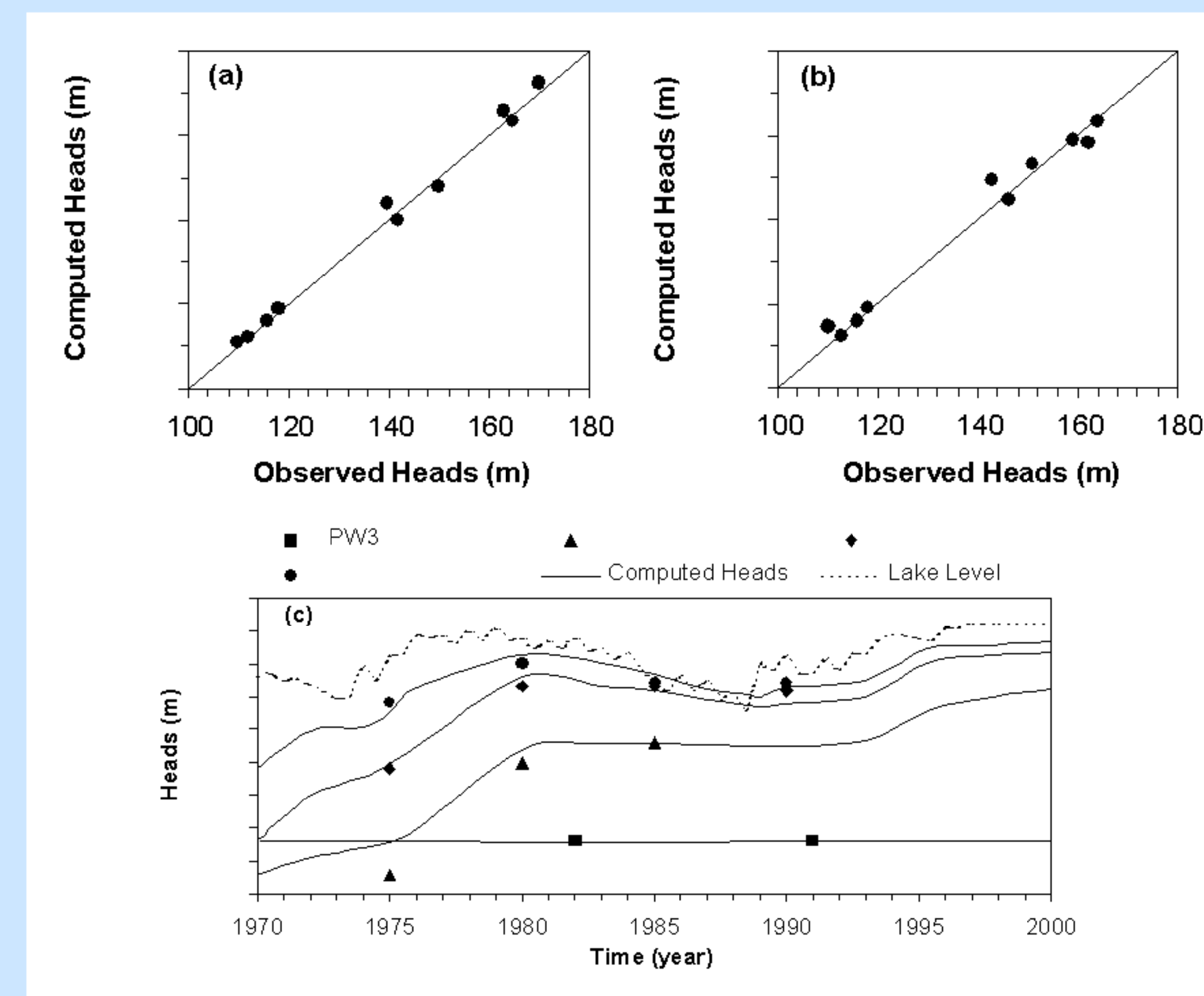
Calibration results: (a) observed versus computed head at observation wells in 1980; (b) observed versus computed heads at observation wells in 1990; and (c) time series of groundwater head at four observation wells.
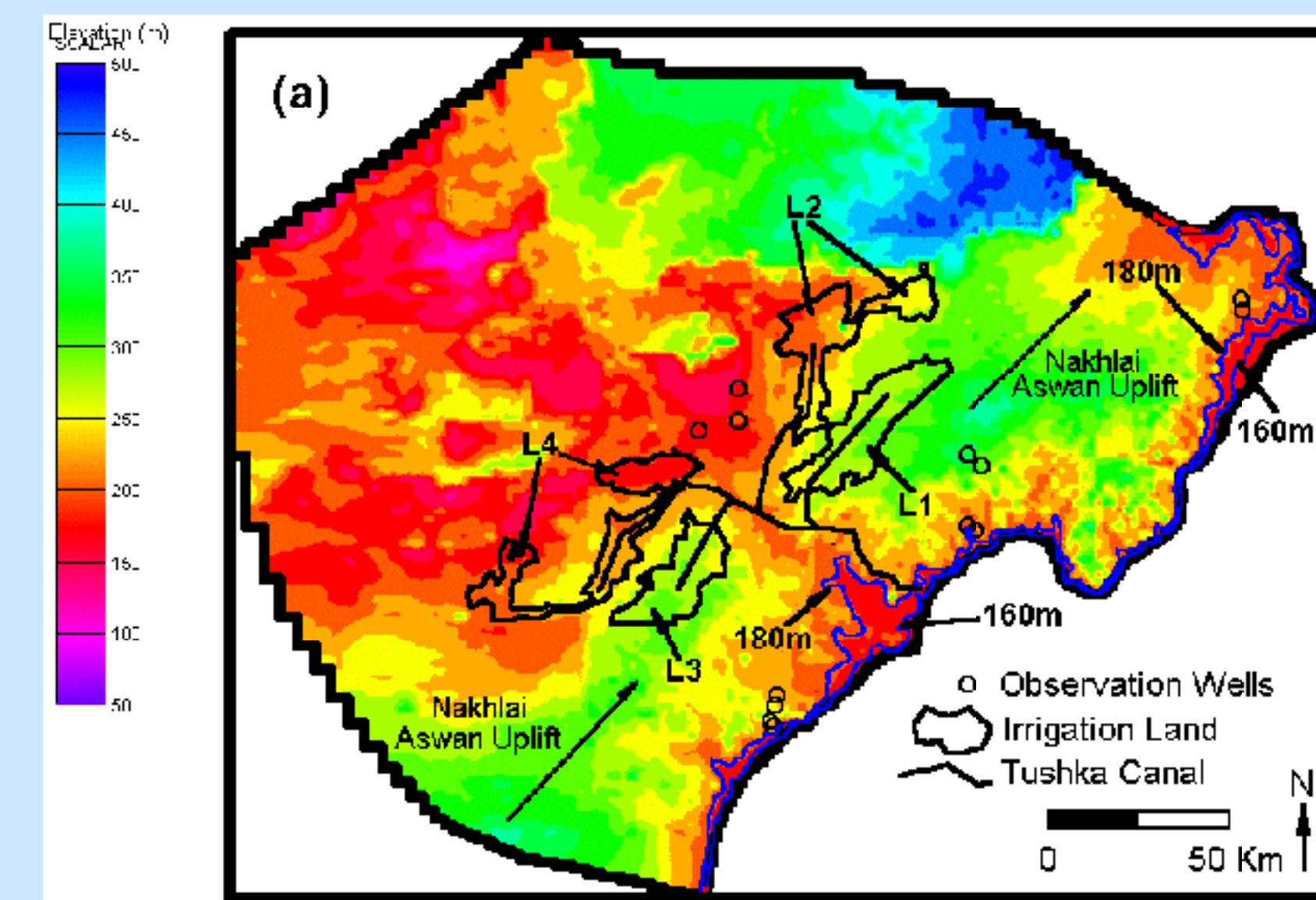
Calibration (1970-2000)
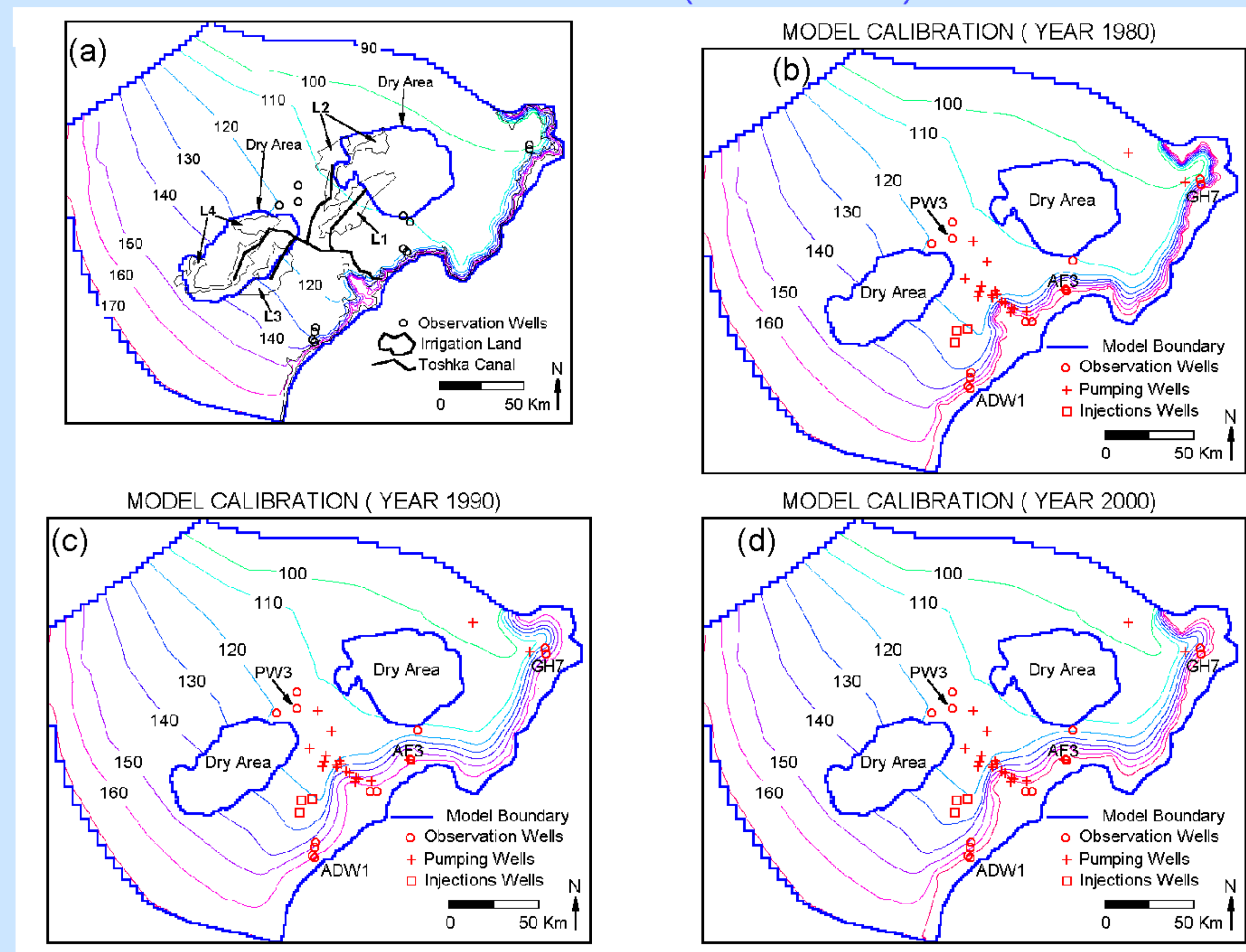
Initial and calibrated groundwater head distributions: (a) initial (1970), (b) in 1980, (c) in 1990, and (d) in 2000.
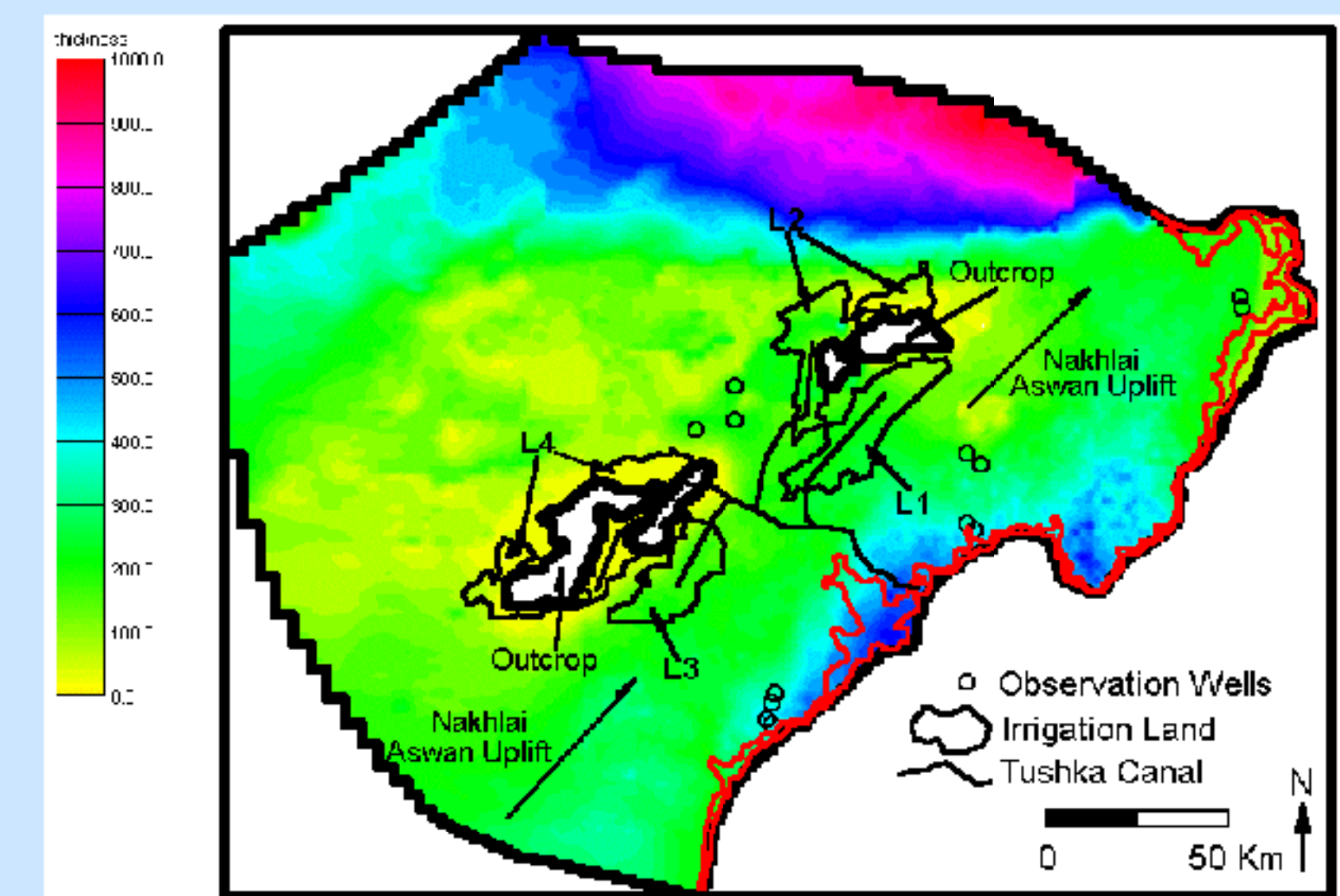
Model Applications (2000-2050)
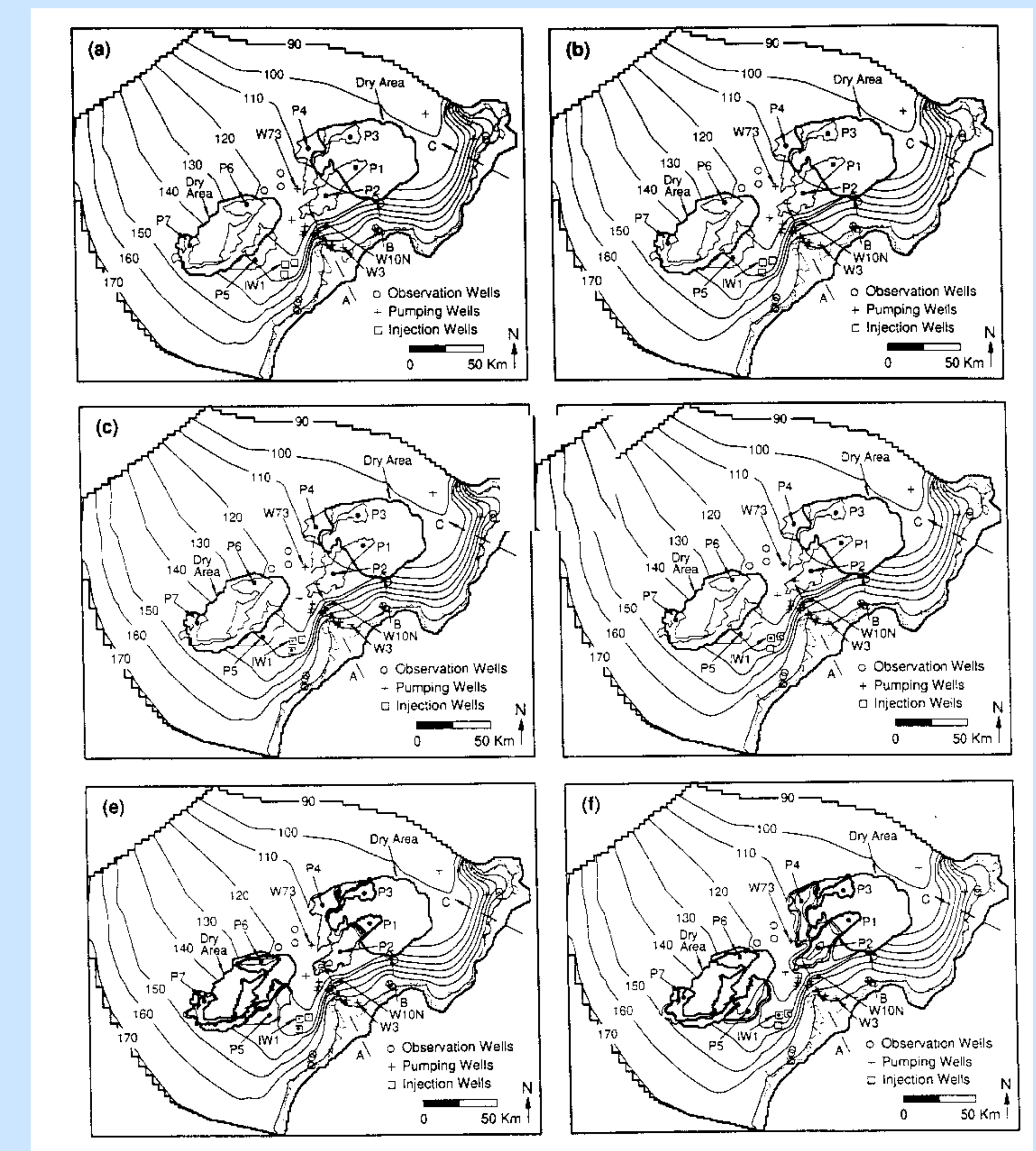
Predicted groundwater head distributions: (a) in 2020 for Scenario 1, (b) in 2050 for Scenario 1, (c) in 2020 for Scenario 2, (d) in 2050 for Scenario 2, (e) in 2020 for Scenario 3, and (f) in 2050 for Scenario 3.

· Scenario 1: Recharge from lake (base case, continuation of 2000 conditions)

· Scenario 2: Base case, plus pumping and injection

· Scenario 3: Base case, plus pumping and injection, plus irrigation recharge

	Year					Surface Elevation	Aquifer Thickness
2010	2020	2030	2040	2050			
201.8	209.6	217.3	224.9	232.4		277.1	83.3
120.0	128.0	135.9	143.7	151.1		268.3	207.4
212.5	221.9	231.1	240.0	248.5		234.5	31.0
116.3	124.3	132.0	139.6	147.1		187.6	183.2
137.2	145.2	153.2	161.0	168.7		285.5	177.9
154.4	162.5	170.6	178.8	187.2		161.5	15.1
170.5	178.8	187.1	195.4	203.5		172.2	10.0

Results

Scenario 1: Net recharge from the lake (1970-2000) is 5.3×10^{10} m^3. Recharge from the lake will continue, at a slower rate than during the previous 30-yr period (~86% reduction in 30-yr recharge).

Scenario 2: No major deviation of the overall head distribution from the base case. Some local cones of depression and groundwater mounds.

Scenario 3: Many proposed irrigation areas with small aquifer thicknesses that were previously dry will become saturated with introduced water. The heads in those areas will continue to increase, resulting in potential flooding and salinization.