Responses to FERC Additional Information Request OP-1(e)

Water Quality

Final Report

Idaho Power Company

Hells Canyon Project
FERC No. P-1971-079

February 2005

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SCHEDULE A: ADDITIONAL INFORMATION REQUEST OP-1(e) WATER QUALITY

Time Required: 9 months

(e) Water quality

Because drawdown of Brownlee reservoir may affect downstream water quality, please provide the following information for Scenarios 2, 5 and 6. In your model runs of this scenario, please assume implementation of aeration of Brownlee reservoir as you have proposed and venting of Brownlee units 1 through 5.

(i) A plot of simulated hourly water temperatures below Hells Canyon dam from January 1 through December 31 for each of the 5 representative years (1992, 1994, 1995, 1999, and 1997).

(ii) A plot of simulated hourly dissolved oxygen (DO) levels below Hells Canyon dam from January 1 through December 31 for each of the 5 representative years (1992, 1994, 1995, 1999, and 1997).

(iii) Semi-monthly plots (February, April, June, August, October, and December) of simulated temperature and DO isopleths in Brownlee reservoir for each of the 5 representative years (1992, 1994, 1995, 1999, and 1997). These plots should be similar in format to the plots that you provided in figures 13 and 26 of Technical Appendix E.2.2-2, except that each plot should be provided in a full-page, black-and-white format.

(iv) A qualitative evaluation of the potential effects on ammonia levels, pH levels, and concentrations of mercury and organo-chlorine compounds in waters discharged from Hells Canyon dam for each of the 5 representative years (1992, 1994, 1995, 1999, and 1997).

Please prepare your responses to parts (d), (e), (f) and (g) of this AIR after consultation with NOAA Fisheries, U.S. Fish and Wildlife Service (FWS), U.S. Forest Service (FS), U.S. Bureau of Land Management (BLM), Idaho Department of Fish and Game (IDFG), Idaho Department of Environmental Quality (IDEQ), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Environmental Quality (ODEQ) Columbia River Inter-Tribal Fish Commission (CRITFC), Nez Perce Tribe (NPT), Shoshone-Bannock Tribes (SBT), Shoshone-Paiute Tribes of the Duck Valley Indian Reservation (SPT), Burns Paiute Tribe (BPT), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Confederated Tribes of Warm Springs (CTWS). Include comments from the consulted entities on your response to items (d), (e), (f) and (g) and your response to their comments with your filing.

In all parts of your response where graphics are requested, full page black-and-white graphics should be provided to ensure readability in both hard copy and electronic formats. In order to facilitate side-by-side comparisons, please provide the graphs that we ask for in subparts (e)(i) through (e)(iii) and subparts (f)(i) and (f)(ii) of this AIR for both current and your proposed operations.[1]

[1] In AIR OP-2, *Current Operations Scenarios*, we ask you to determine whether your proposed operations are the same as your current operations.

1. INTRODUCTION

This report presents simulated water quality results requested by the Federal Energy Regulatory Commission (FERC) from operational scenarios 2, 5, and 6 as part of the additional information request (AIR) OP-1. Operational scenarios 2 (OP-2), 5 (OP-5), and 6 (OP-6) all involve drawdown of Brownlee Reservoir, which could affect water quality in discharge from Hells Canyon Dam. FERC's AIR specifically requested that reservoir aeration and turbine aeration be incorporated into the modeling. However, FERC did not specifically request that upstream water quality improvements anticipated from implementation of the *Snake River–Hells Canyon Total Maximum Daily Load (TMDL)* (IDEQ and ODEQ 2003) be incorporated.[2] As such, IPC has not done so.

The CE-QUAL-W2 model used for our modeling is a two-dimensional (2D, laterally averaged) hydrodynamic water quality model. Some additional assumptions to the basic model package are required to incorporate reservoir and turbine aeration as requested. The effects of the reservoir aeration system are modeled in CE-QUAL-W2 using customized coding developed for IPC. The coding allows oxygen to be added at a specified rate to a specified number of model cells for a range of days. The desired amount of oxygen per year is converted into a kilogram per day rate (i.e., 1,125 tons/yr equals 15,727 kg/day over the 65 days from Julian day 182 to 247), and that mass is added equally into the specified model segments and layers. To represent rising bubbles, the coding also includes a factor by which vertical mixing between model layers can be increased. This factor is set to increase mixing slightly since the diffuser design at the oxygen flow rates are anticipated to cause relatively little mixing.

Model segments and layers are aerated to represent a conceptual system location in the upstream end of the transition zone as described in more detail in IPC's response to FERC's AIR WQ-1. The conceptual location is centered near river mile (RM) 325, approximately 2 miles downstream of Spring Recreation Site, with diffusers extending upstream for approximately 1.8 miles. Model layers are aerated to represent 40 ft (12.2 m) of depth, starting slightly off the bottom to show the ability to float the diffuser line from anchors. Additional information on conceptual design, conceptual operational plan, and reservoir aeration modeling is also provided in IPC's response to AIR WQ-1. It should be noted that the diffuser system location was evaluated and optimized for Brownlee Reservoir's transition zone under proposed operations for the representative years as described in WQ-1. Aeration was not reevaluated for each operational scenario in this response. Scenarios OP-2 and OP-6 were modeled with aeration at the WQ-1 conceptual

[2] The TMDL uses a watershed approach in addressing water quality issues in the SR-HC reach (RM 188-409) and in this manner recognizes that various stakeholders have proportionate responsibilities for current conditions. See: SR-HC TMDL, page 450, and discussion in AIR WQ-1.

location and the TMDL allocation amount (1125 tons/yr) added from Julian day 182 through 247. Likewise, proposed operations incorporate aeration at the same location, amounts, and timing. Since operating at minimum pool year round in OP-5 creates riverine conditions at the proposed aeration location, aeration was moved downstream to a location in the pool comparable in depth to the proposed location. The feasibility and costs of the aeration system at this location have not been fully evaluated.

In order to begin the CE-QUAL-W2 model runs necessary to address the AIRs in the timeframe allotted an assumption on the effects of proposed turbine aeration at Brownlee was necessary early in the process. Therefore, in the CE-QUAL-W2 modeling a 1 mg/L DO increase in Brownlee discharge was assumed when DO was below 6 mg/L, and a 0.33 mg/L increase assumed with DO was above 6 mg/L. This assumption was based on preliminary estimates of the effects of blower installation on unit 5 (only operating when discharge DO fell below 6 mg/L), information at that time on baffle installation (i.e. 2001 Mobley engineering report) and preliminary information on blowers for units 1-4 (see IPC's response to AIR WQ-1). Ongoing studies of turbine venting at the Brownlee Project have determined that the previously proposed baffle installation is infeasible for increasing discharge DO. By the time baffle installation was determined to be ineffective sufficient time did not remain to refine the assumption of a 1 mg/L increase in DO.

2. RESPONSES

2.1. Response to OP-1(e)(i)

Figures 1 through 15 show Brownlee inflow, outflow, and water surface elevations for each operational scenario for each representative water year (1992, 1994, 1995, 1999, and 1997). Figures 16 through 20 show the same information for proposed operations. These plots are included for comparison with simulated temperature and DO results from OP-2, OP-5, and OP-6. Figures 21 through 35 show simulated hourly temperatures in the Hells Canyon outflow from January 1 through December 31 for OP-2, OP-5, and OP-6 for each representative water year.

2.2. Response to OP-1(e)(ii)

Figures 36 through 50 show simulated hourly DO levels in the Hells Canyon outflow from January 1 through December 31 for OP-2, OP-5, and OP-6 for each representative water year.

2.3. Response to OP-1(e)(iii)

Figures 51 through 110 show semimonthly (February, April, June, August, October, and December) simulated temperature and DO isopleths for Brownlee Reservoir for each representative water year under proposed operations. Figures 111 through 170 show the same information for OP-2; Figures 171 through 230, for OP-5; and Figures 231 through 290, for OP-6.

2.4. Response to OP-1(e)(iv)

Operational scenarios 2, 5, and 6 all involve drawdown of Brownlee Reservoir, which could affect downstream water quality. Qualitative evaluation of the potential effects of these operational scenarios on levels of ammonia, pH, and concentrations of mercury and organochlorine compounds in water discharged from Hells Canyon Dam was specifically requested in this AIR. This section reviews reservoir processes related to operations and cycling of these specific constituents and presents potential effects of each operational scenario on discharge levels.

2.4.1. Reservoir Processes

There are a number of processes that occur during drawdown of Brownlee Reservoir that could affect discharge concentrations of the specified constituents. One process driving discharge levels is sediment scour and redistribution. Drawdown exposes sediments that have accumulated in the transition zone and creates higher velocities in the upstream end of the reservoir. Sediment scour and redistribution occurs under current operations with large drawdown in spring for flood control. In 1997 when riverine conditions were created from a drawdown to near-minimum pool in April for flood control (Figure 20) sediment scour and redistribution processes were seen. During this drawdown, turbidity measurements were nearly four times higher in the upper end of Brownlee Reservoir (RM 315–320) than in the inflow (RM 340) a result indicating that substantial erosion and scour of deposited sediments were occurring. Some of this material was likely redistributed to deeper parts of the reservoir while other material was discharged, as suggested by turbidity spikes in both Brownlee and Hells Canyon outflows at the end of April.

Under the operational scenarios, sediment scour and redistribution processes would occur both as an initial redistribution or flushing and on an annual basis once a new dynamic equilibrium were established. Initially, overall loading of sediment and associated materials would be increased in the discharge as accumulated sediments were flushed out. Over time, a new equilibrium would be established, and patterns in the discharge would be dependent on the operational scenario and flow conditions. Summer drawdown, as incorporated into OP-2 and OP-6, would result in less sediment being stored, thereby affecting both summer discharge levels, conditions in the transition zone and downstream through the reservoir. Once dynamic equilibrium was established, operation at minimum pool year round could result in sediments being stored farther downstream and more sediments being exported year round.

Another process driving outflow levels of the specified constituents is discharge of water stored in the epilimnion, metalimnion, and transition zone. Drawdown results in the discharge of water stored in the transition zone that, depending on flow conditions (i.e., high flow or low flow year), may have accumulated anoxic products. Discharge of stored hypolimnetic water occurs during fall reservoir turnover. Discharge peaks in inorganic nutrients are seen in the fall due to discharge of hypolimnetic water and low biological uptake. In a summer drawdown, such as in OP-2 and OP-6, stored water would be discharged during times of high biological uptake.

A final factor that may affect discharge levels of some specified constituents in OP-5 is depth (i.e., thickness) of the epilimnion. Under current conditions, the epilimnion in the Brownlee Reservoir is deep and seems to be strongly controlled by the physical configuration of the power intake channel from which the penstocks draw water. Results of modeling operations at minimum pool suggest that the epilimnion would be considerably shallower and anoxic conditions in the metalimnion and hypolimnion would be closer to the surface. These findings suggest that there is more potential for periodic mixing of epilimnetic and metalimnetic waters and movement of anoxic water and products into upper layers where it can be discharged.

2.4.1.1. Ammonia Processes

A major pathway for ammonia production is heterotrophic bacterial decomposition of organic matter where ammonia is generated as a primary end product. Under anoxic conditions in the water and sediments, bacterial nitrification of ammonia to nitrate and nitrite ceases and ammonia accumulates. When overlying water is anoxic, the capacity of sediments to absorb ammonia is greatly reduced and ammonia is released (Wetzel 2001). Accumulation of ammonia (and other anoxic products, including inorganic phosphorus and dissolved metals) throughout the year in the hypolimnion and deeper areas of the transition zone results as a combination of these processes. Large inflowing organic nitrogen loads are transformed in Brownlee Reservoir, resulting in the retention of organic nitrogen and export of ammonia (Myers et al. 2003). Ammonia levels in discharge from Hells Canyon Dam closely mirror levels in Brownlee discharge and show some seasonal patterns with peaks in spring and late fall. These patterns coincide with periods of high inflow, reservoir drawdown, and fall turnover, which all result in redistribution of nutrients accumulated in the water column and sediments. Elevated springtime ammonia levels in discharge from Brownlee, Oxbow, and Hells Canyon reservoirs suggest that sediment scour can release anoxic products from reservoir sediments. The highest spring ammonia peak (0.7 mg/L) measured in Hells Canyon discharge occurred in April 1997 when the reservoir was drawn down to minimum pool.

2.4.1.2. Mercury Processes

The complex cycling of mercury (Hg) among its many pools and forms in aquatic systems makes even a qualitative evaluation of effects of operational scenarios difficult. Inorganic mercury (InHg) and highly toxic, bioaccumulative methylmercury (MeHg) compounds are partitioned among sediment, water, and biota pools in both organic/inorganic and dissolved/particulate forms. The majority of InHg is typically stored in sediments (Meili 1997). Concentrations of MeHg and proportions of MeHg to InHg depend on the balance of methylation, demethylation, and chemical stabilization in the system. MeHg is formed by methylation of InHg in the presence of organic matter. Methylation is thought to be a microbial process highly dependent on methanogenic and sulfate-reducing bacteria in anoxic conditions, although it can also occur in oxic conditions (Miskimmin et al. 1992). Demethylation, which is also controlled directly by microbial activity or abiotically by sunlight, is highest in oxic photic zones (Meili 1997).

Organic matter concentrations and cycling exert strong control on the transport and transformations of Hg in aquatic systems. Concentrations of MeHg and total Hg typically increase with the concentration of dissolved organic carbon (Driscoll et al. 1994). Other important parameters influencing the cycle include concentrations and redox states of iron, manganese, chloride, and sulfur compounds.

Methylation appears highest in layers of the water column and sediments with steep redox gradients and high microbial activity (i.e., the metalimnion of eutrophic lakes and top centimeters of sediment). Oxic sediments can be a sink for InHg and MeHg while anoxic sediments can be a source. A buildup of MeHg is often seen in anoxic water where conditions slow demethylation and anoxic sediments increase MeHg release.

2.4.1.3. Organochlorine Compounds

Similar to mercury, organochlorine compounds are strongly associated with sediments. Processes causing sediment disturbance and redistribution may make organochlorine compounds more available for biological accumulation.

2.4.1.4. Processes Affecting pH

In natural waters, pH is governed mainly by interaction of H+ ions arising from dissociation of H_2CO_3 (carbonic acid) and from OH ions produced during hydrolysis of HCO_3^- (bicarbonate) and from organic decomposition (Wetzel 2001). Carbonic acid is formed from hydration of dissolved CO_2 where equilibrium exists with CO_2, H_2CO_3, and CO_3^{2-} (carbonate). When this equilibrium is shifted by removal of CO_2 (e.g., from photosynthesis) or addition of CO_2 (e.g., microbial respiration), pH can be shifted. Vertical patterns of pH in eutrophic waters can be strong due to photosynthetic removal of CO_2 in the photic zone (raising pH) and CO_2 generation from heterotrophic decay of organic matter, nitrification of ammonia, and oxidation of sulfide (lowering pH). These processes, combined with other decomposition processes, result in a decrease in pH in anoxic waters such as those in the metalimnion or hypolimnion. These patterns are especially pronounced in Brownlee Reservoir due to high inflowing organic loads and high primary productivity.

2.4.2. Potential Effects of Operation Scenarios

2.4.2.1. Potential Effects of OP-2

Operations in OP-2 are similar to proposed operations in every year except that the majority of summer/fall drawdowns occur earlier and drawdown is greater in low and medium-low flow years. Simulated Hells Canyon discharge shows that summer DO and temperature levels may be increased under low and medium-low flow conditions (Figures 21, 22, 36, and 37). This increase is likely due to the discharge of warmer oxygenated epilimnetic water during drawdown. In the simulation, discharged anoxic waters from the transition zone in low flow years apparently do not affect outflow DO. In medium to high flow years, very little change to simulated discharge temperature or DO is seen.

Sediment scour may be increased, and the timing changed, during drawdown in low and medium-low flow years since the extent of drawdown is greater than in proposed operations. Timing of sediment scour may be changed in medium to high flow years since more drawdown occurs earlier. Some of the sediments redistributed from the transition zone would be stored farther downstream and may provide more permanent burial of organochlorine and mercury compounds. Fine sediments and associated ammonia, mercury, and organochlorines could be redistributed to the discharge. However, since drawdown is not to minimum pool (as in OP-6), a larger proportion of the scoured sediments would be redeposited in deeper areas of the reservoir.

Negligible changes in simulated discharge DO and temperature for medium to high flow years suggest that ammonia levels would not be increased over those under proposed operations. Increases in simulated discharge DO and temperature for low and medium-low water years also suggest that ammonia levels would not be increased. However, earlier discharge of more stored water in the anoxic transition zone would occur annually. This water would be mixed with epilimnion water where uptake rates may prevent Hells Canyon discharge levels from being increased, but more ammonia (and dissolved phosphorus) would be available for uptake earlier in the year under OP-2 operations. This process is unlikely to increase overall loading to discharge from Hells Canyon Dam compared with that under proposed operations, but timing of nutrient availability in the reservoir and discharge may change. Discharge of stored water from the anoxic transition zone could also change timing of the discharge of lower pH water and any accumulated MeHg.

2.4.2.2. Potential Effects of OP-5

Operation of Brownlee Reservoir at run-of-river minimum pool is an extreme scenario and even a qualitative evaluation is difficult. Simulated discharge temperature is increased in the spring and summer and decreased in the fall, compared with temperature under proposed operations. This difference is very pronounced in low and medium-low flow years (Figures 26 and 27) but only slight in medium to high flow years (Figures 28–30). Simulated discharge DO is markedly lower in the spring of low flow years and higher in the summer and fall than under proposed operations (Figure 41). DO in medium to high flow years is generally higher in the spring through fall (Figures 43–45). Higher spring discharge temperatures in low flow years are a result of less cool water being stored when the reservoir is at minimum pool. Lower spring discharge DO in a low flow year suggests that residence time is long enough in low flow years for significant decay of organic matter in the inflow to decrease DO levels.

Initially, sediment scour would increase while the reservoir was drawn down to minimum pool. Initial scour of exposed sediment deposits would be larger in spring during high inflows and in high flow years than in low flow years. Scour processes in OP-5 would likely result in increased ammonia, mercury, and organochlorine levels discharged from Hells Canyon Dam as these sediments were scoured. Some of the sediments redistributed from the transition zone would be stored farther downstream and may provide more permanent burial of organochlorine and mercury compounds. Following a number of high flow events, these stored sediments would be flushed out and increases due to scour of stored sediments should stop. However, as a new dynamic equilibrium were established over time, overall loading of the constituents due to sediment scour might not be increased, but timing of ammonia peaks in the discharge might change due to other processes.

Earlier fall turnover times and potential effects of epilimnetic depth could affect timing of ammonia peaks in the discharge. In addition, discharge concentrations of ammonia during fall turnover may be increased due to decreased epilimnetic volume available to mix with hypolimnetic water as the reservoir destratifies. Although summer and fall discharge DO would be generally higher in all flow years, decreased epilimnion depth and earlier turnover would create potential for increased discharge ammonia levels in summer and fall of all years. An example of this phenomenon can be seen in medium-high and high flow years where late summer/early fall discharge DO periodically drops below DO levels in proposed operations (Figures 44 and 45). Discharge timing of ammonia peaks could also be moved earlier in the year in low flow years. Simulated discharge DO suggests that, in low flow years, spring ammonia and potentially MeHg levels in the discharge could be increased, compared with levels under proposed operations. Accompanying these increases may be a decrease in pH compared with pH under proposed operations.

2.4.2.3. Potential Effects of OP-6

Drawdown in OP-6 is more extreme than in OP-2. Unlike OP-2, operations for the entire year differ from proposed operations. Simulated discharge temperatures show summer increases in low and medium-low flow years and fall decreases in all years (Figures 31–35). Simulated discharge DO shows summer and fall increases in low flow years and only fall increases in other years (Figures 46–50). In years when spring water surface elevation is significantly changed from elevation under proposed operations, some changes in discharge temperature and DO can be seen (Figures 43 and 48).

Increased summer temperatures are likely due to the discharge of warmer epilimnetic water during drawdown. In the simulations, discharged anoxic waters in the transition zone in low flow years apparently do not affect outflow DO. However, a slight decrease in discharge DO is seen in medium-low flow years. Therefore, depending on flow conditions and reservoir DO patterns, the discharge of stored water may decrease DO. This process could increase summer and early fall levels (during drawdown) of ammonia and potentially MeHg levels discharged from Hells Canyon Dam over those under proposed operations. There is also potential for an accompanying decrease in pH from this process. Discharged stored water would be mixed with epilimnetic water where more ammonia (and dissolved phosphorus) would be available for uptake earlier in the year. Increases from discharge of stored water would likely be more pronounced in lower flow years (i.e., 1992 and 1994) when anoxic conditions have developed in the transition zone by the end of June (beginning of drawdown in OP-2 and OP-6).

Fall turnover timing would likely be earlier under OP-6 operations since operations at minimum pool allow for cooler water to reach the thermocline earlier. This process would change timing of ammonia and potentially MeHg discharge peaks, increasing levels earlier than under proposed operations. In addition, discharge concentrations of ammonia and MeHg during fall turnover may be increased due to decreased epilimnetic volume available to mix with hypolimnetic water as the reservoir destratifies. These potential effects of earlier turnover timing and decreased epilimnetic volume would occur in all flow years.

Initially, OP-6 operations may result in increased overall loading of ammonia, mercury, and organochlorines associated with stored sediment in the transition zone. Under proposed operations, sediments are stored in low and medium-low flow years to be flushed out in spring of higher flow years during drawdowns for flood control (i.e., 1997). Initially, under OP-6, scour would occur every year, increasing discharge levels in the summer and fall when productivity was high. However, a new equilibrium may be reached following high flow years when significant stored sediment would be redistributed. In this situation, less sediment would be stored every year and some would be redistributed annually in summer and fall. In the long term, this process of annual storage and flushing may still increase summer and fall discharge levels in the long term, over those under proposed operations in most flow years. Some of the sediments scoured from the transition zone would be stored farther downstream and may provide more permanent burial of organochlorine and mercury compounds.

3. CONSULTATION

Comments were requested on a draft version of this report provided to the entities as required in FERC's AIR (see Schedule A). Comments were received from the U.S. Bureau of Land Management (BLM) Oregon Department of Environmental Quality (ODEQ) and The National Marine Fisheries Service (NOAA Fisheries) following the provided 30-day commenting period. ODEQ requested that it be clearly stated in this document that while a 30-day commenting period was provided, a collaborative forum for stakeholder discussion and input regarding the draft AIR response was not provided. Tight timelines for completing the work required in this AIR precluded the creation of such a forum. Nevertheless, the consultation process for this AIR response was consistent with the process outlined by FERC in the May 4, 2004 issuance of the AIRs.

Both BLM and ODEQ noted that the operational scenarios were not simulated with inflow water quality improvements from upstream TMDLs. However, FERC's AIR did not specifically request that these simulations be included. Since it is difficult to determine FERC's specific intentions in all the AIRs, IPC's approach to responding to the requests was to address each one as specifically as possible. Sufficient time was not available to run these models and incorporate the results in response to these comments.

ODEQ, BLM and NOAA fisheries requested that presentation of the simulated hourly results be reorganized to include more information or make specific comparisons easier. FERC's AIR specifically requested DO and temperature "levels" be presented but did not request specific comparisons or measurements such as percent saturation. Sufficient time was not available to incorporate all of BLM's and ODEQ's requests. However, the figures in this document have been revised to use all available space improving readability and thereby aiding hard copy viewers.

NOAA Fisheries generally agreed with IPC's analysis and assessment of the model results. NOAA Fisheries restated their concerns noted in comments to IPC's response to FERC's AIR WQ-1 with respect to anoxic sediments, SOD and oxygen injection. Sediment oxygen demand in Brownlee Reservoir is largely a legacy issue of years of degraded water quality inflows to the reservoir. IPC believes that the TMDL appropriately allocated IPC's DO responsibility as 1,125 tons/year. This allocation was not identified to diminish in the future as sediment oxygen demand decreases. It would not be equitable or appropriate to require IPC to initially inject additional oxygen to offset legacy pollution from upstream sources.

A confusing statement in section 2.4.2.1 highlighted by NOAA Fisheries comment number 5 was clarified by removing reference to medium-low flow years.

BLM requested that the conceptual reservoir aeration system location and turbine aeration studies and assumptions be further described in this document. The information presented in this document related to BLM's comments are intended as a summary of a much larger analysis developed in response to FERC's AIR WQ-1 "dissolved oxygen augmentation". Many details that address BLM's comments can be found in IPC's response to WQ-1, which will be available upon request following filing with FERC. In addition, text has been added to the introduction to clarify the incorporation of aeration into the CE-QUAL-W2 modeling.

4. Literature Cited

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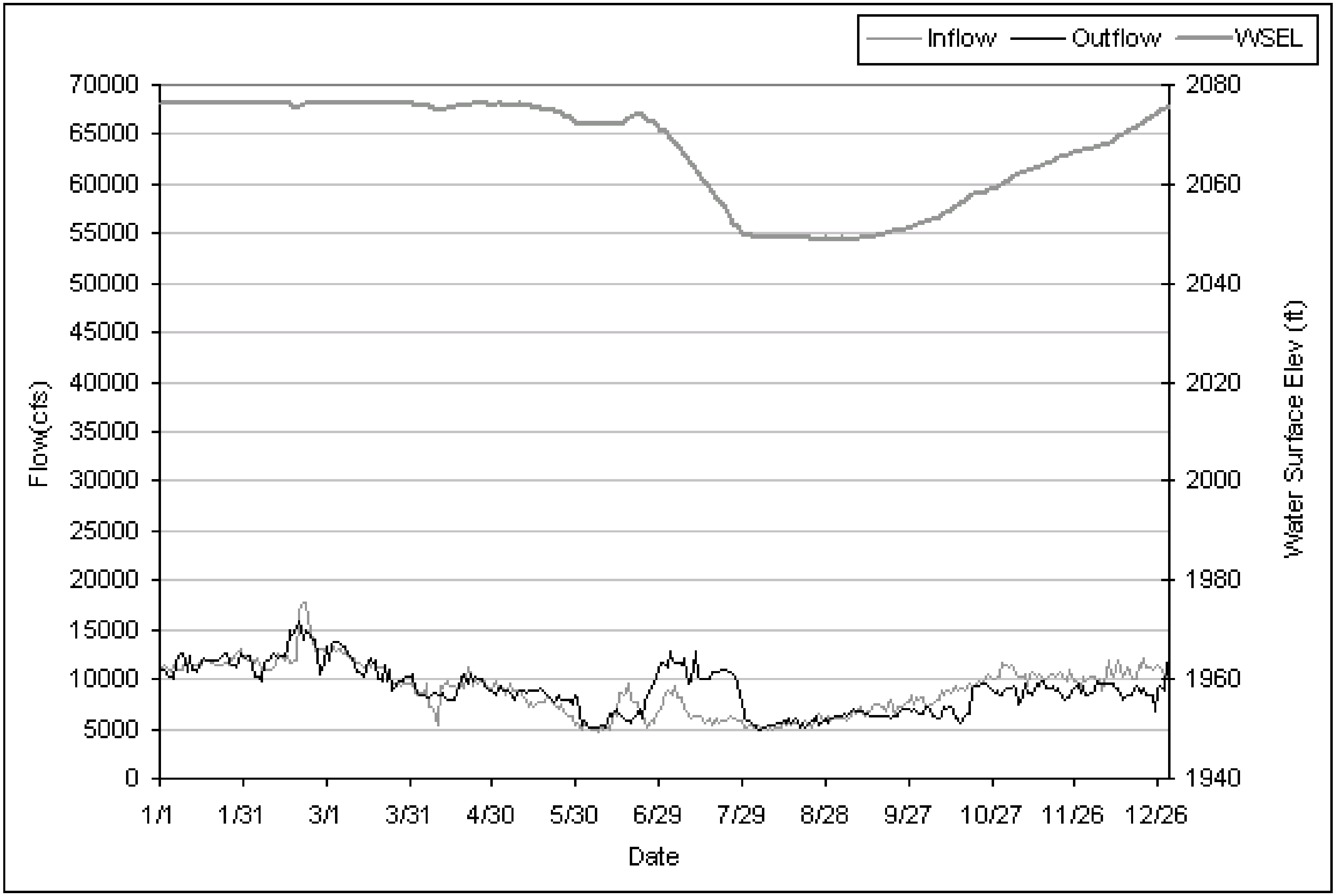

Figure 1. 1992 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-2.

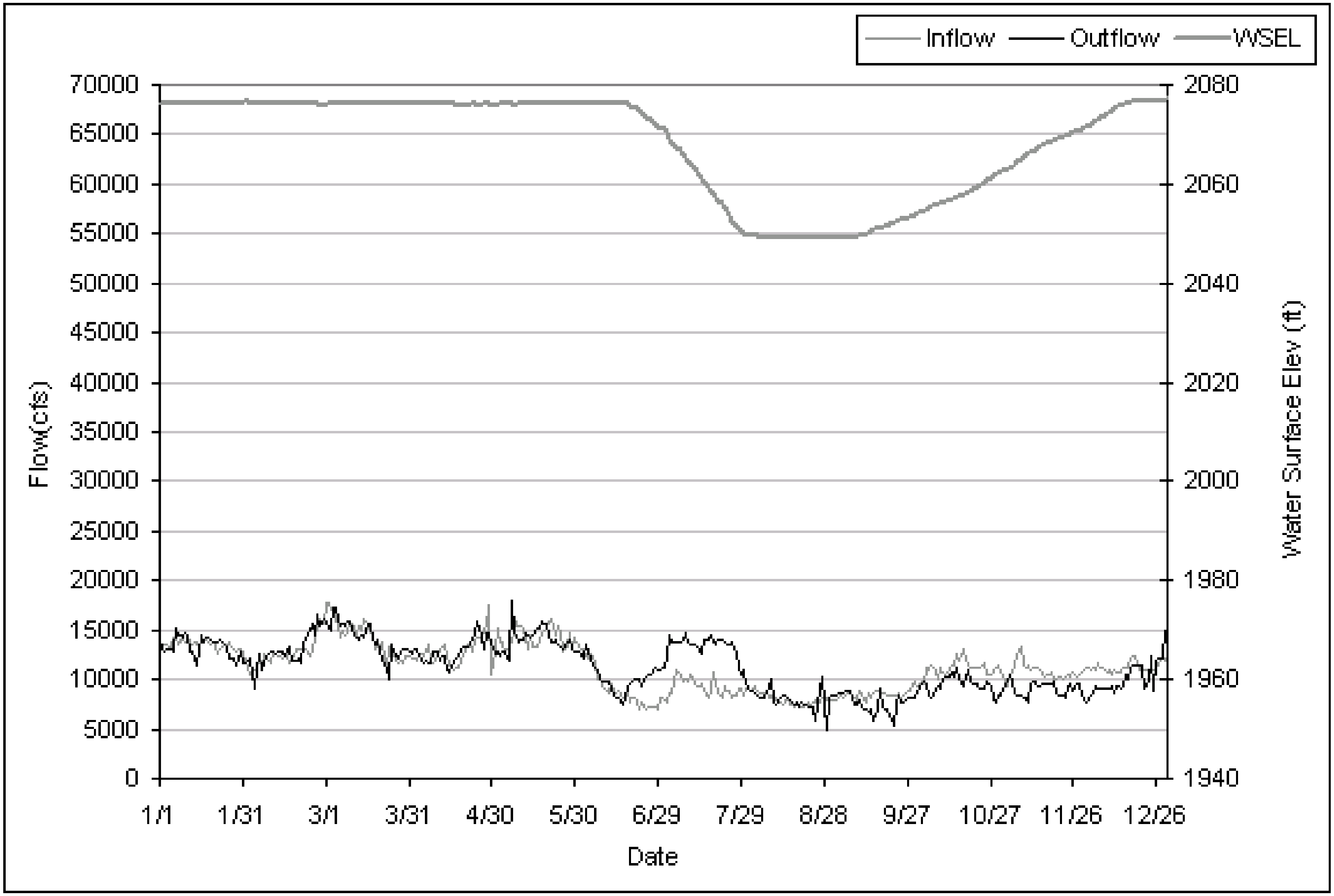

Figure 2. 1994 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-2.

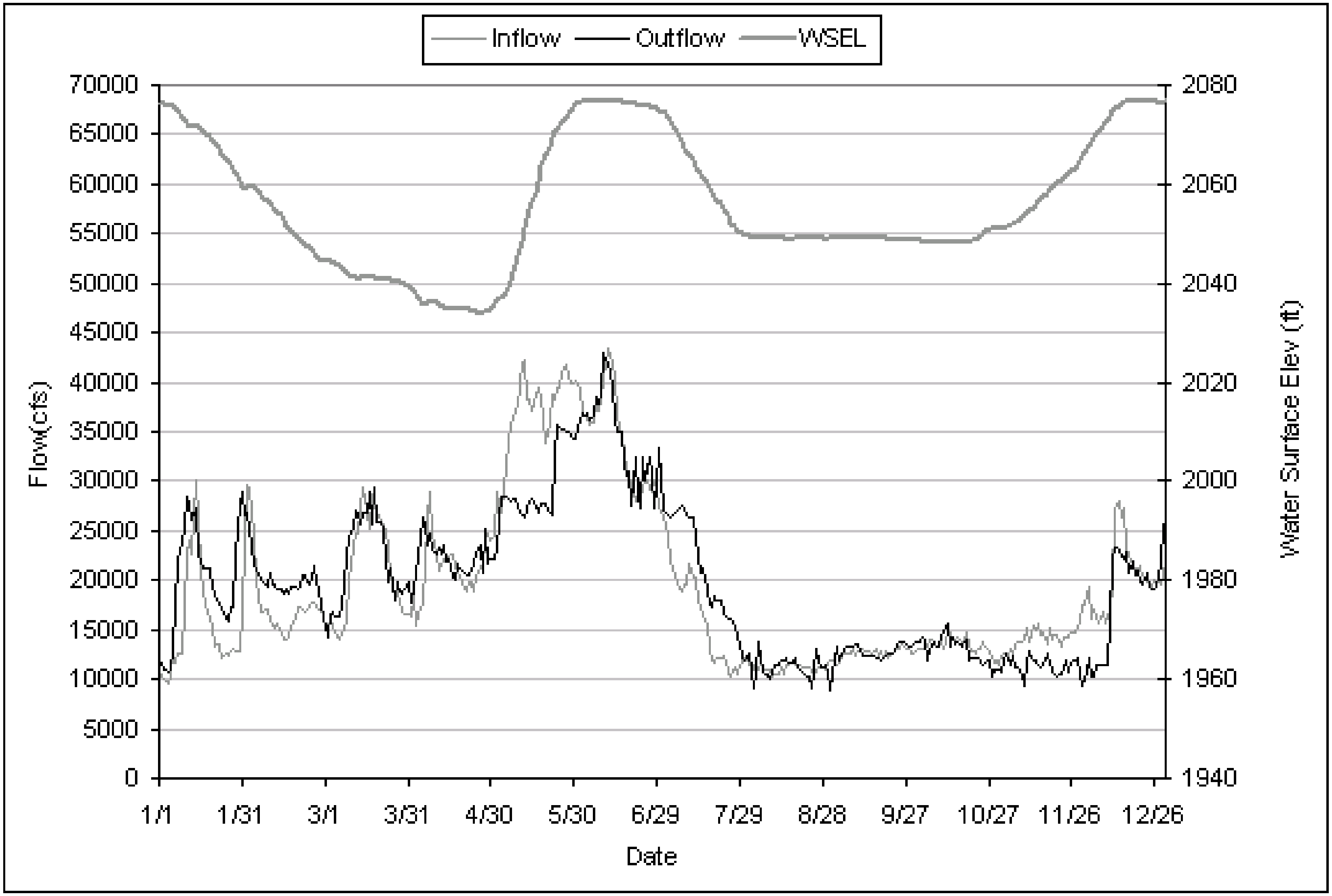

Figure 3. 1995 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-2.

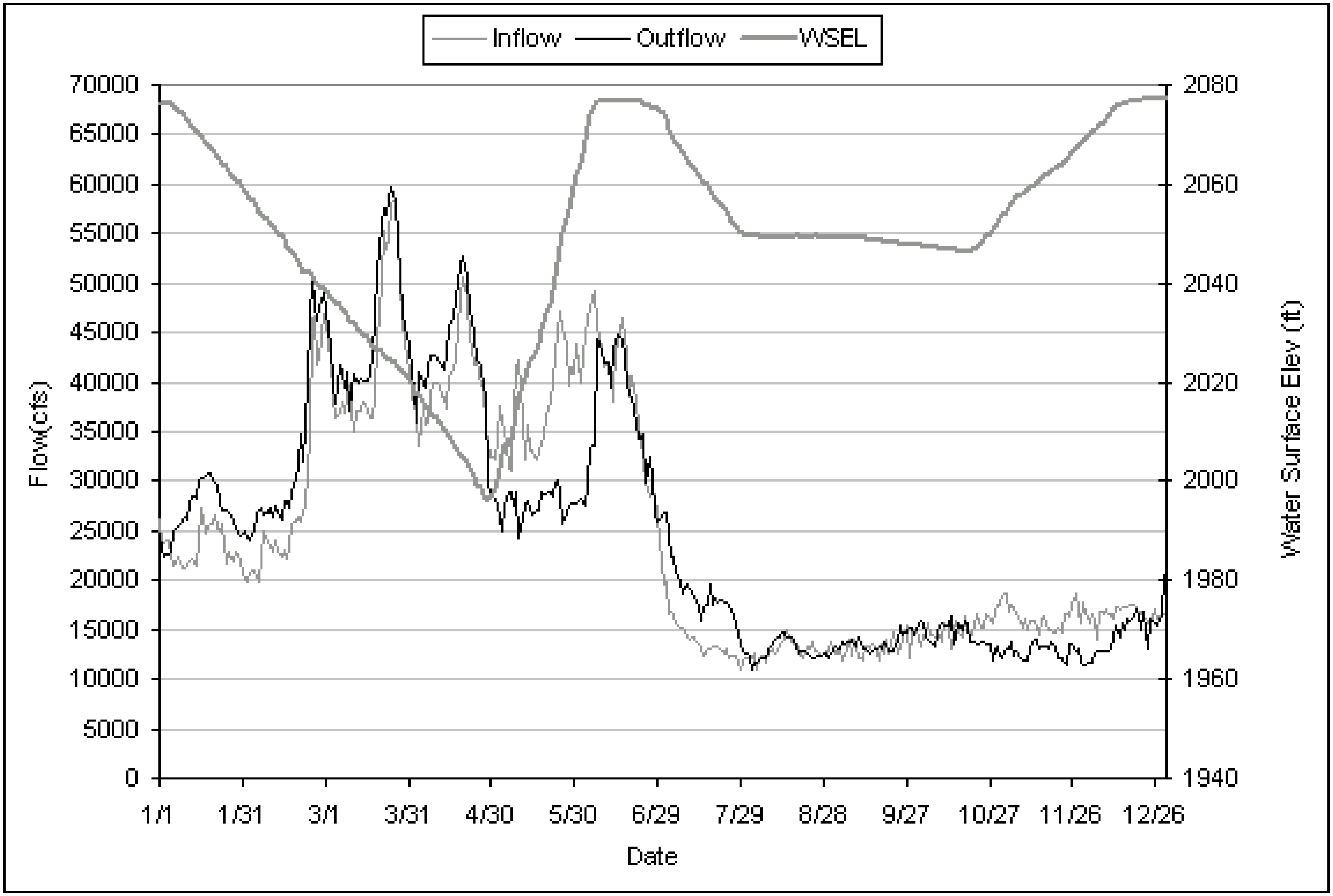

Figure 4. 1999 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-2.

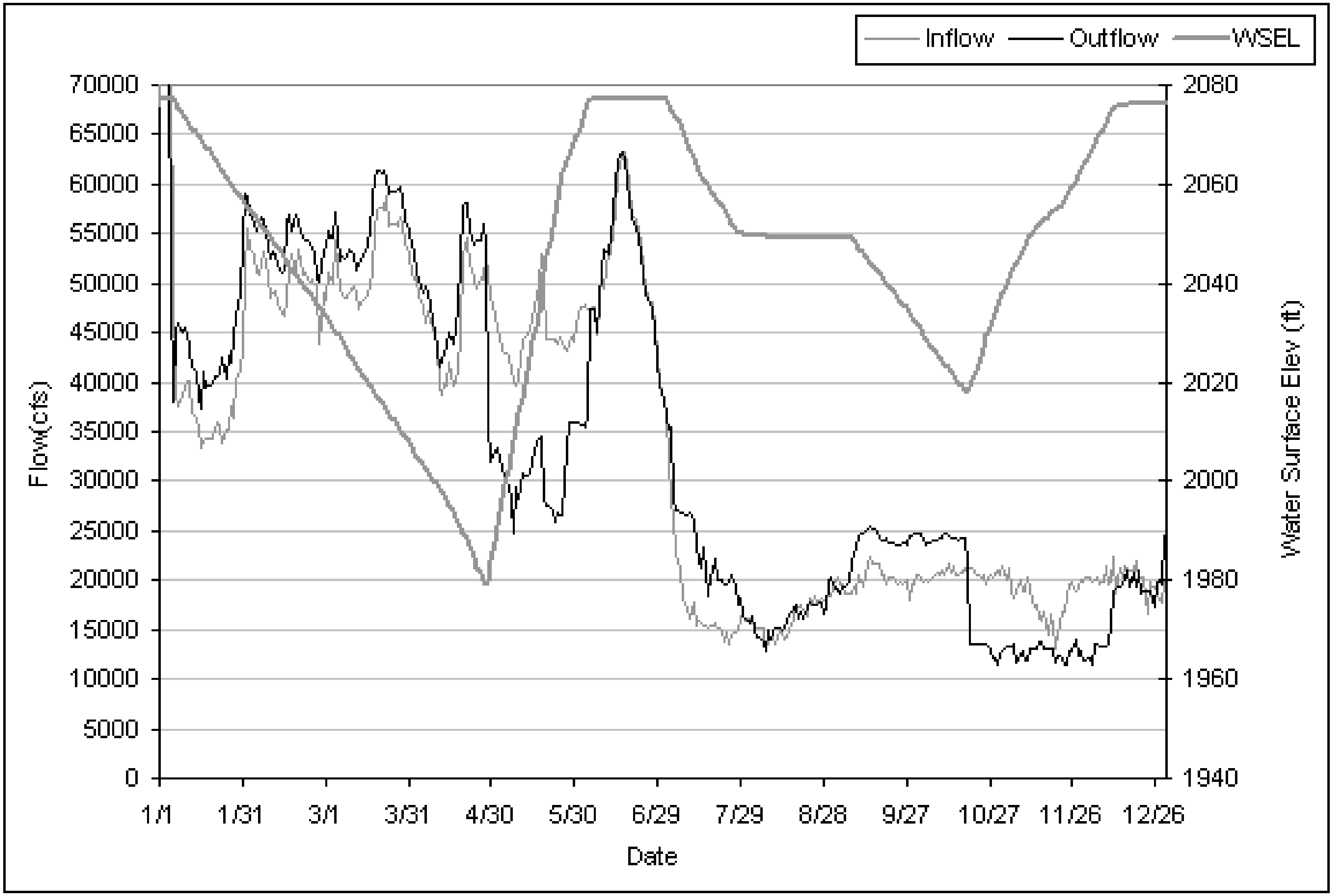

Figure 5. 1997 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-2.

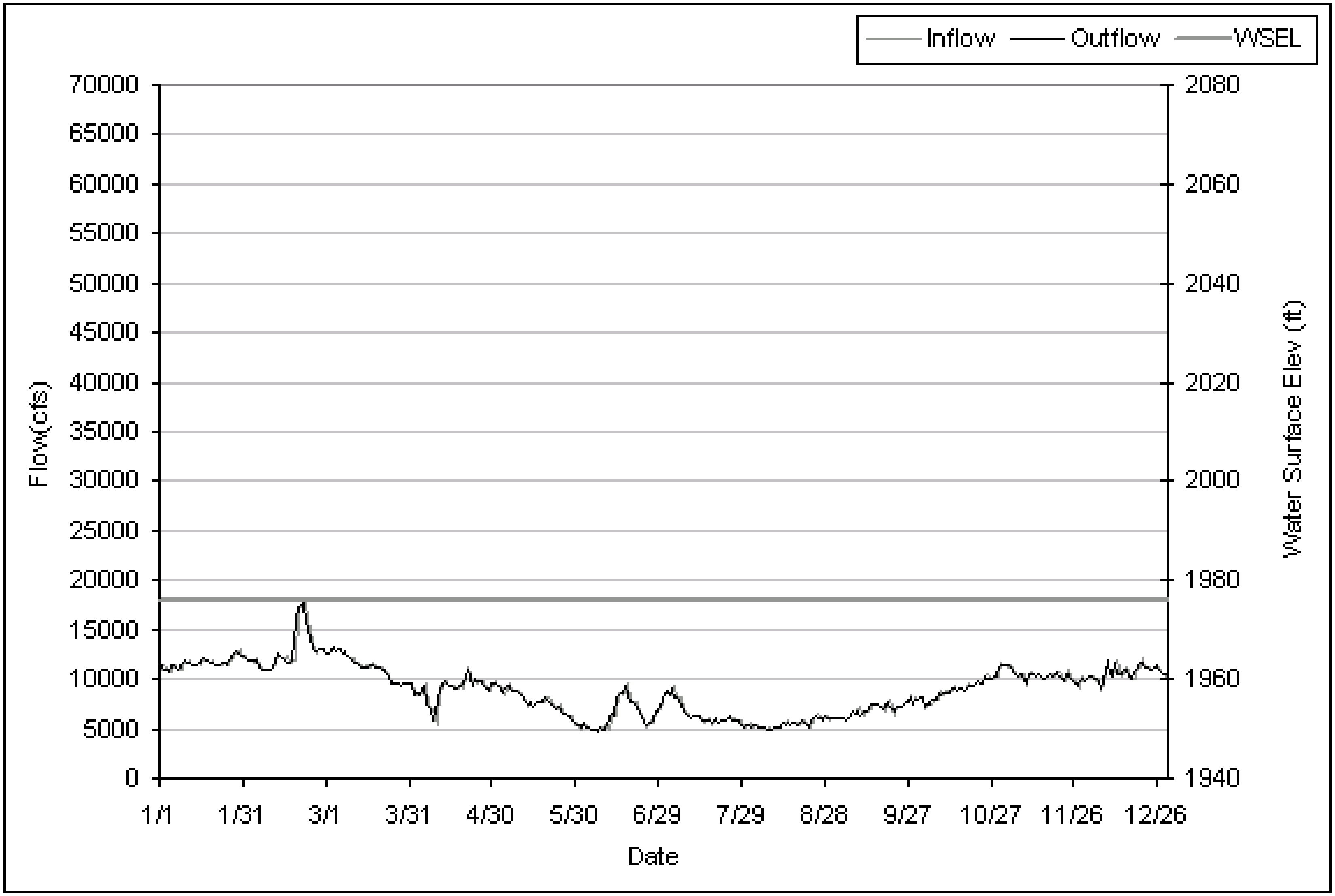

Figure 6. 1992 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-5.

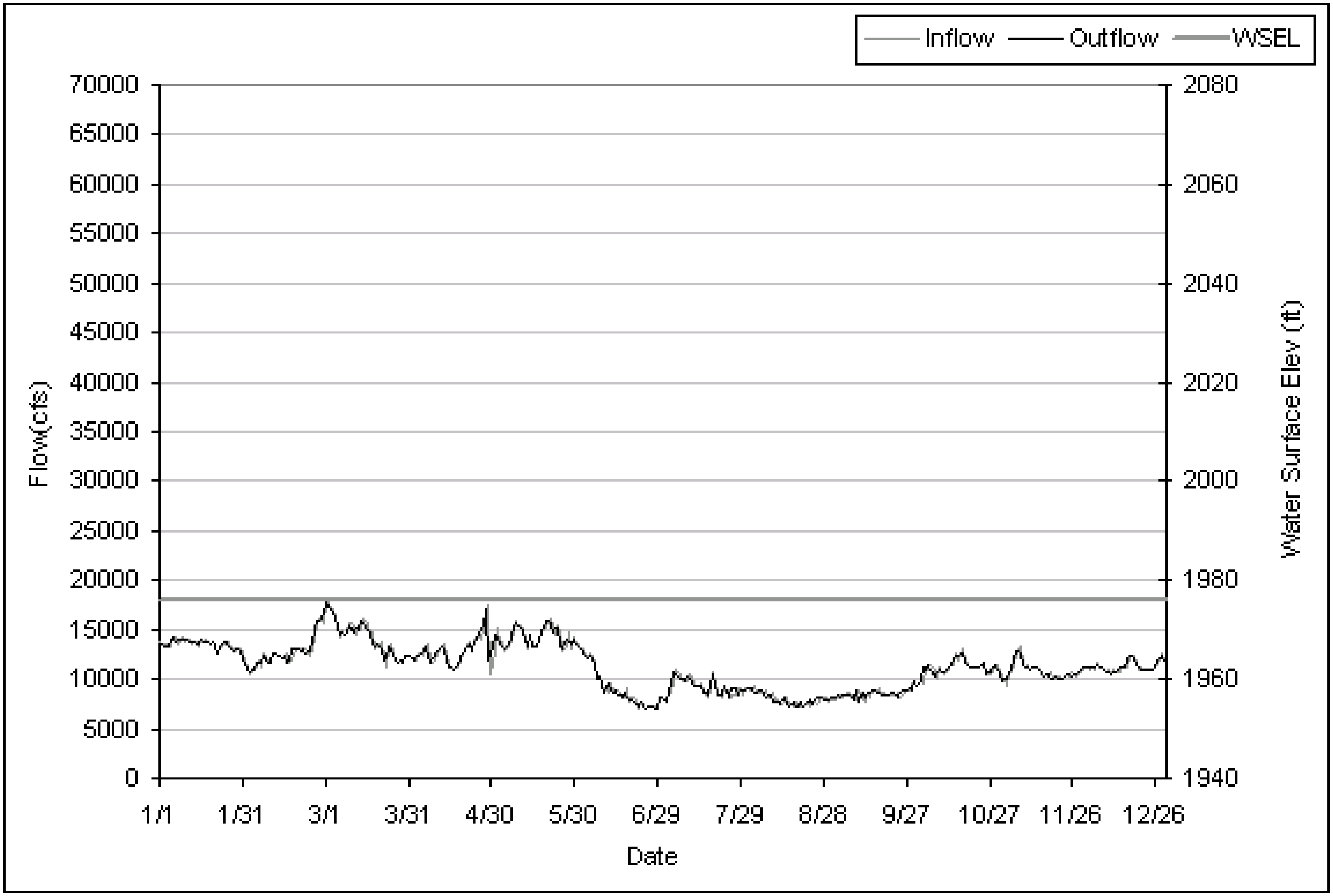

Figure 7. 1994 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-5.

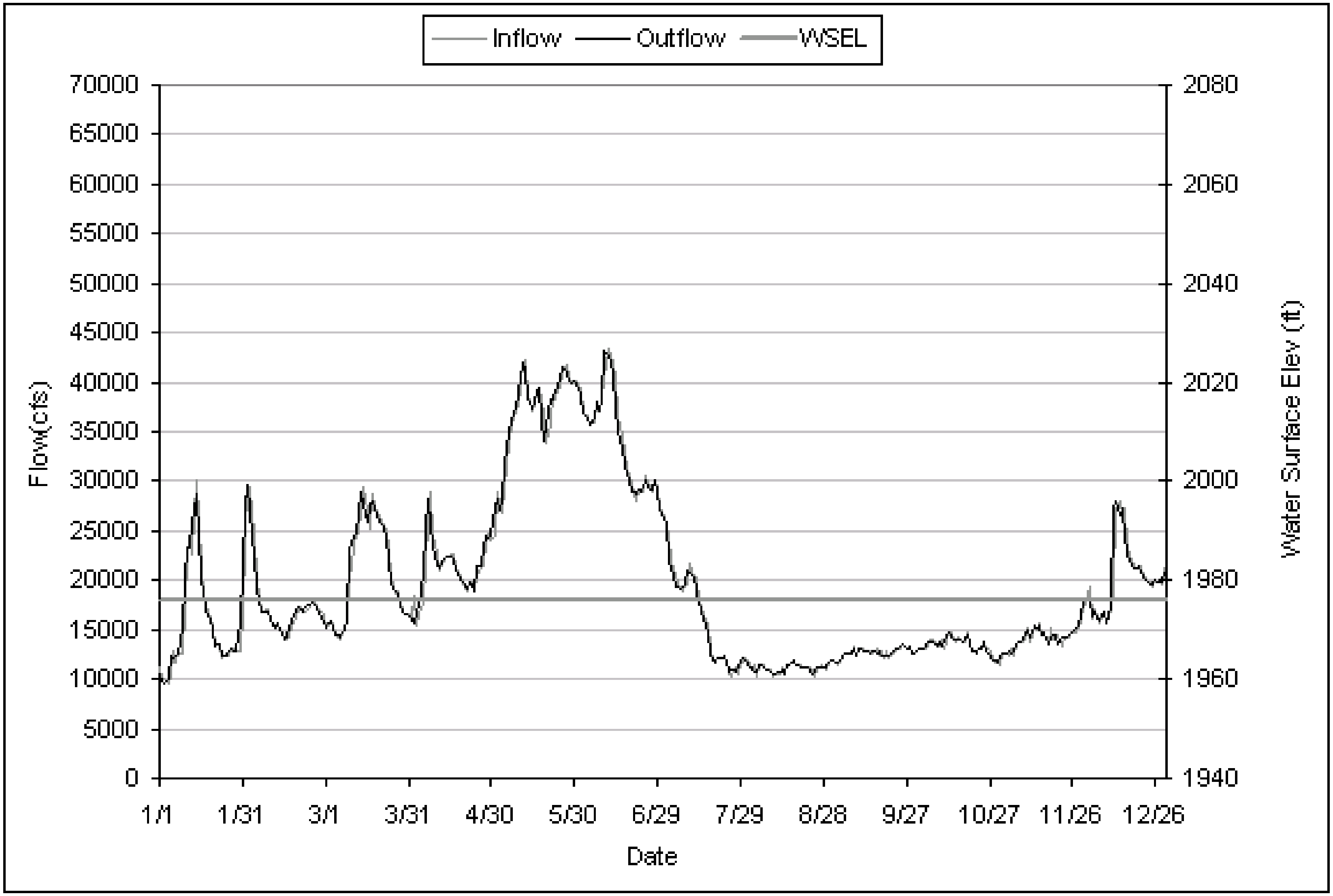

Figure 8. 1995 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-5.

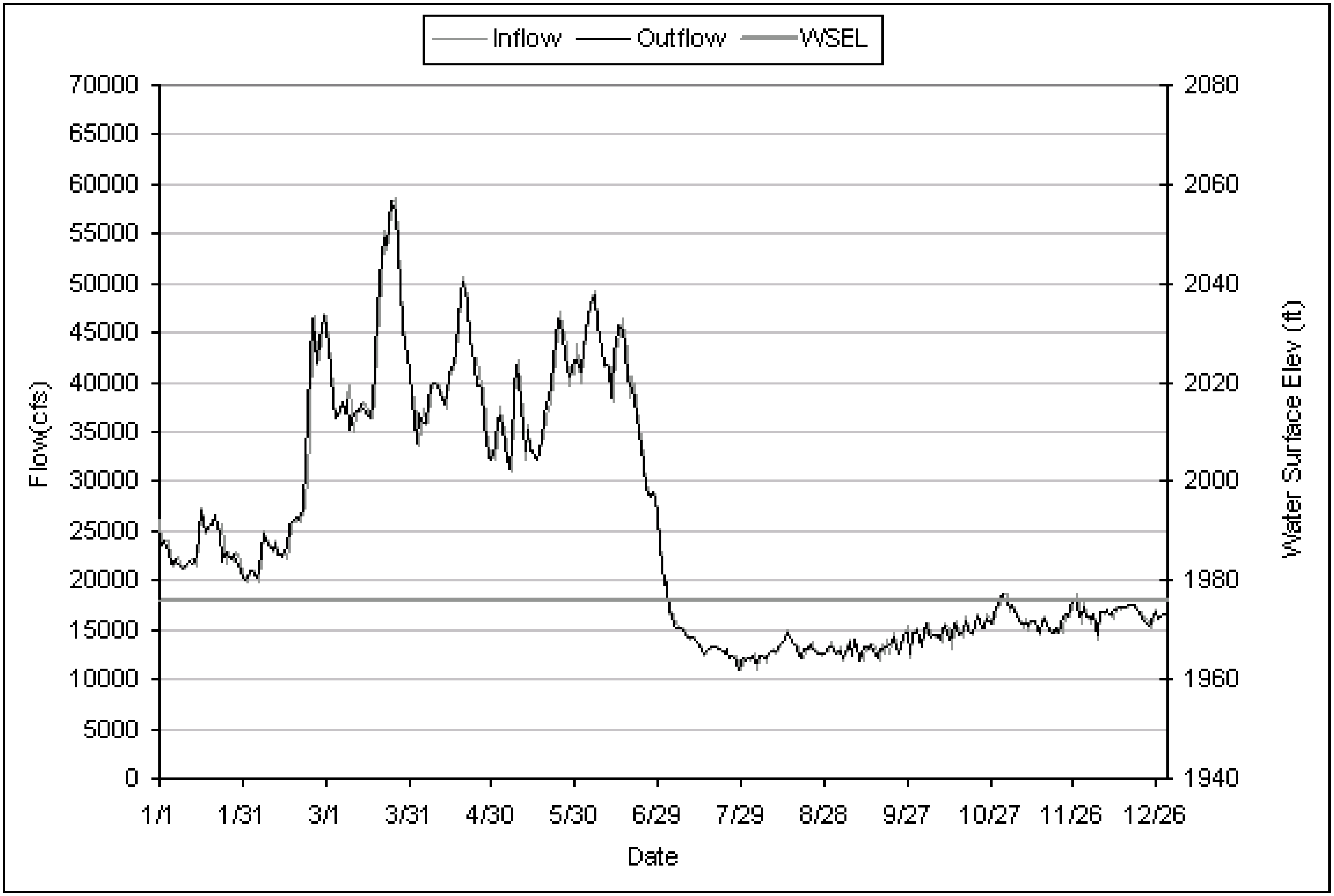

Figure 9. 1999 Brownlee reservoir Inflows, outflows and water surface elevations for operations modeled in scenario OP-5.

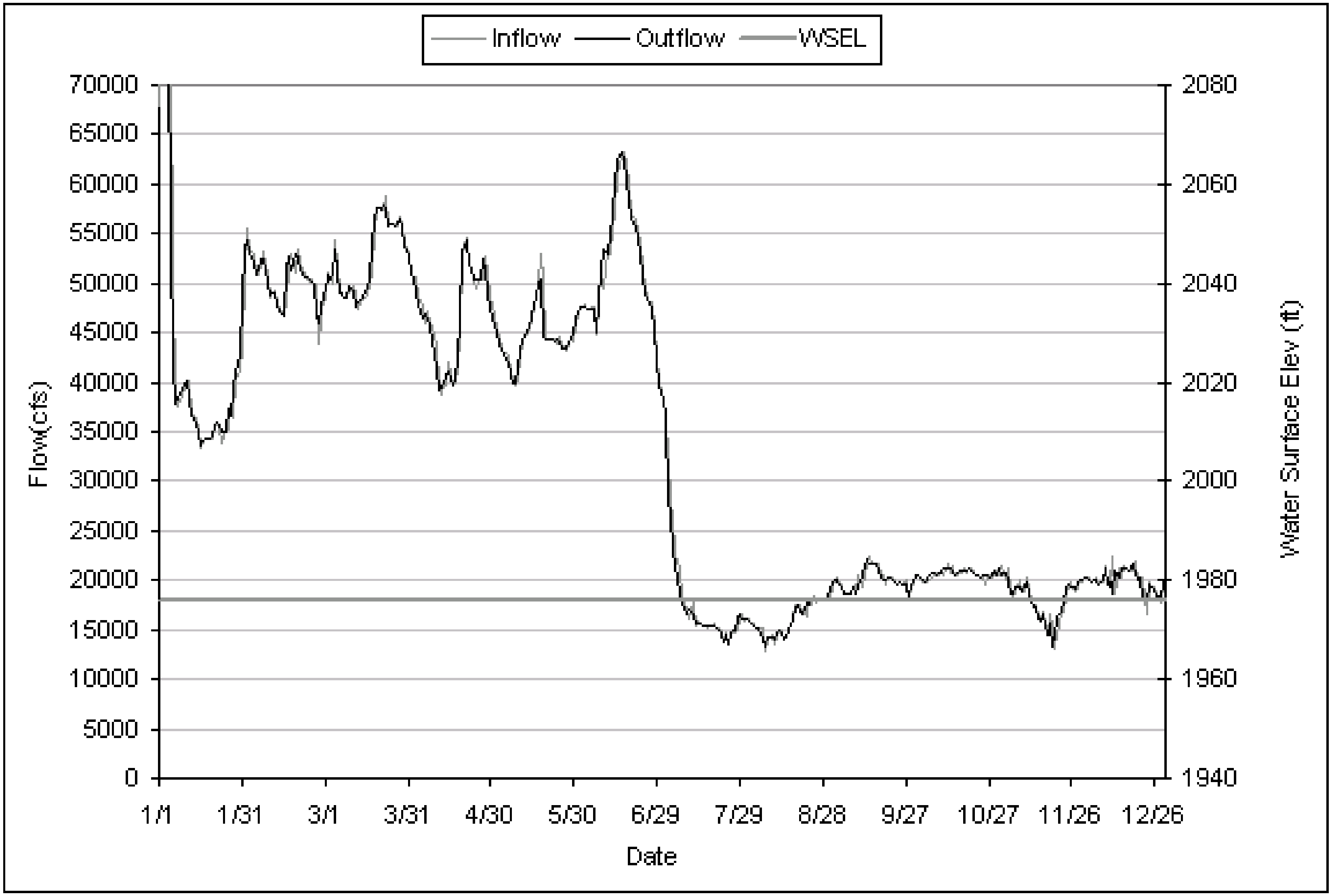

Figure 10. 1997 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-5.

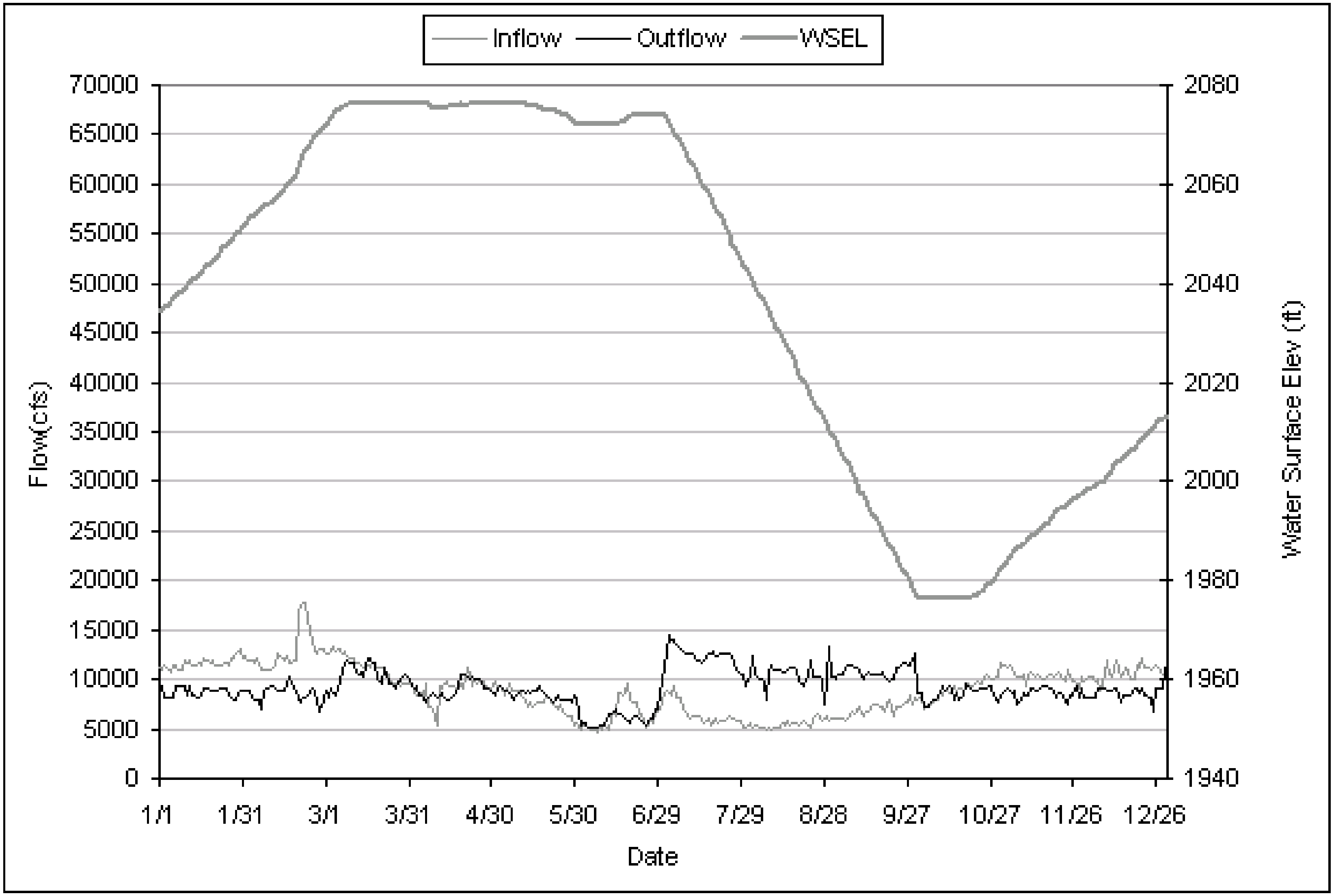

Figure 11. 1992 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-6.

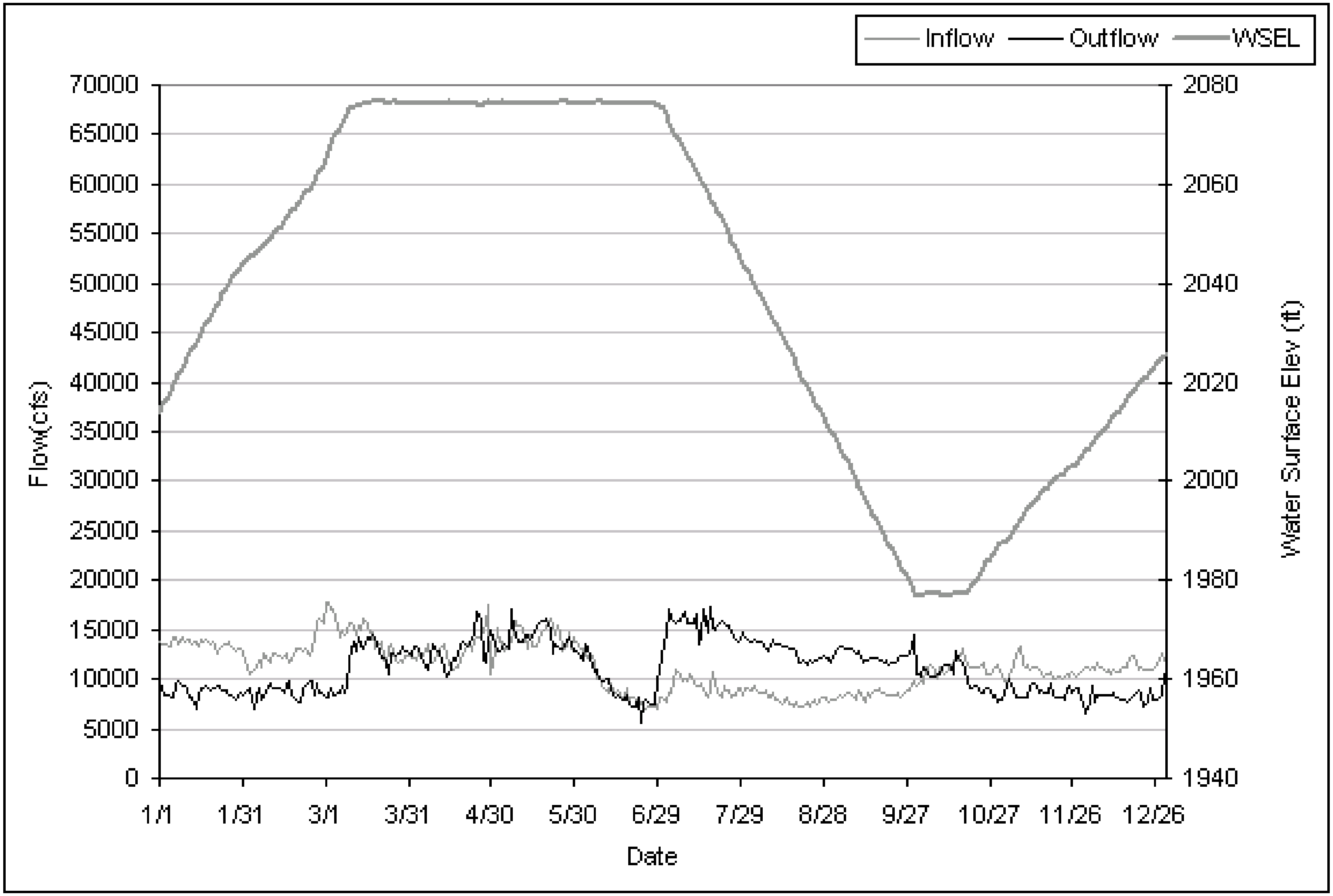

Figure 12. 1994 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-6.

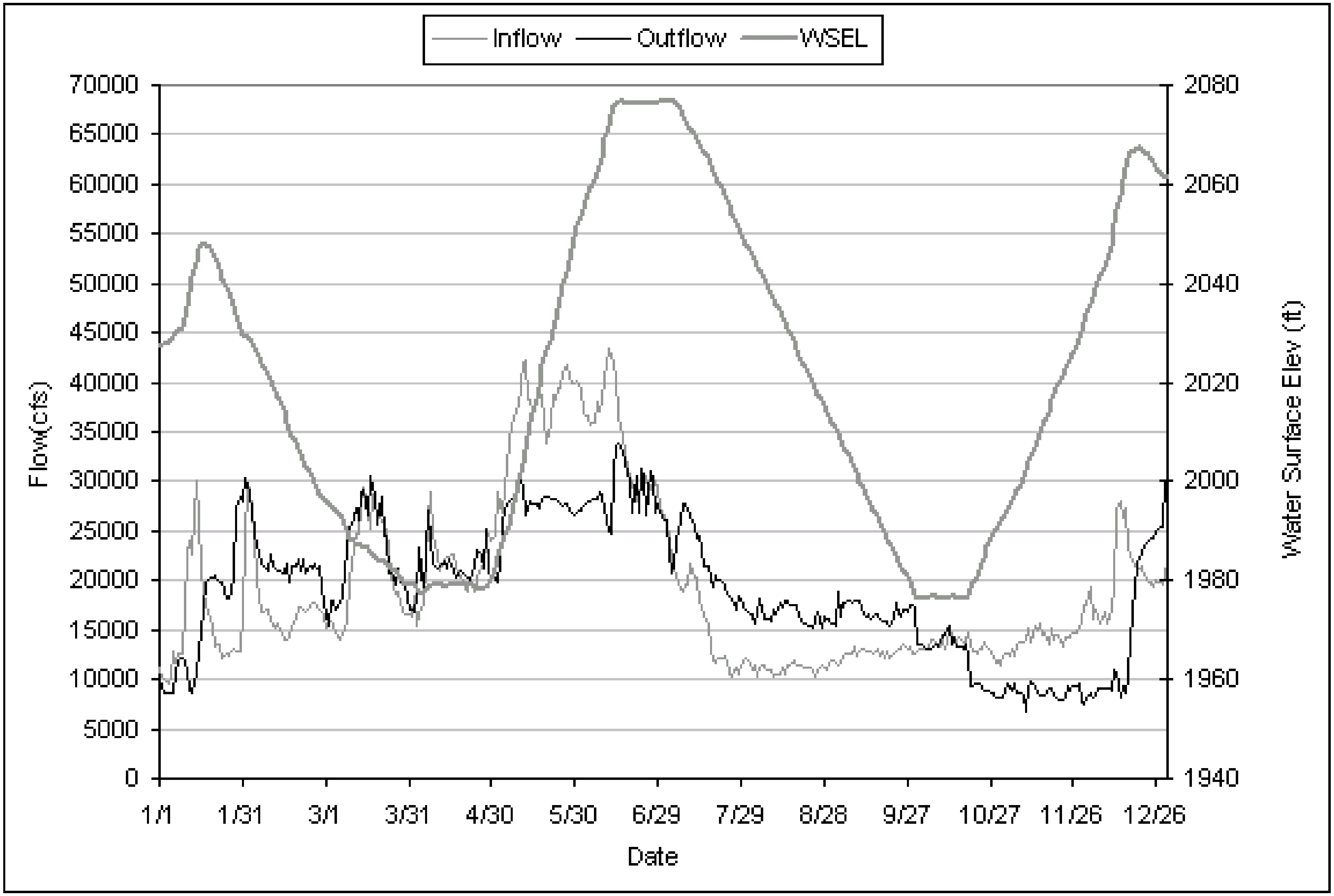

Figure 13. 1995 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-6.

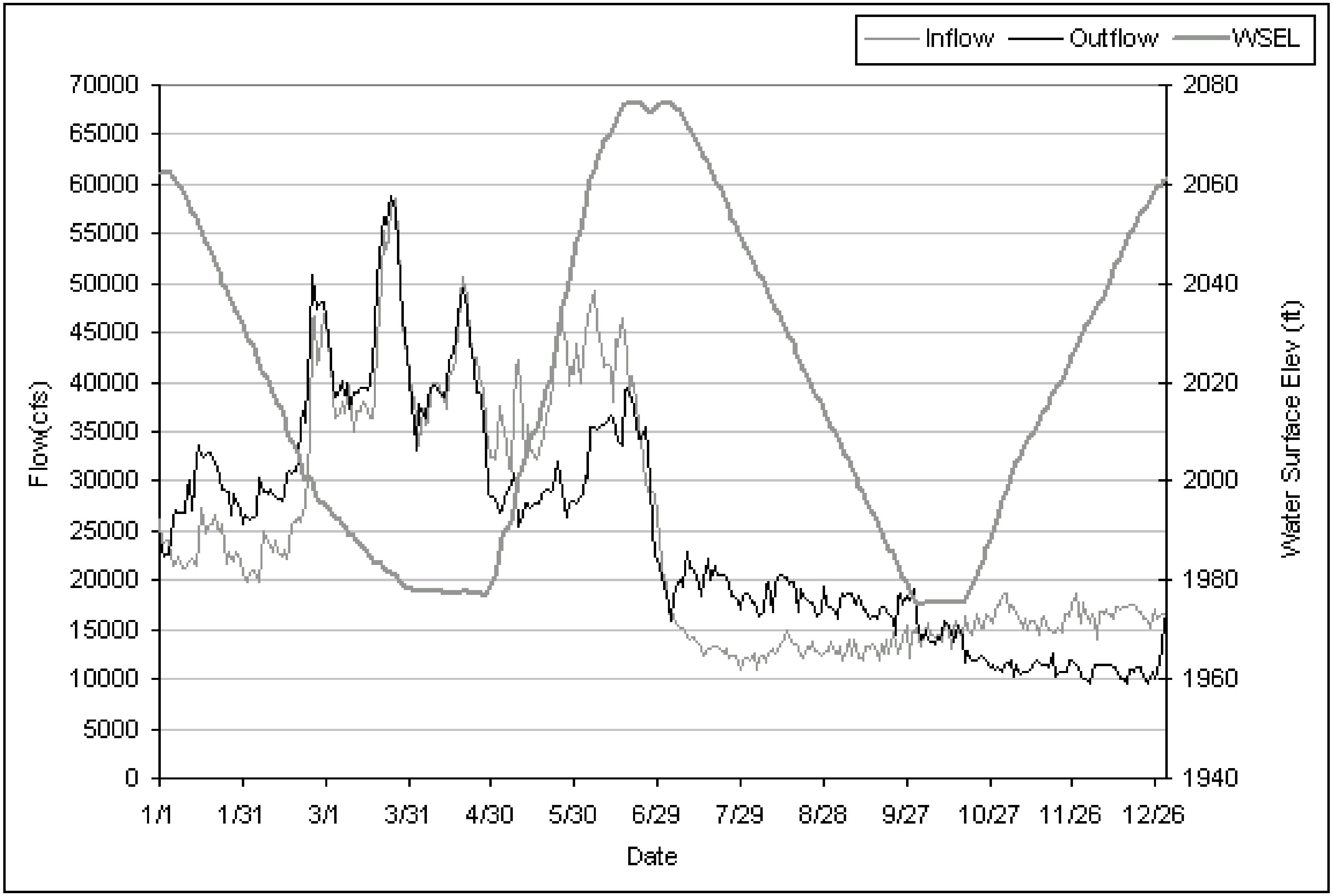

Figure 14. 1999 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-6.

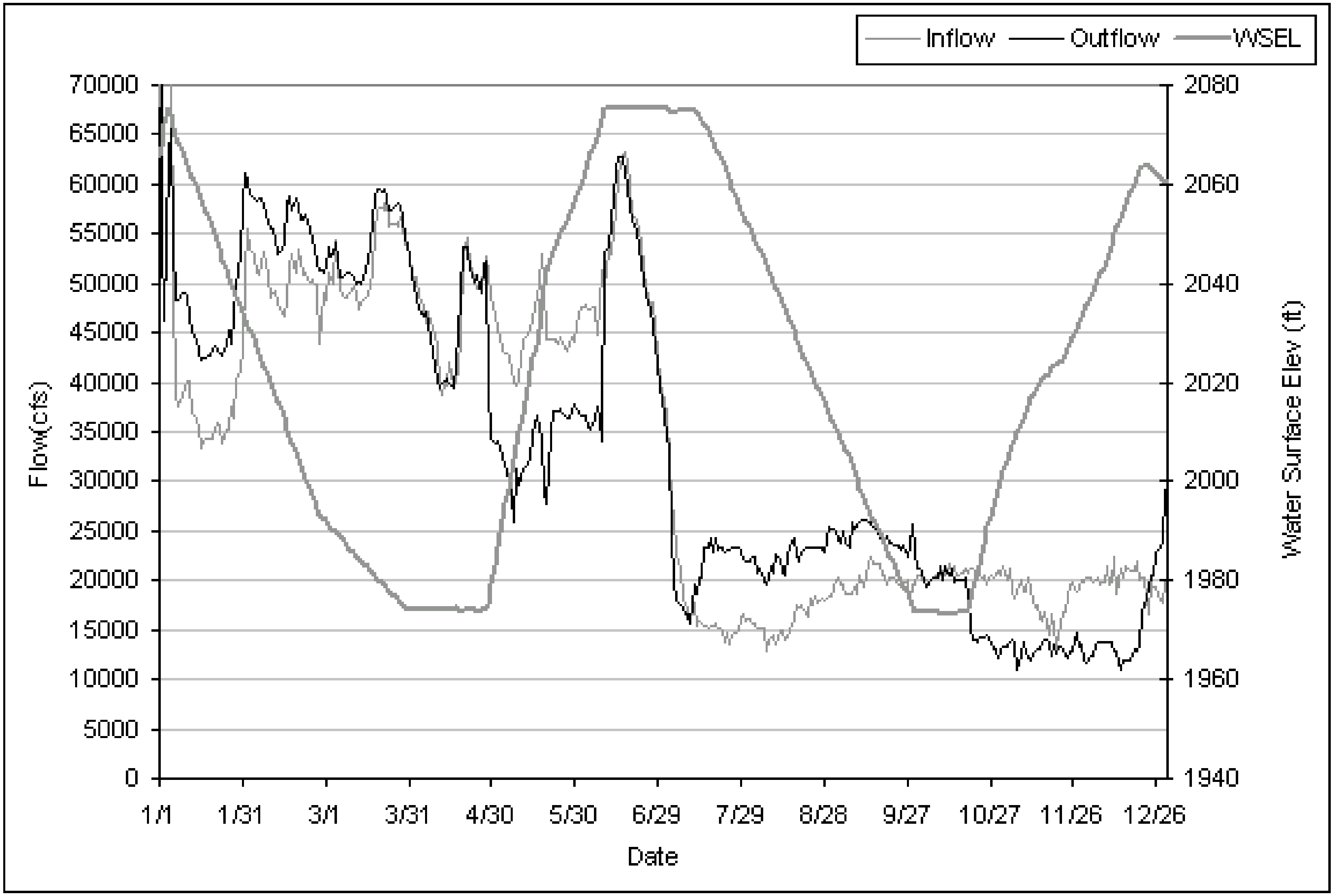

Figure 15. 1997 Brownlee Reservoir inflows, outflows, and water surface elevations for operations modeled in scenario OP-6.

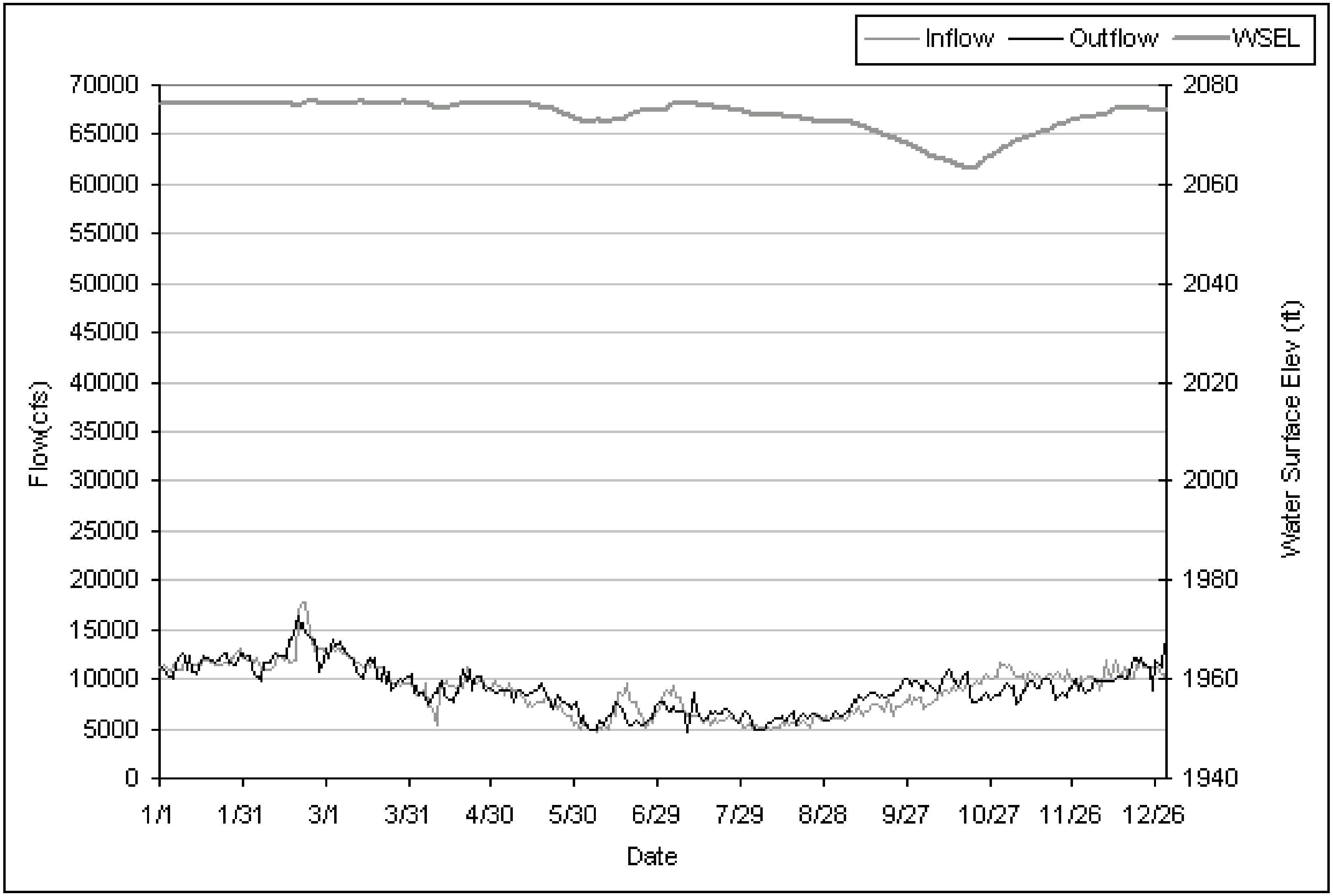

Figure 16. 1992 Brownlee reservoir Inflows, outflows and water surface elevations for proposed operations.

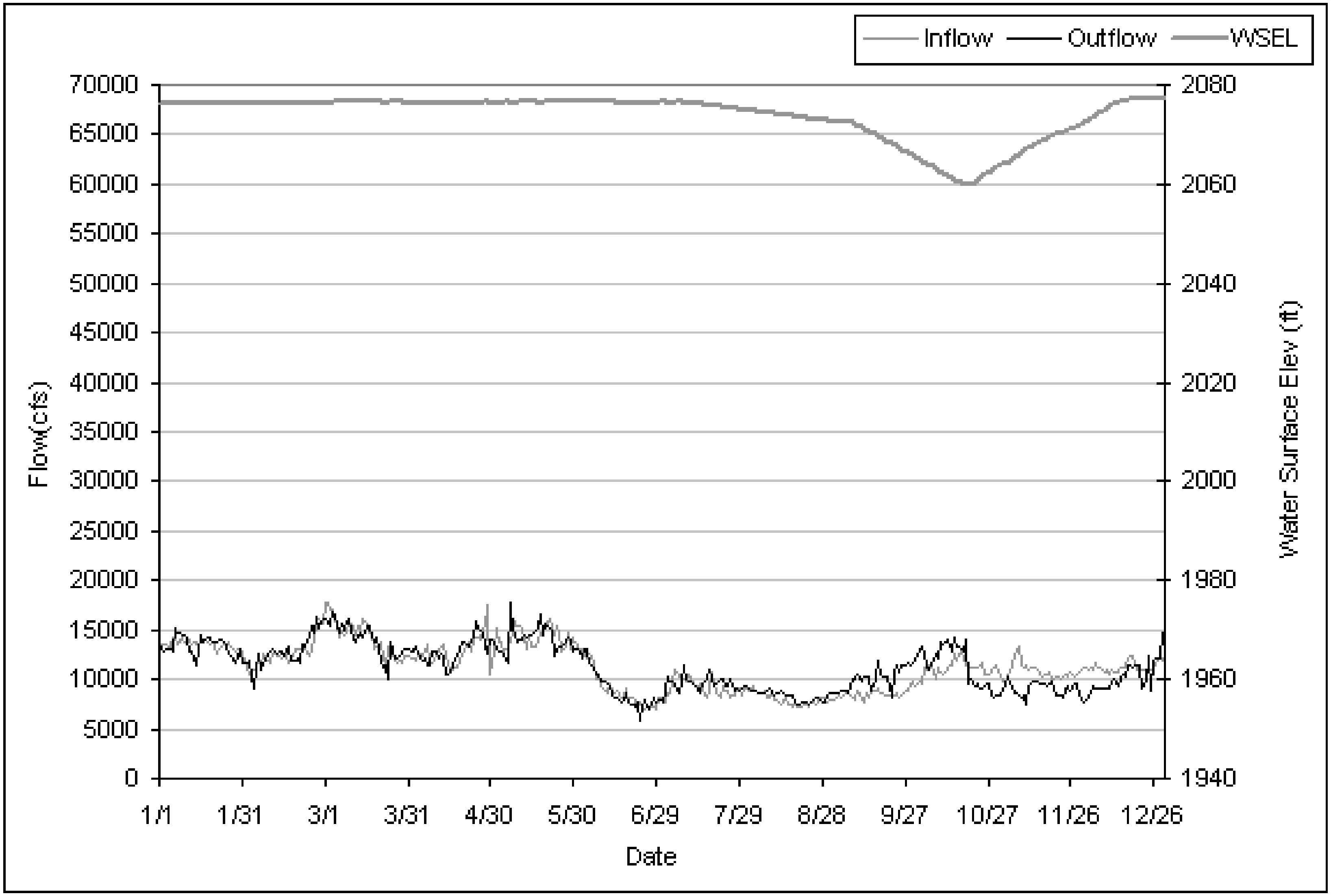

Figure 17. 1994 Brownlee Reservoir inflows, outflows, and water surface elevations for proposed operations.

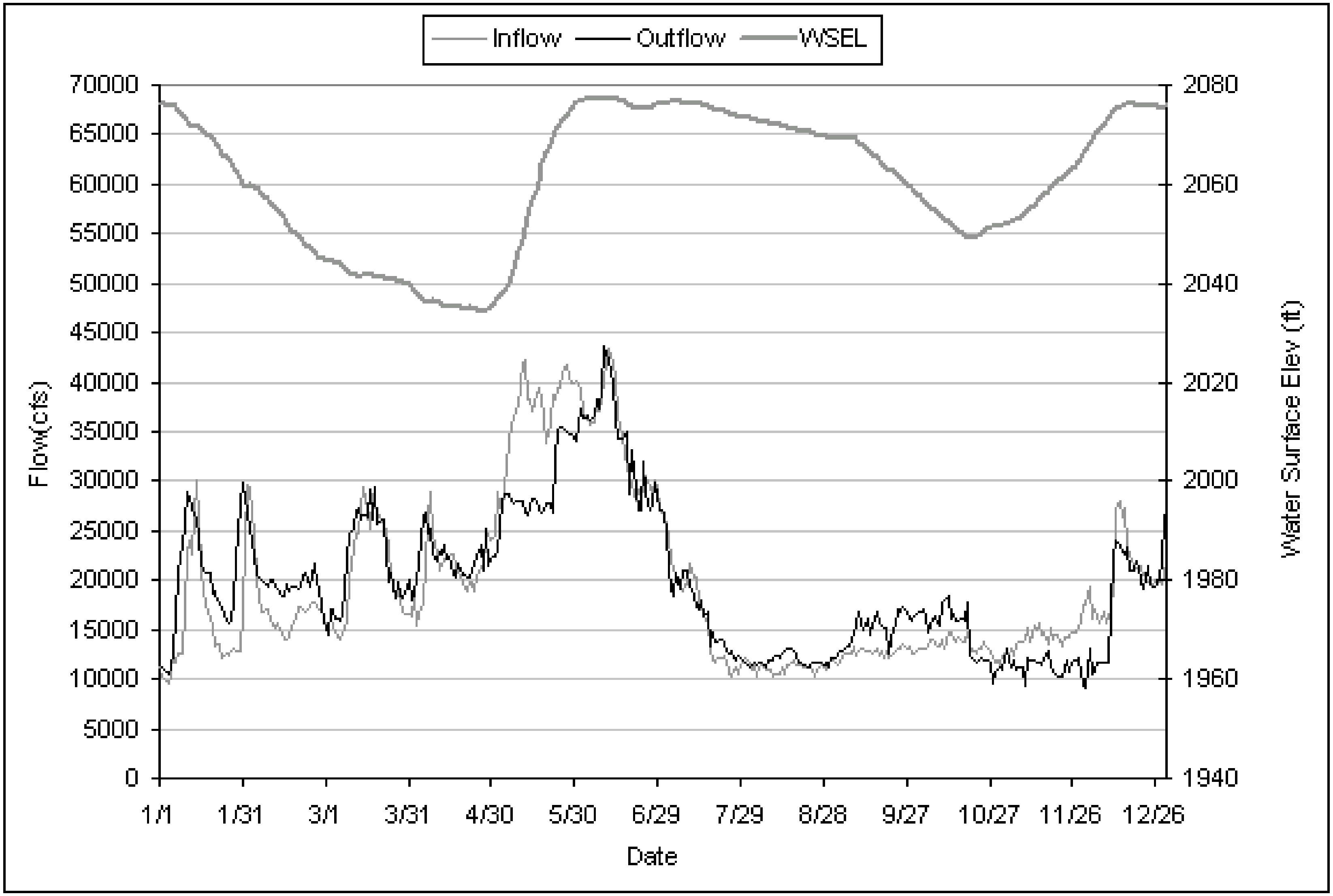

Figure 18. 1995 Brownlee Reservoir inflows, outflows, and water surface elevations for proposed operations.

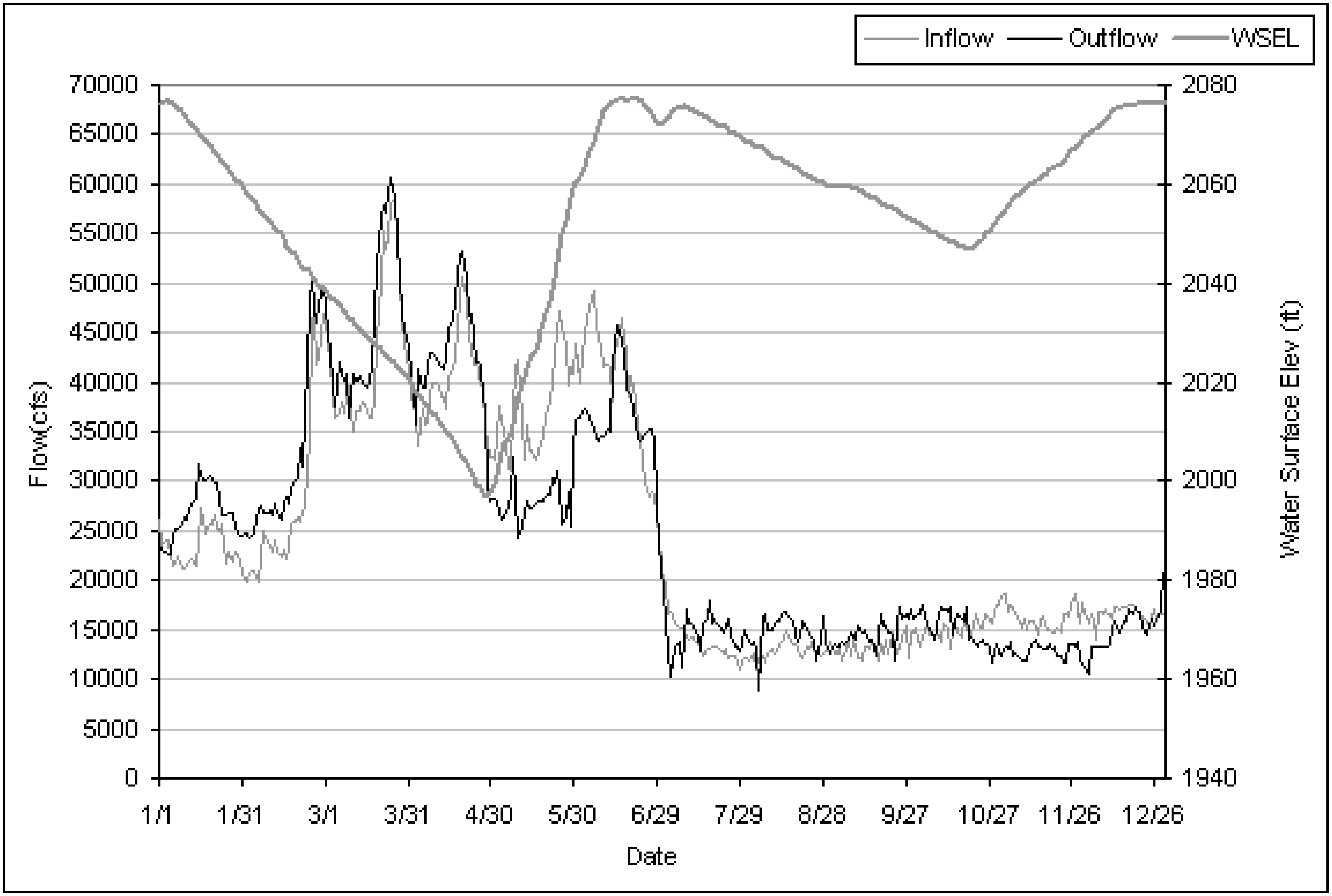

Figure 19. 1999 Brownlee Reservoir inflows, outflows, and water surface elevations for proposed operations.

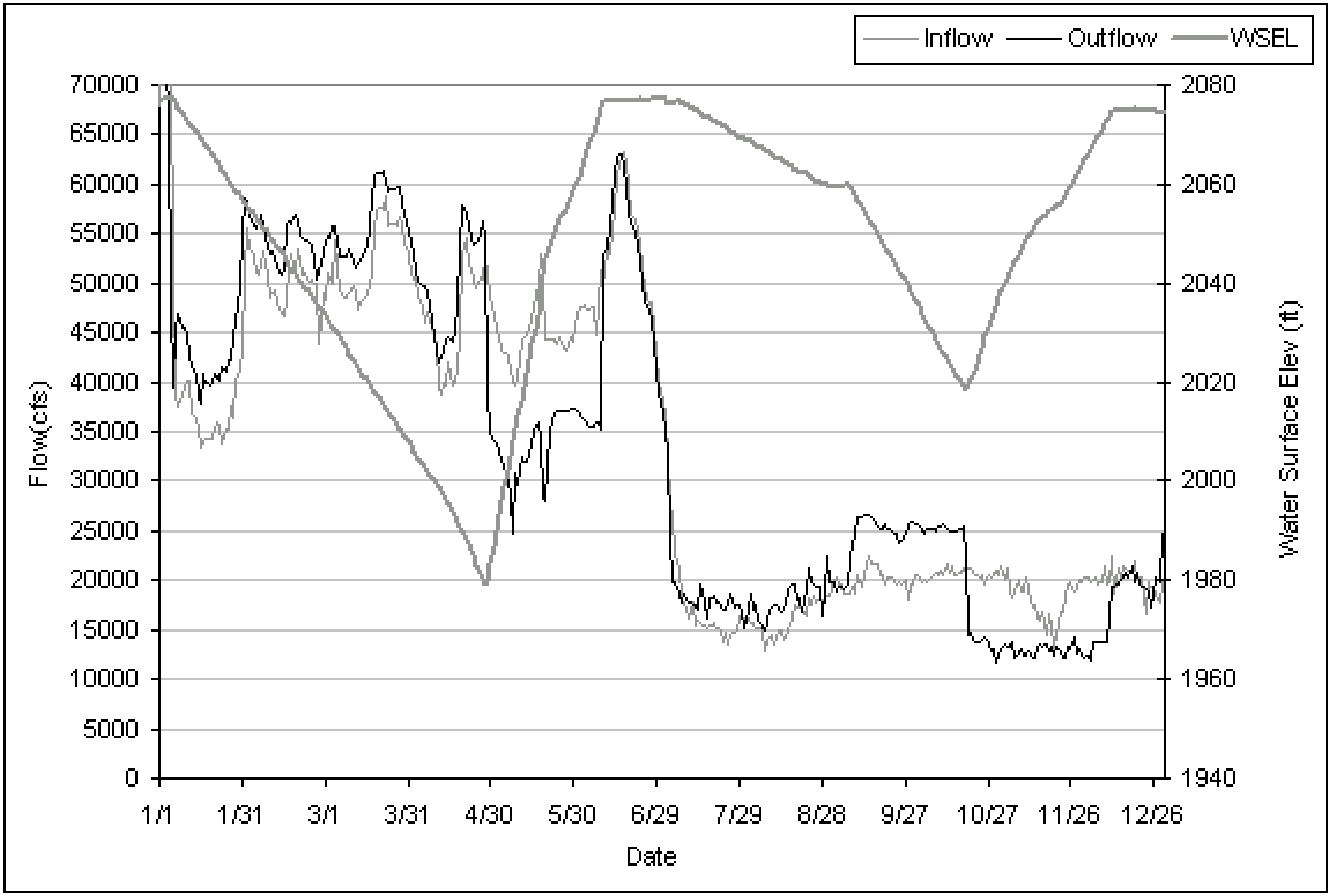

Figure 20. 1997 Brownlee reservoir Inflows, outflows and water surface elevations for proposed operations.

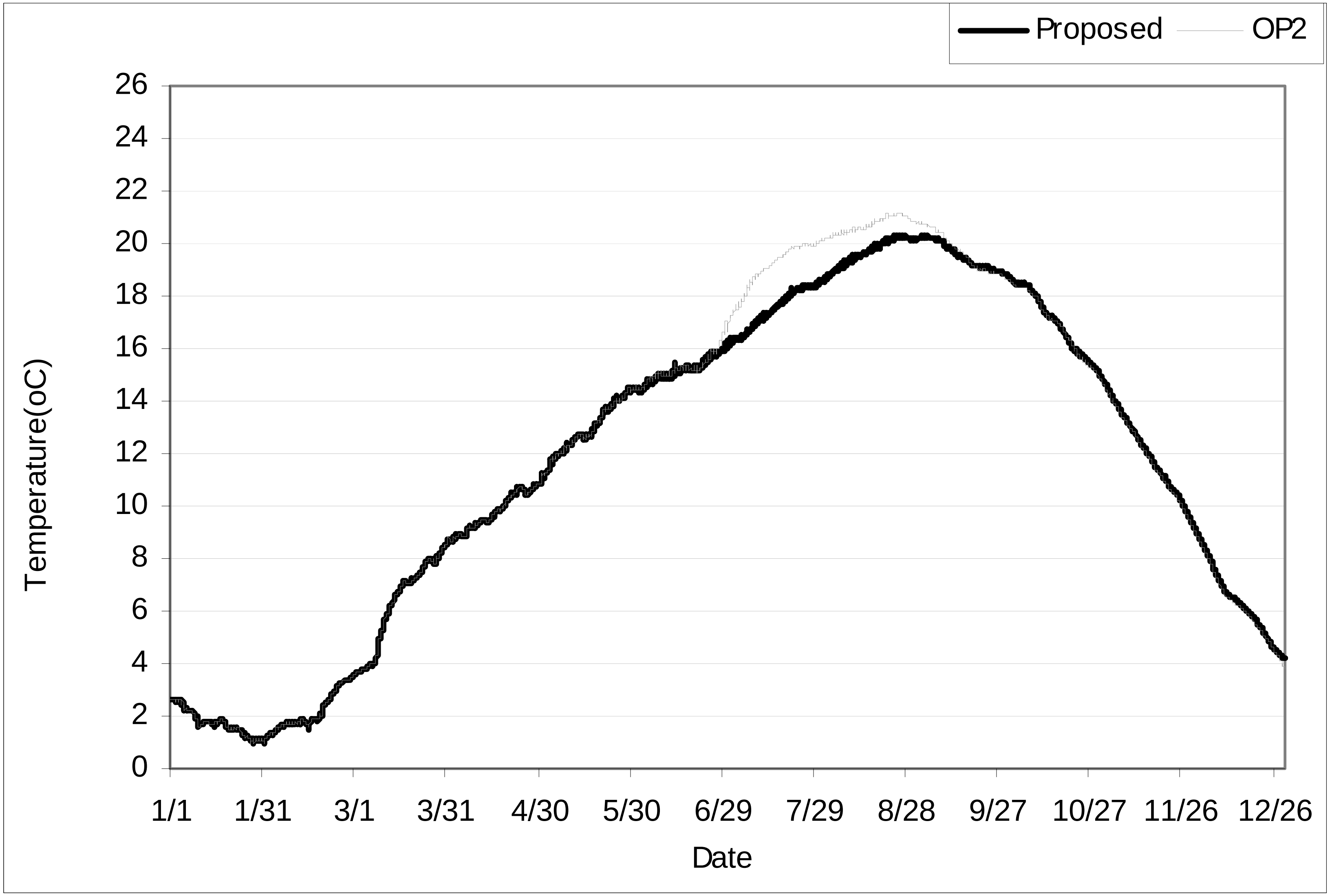

Figure 21. 1992 simulated hourly Hells Canyon outflow temperatures for scenario OP-2 and proposed operations.

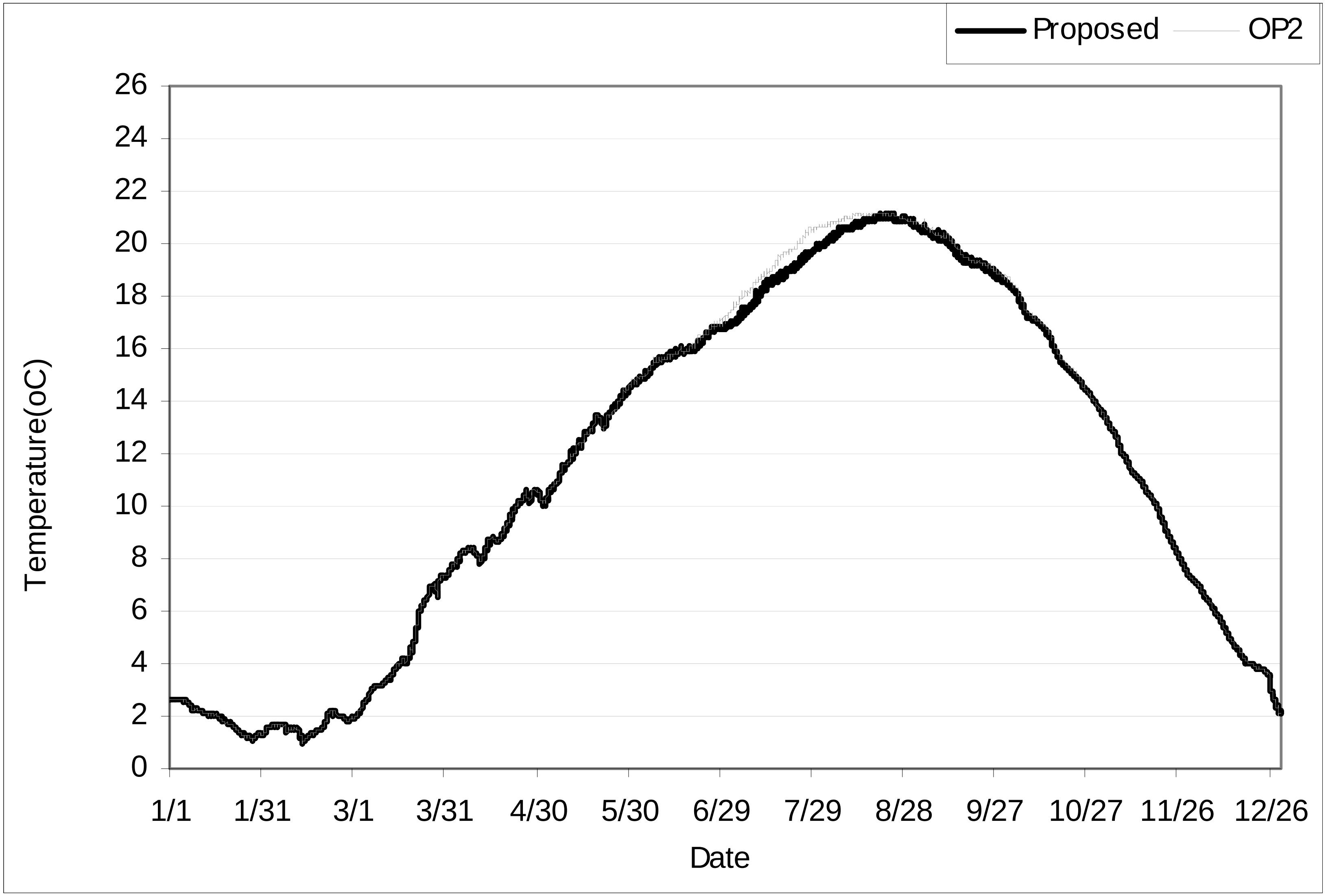

Figure 22. 1994 simulated hourly Hells Canyon outflow temperatures for scenario OP-2 and proposed operations.

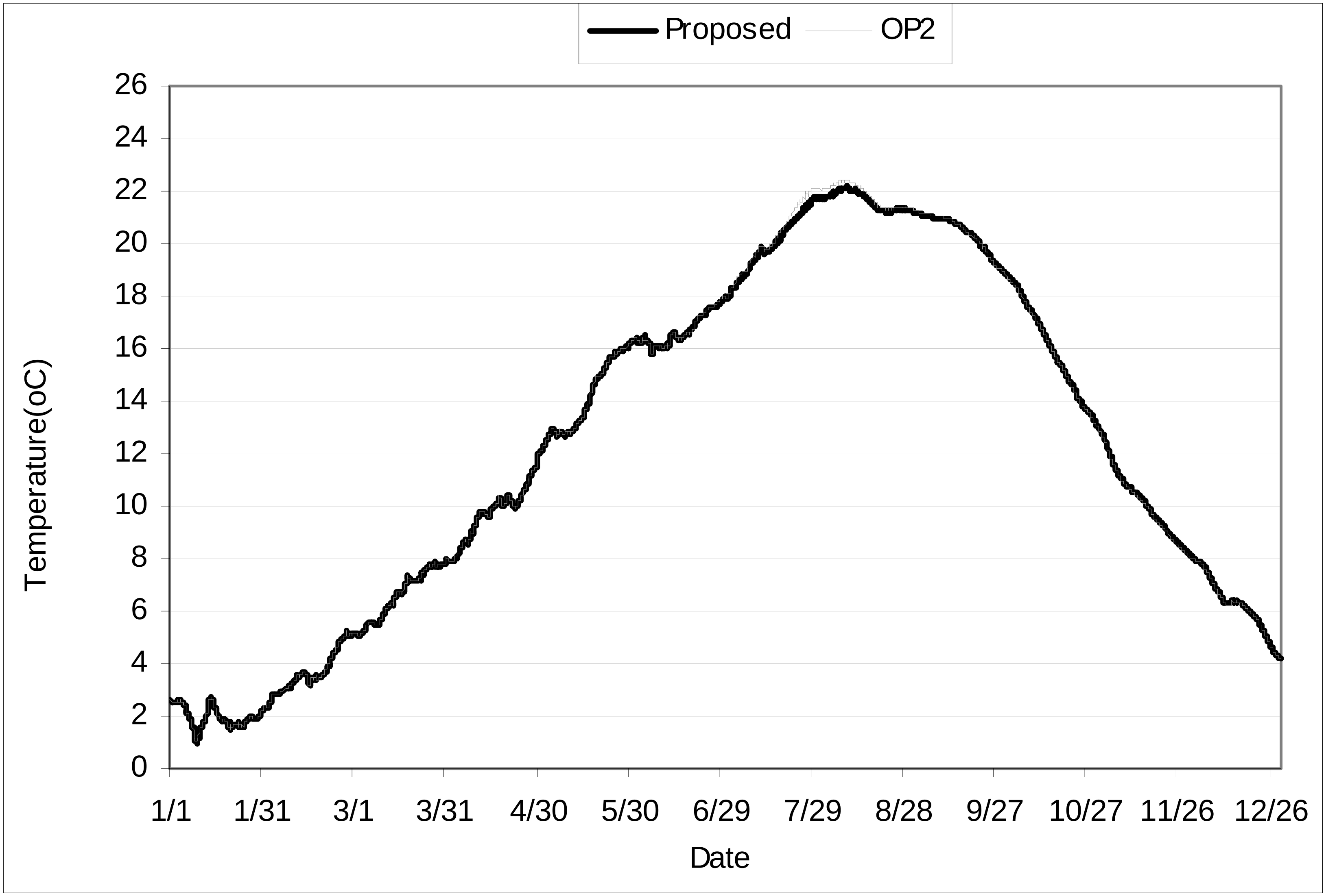

Figure 23. 1995 simulated hourly Hells Canyon outflow temperatures for scenario OP-2 and proposed operations.

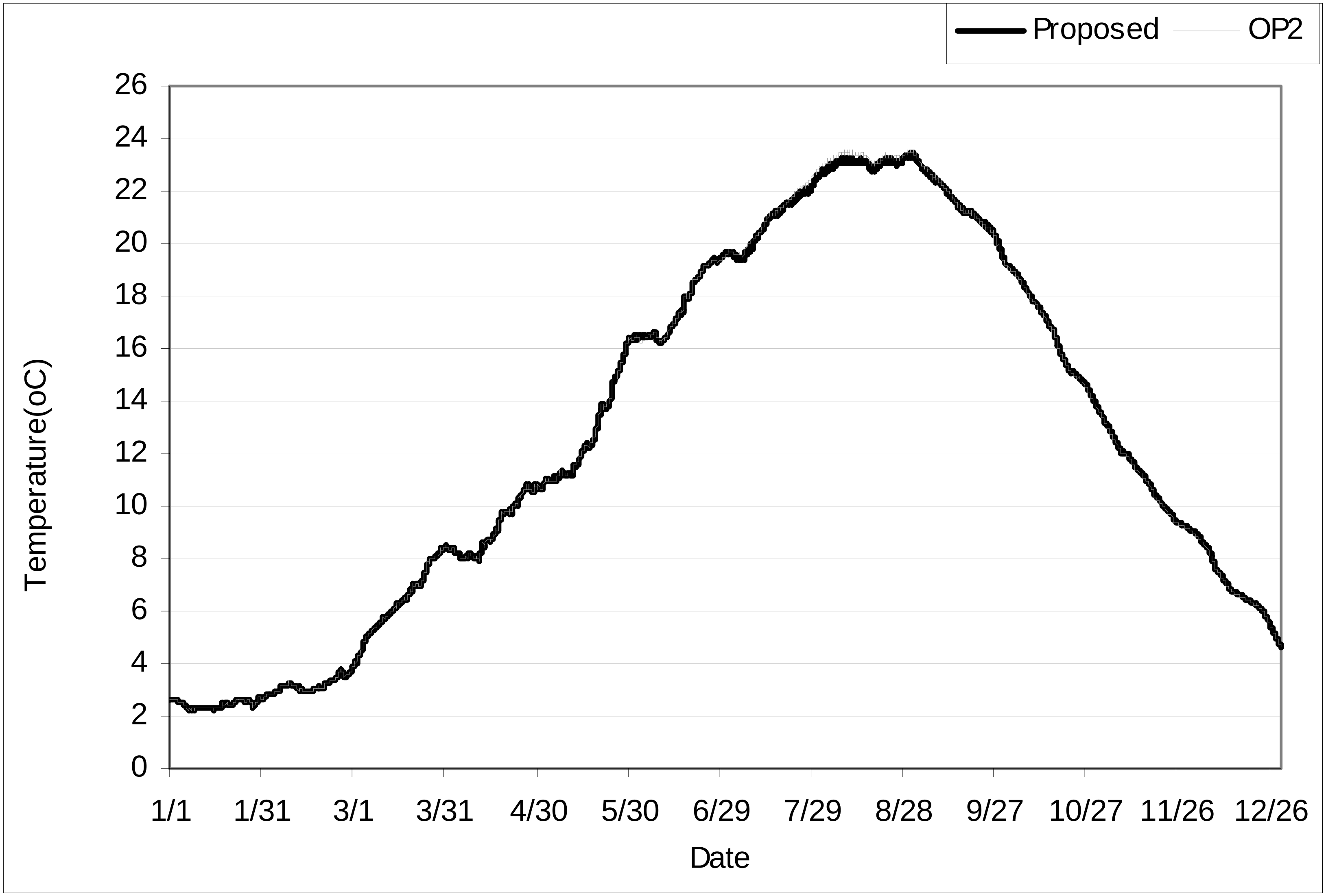

Figure 24. 1999 simulated hourly Hells Canyon outflow temperatures for scenario OP-2 and proposed operations.

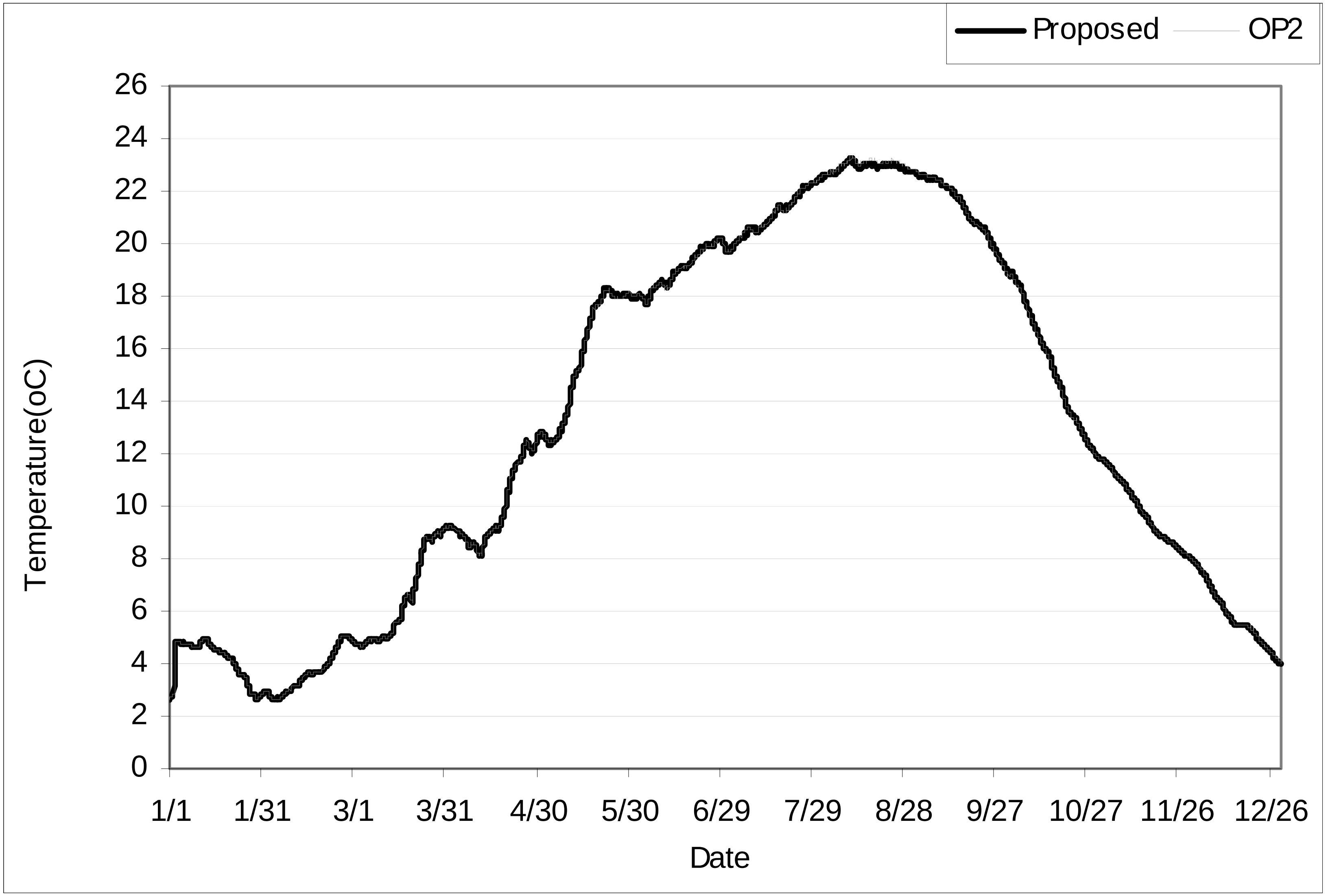

Figure 25. 1997 simulated hourly Hells Canyon outflow temperatures for scenario OP-2 and proposed operations.

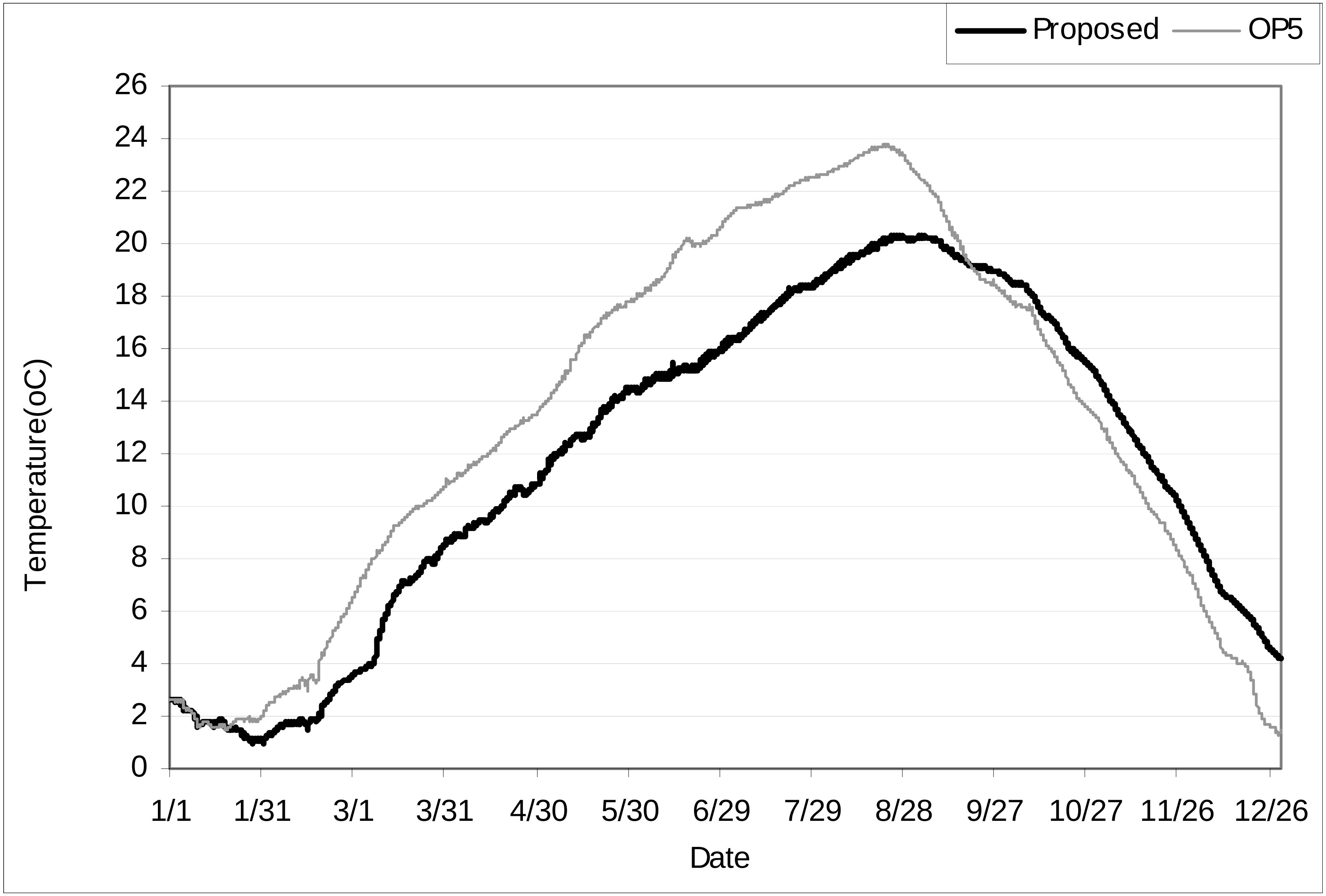

Figure 26. 1992 simulated hourly Hells Canyon outflow temperatures for scenario OP-5 and proposed operations.

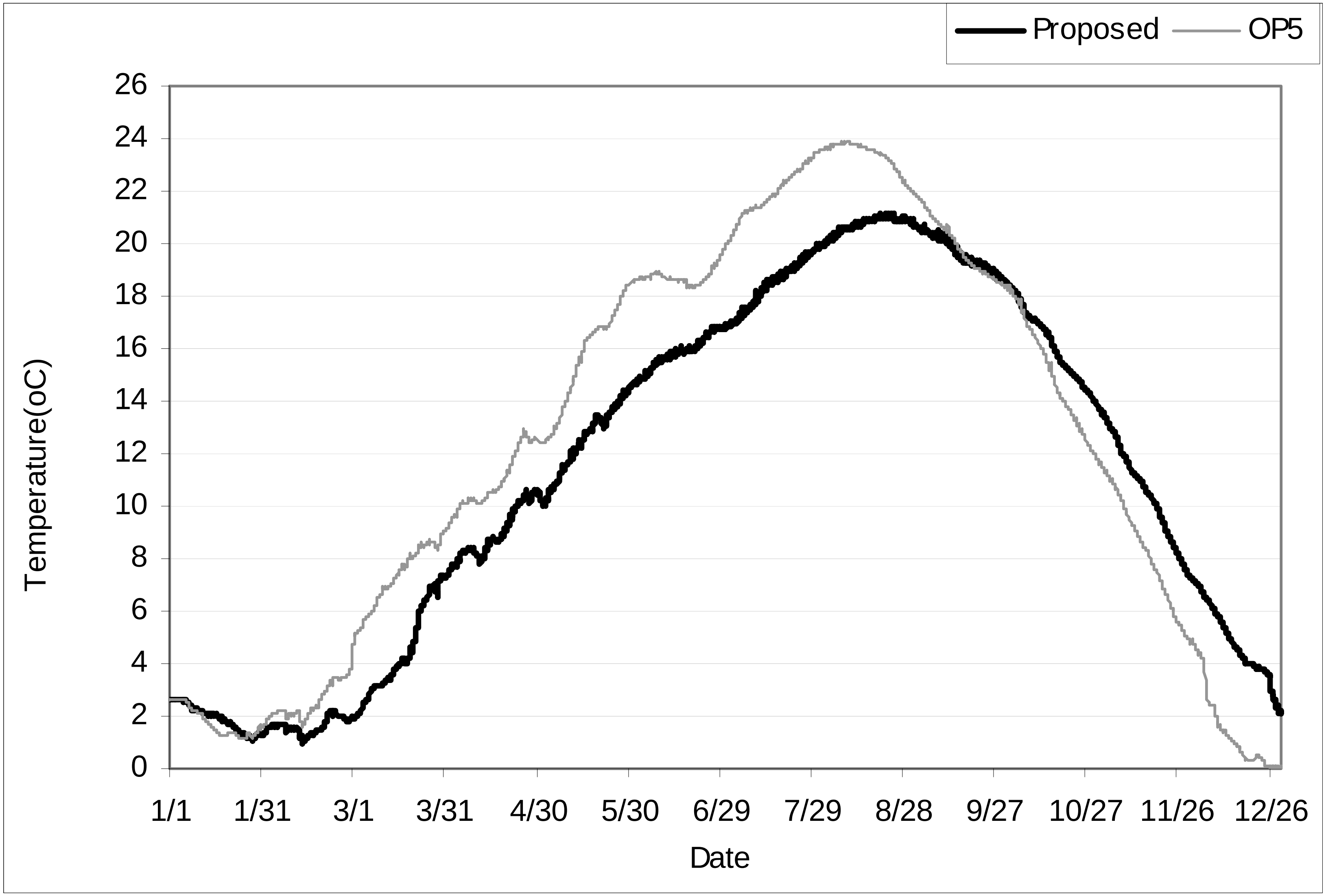

Figure 27. 1994 simulated hourly Hells Canyon outflow temperatures for scenario OP-5 and proposed operations.

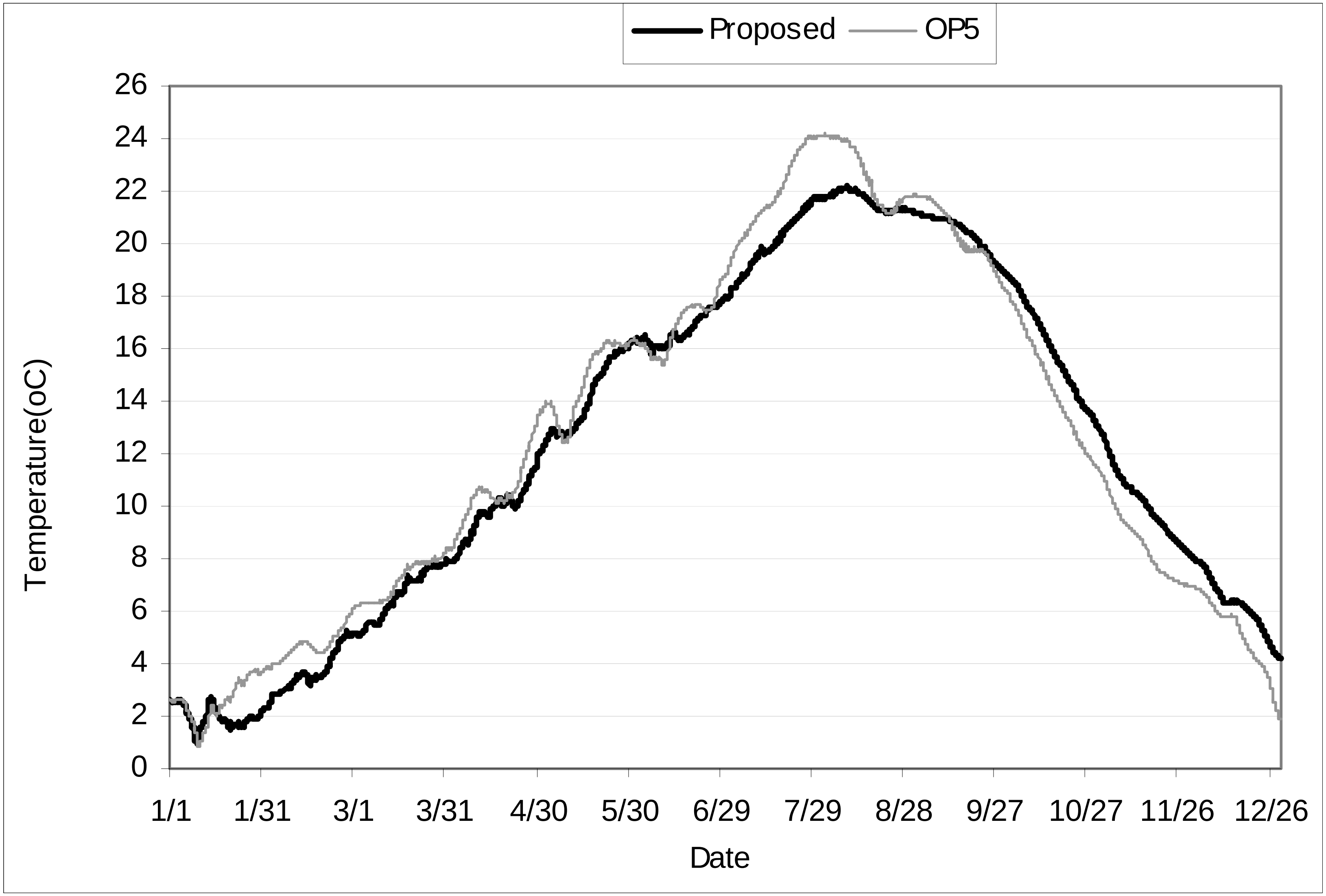

Figure 28. 1995 simulated hourly Hells Canyon outflow temperatures for scenario OP-5 and proposed operations.

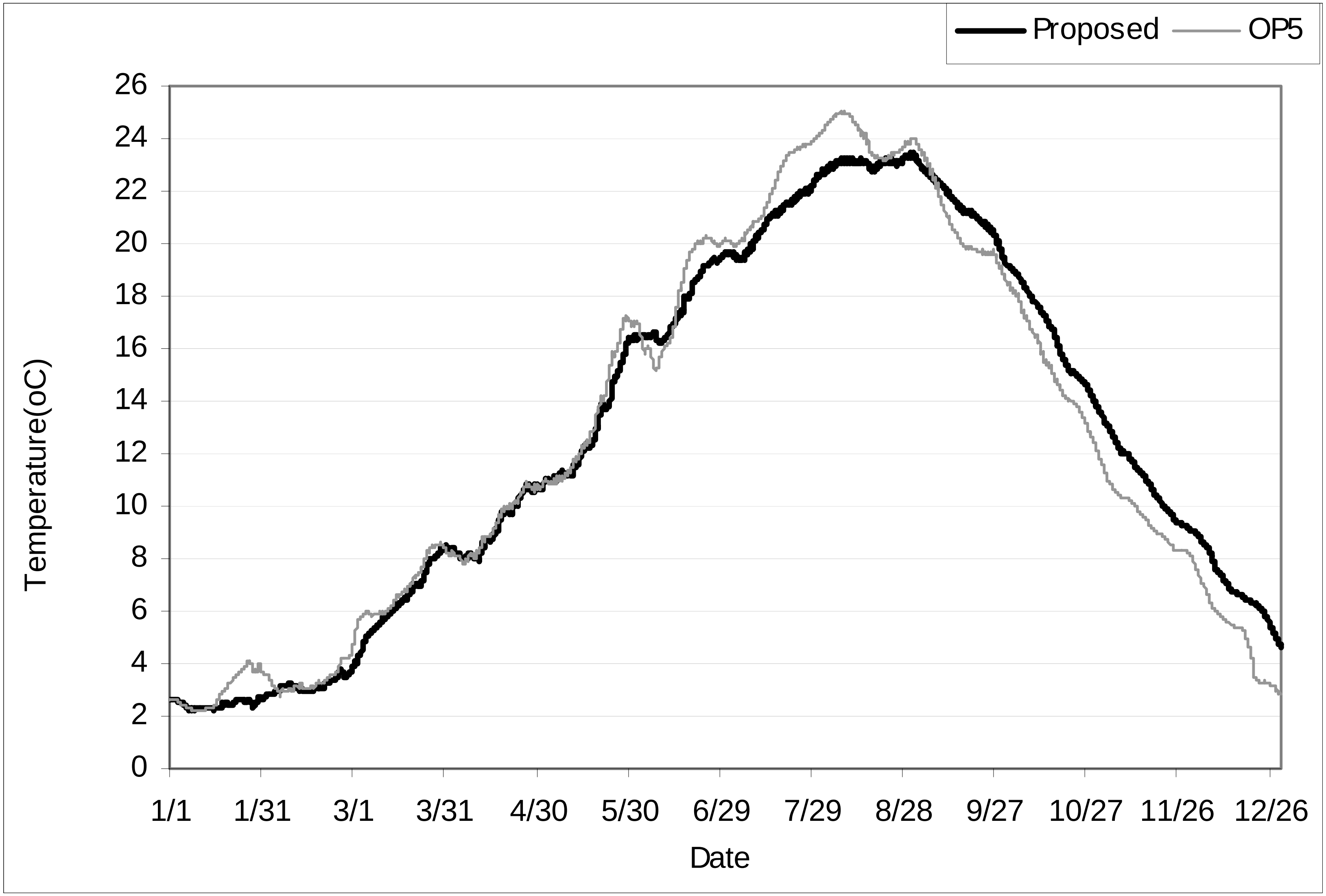

Figure 29. 1999 simulated hourly Hells Canyon outflow temperatures for scenario OP-5 and proposed operations.

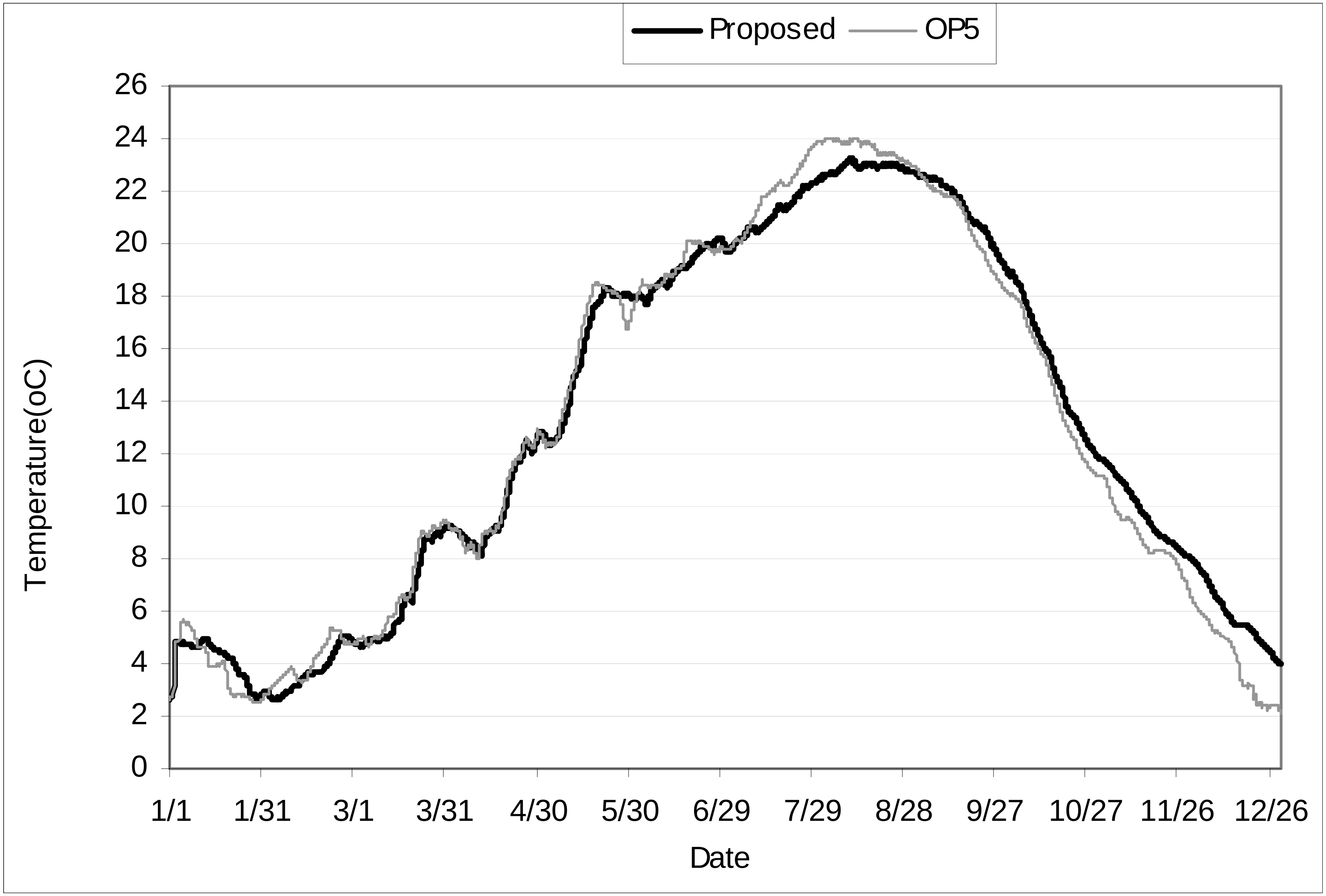

Figure 30. 1997 simulated hourly Hells Canyon outflow temperatures for scenario OP-5 and proposed operations.

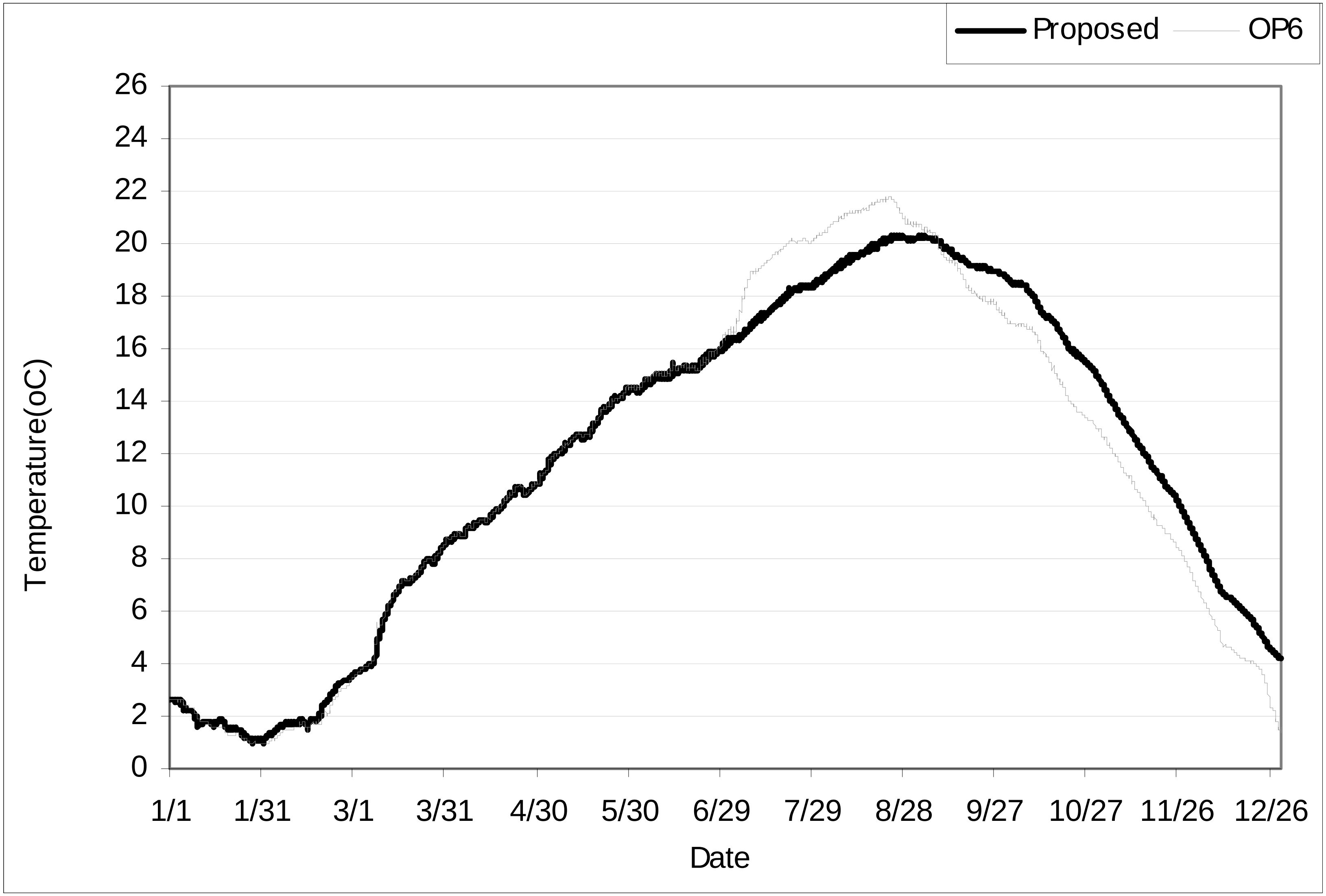

Figure 31. 1992 simulated hourly Hells Canyon outflow temperatures for scenario OP-6 and proposed operations.

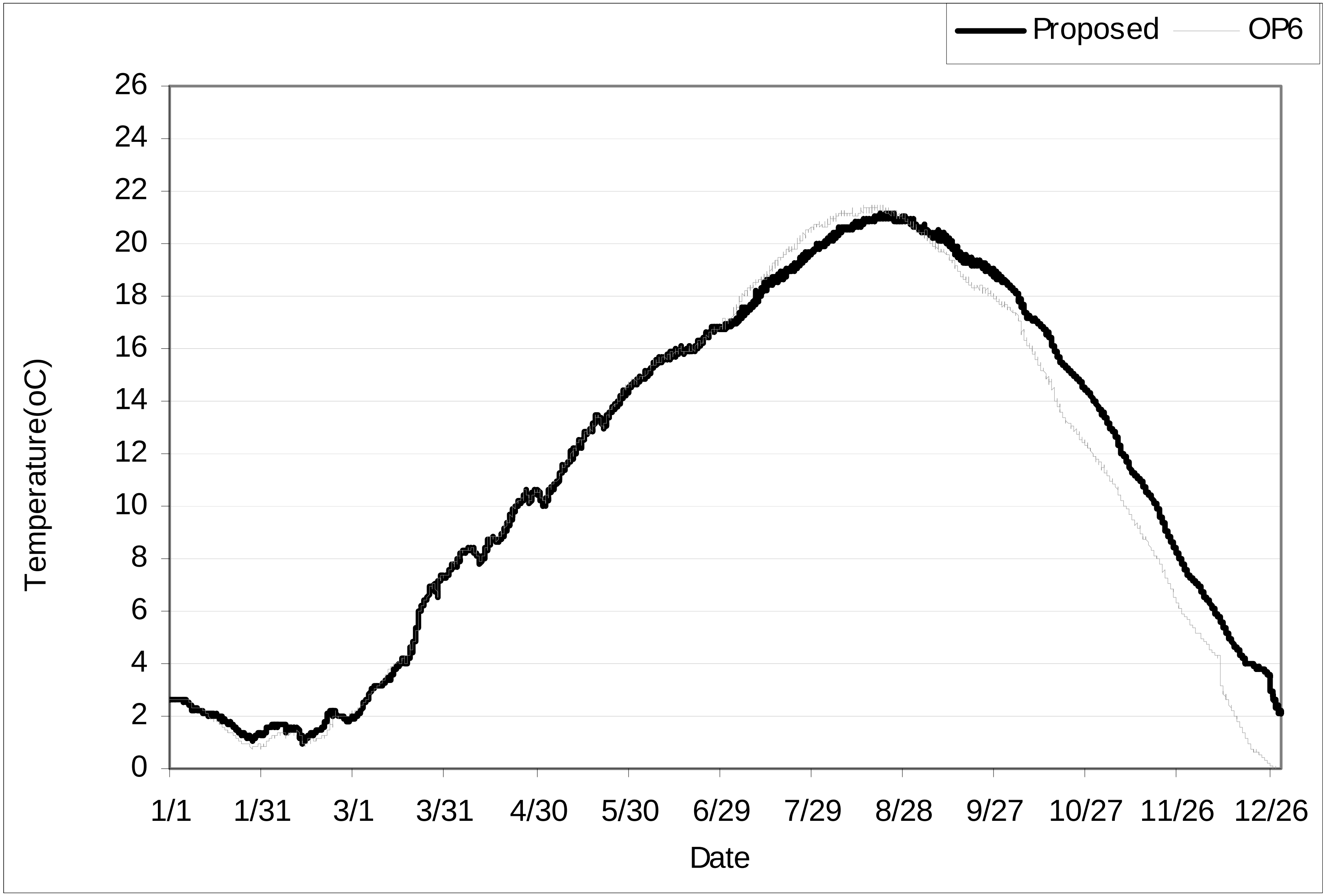

Figure 32. 1994 simulated hourly Hells Canyon outflow temperatures for scenario OP-6 and proposed operations.

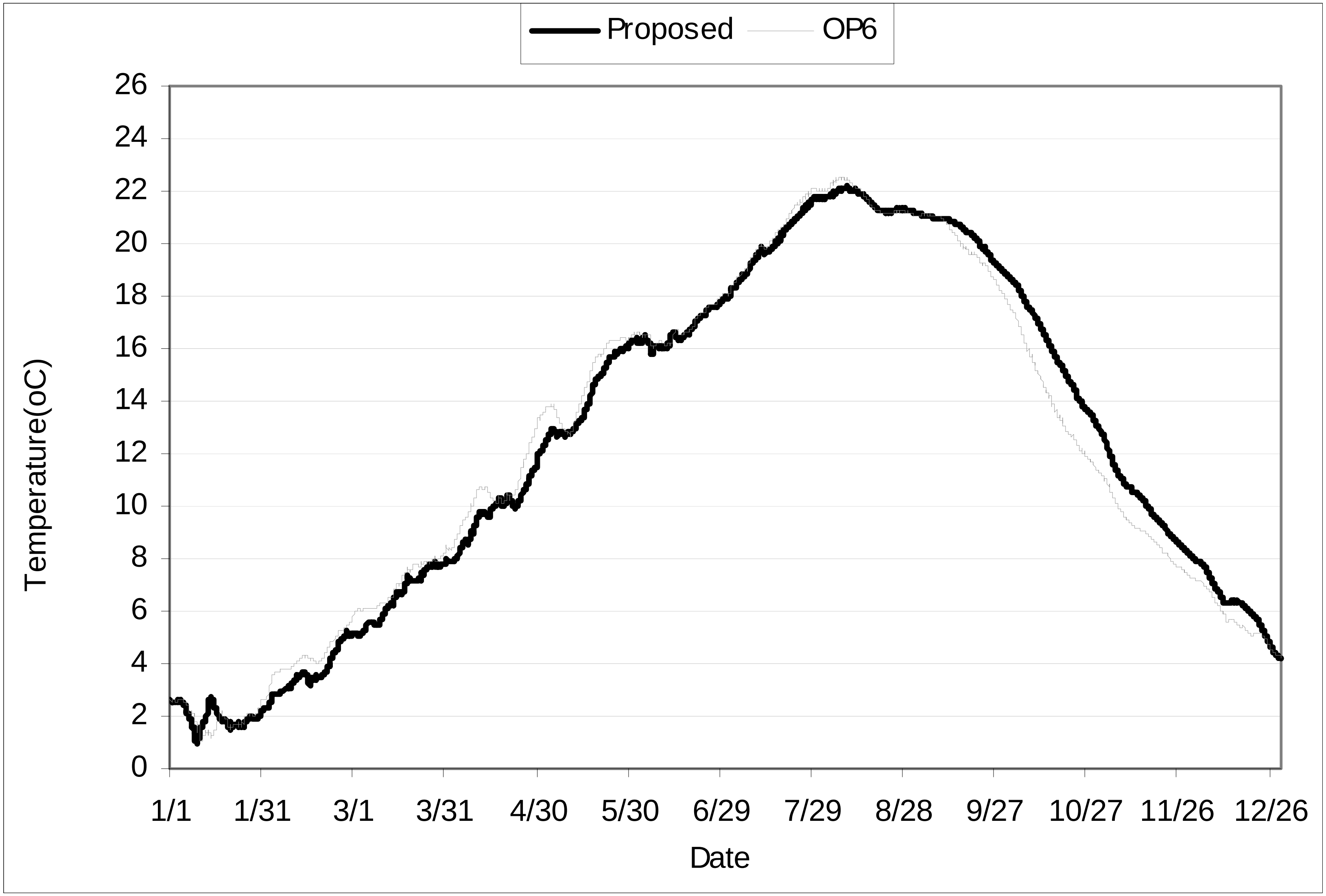

Figure 33. 1995 simulated hourly Hells Canyon outflow temperatures for scenario OP-6 and proposed operations.

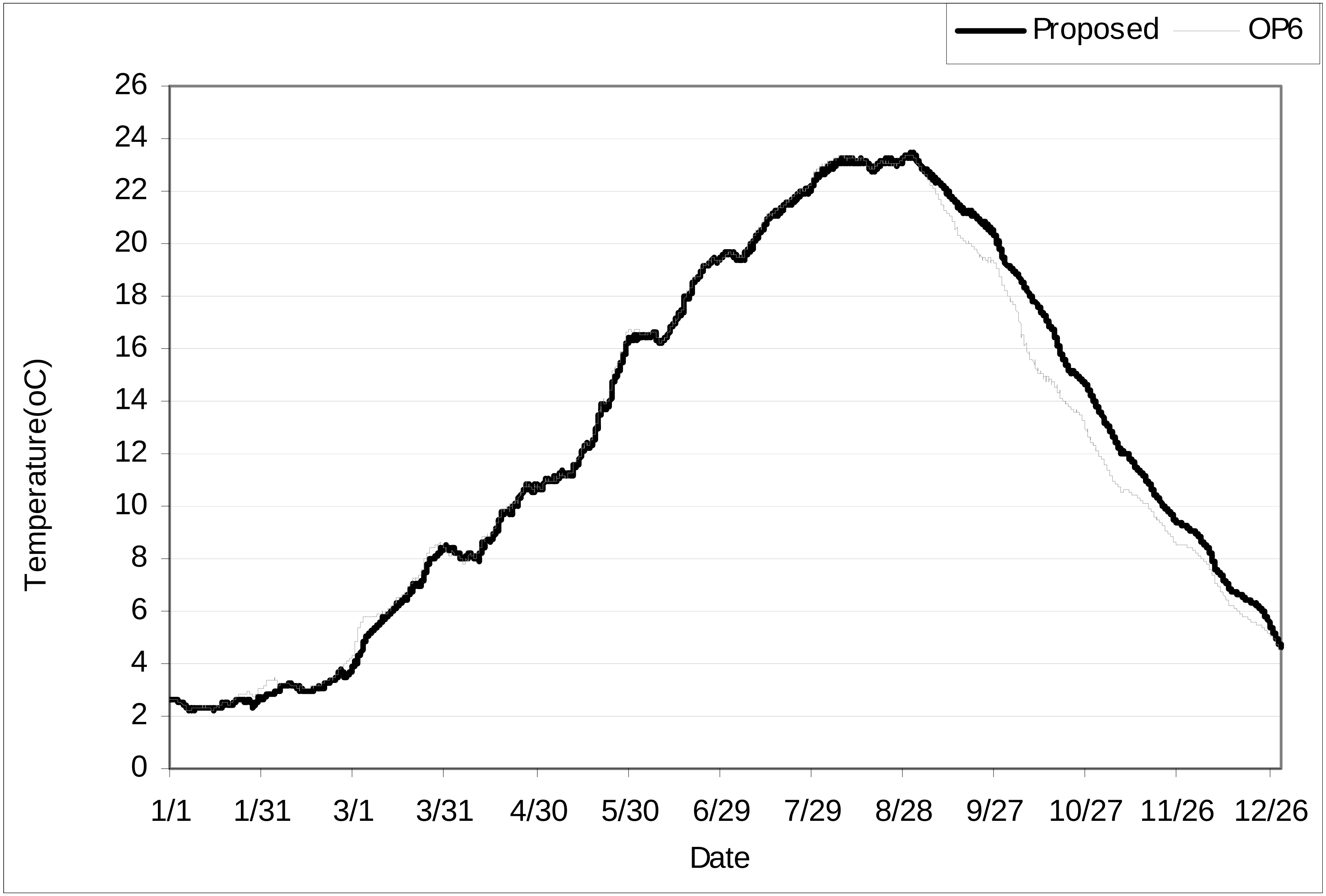

Figure 34. 1999 simulated hourly Hells Canyon outflow temperatures for scenario OP-6 and proposed operations.

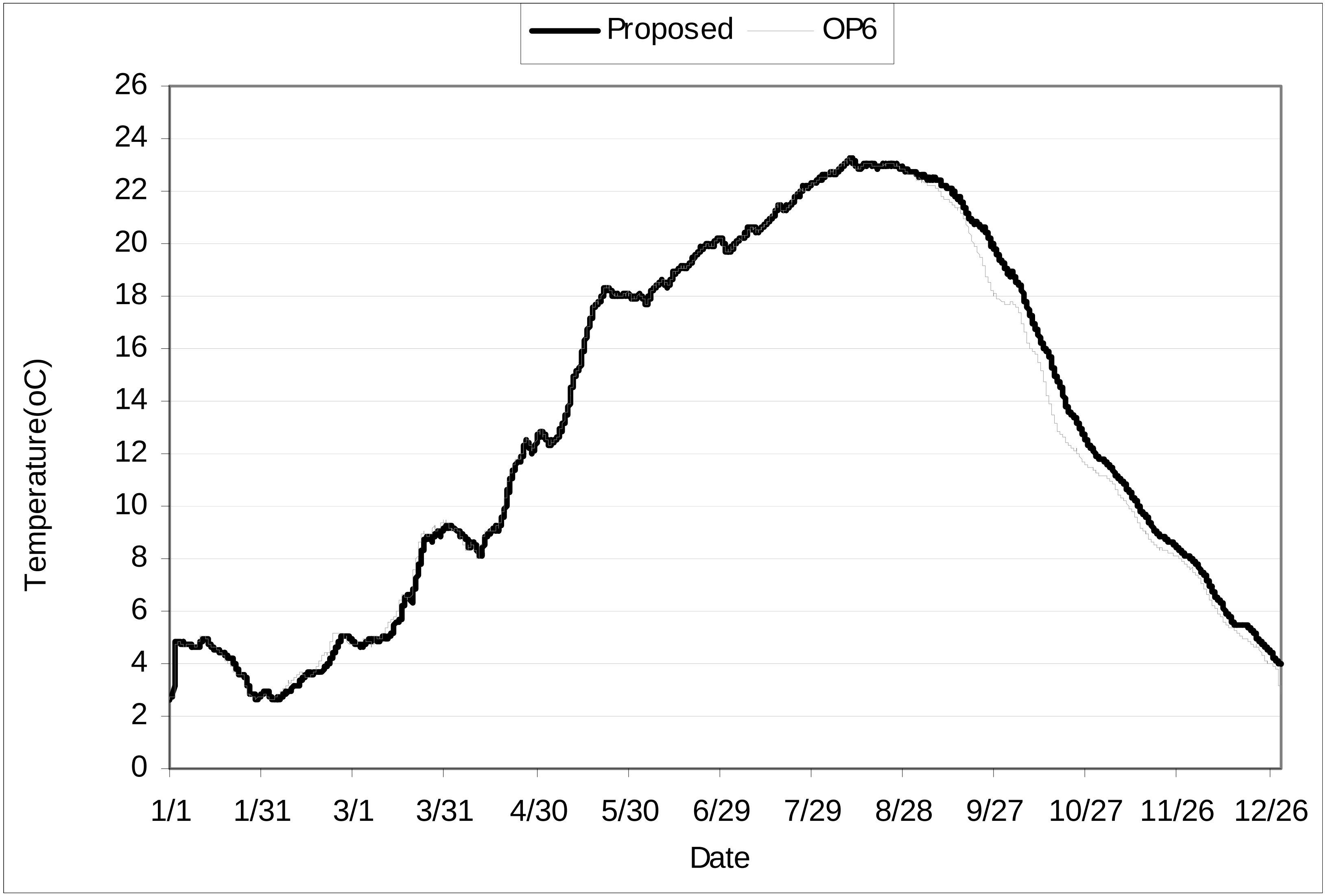

Figure 35. 1997 simulated hourly Hells Canyon outflow temperatures for scenario OP-6 and proposed operations.

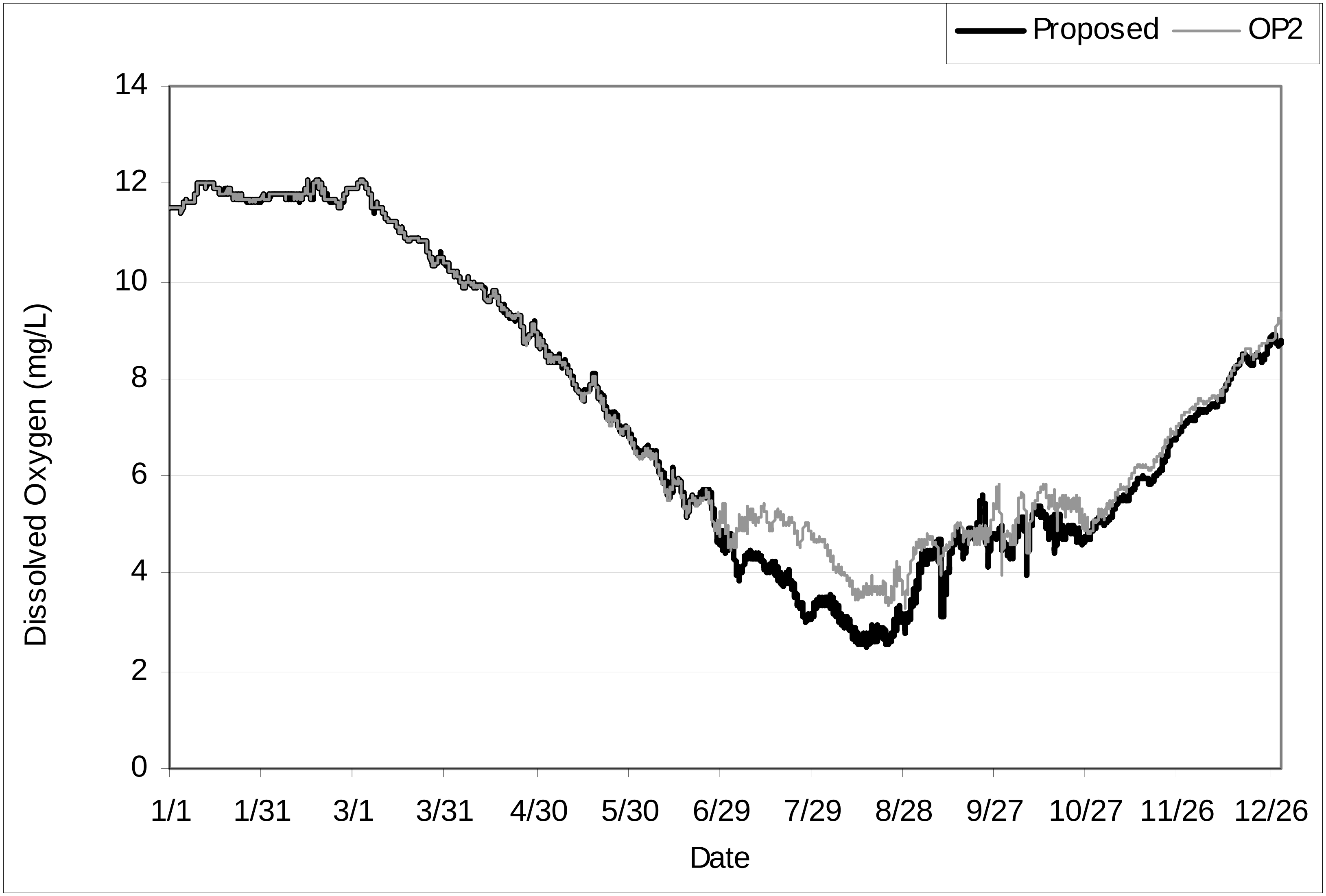

Figure 36. 1992 simulated hourly Hells Canyon outflow DO for scenario OP-2 and proposed operations.

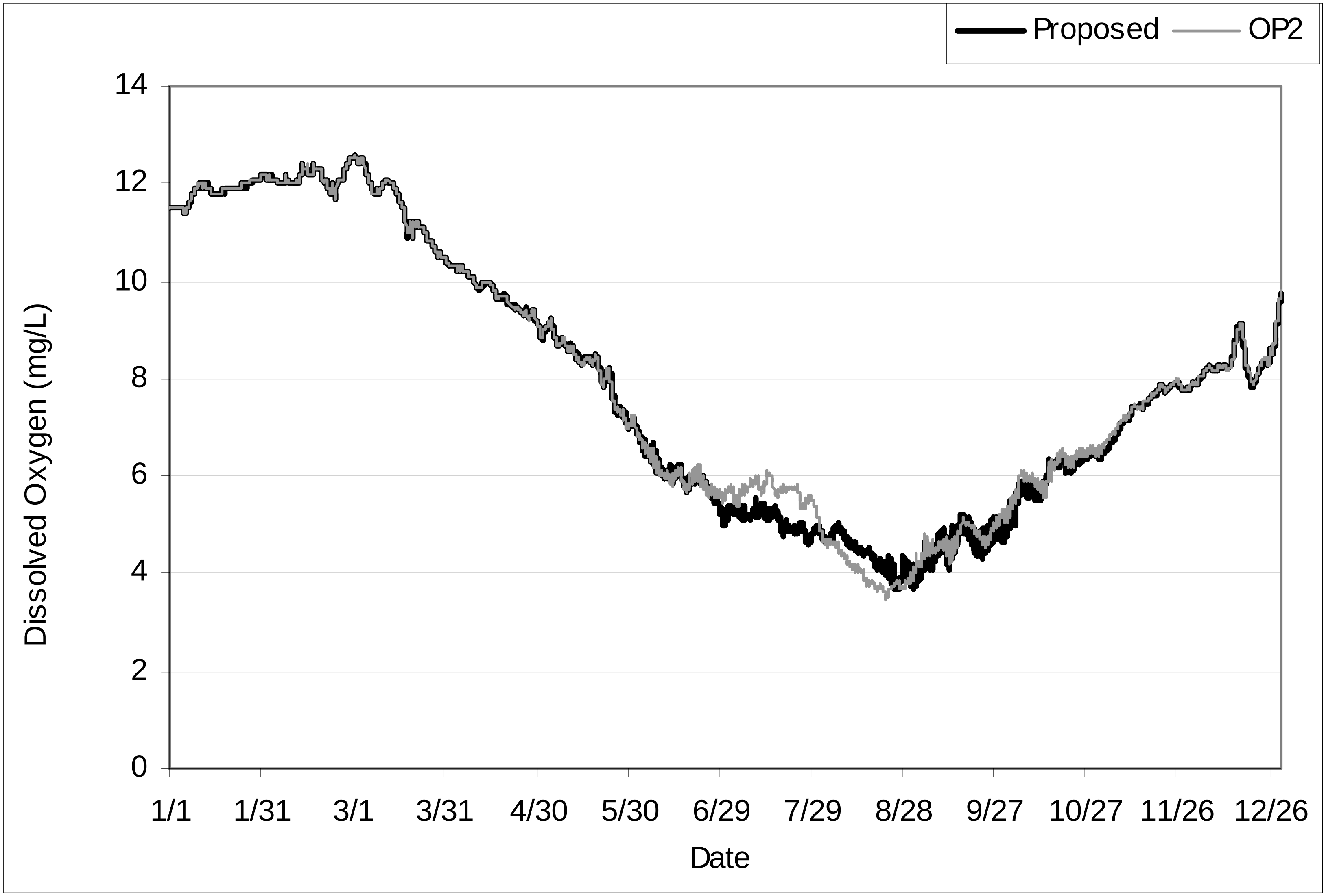

Figure 37. 1994 simulated hourly Hells Canyon outflow dissolved oxygen for scenario OP-2 and proposed operations.

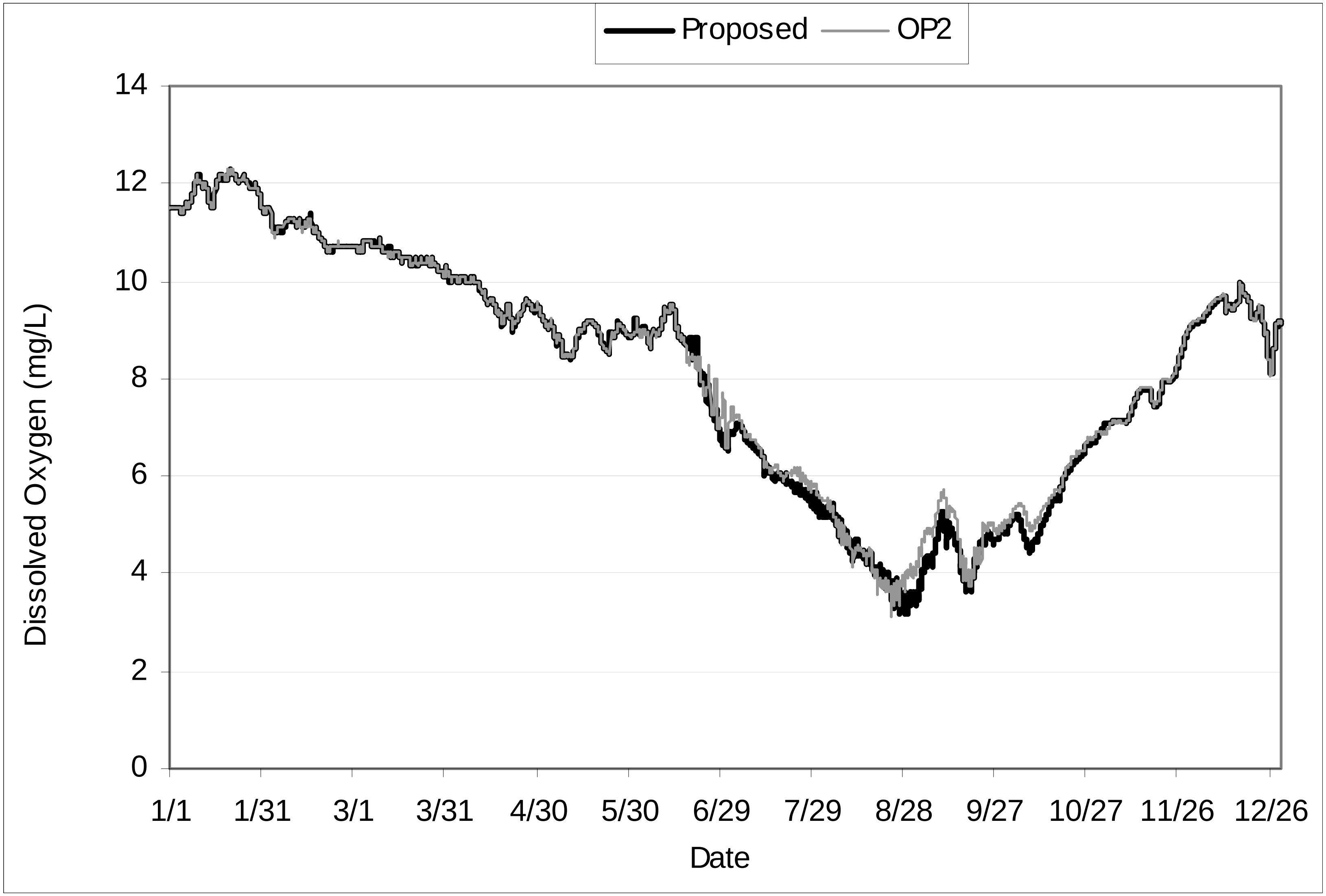

Figure 38. 1995 simulated hourly Hells Canyon outflow DO for scenario OP-2 and proposed operations.

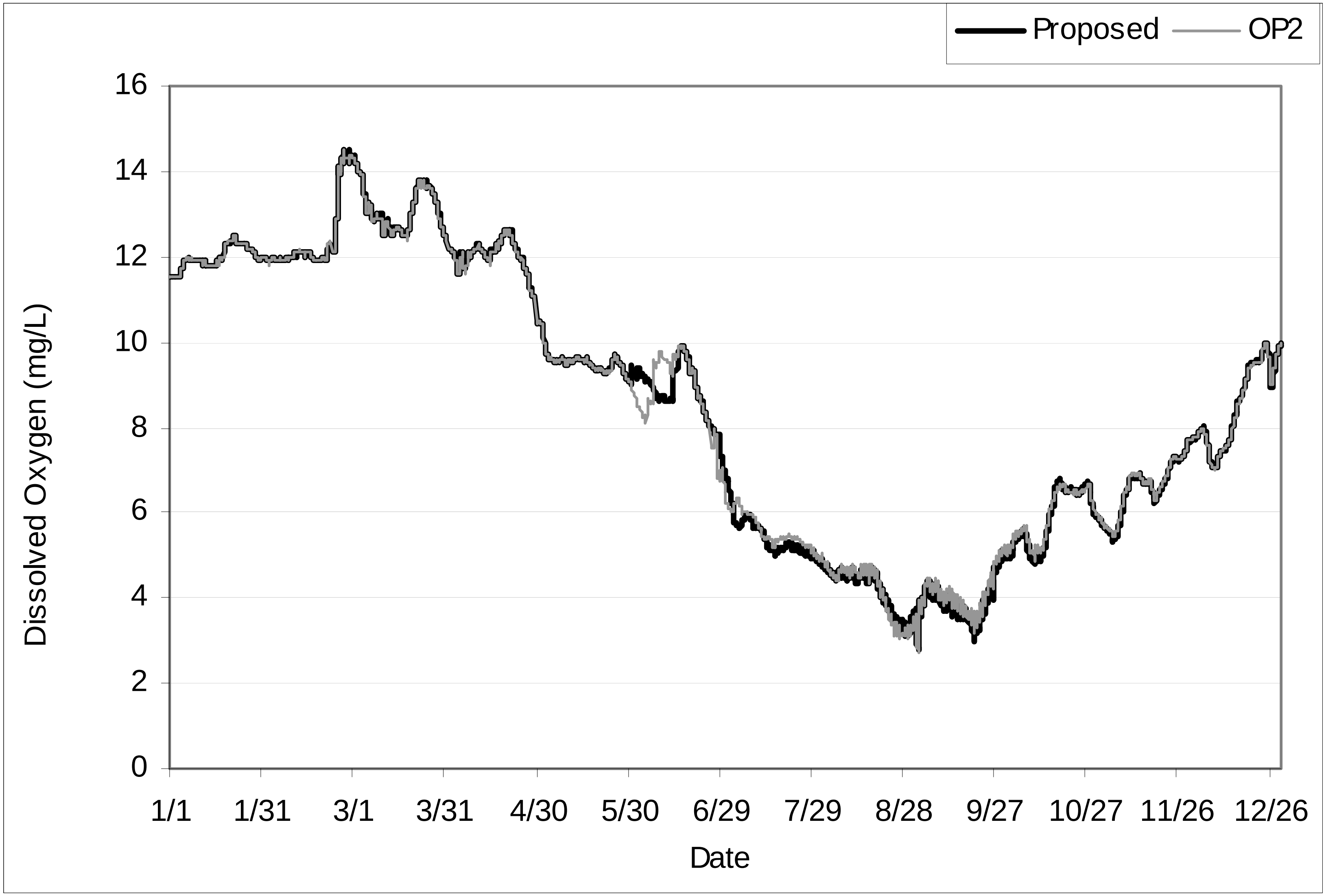

Figure 39. 1999 simulated hourly Hells Canyon outflow dissolved oxygen for scenario OP-2 and proposed operations.

Figure 40. 1997 simulated hourly Hells Canyon outflow DO for scenario OP-2 and proposed operations.

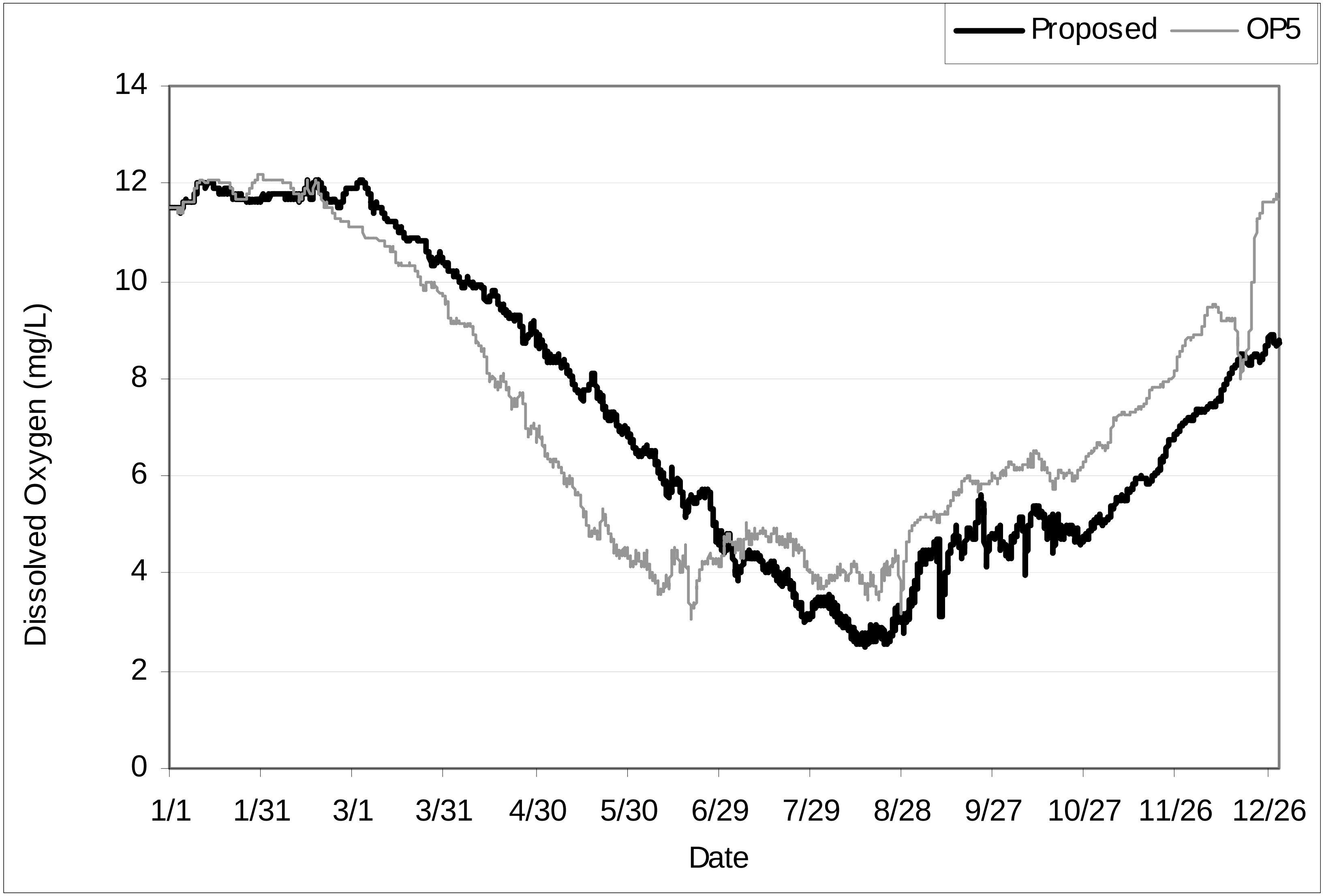

Figure 41. 1992 simulated hourly Hells Canyon outflow dissolved oxygen for scenario OP-5 and proposed operations.

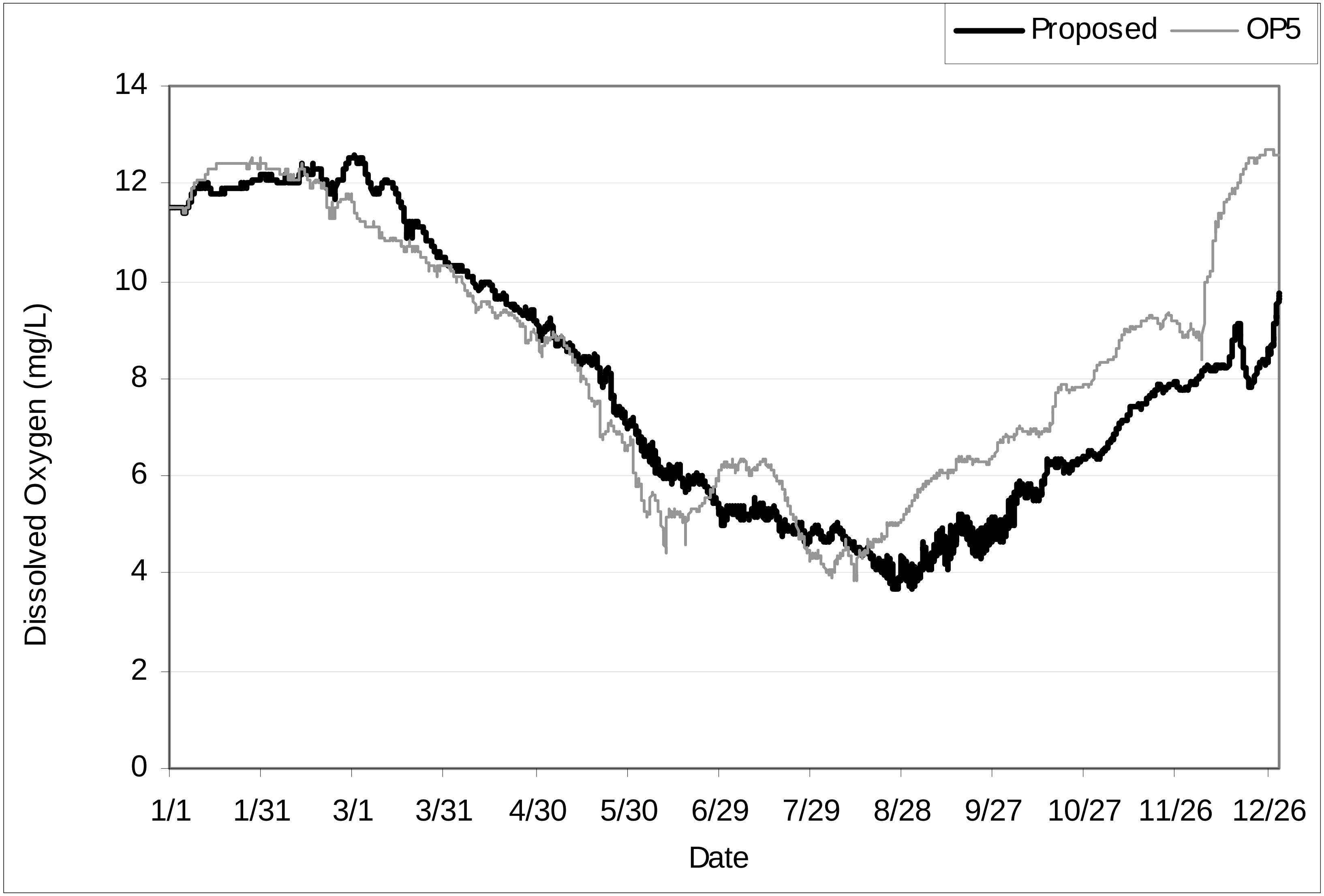

Figure 42. 1994 simulated hourly Hells Canyon outflow DO for scenario OP-5 and proposed operations.

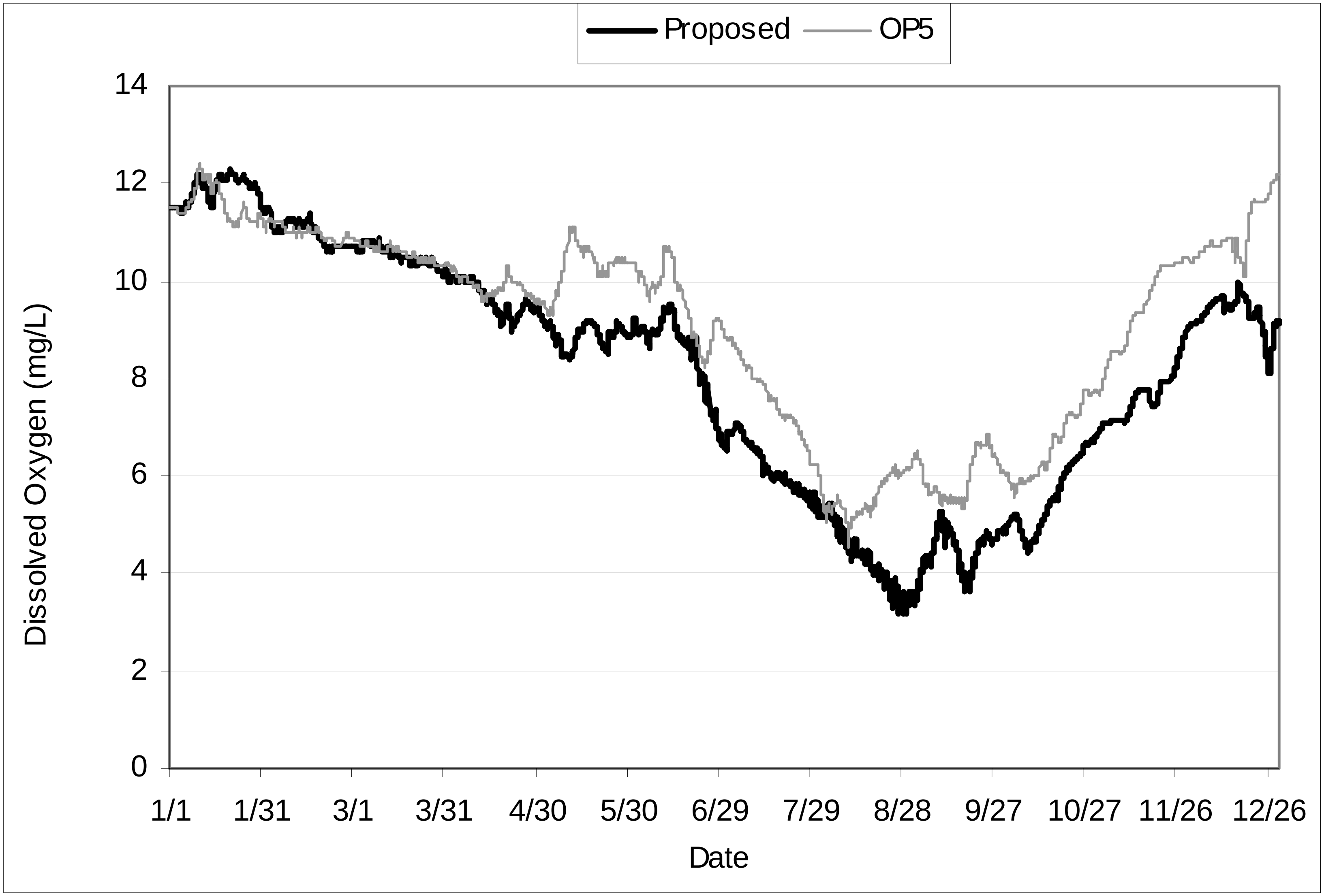

Figure 43. 1995 simulated hourly Hells Canyon outflow dissolved oxygen for scenario OP-5 and proposed operations.

Figure 44. 1999 simulated hourly Hells Canyon outflow DO for scenario OP-5 and proposed operations.

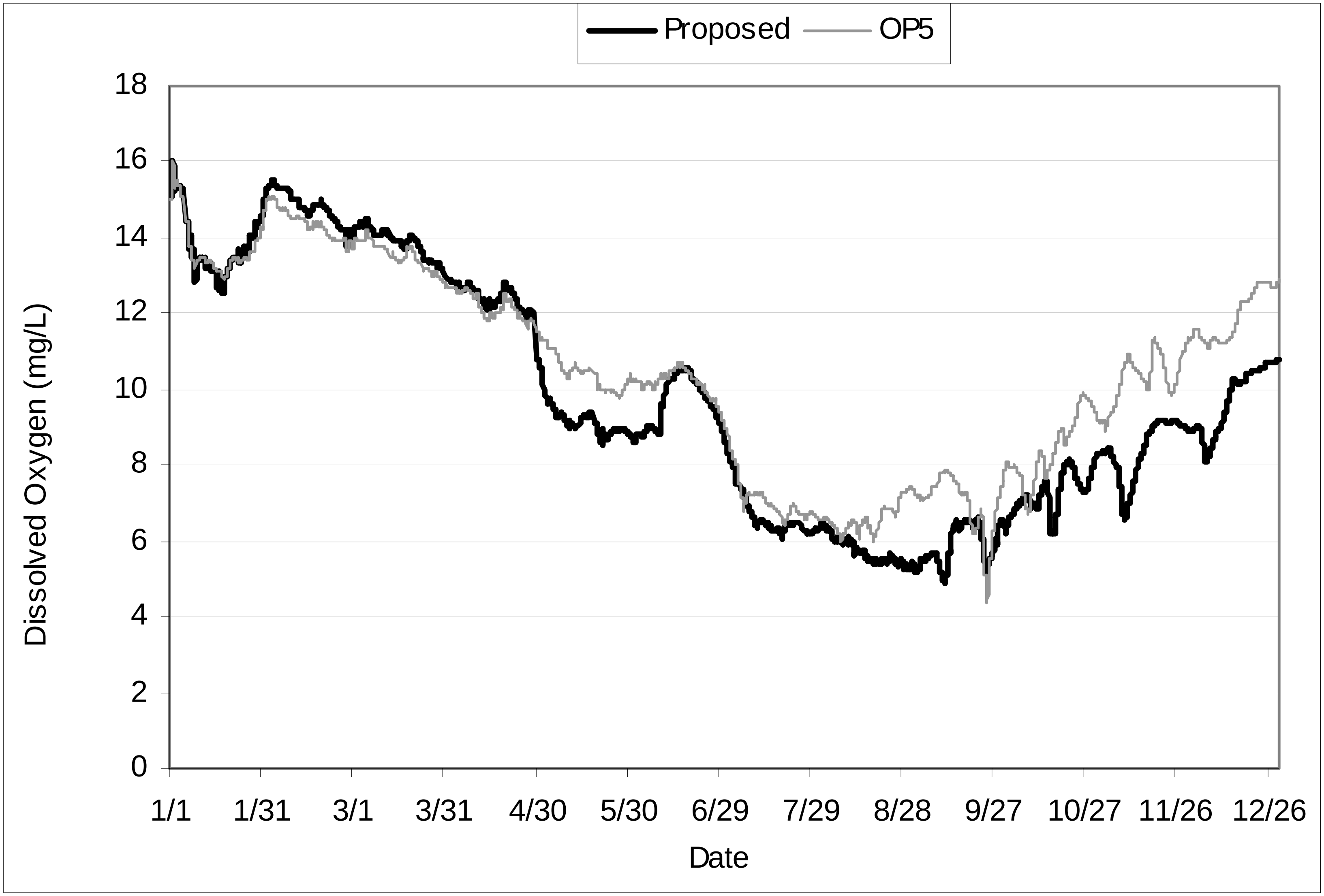

Figure 45. 1997 simulated hourly Hells Canyon outflow dissolved oxygen for scenario OP-5 and proposed operations.

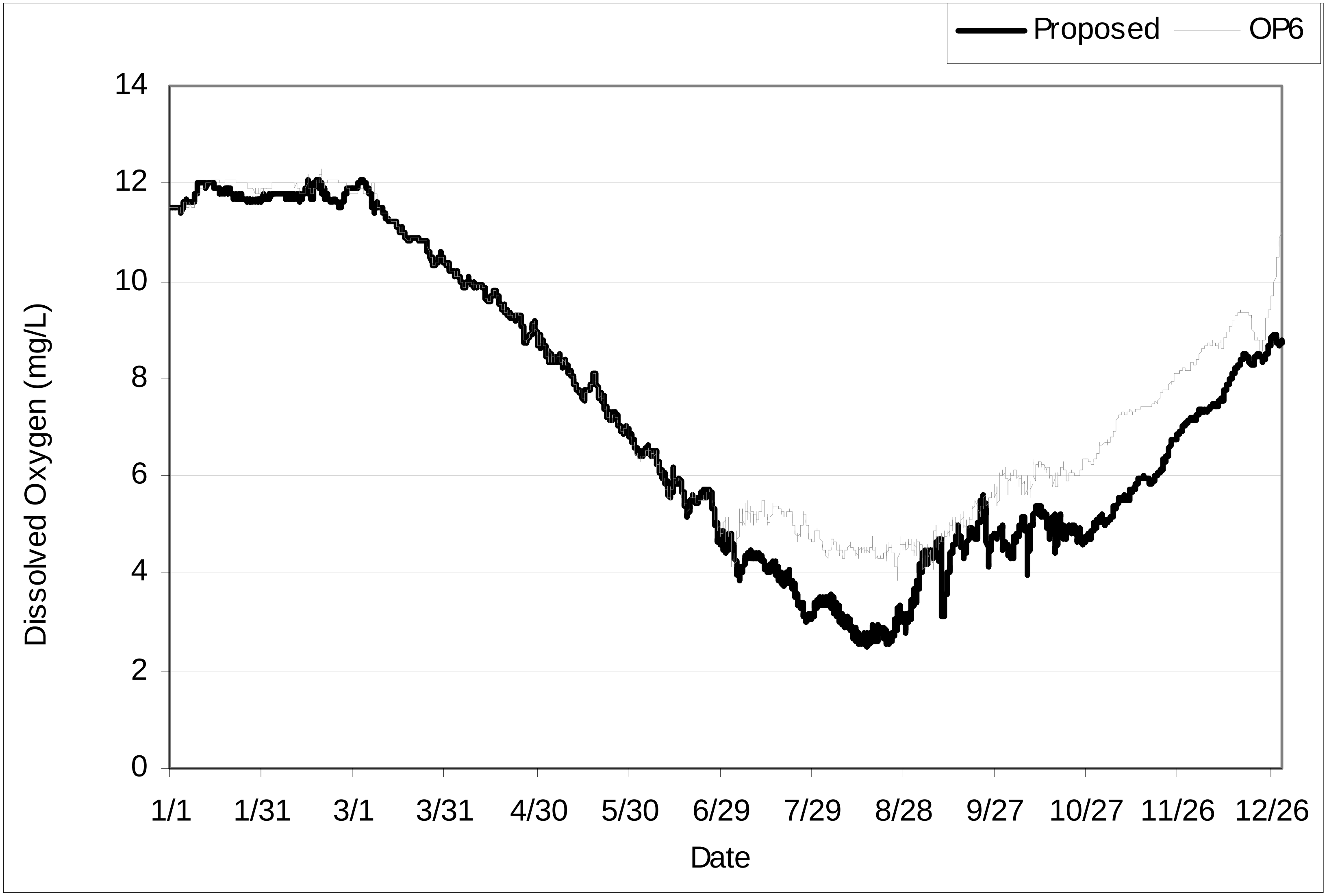

Figure 46. 1992 simulated hourly Hells Canyon outflow DO for scenario OP-6 and proposed operations.

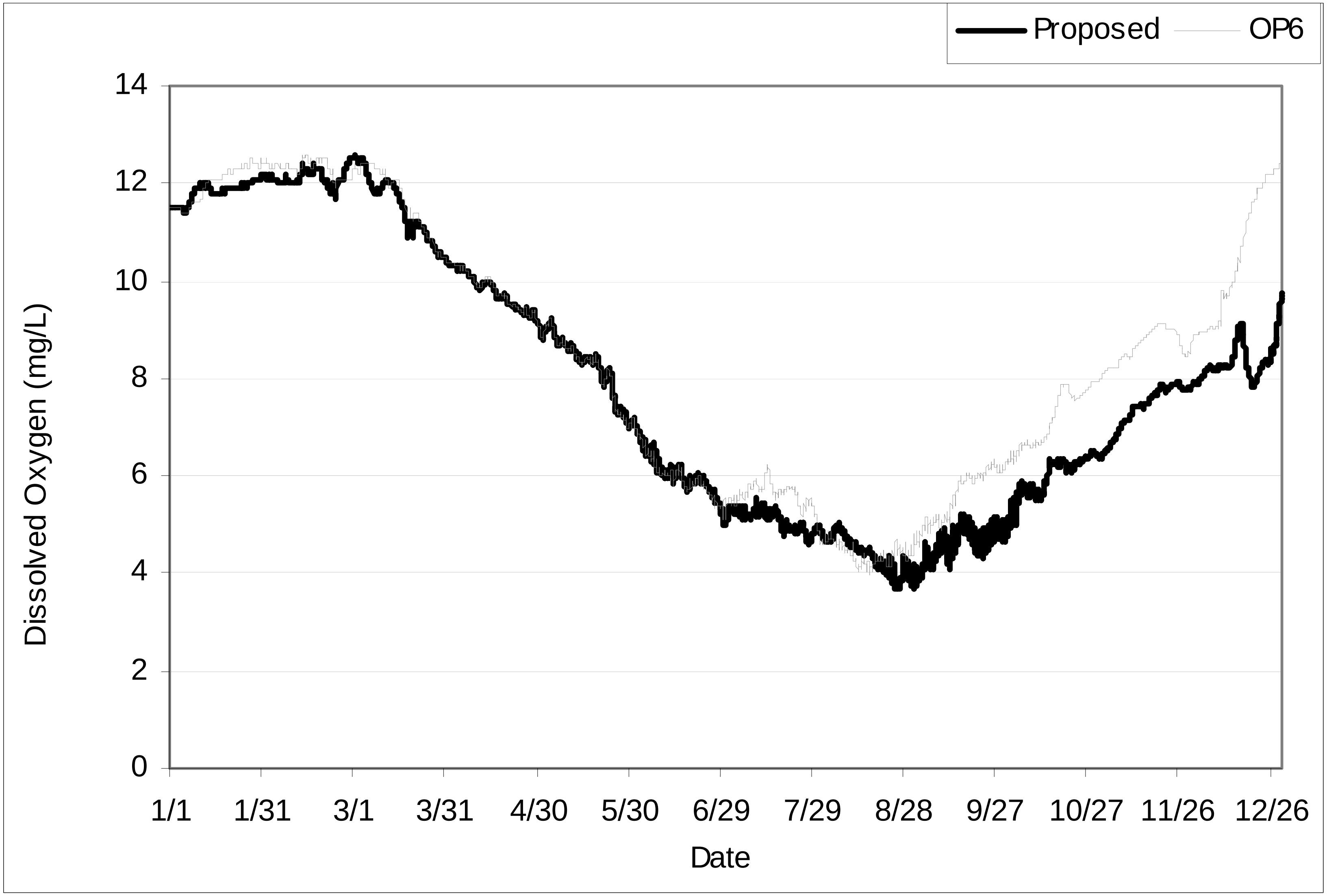

Figure 47. 1994 simulated hourly Hells Canyon outflow DO for scenario OP-6 and proposed operations.

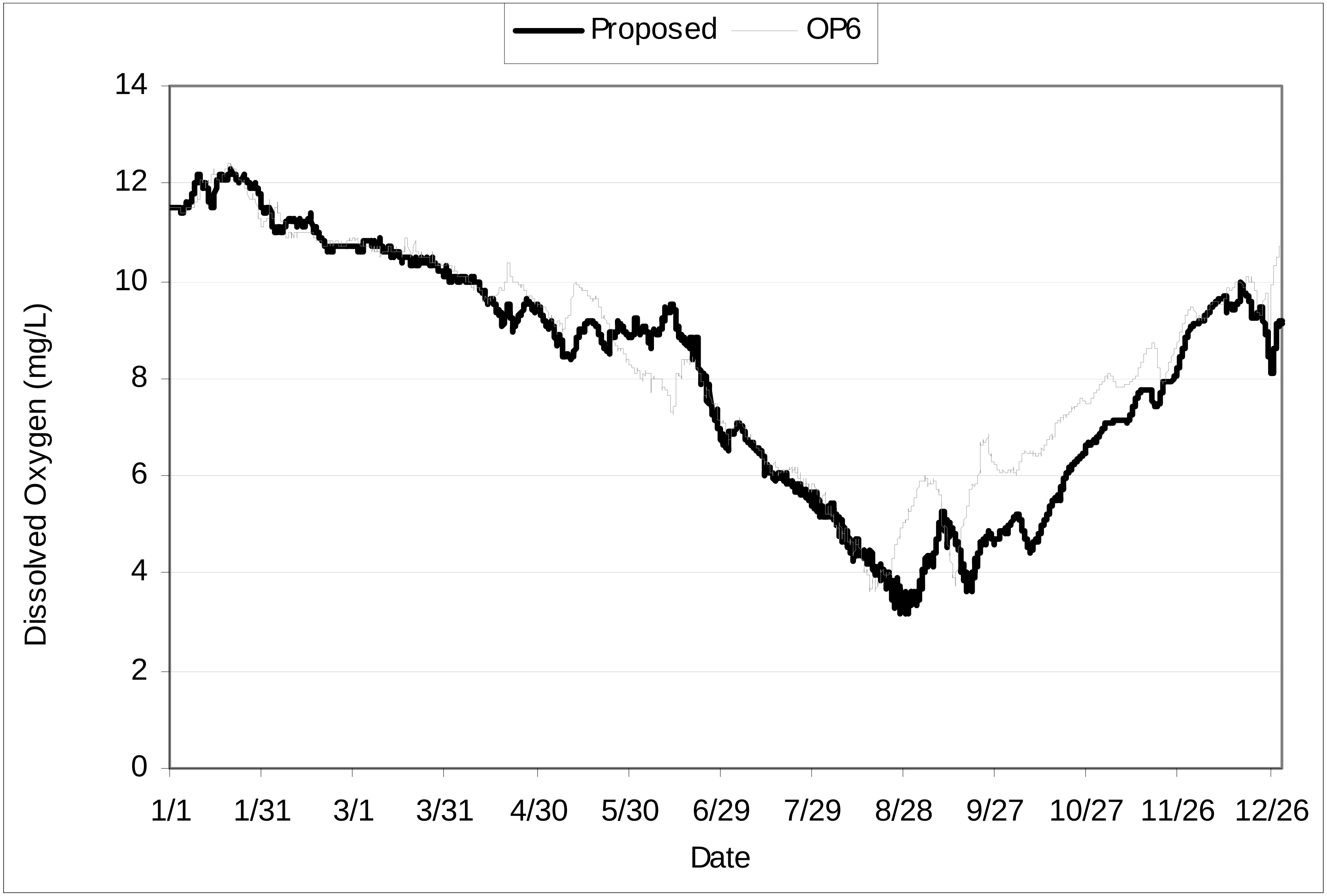

Figure 48. 1995 simulated hourly Hells Canyon outflow DO for scenario OP-6 and proposed operations.

Figure 49. 1999 simulated hourly Hells Canyon outflow DO for scenario OP-6 and proposed operations.

Figure 50. 1997 simulated hourly Hells Canyon outflow DO for scenario OP-6 and proposed operations.

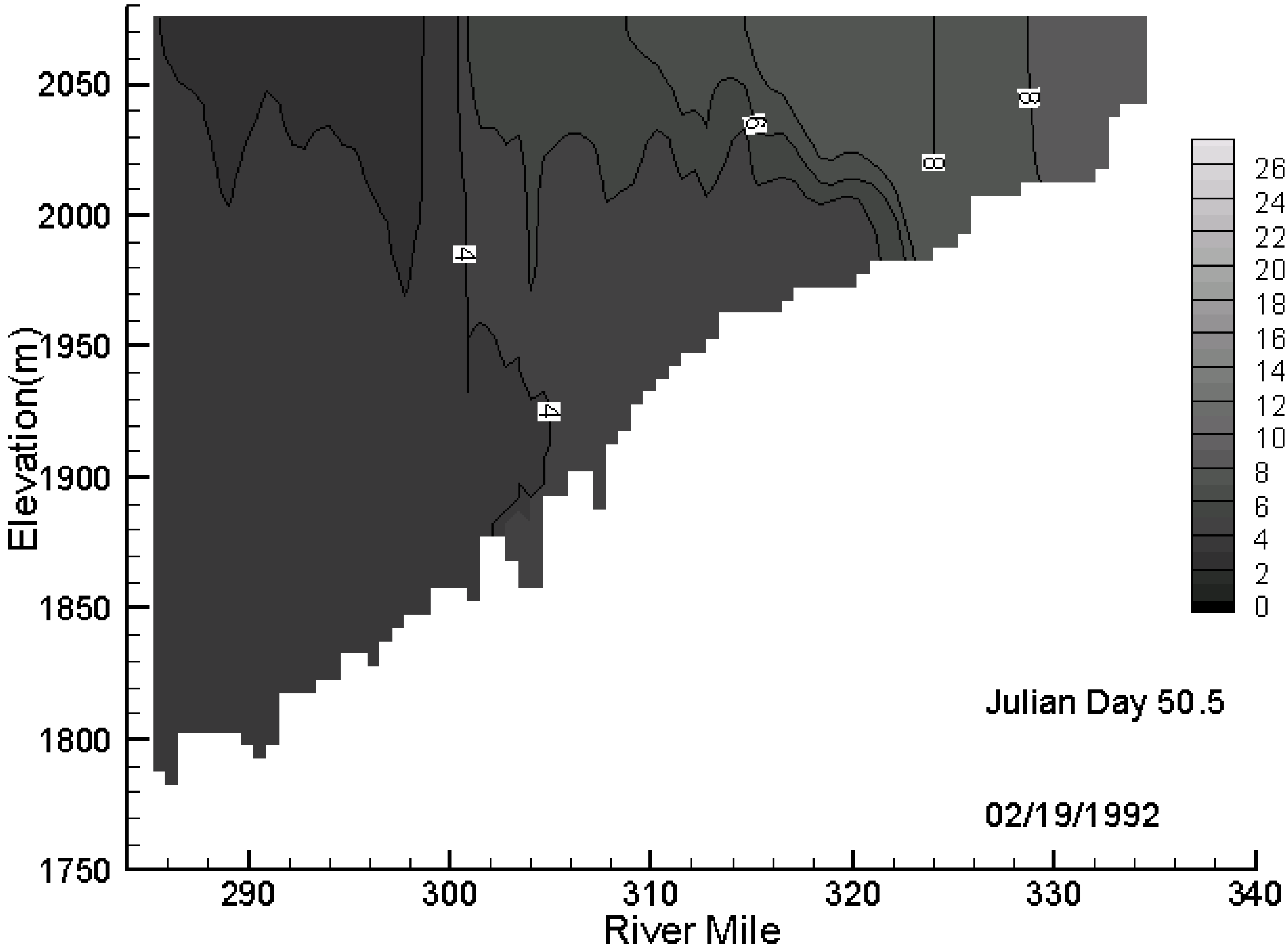

Figure 51. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

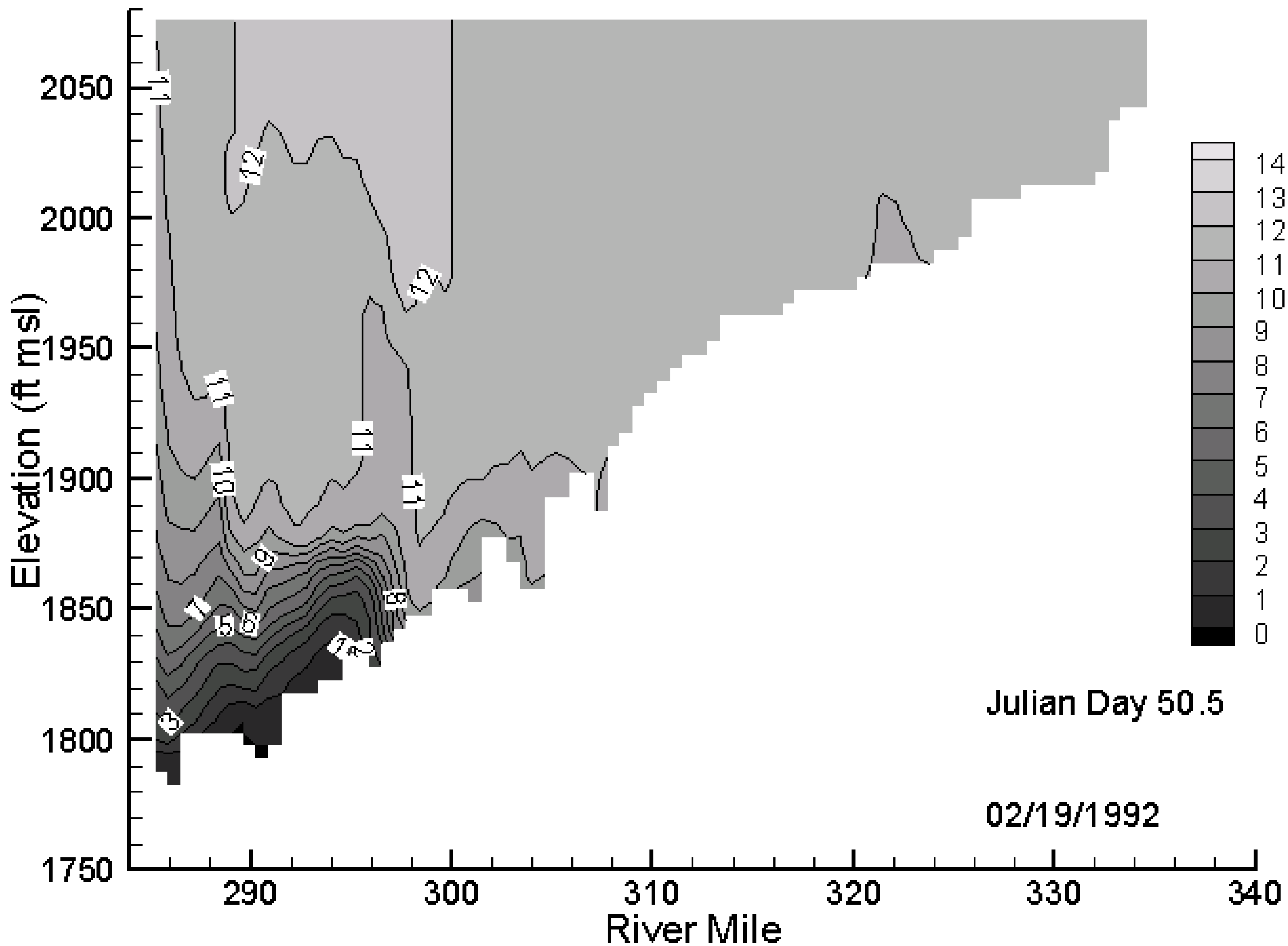

Figure 52. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

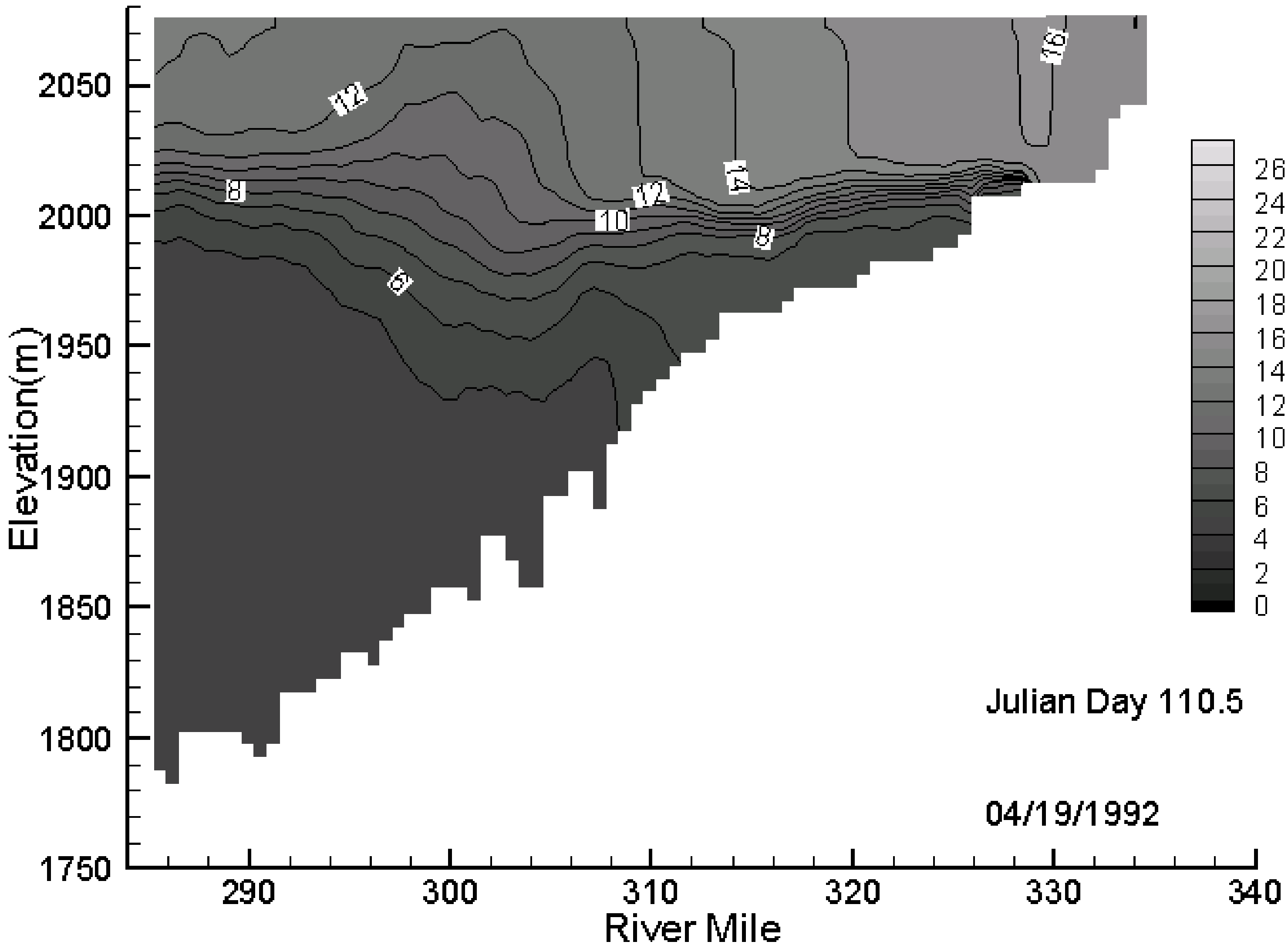

Figure 53. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

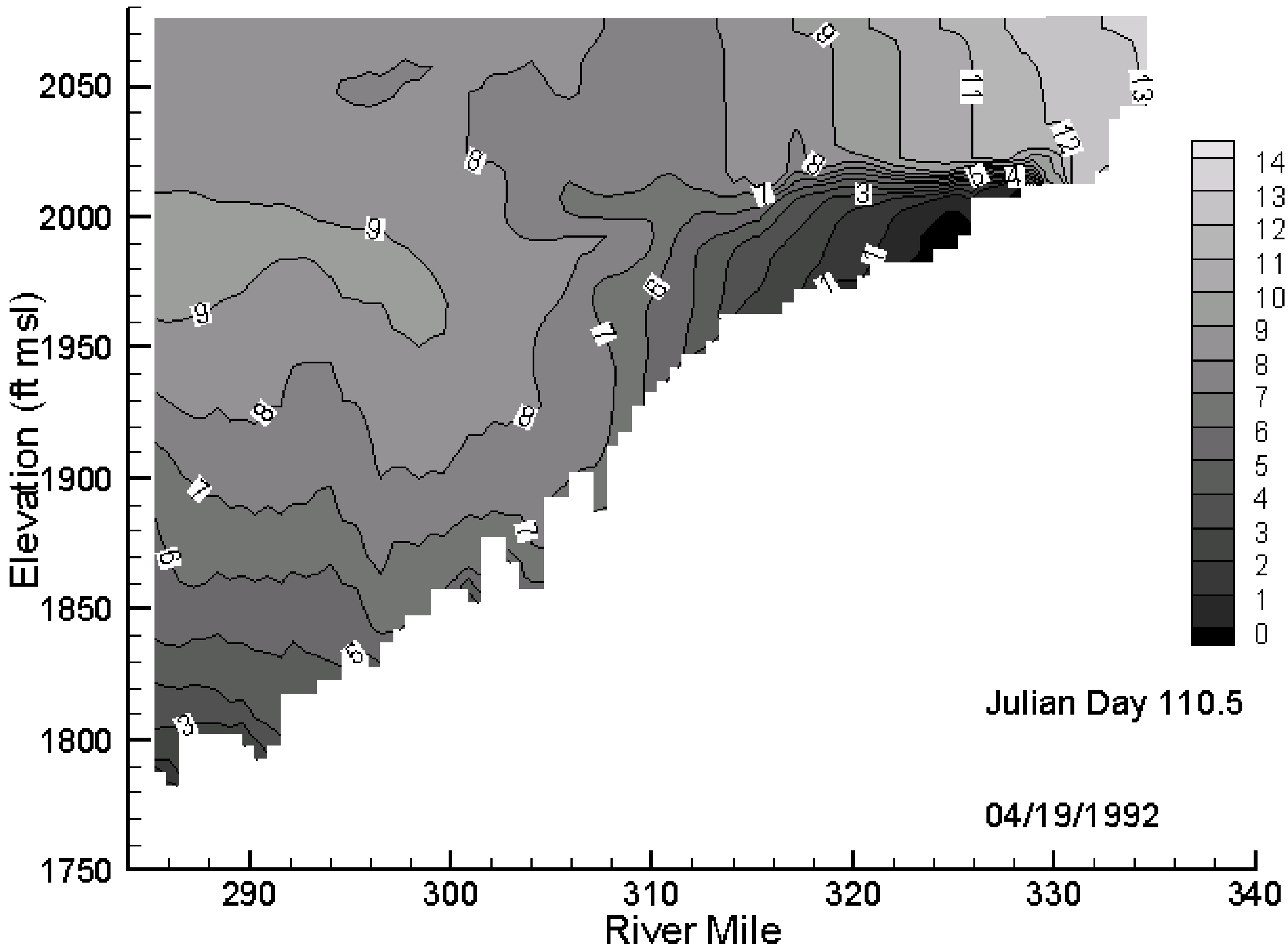

Figure 54. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

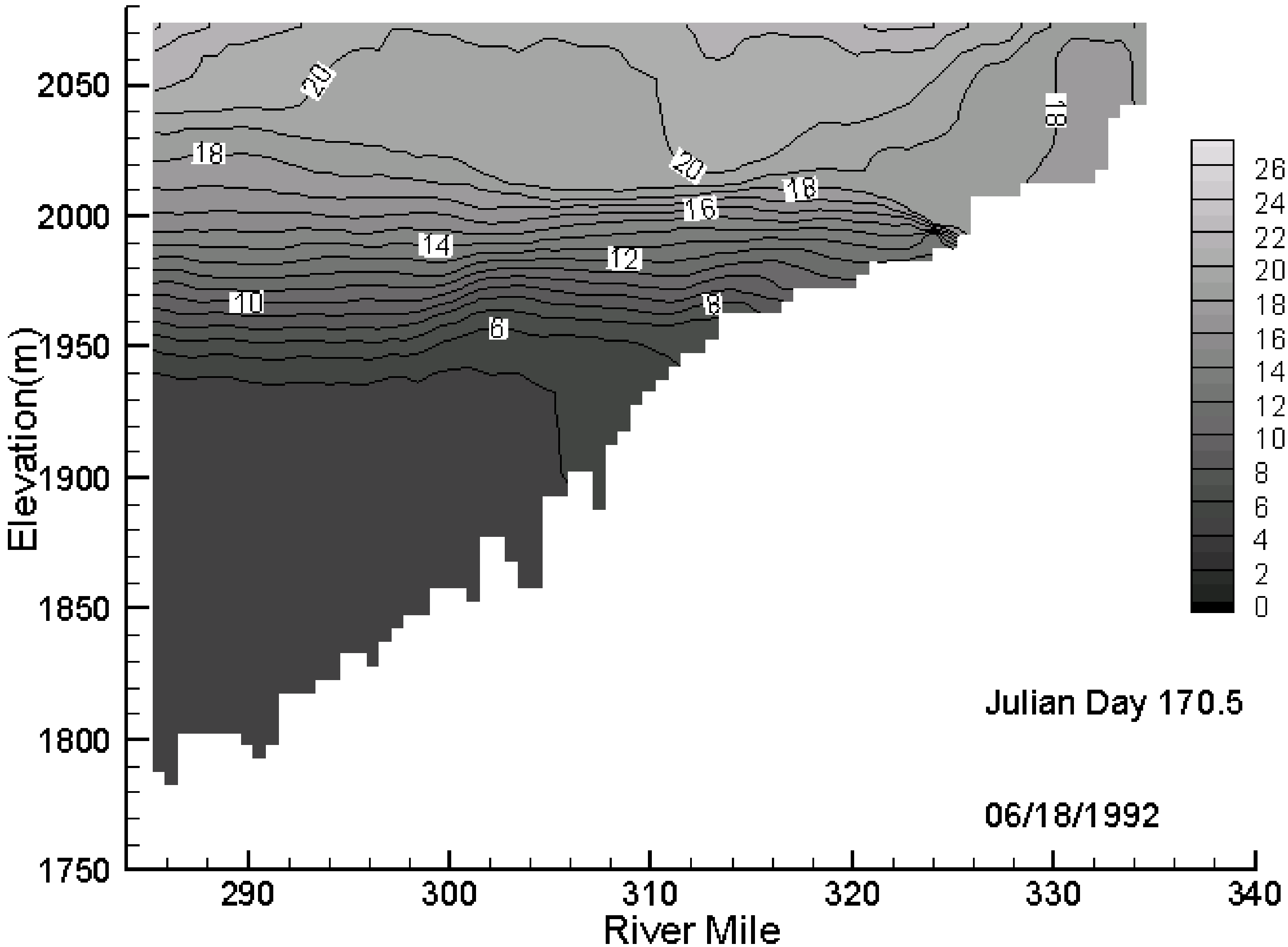

Figure 55. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

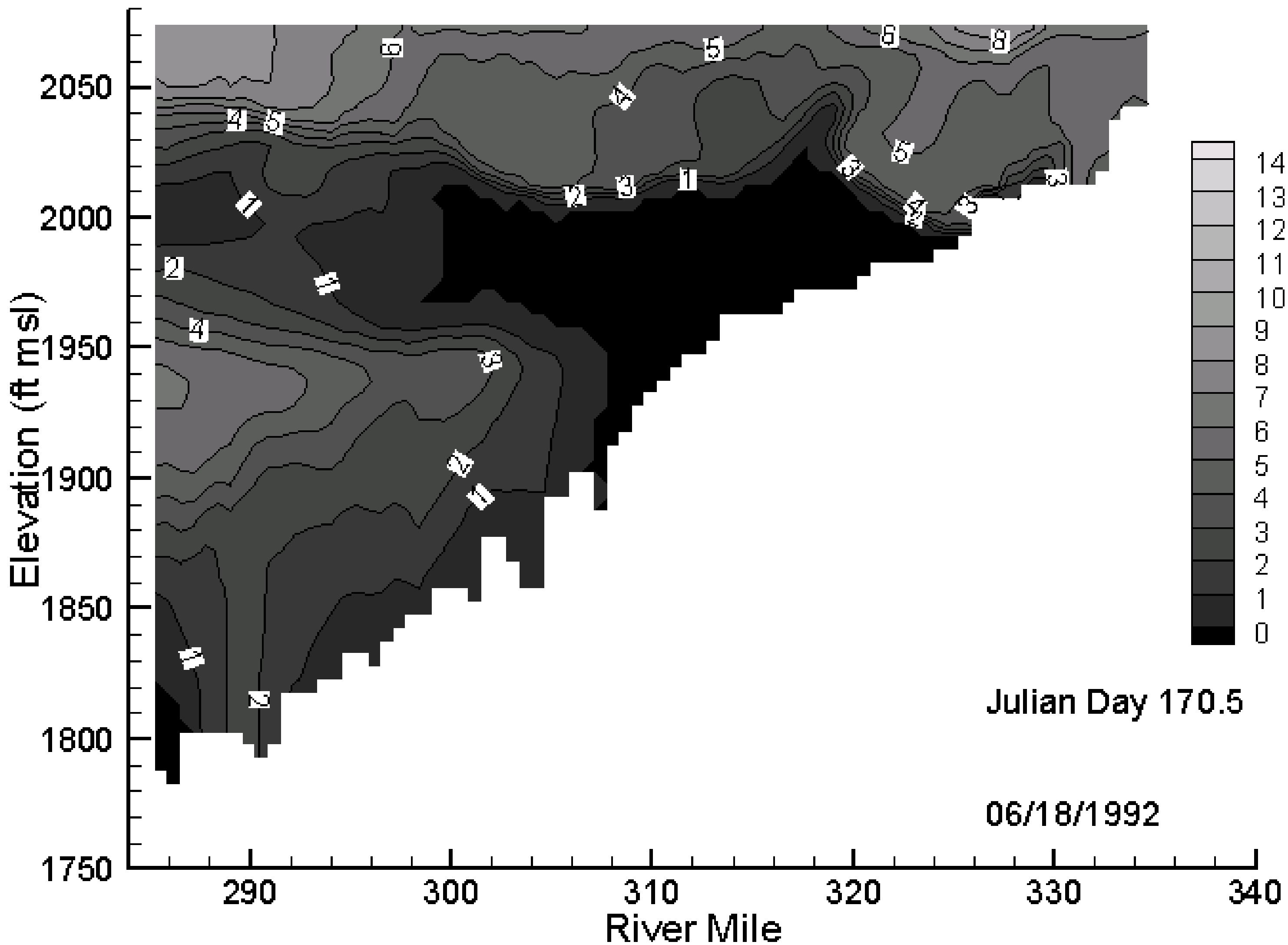

Figure 56. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

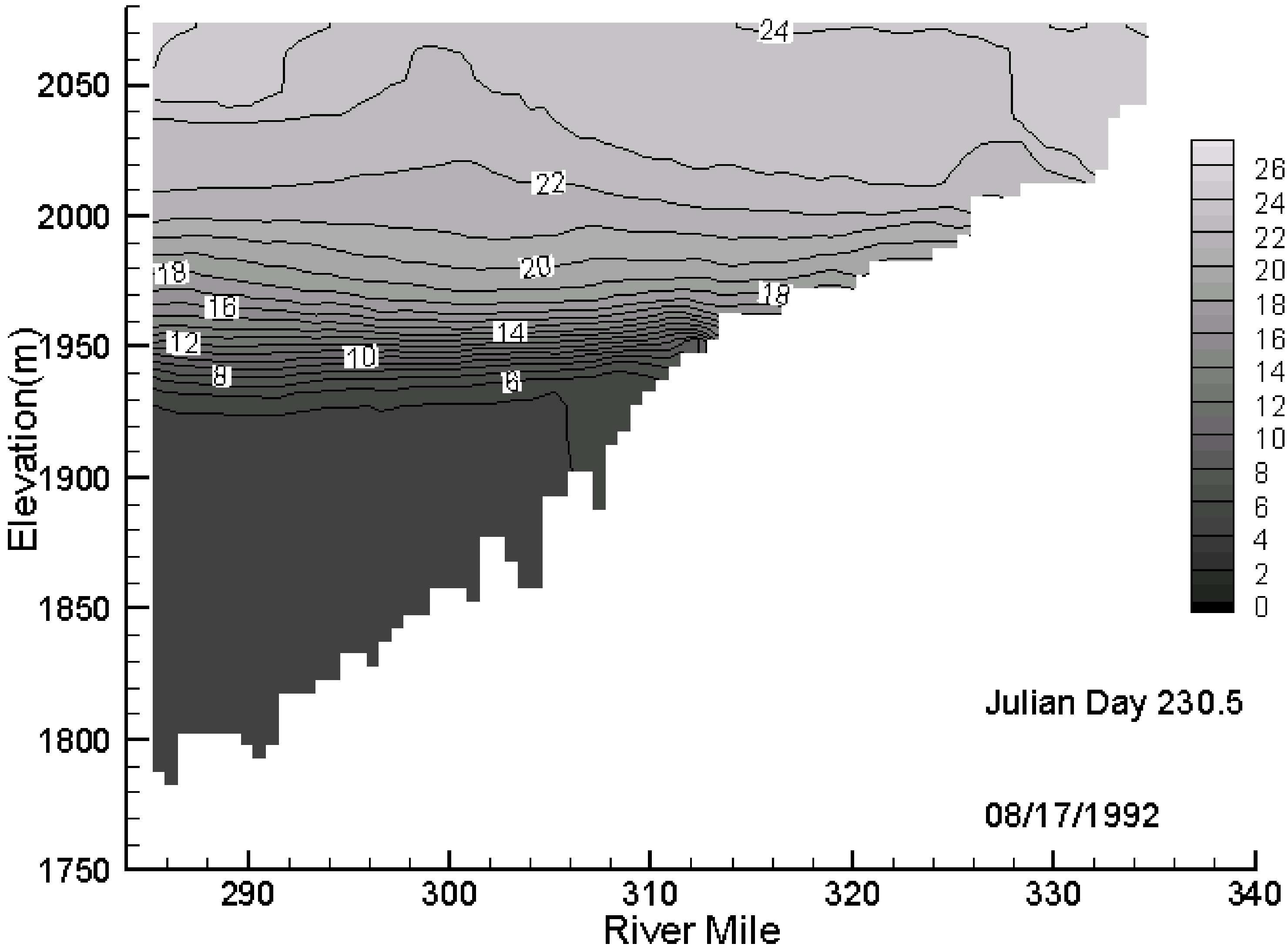

Figure 57. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

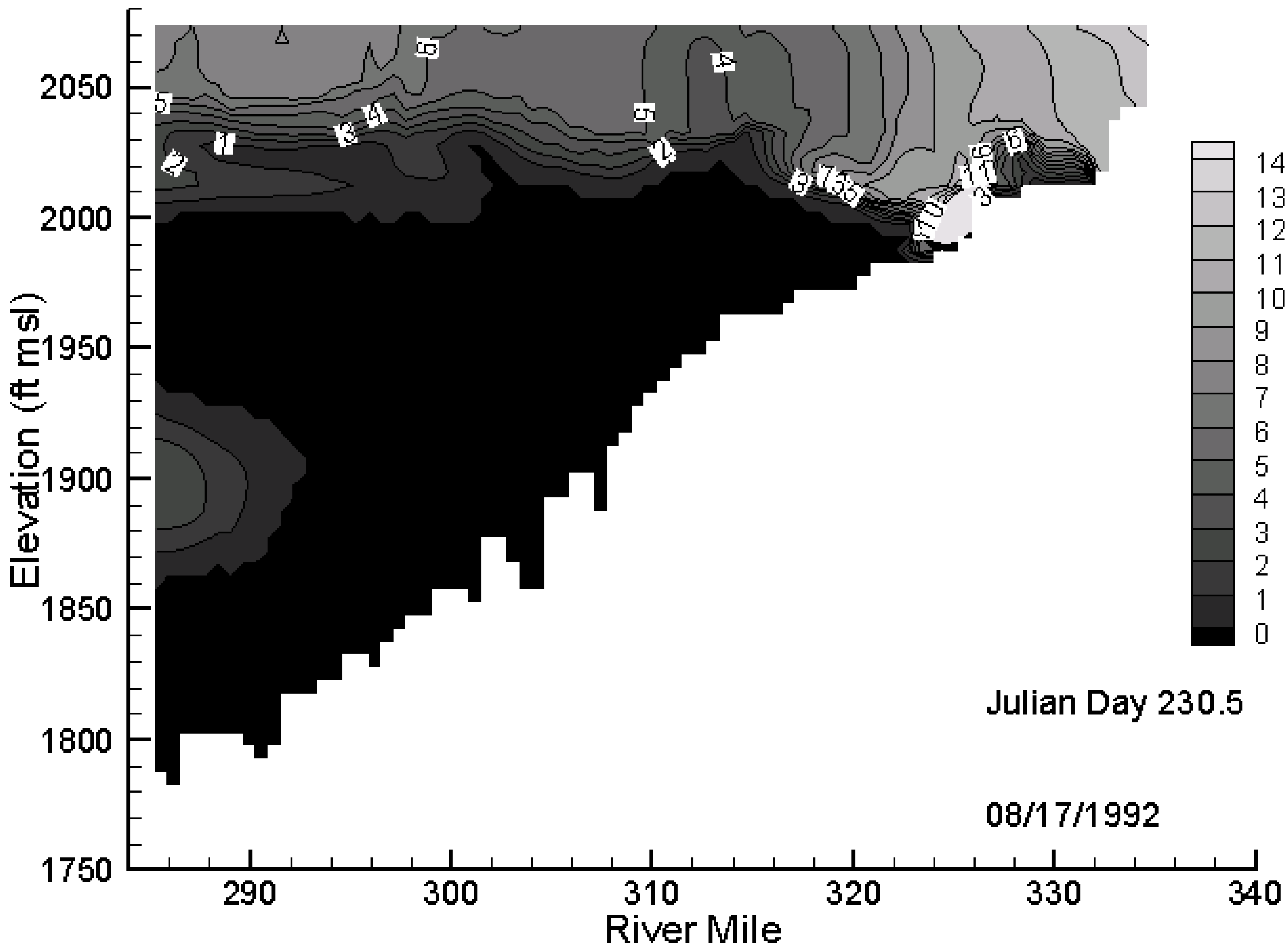

Figure 58. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

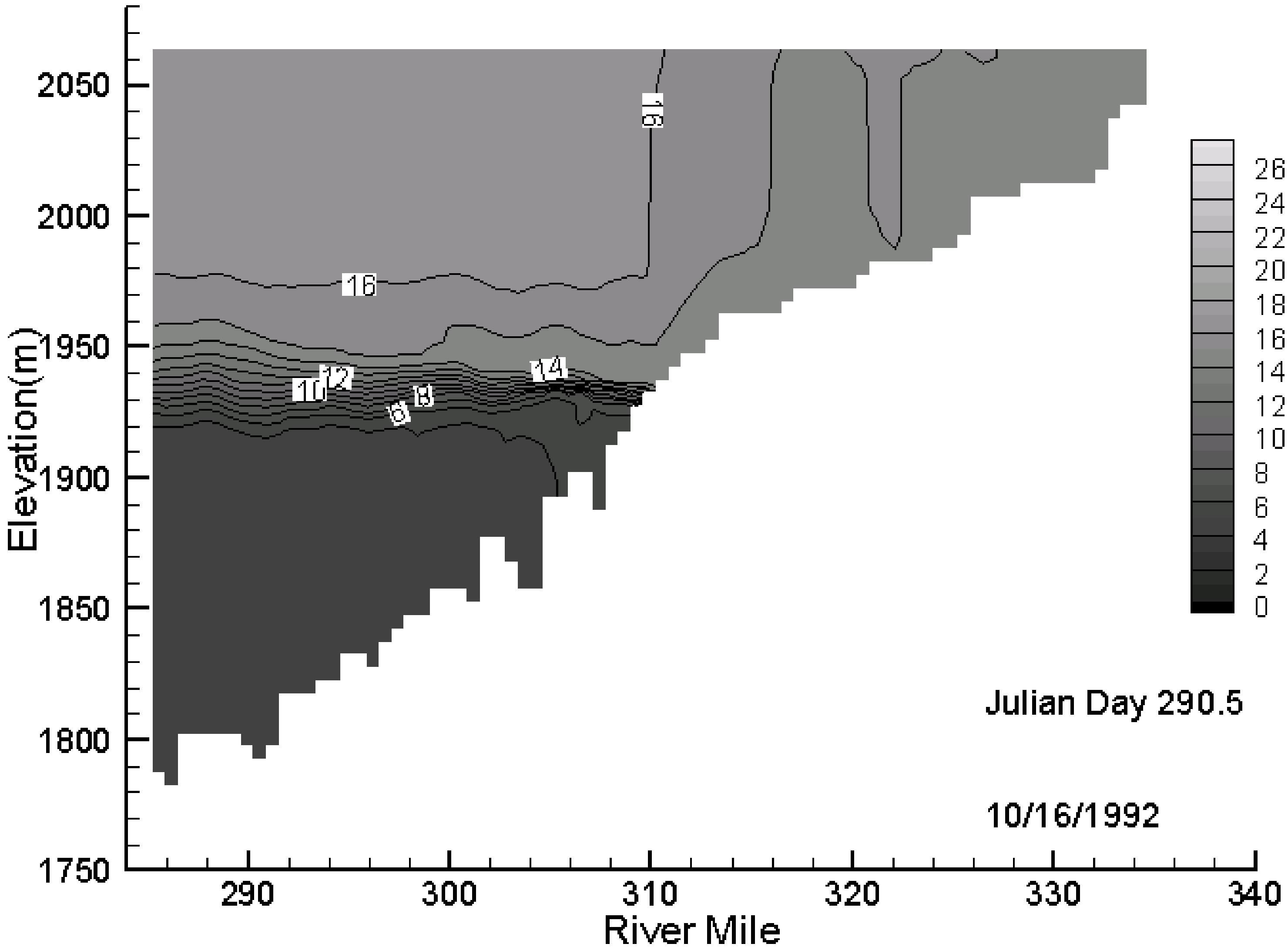

Figure 59. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

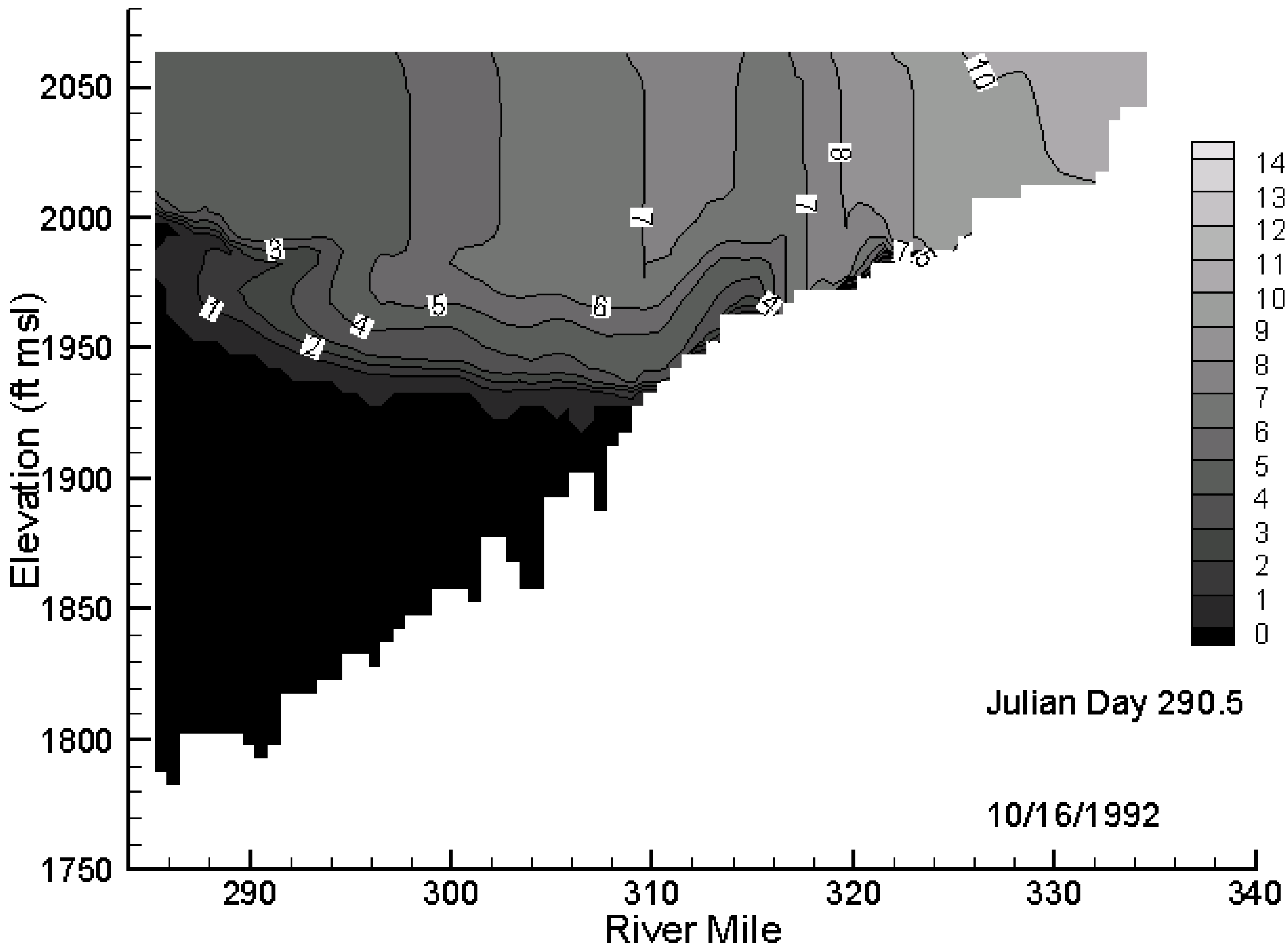

Figure 60. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

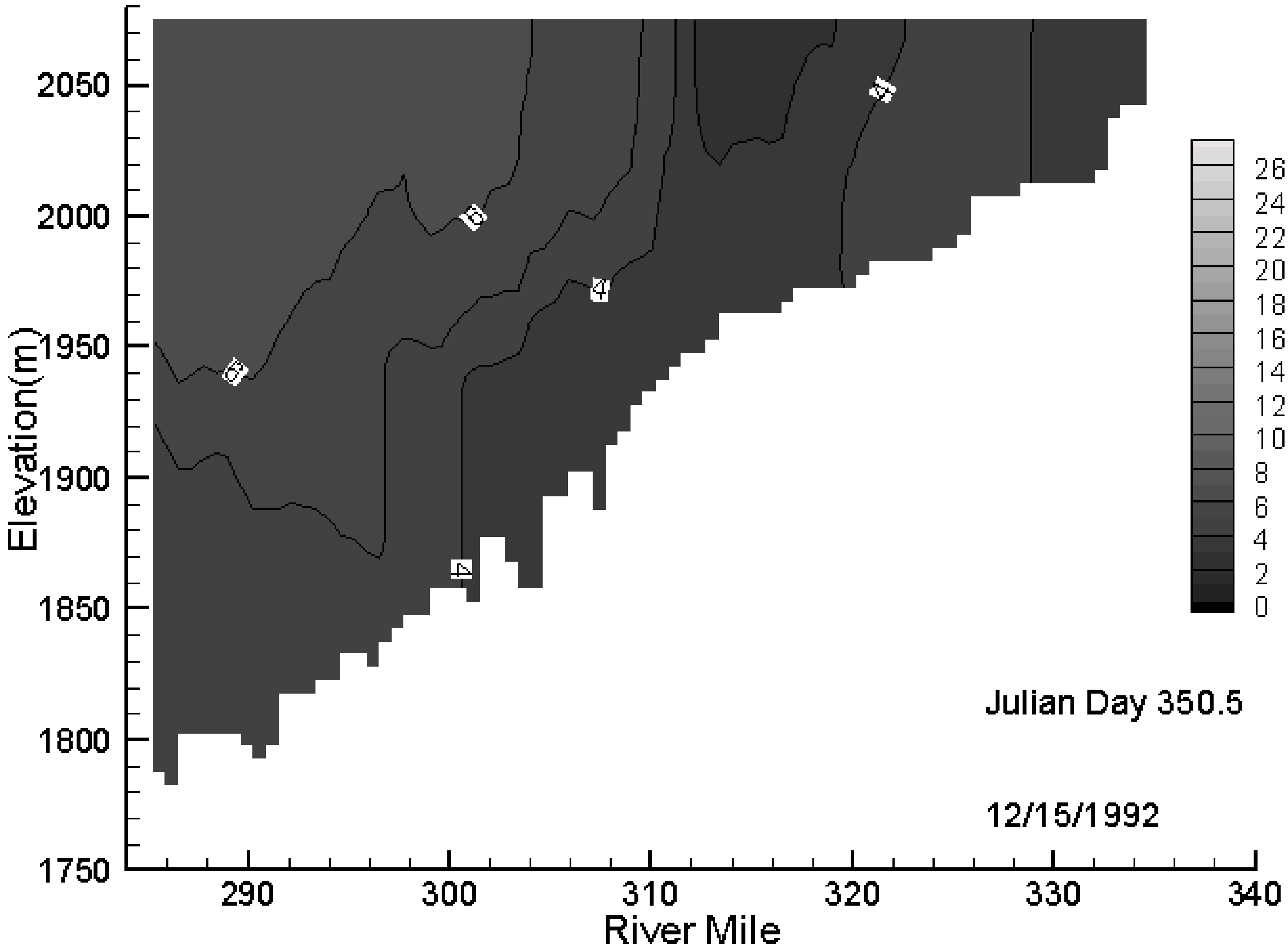

Figure 61. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

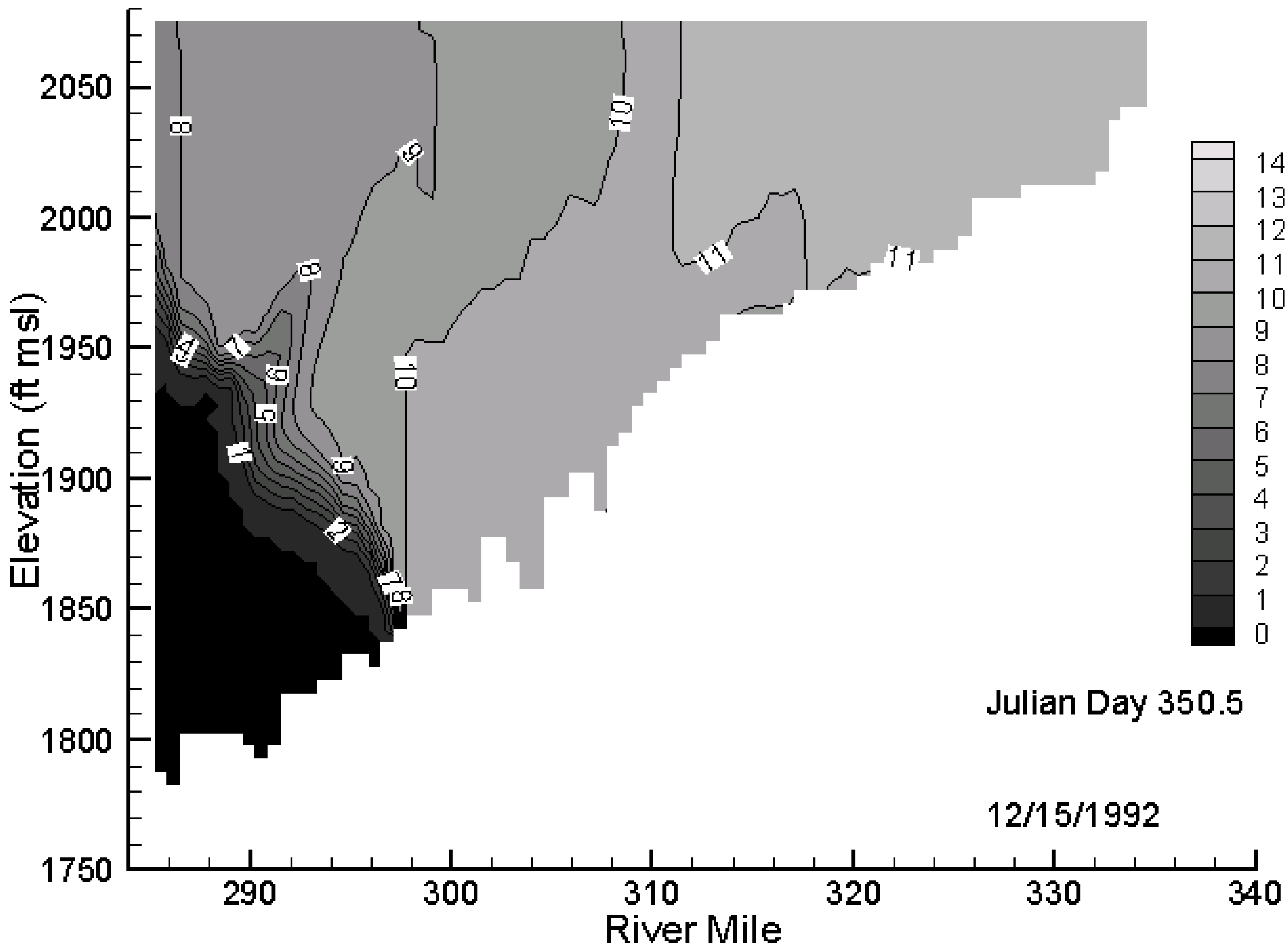

Figure 62. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

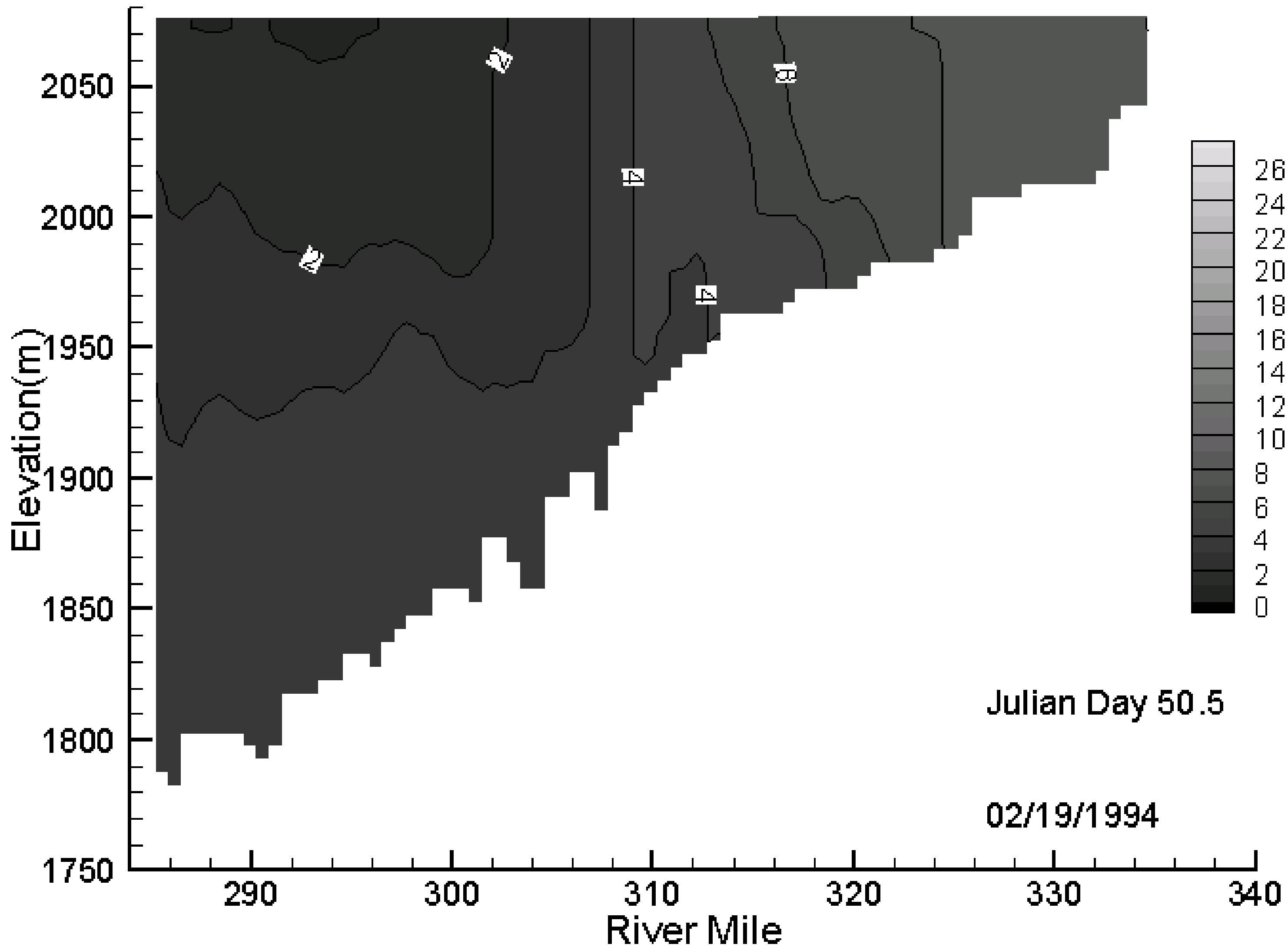

Figure 63. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

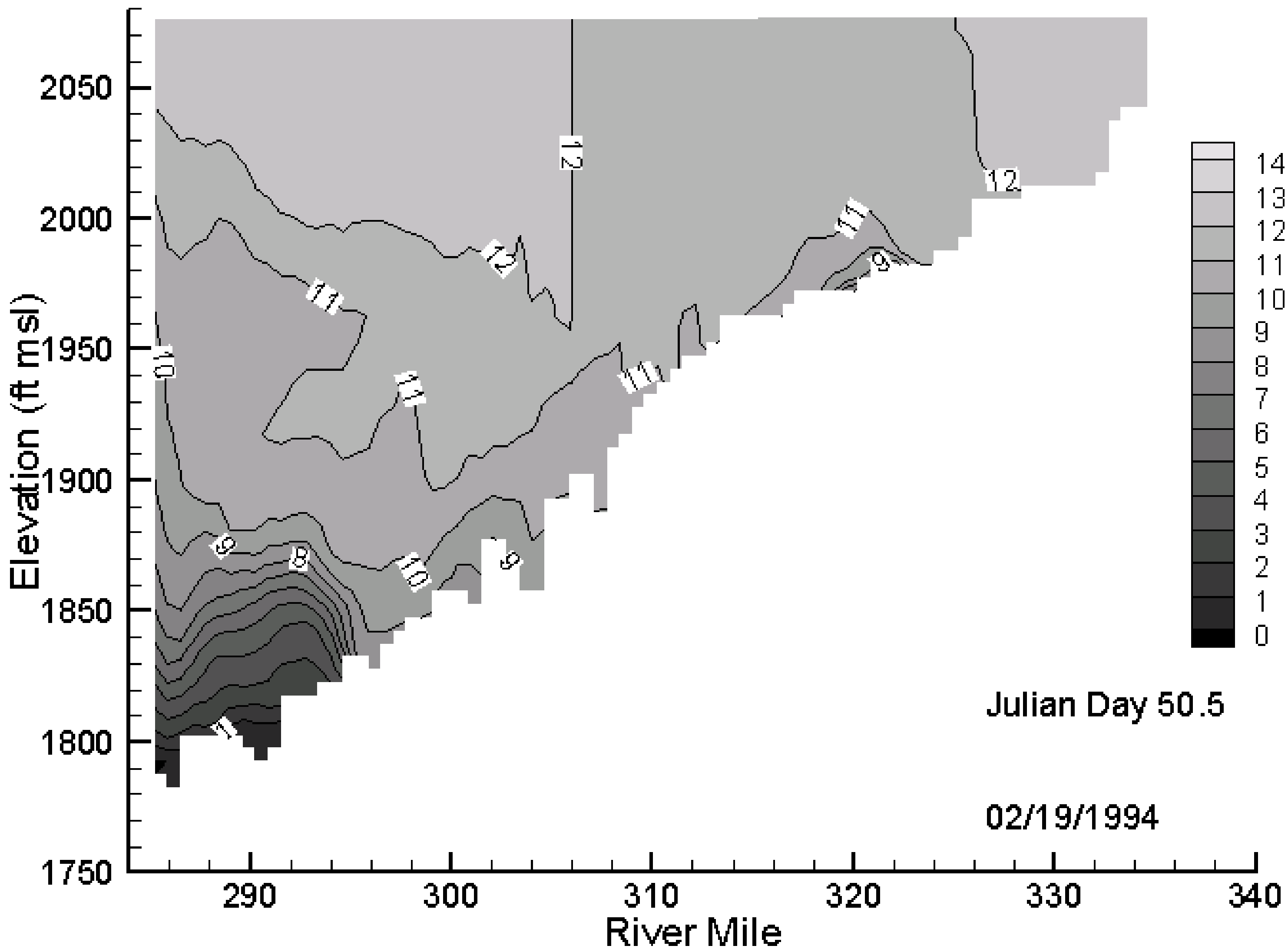

Figure 64. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

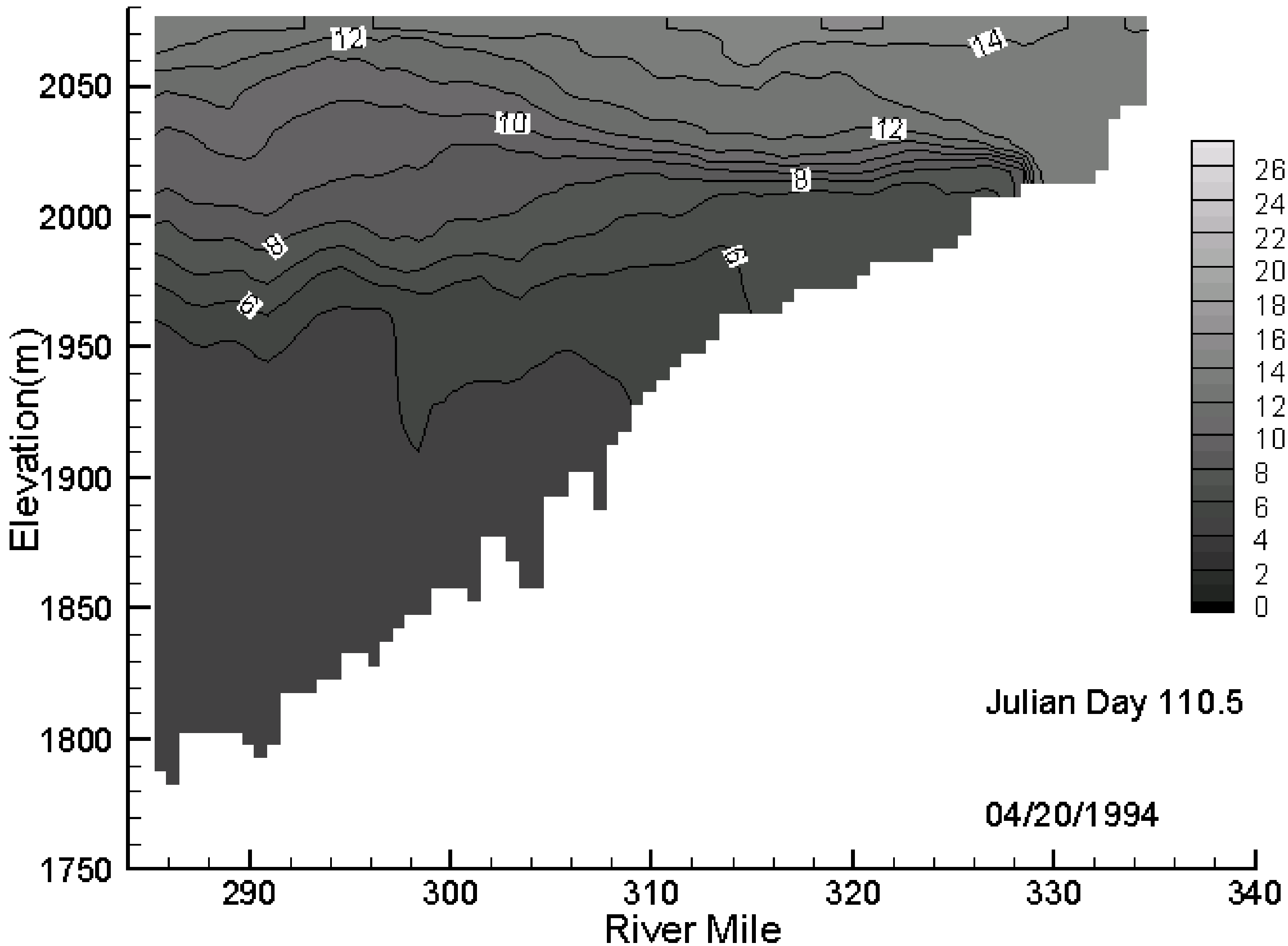

Figure 65. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

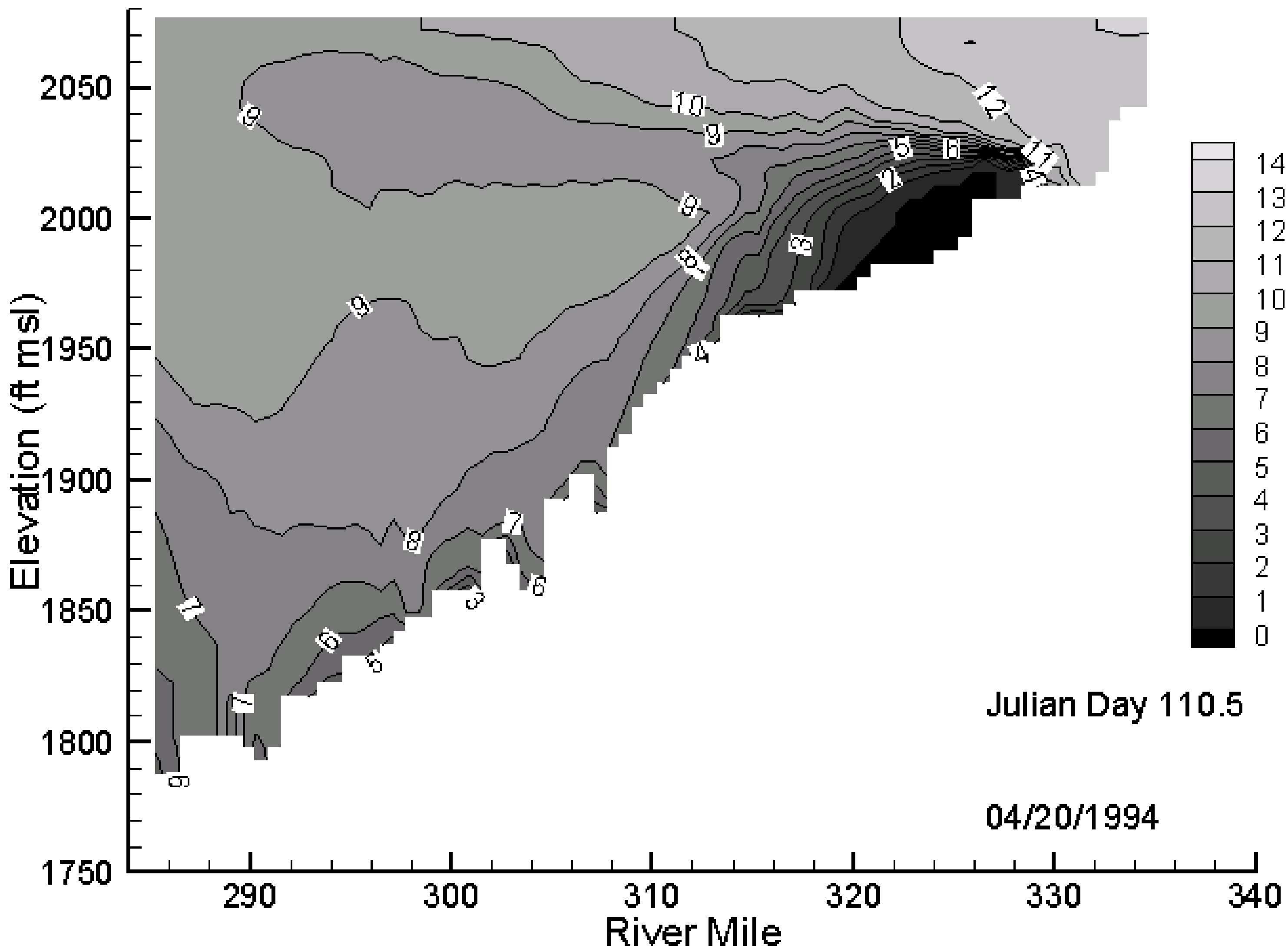

Figure 66. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

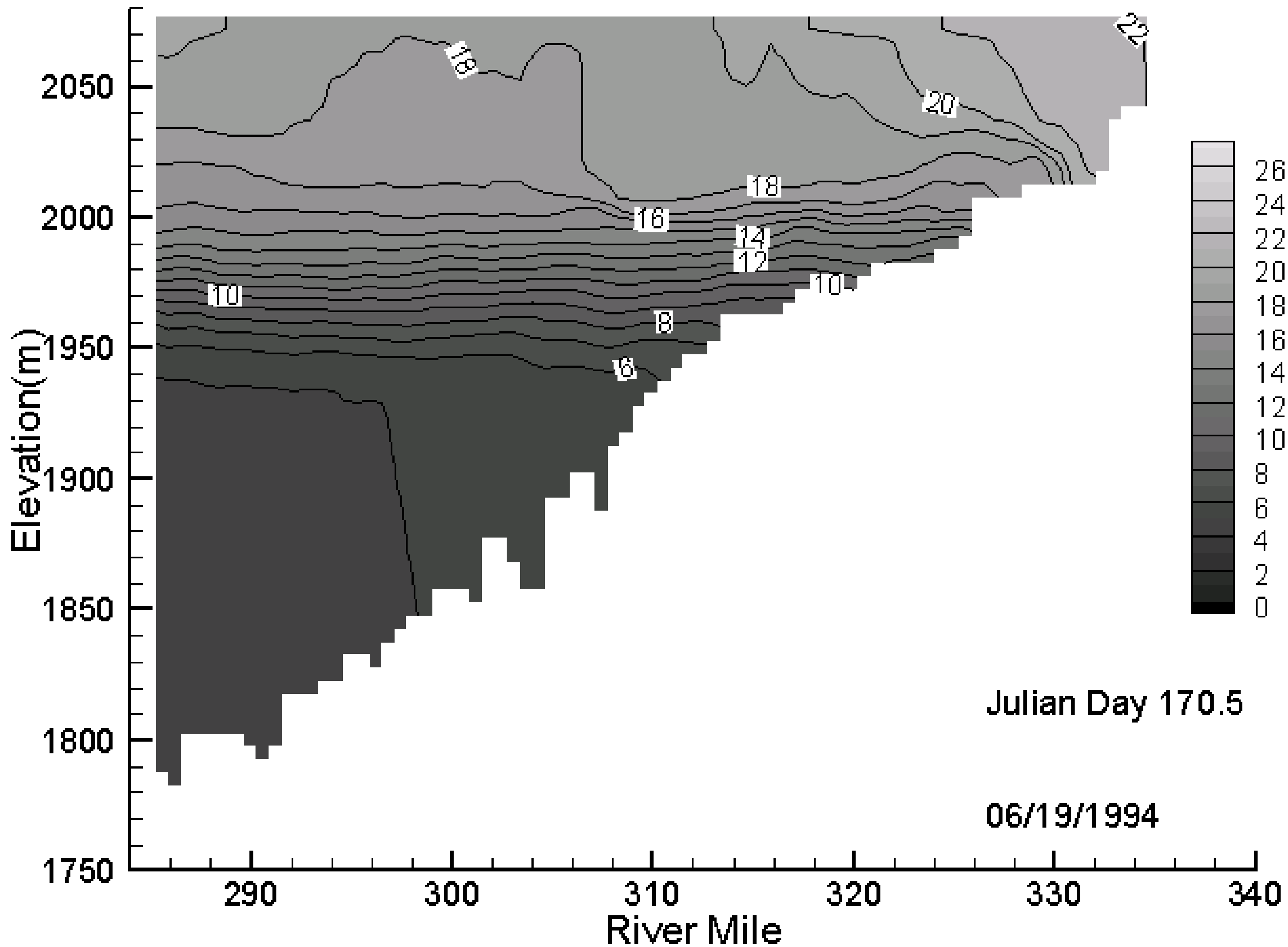

Figure 67. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

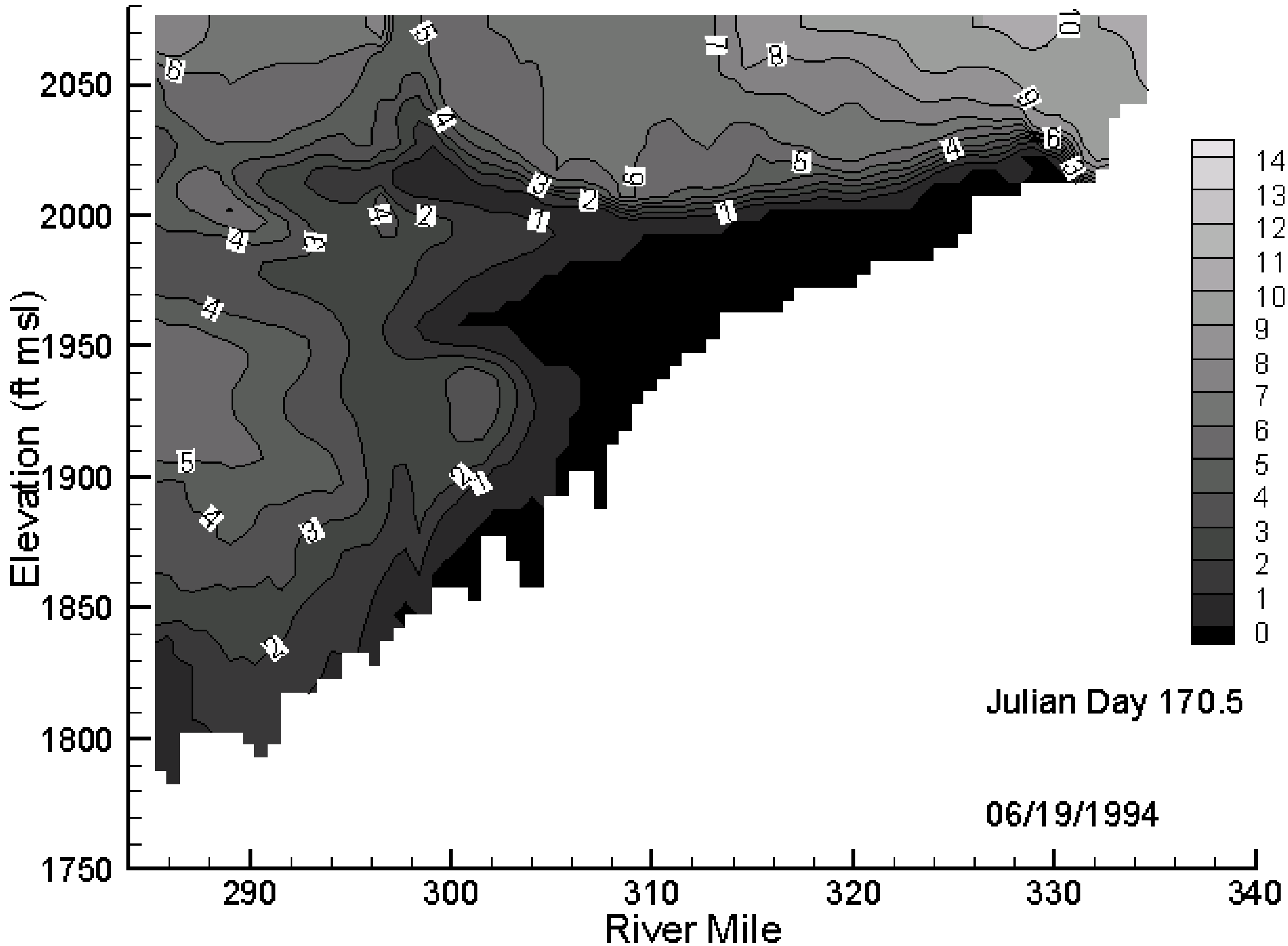

Figure 68. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

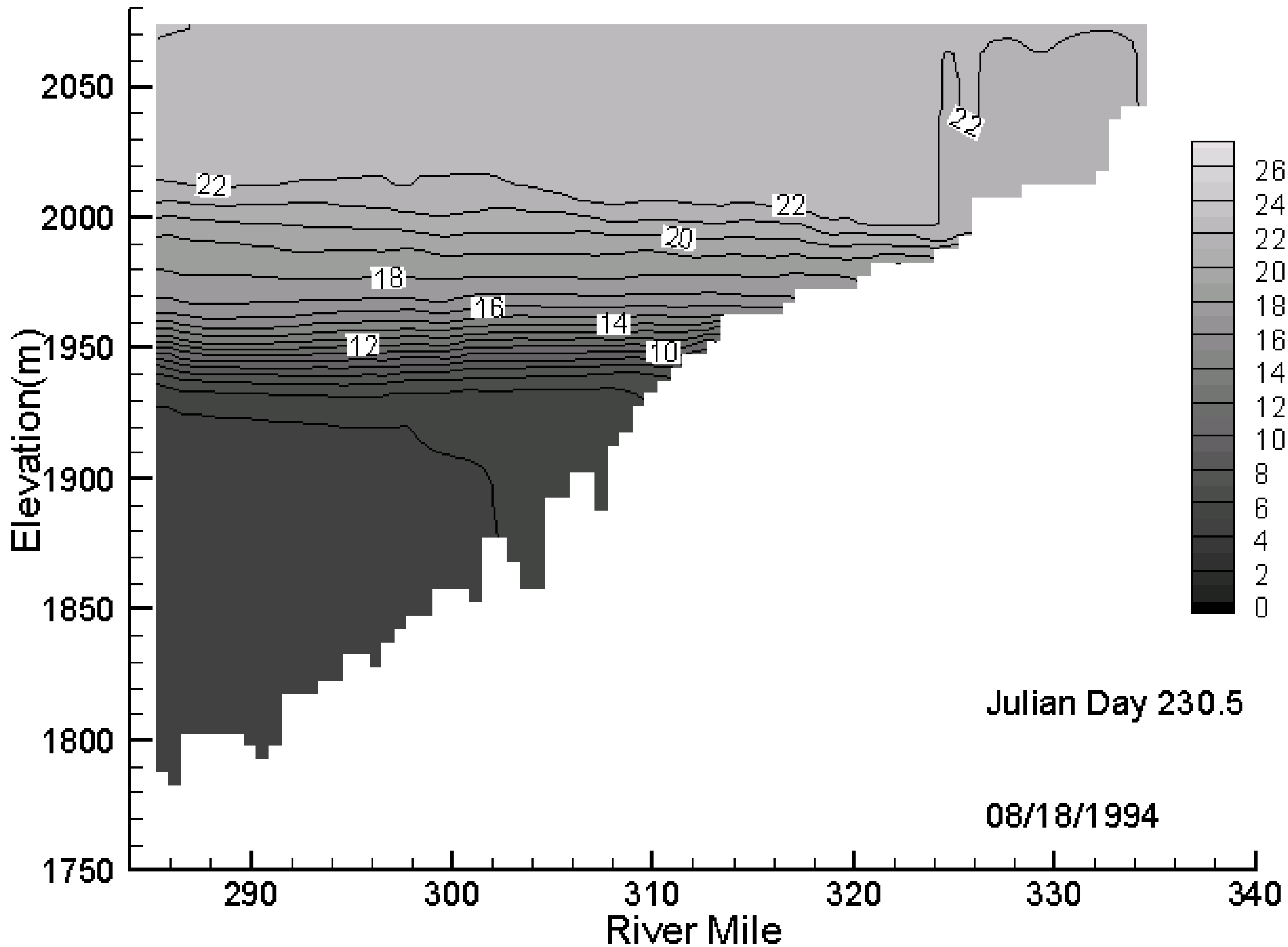

Figure 69. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

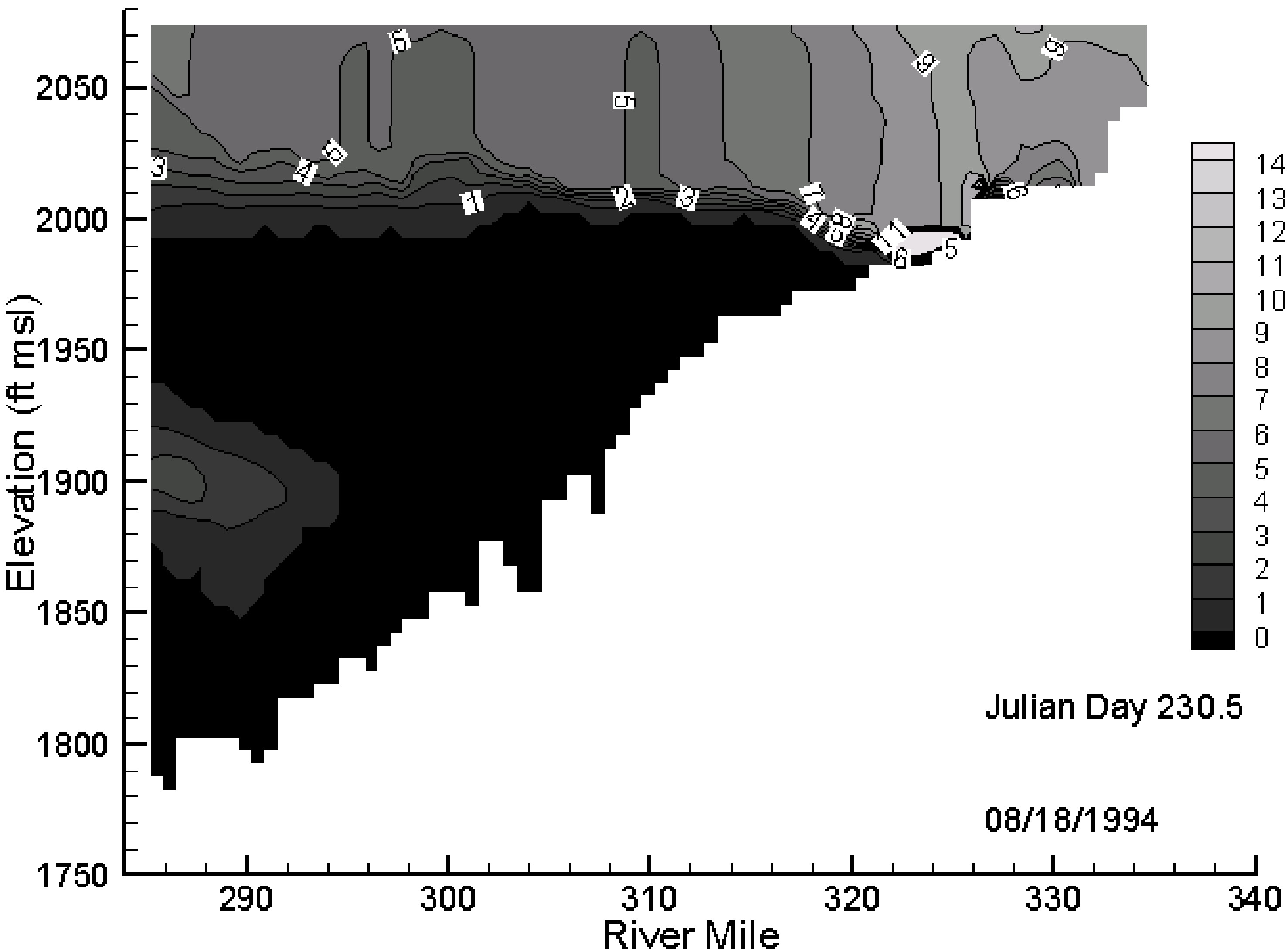

Figure 70. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

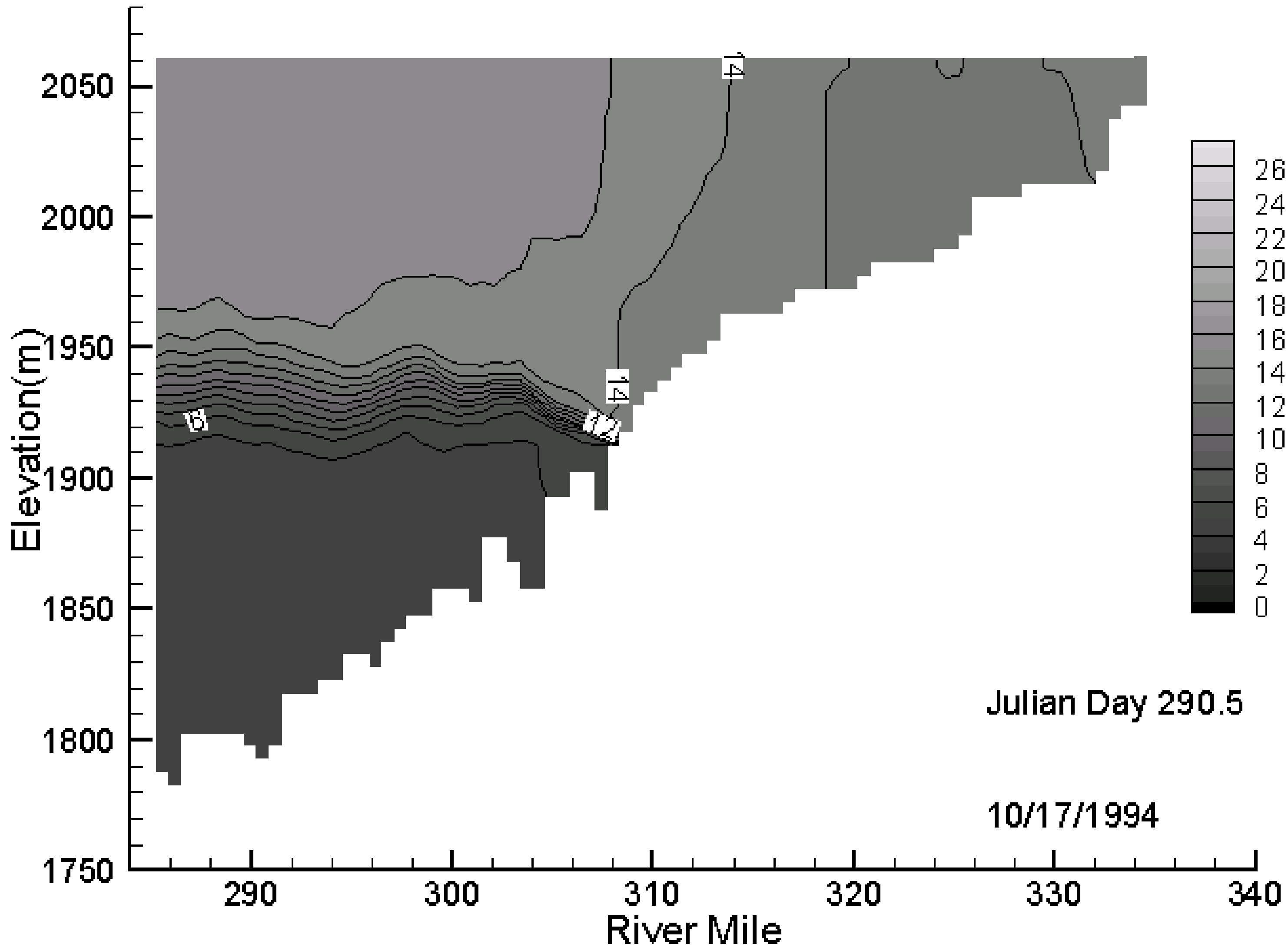

Figure 71. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

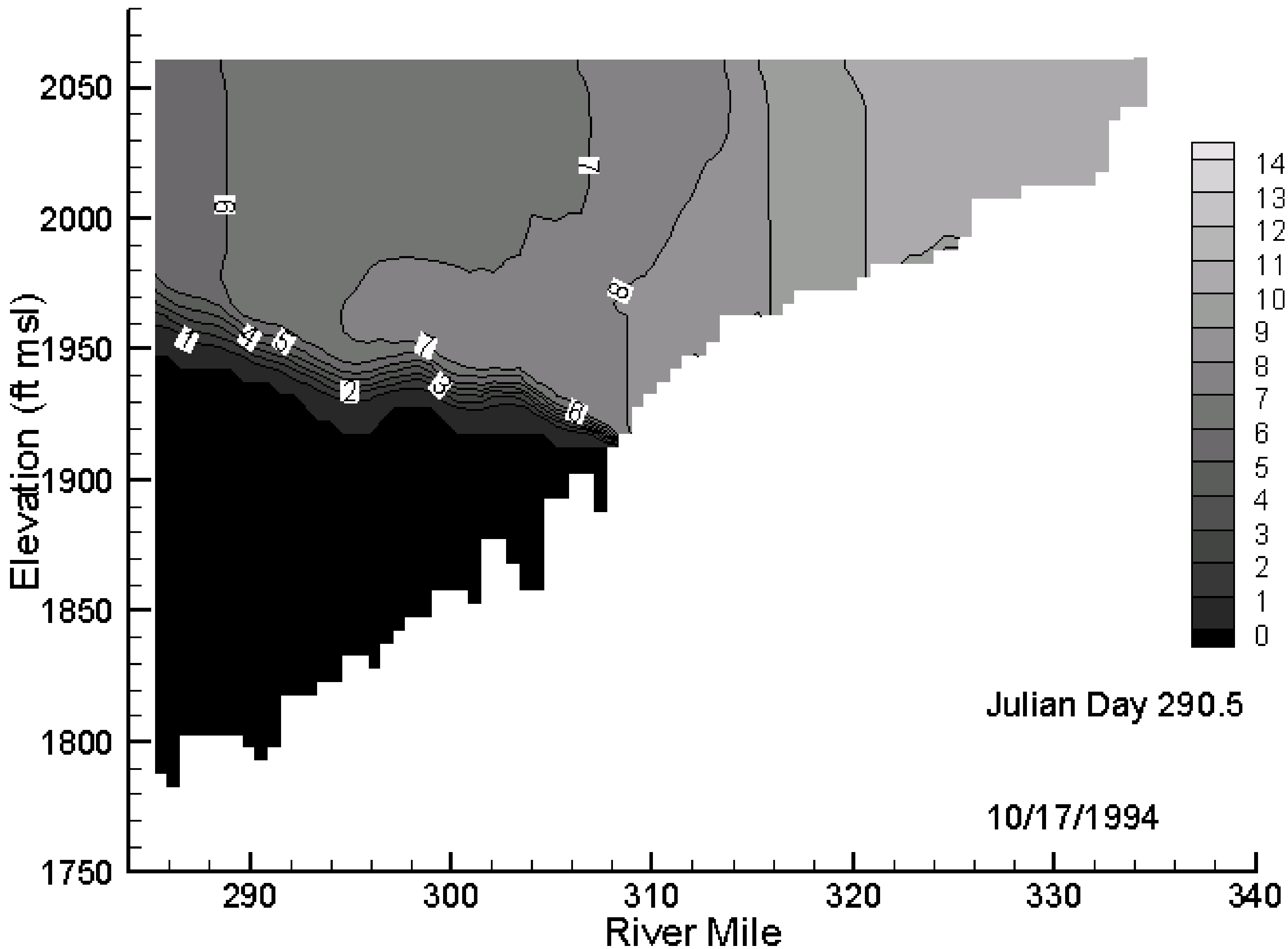

Figure 72. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

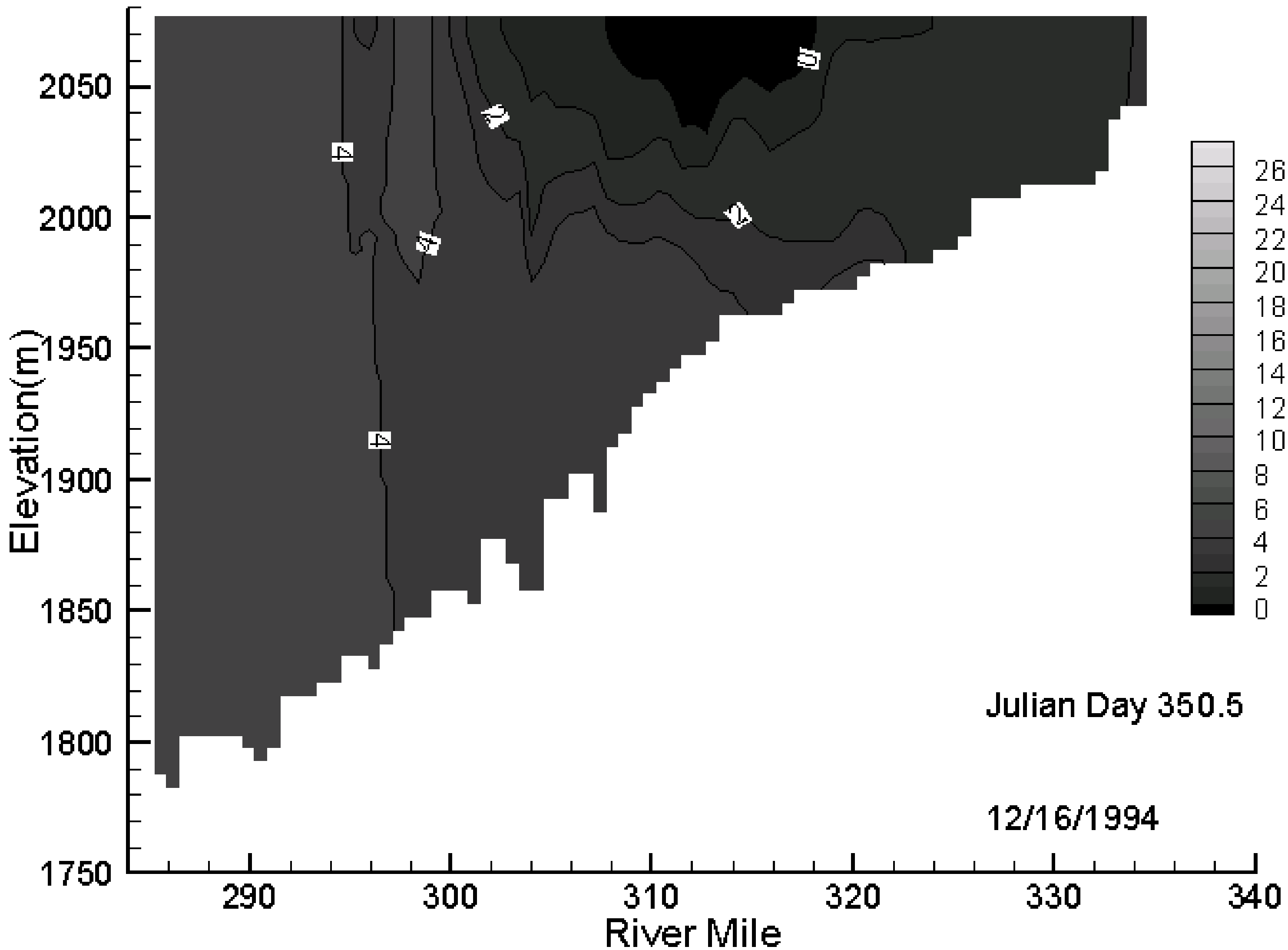

Figure 73. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

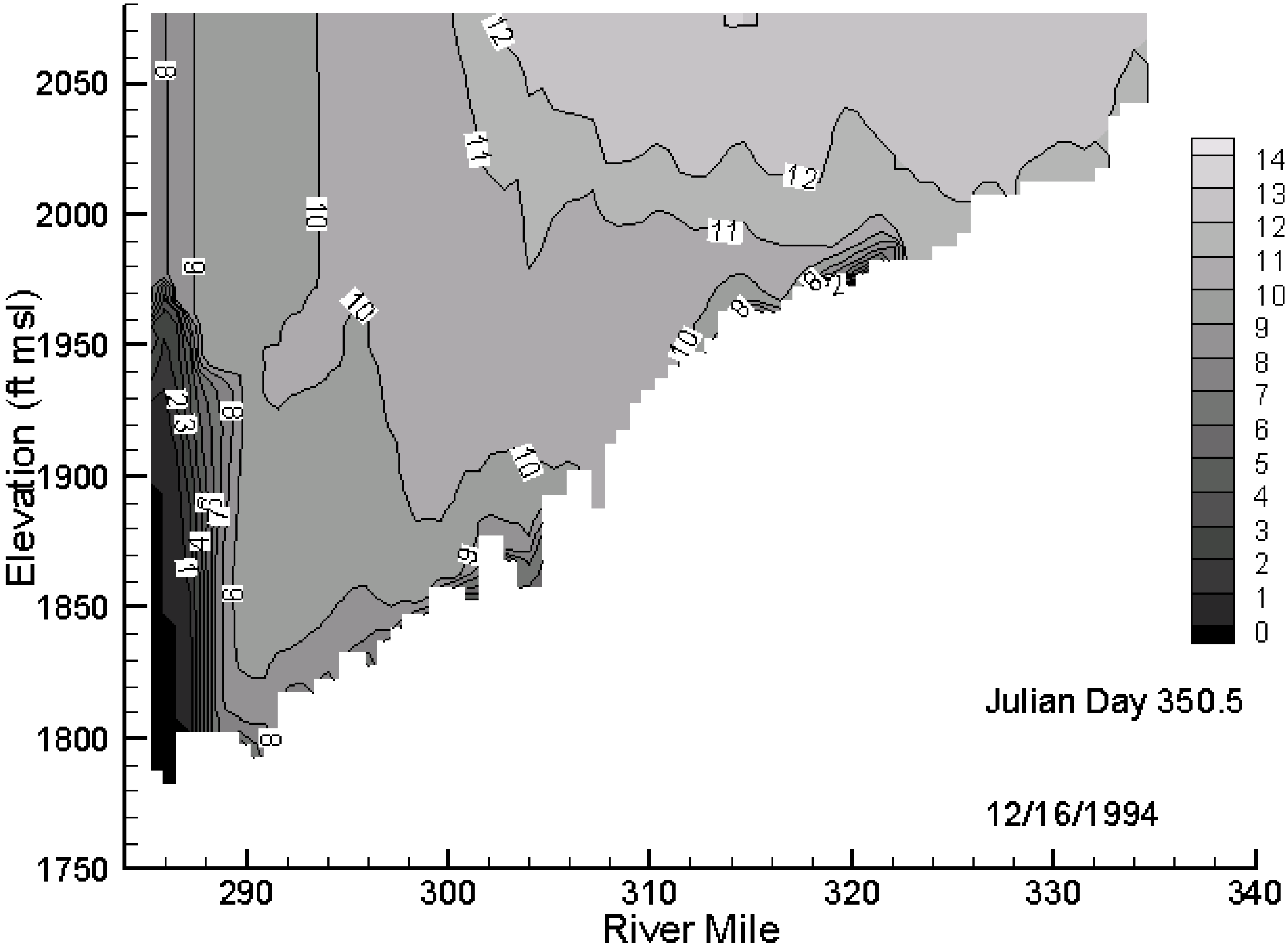

Figure 74. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

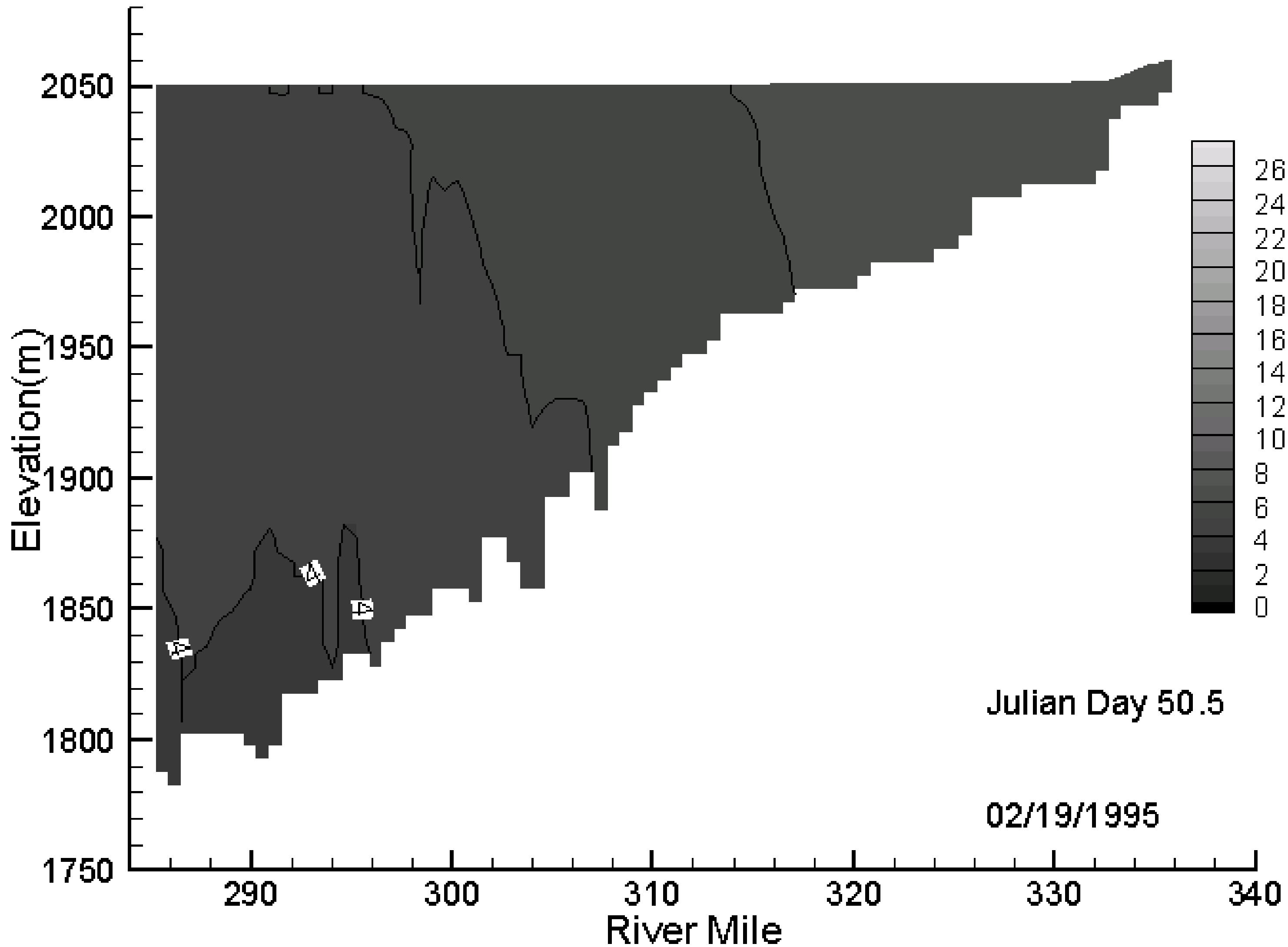

Figure 75. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location

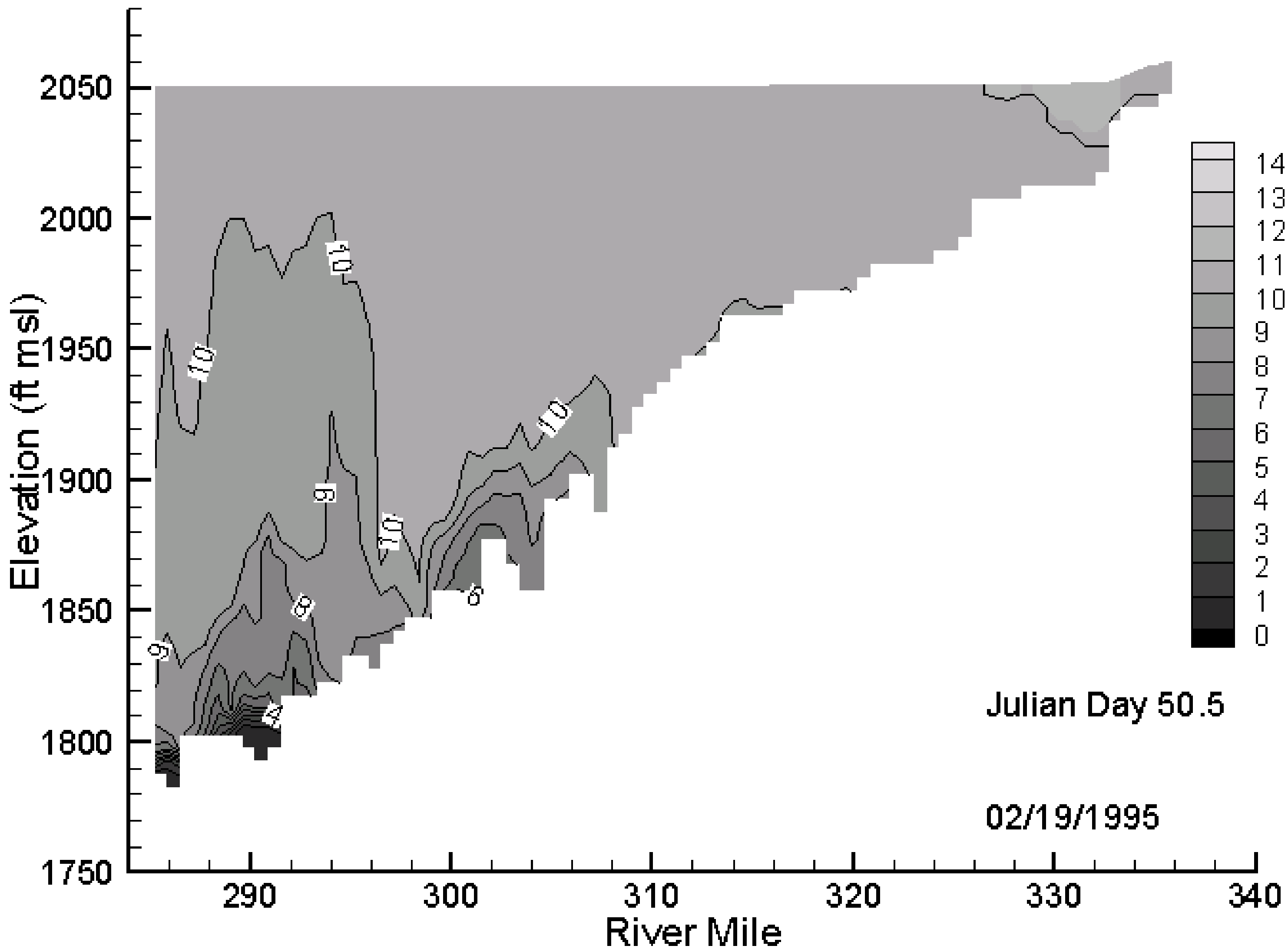

Figure 76. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location

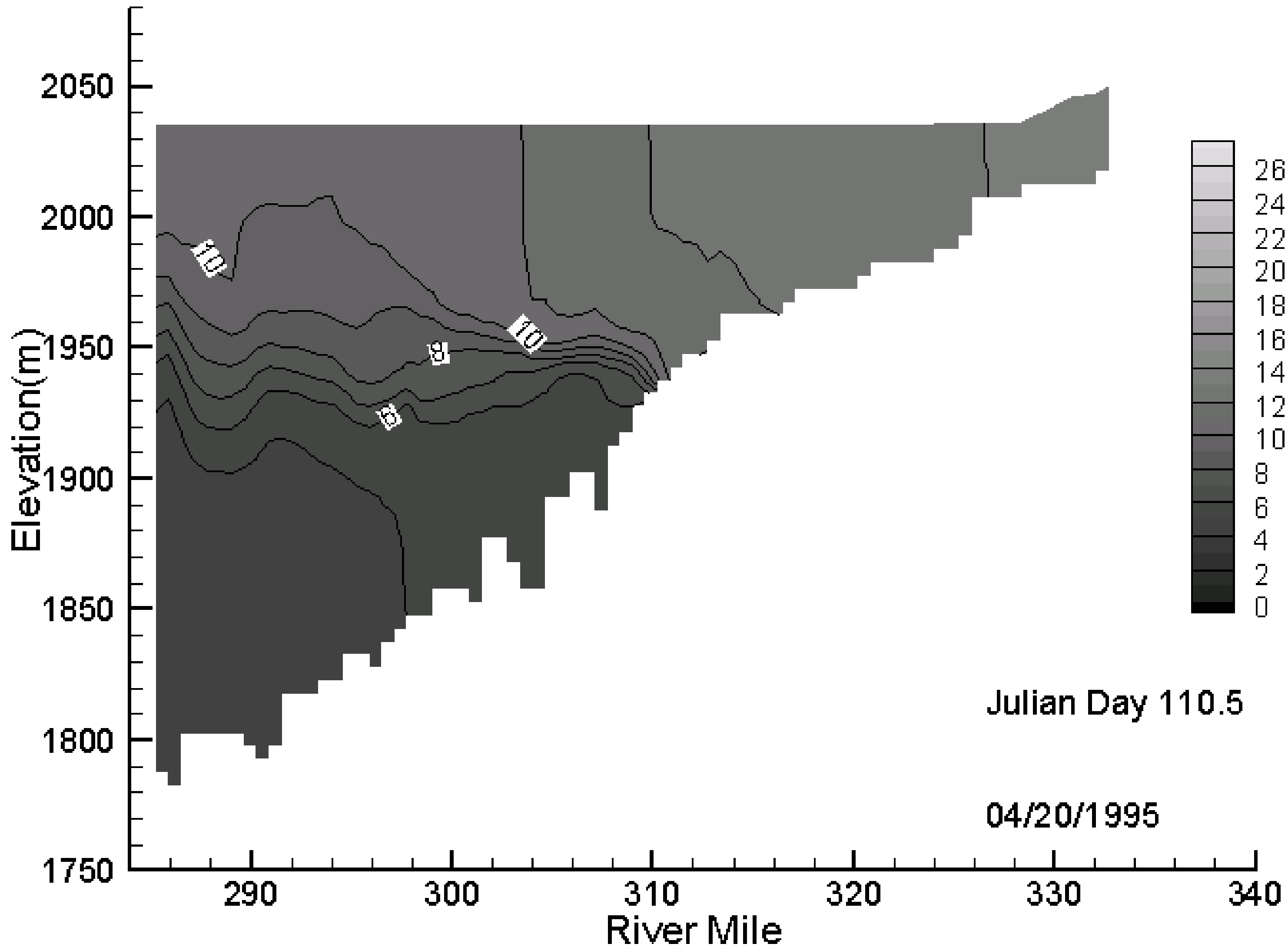

Figure 77. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

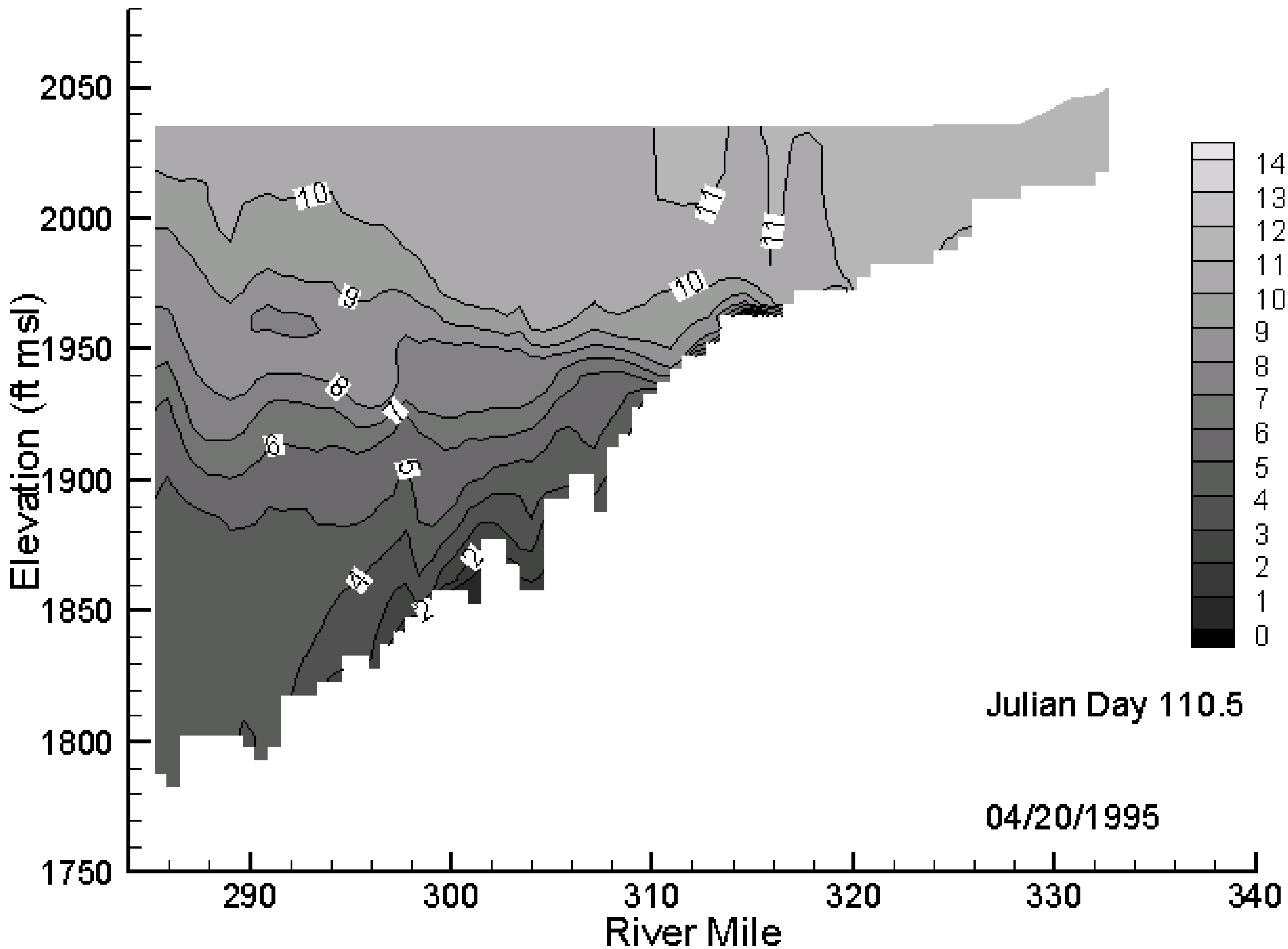

Figure 78. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

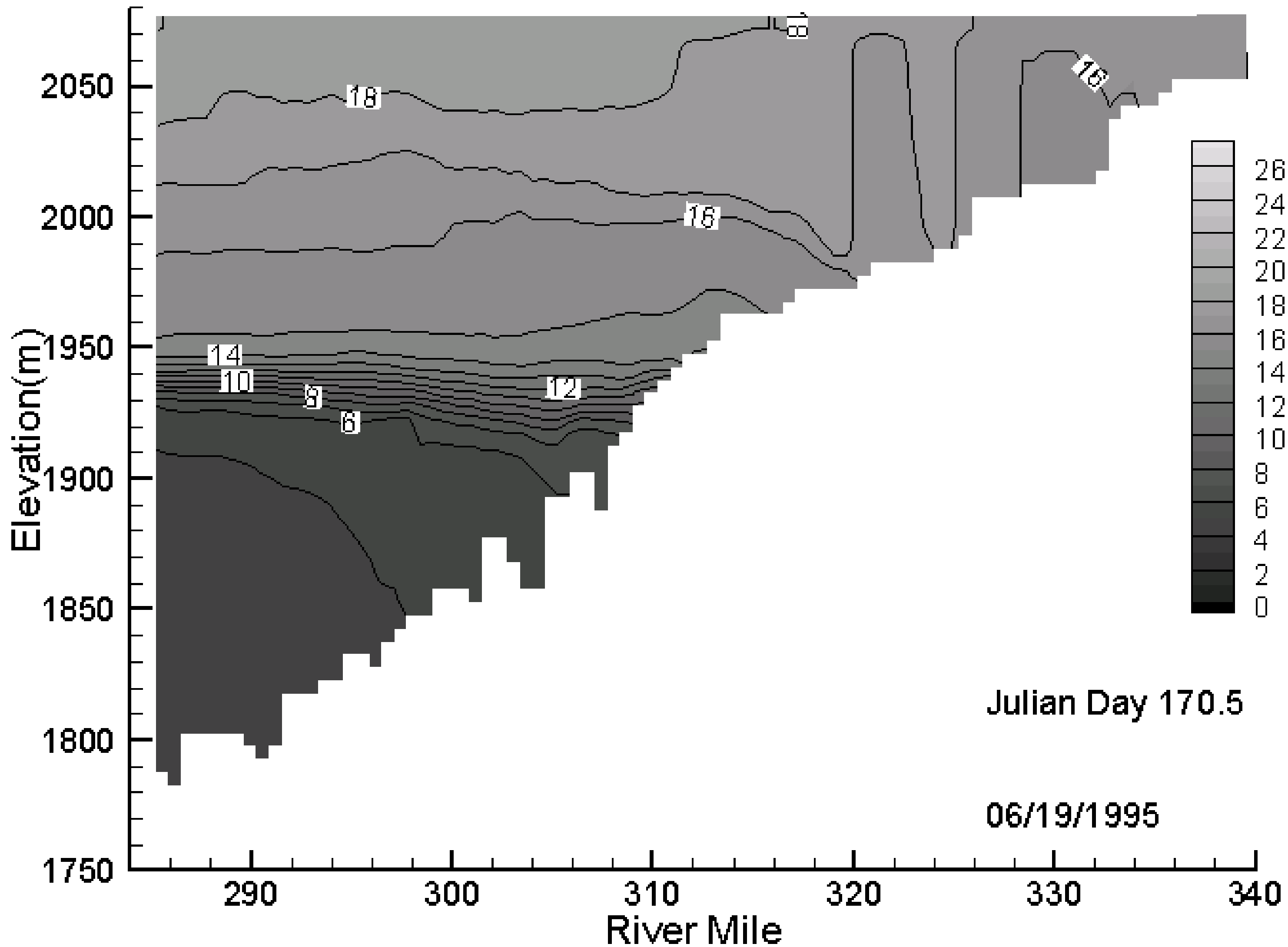

Figure 79. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

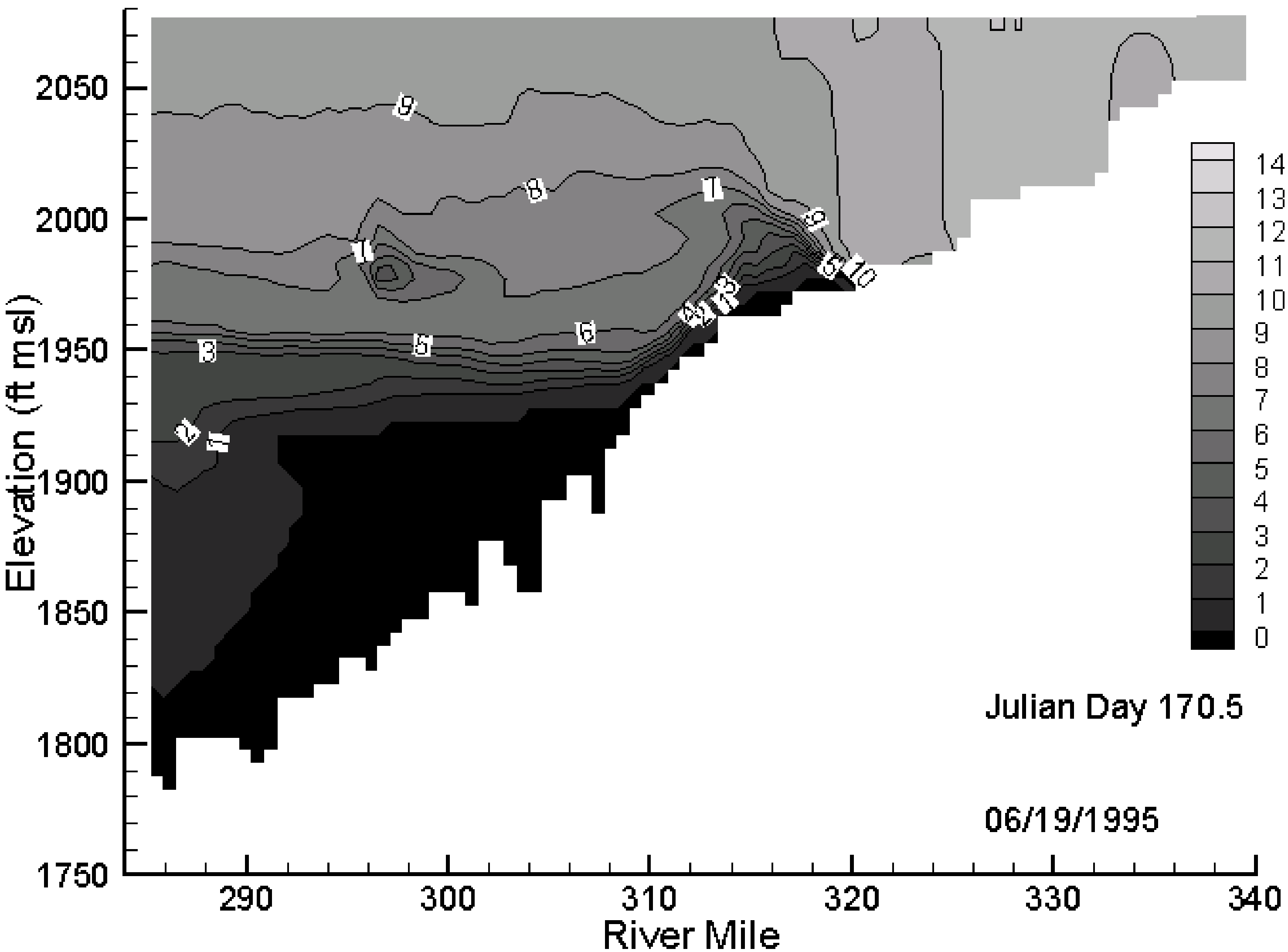

Figure 80. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

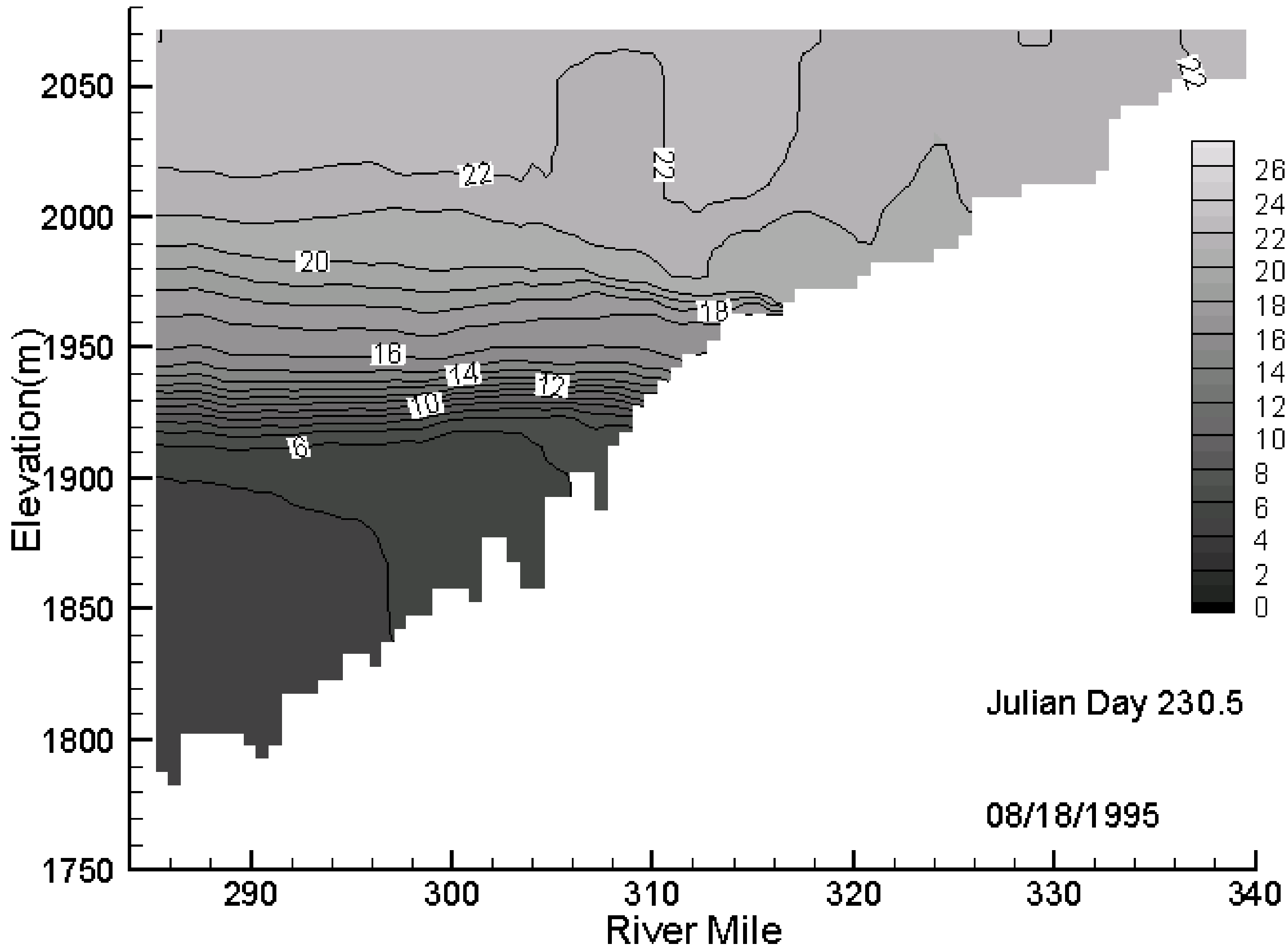

Figure 81. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

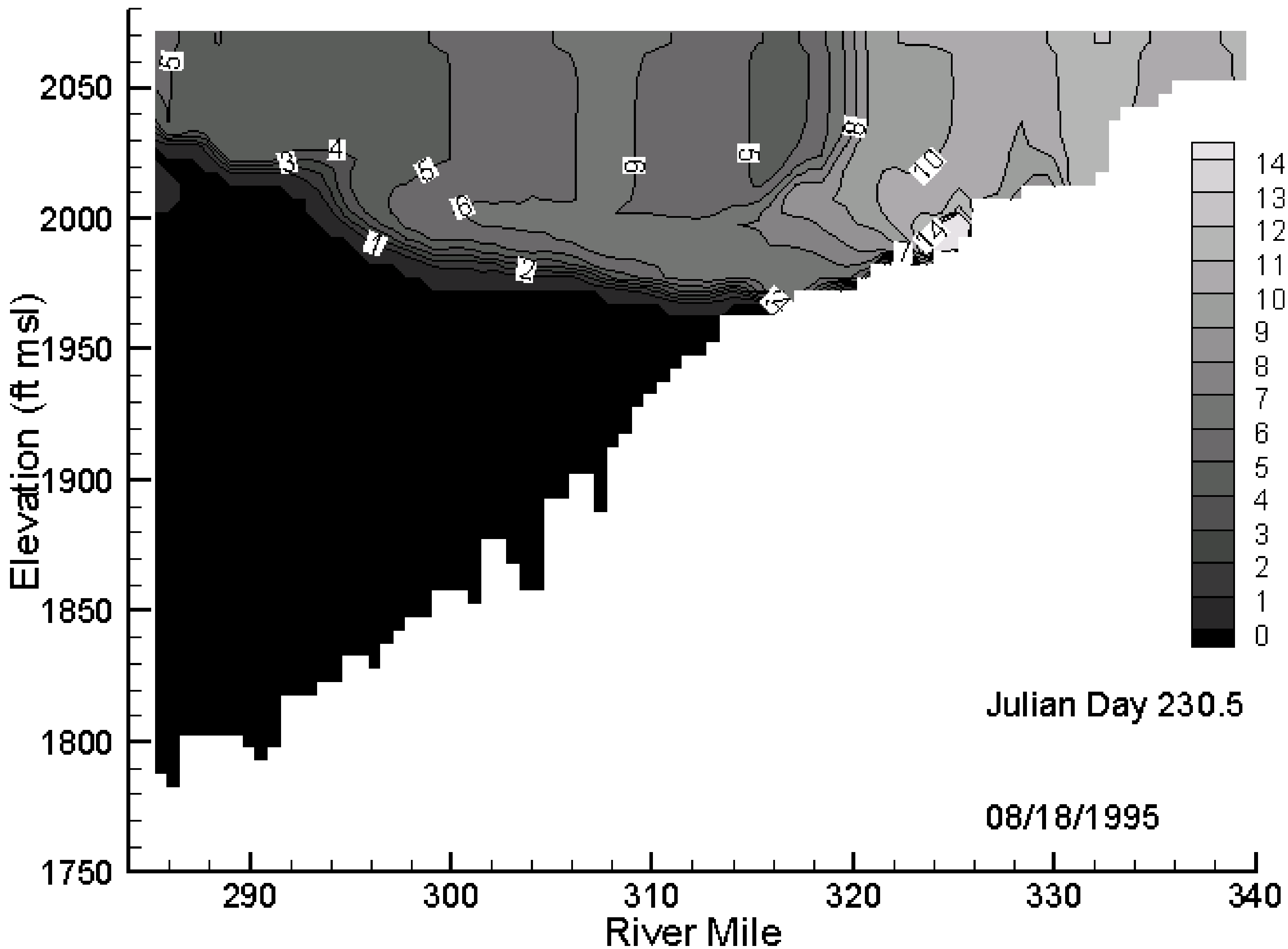

Figure 82. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

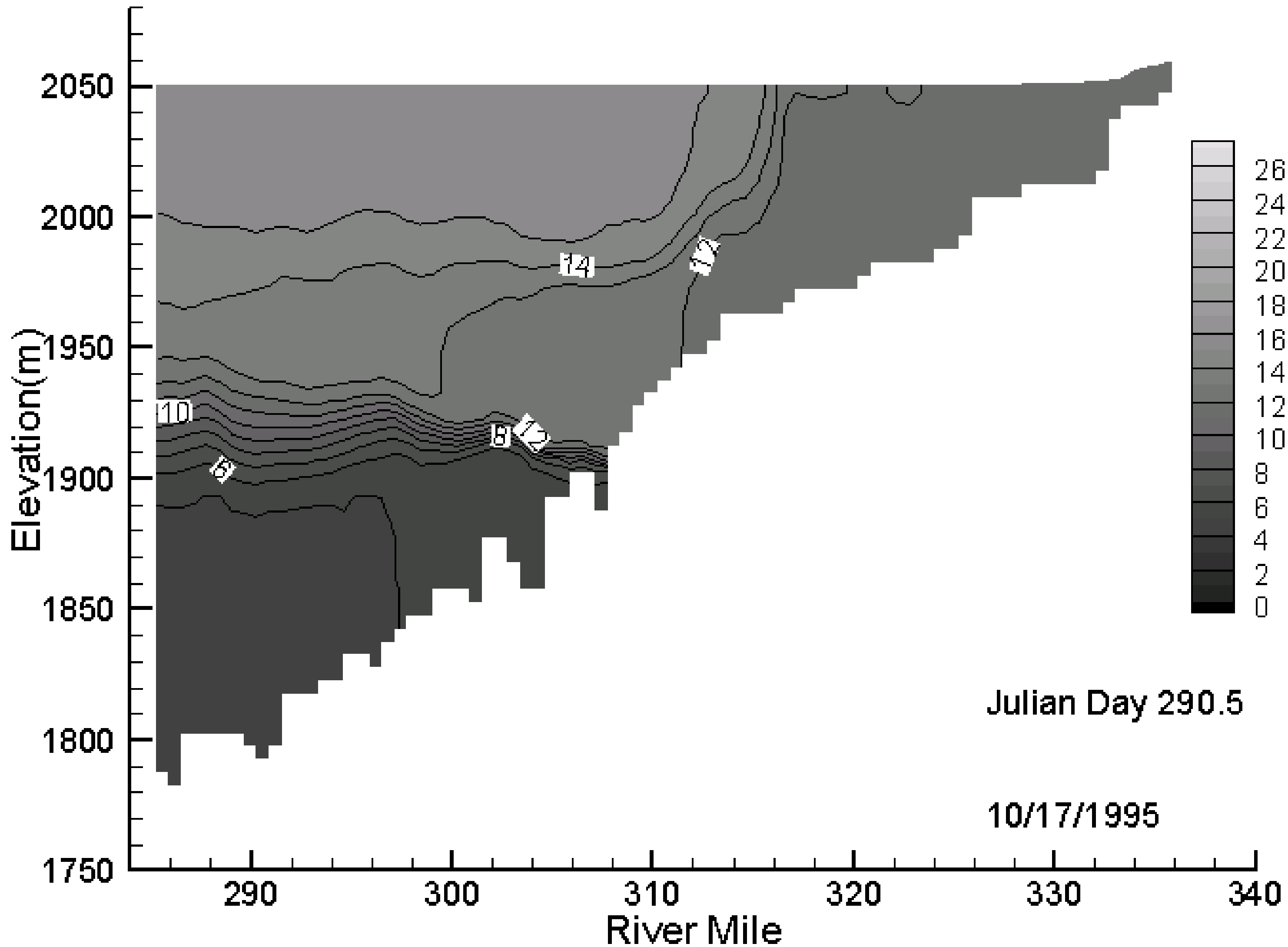

Figure 83. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

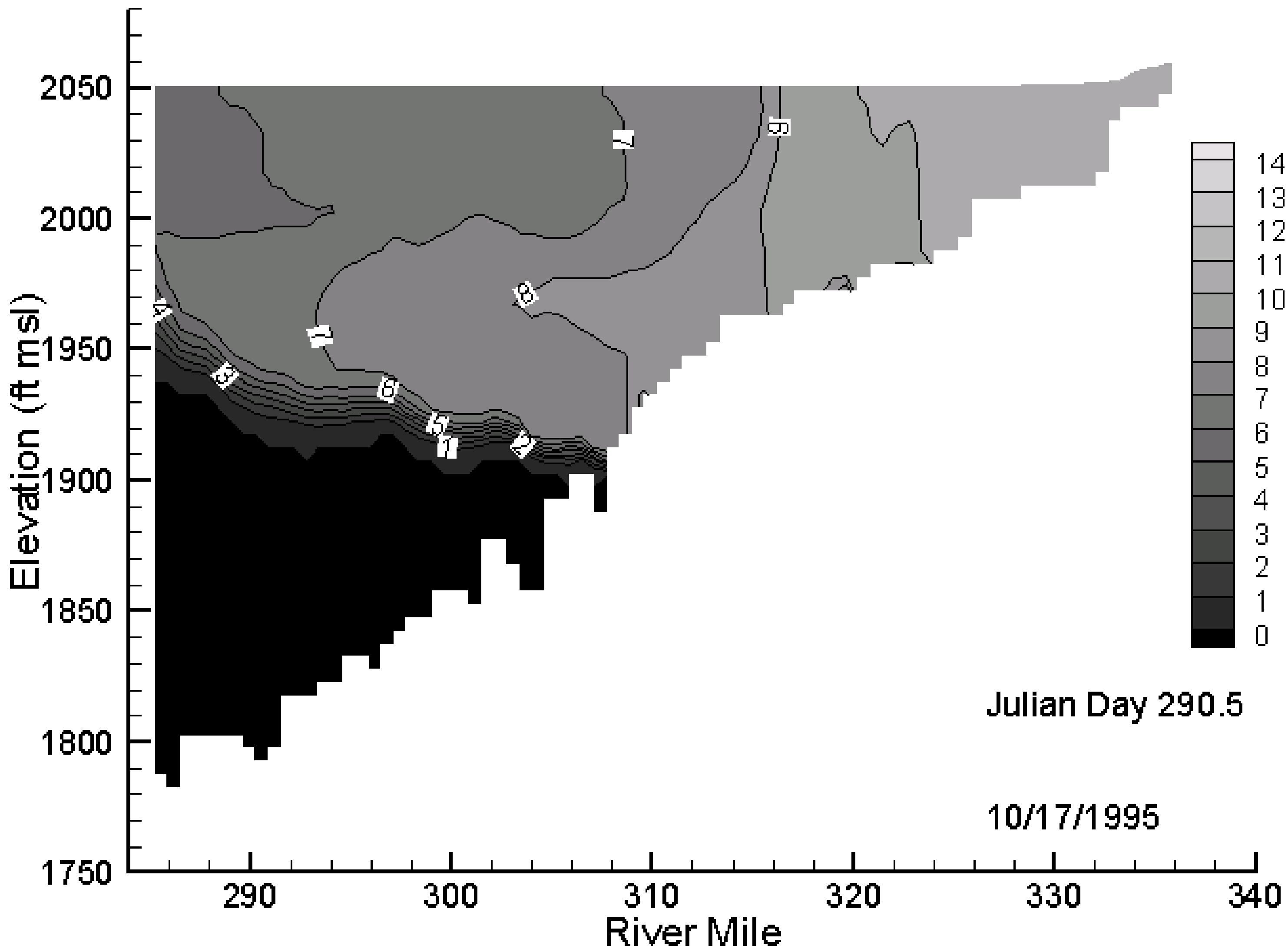

Figure 84. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

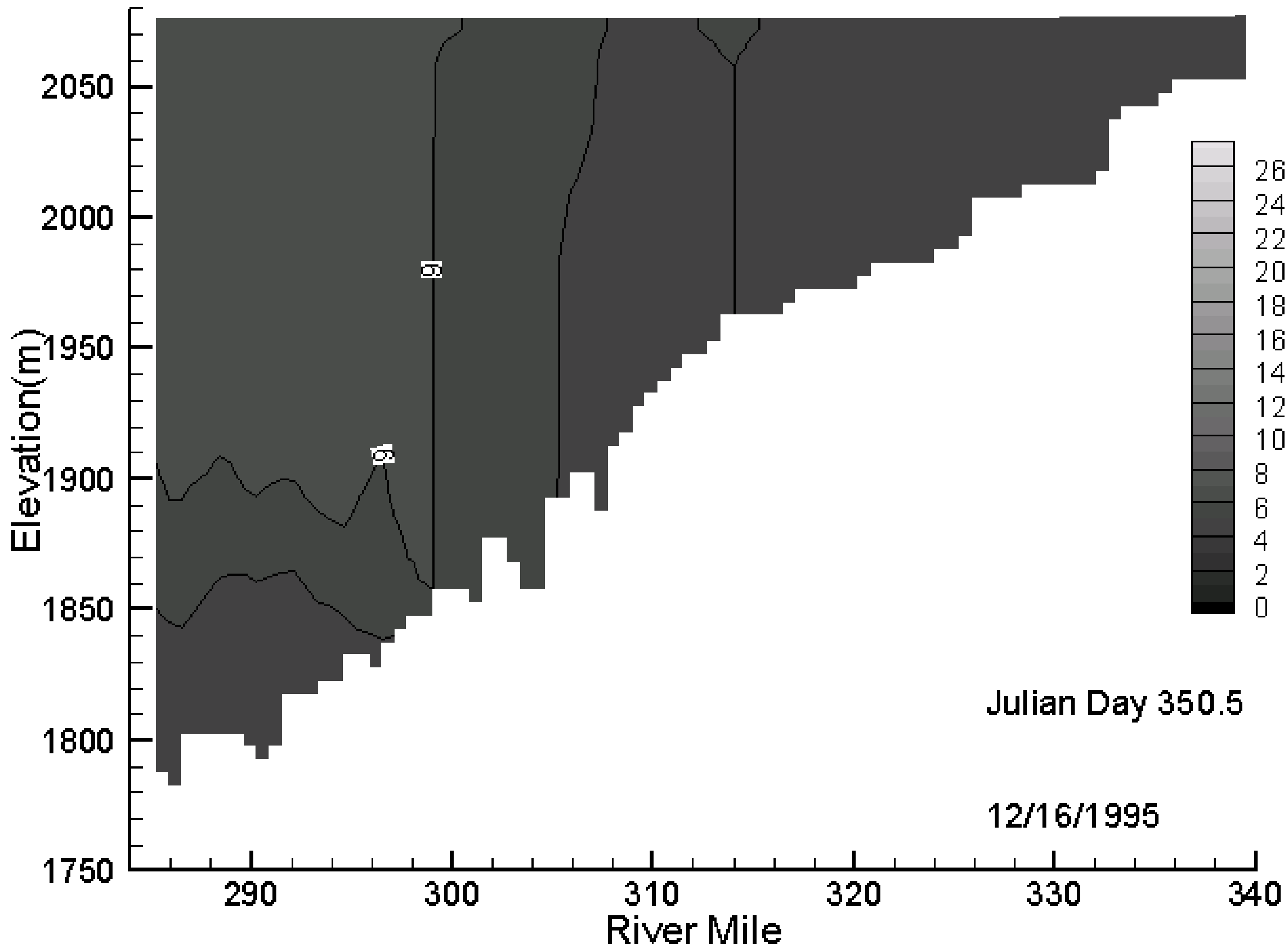

Figure 85. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

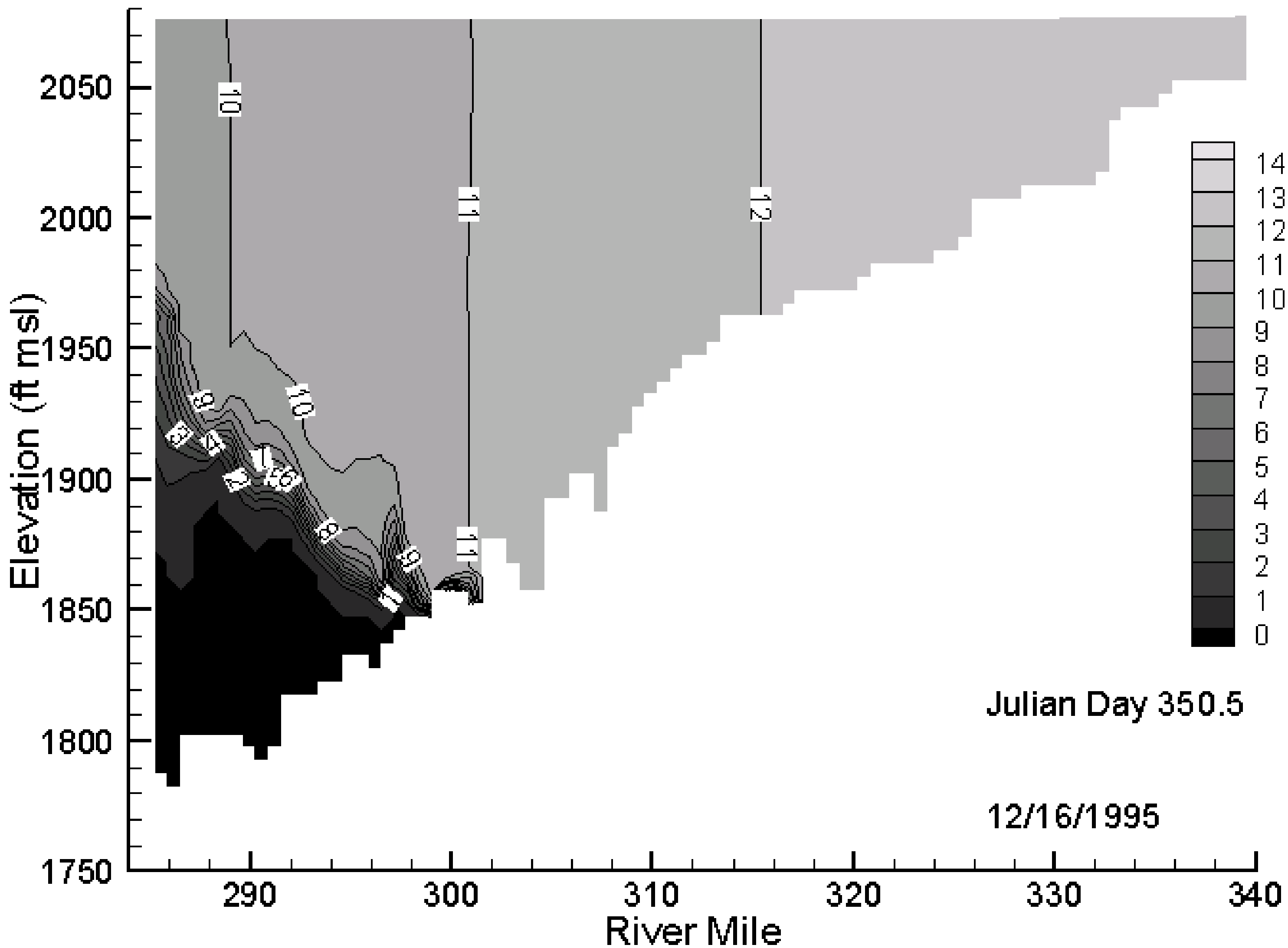

Figure 86. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

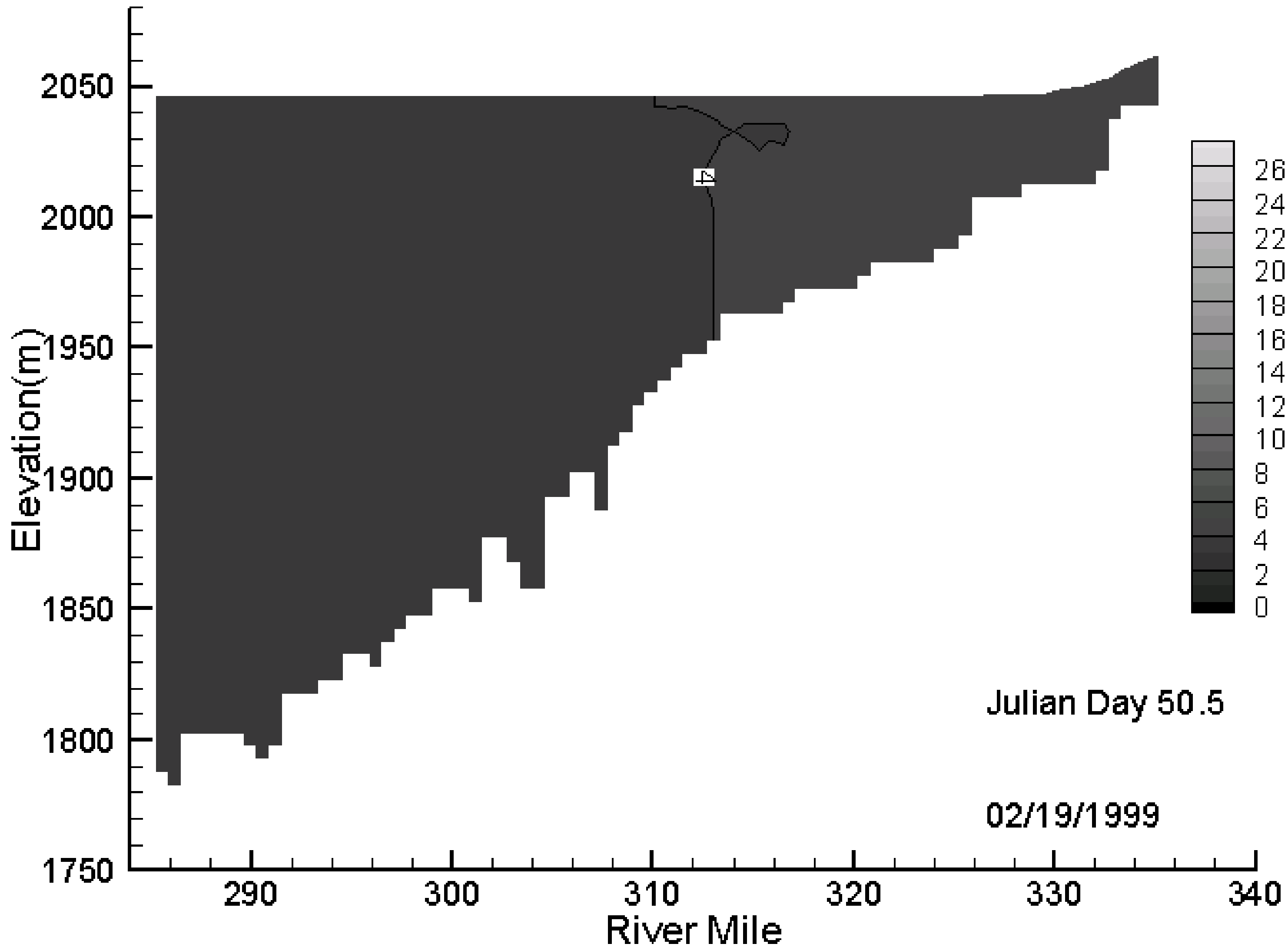

Figure 87. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

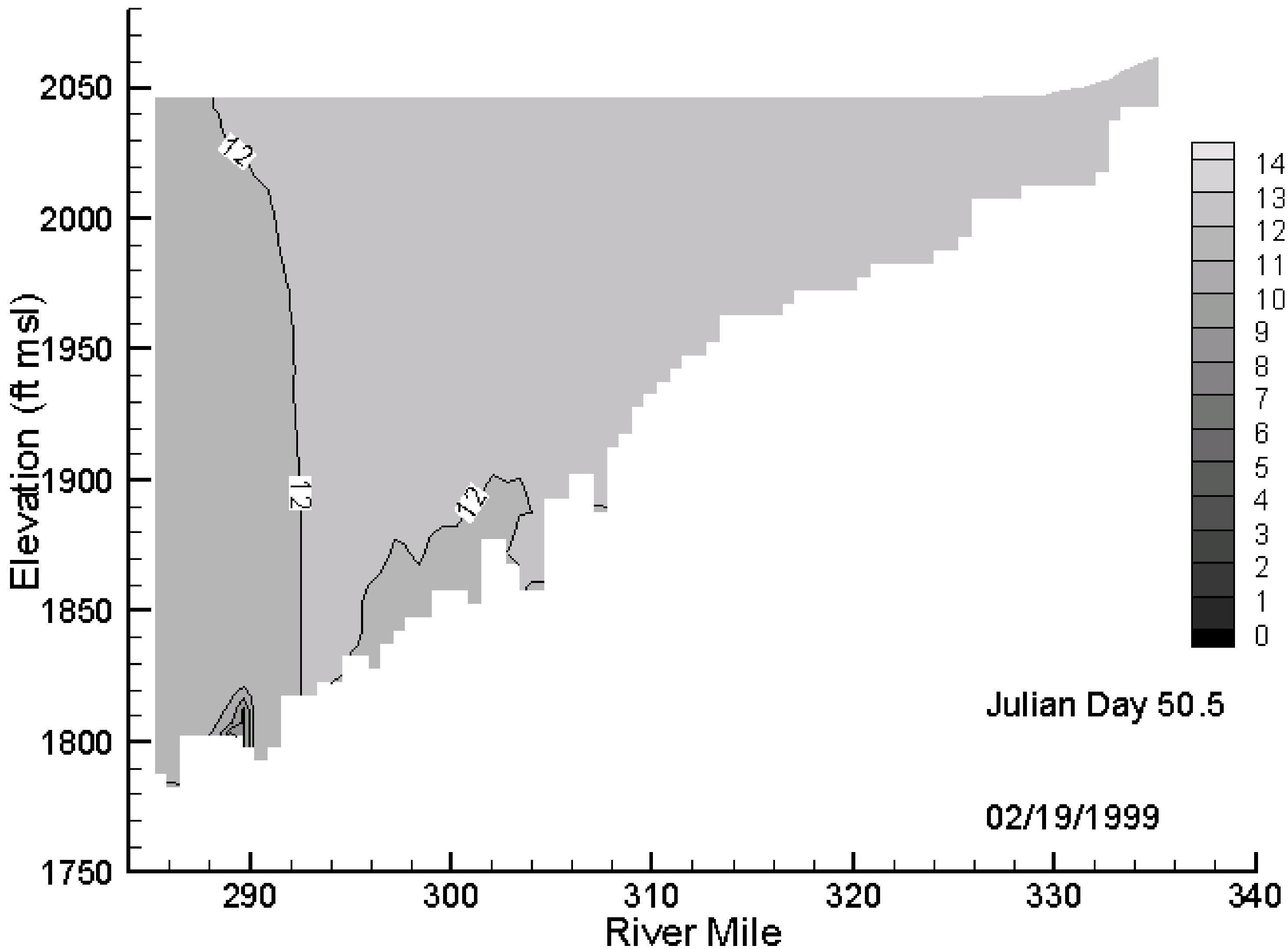

Figure 88. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

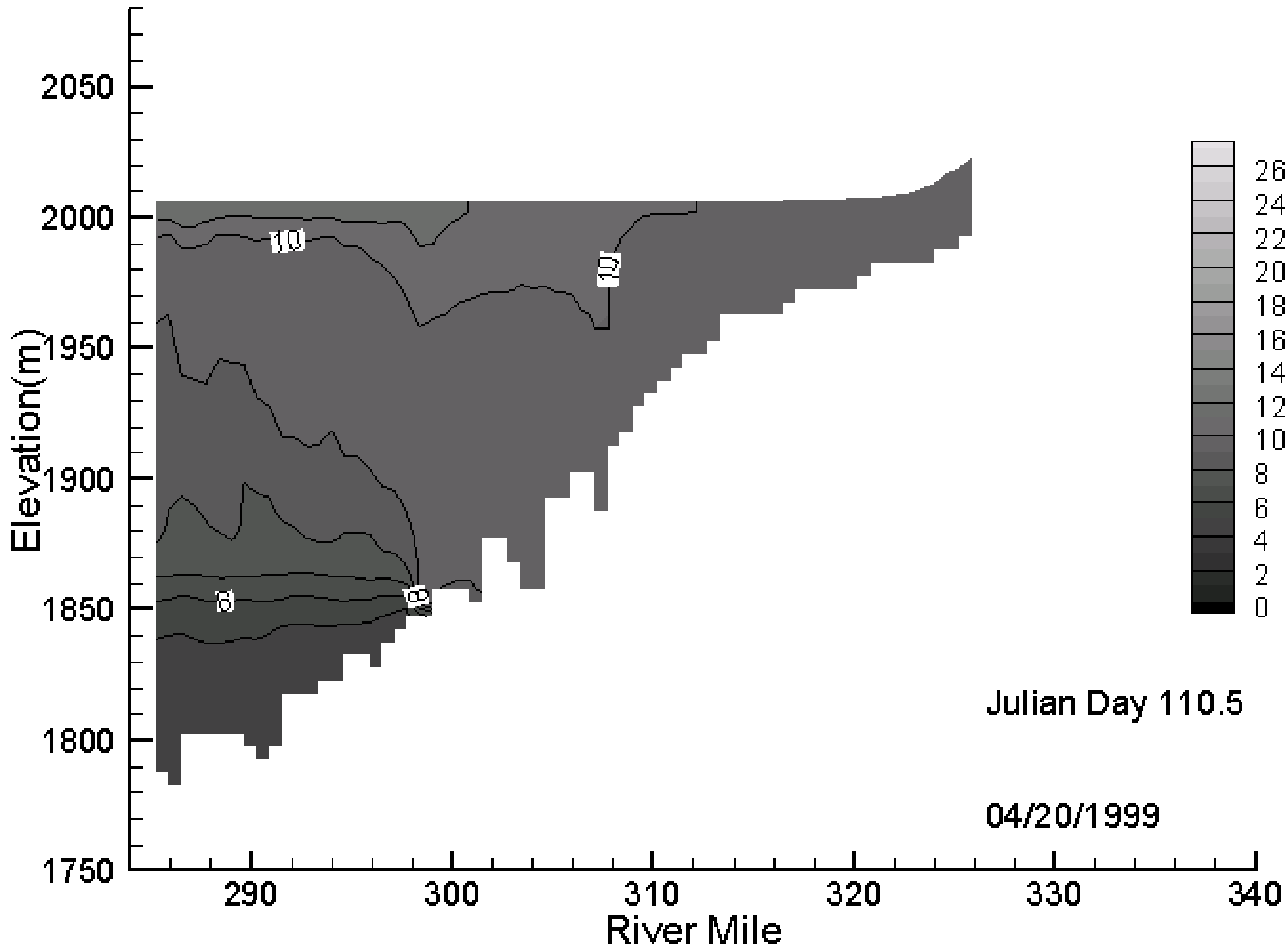

Figure 89. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

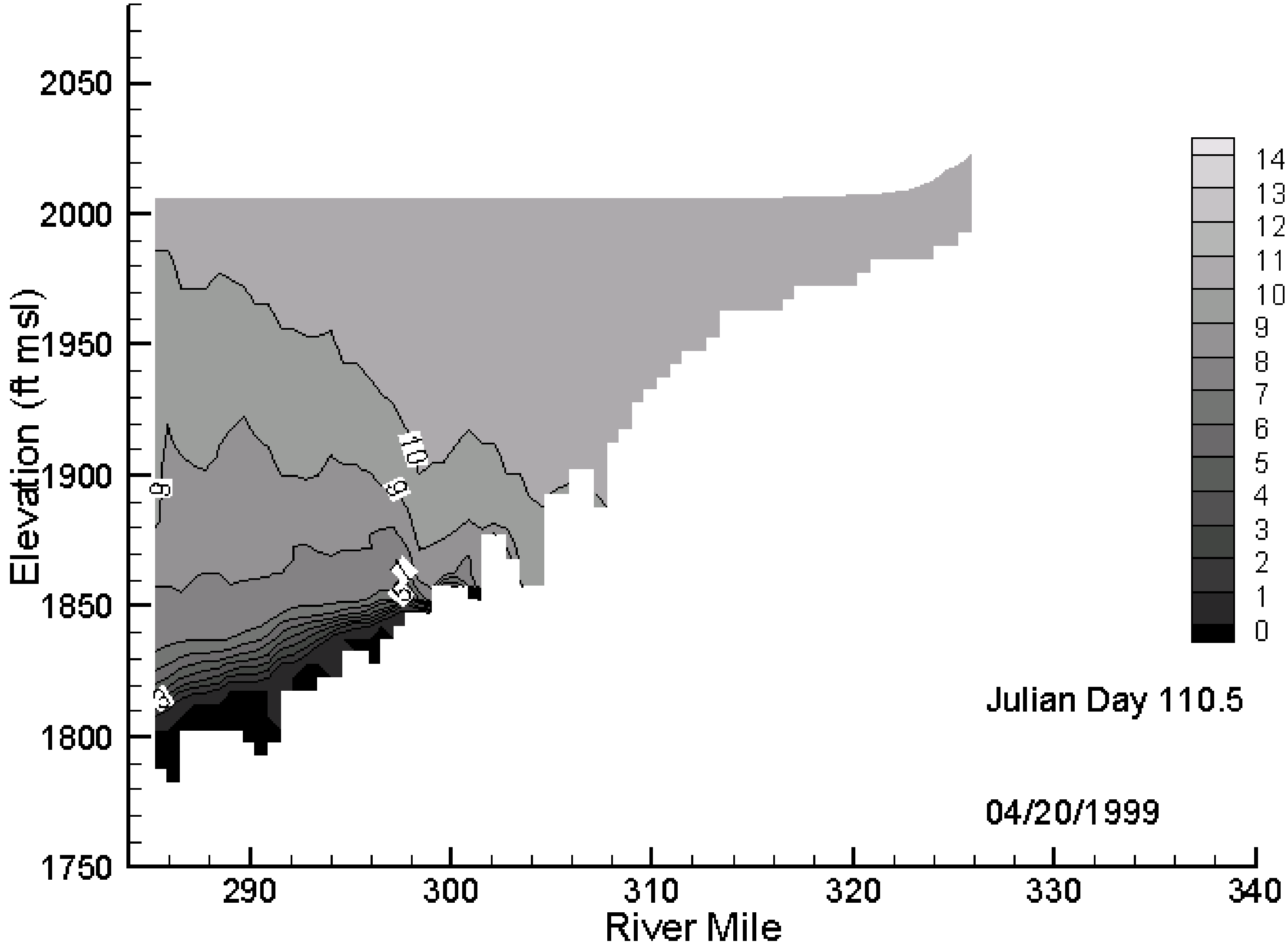

Figure 90. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

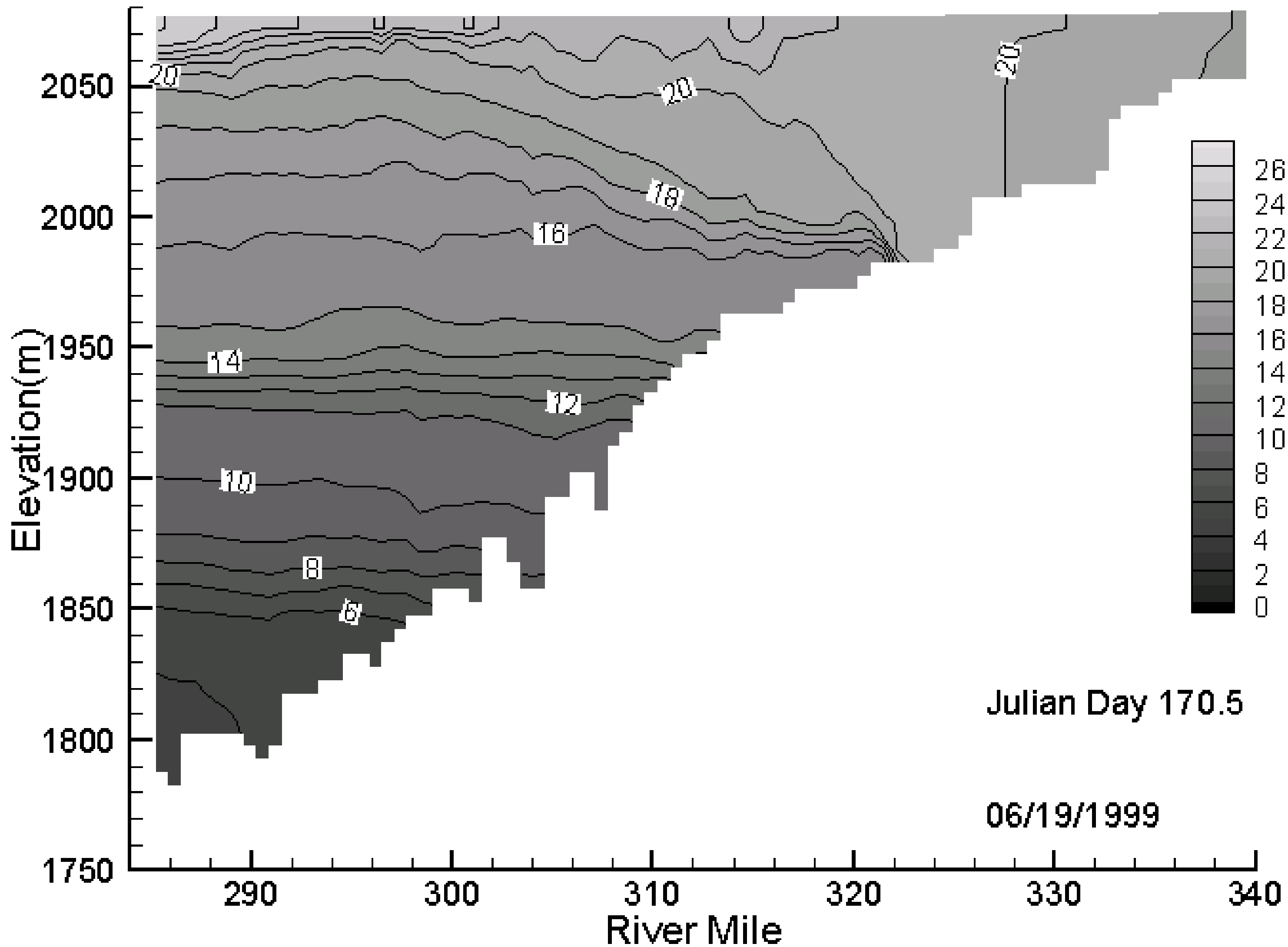

Figure 91. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

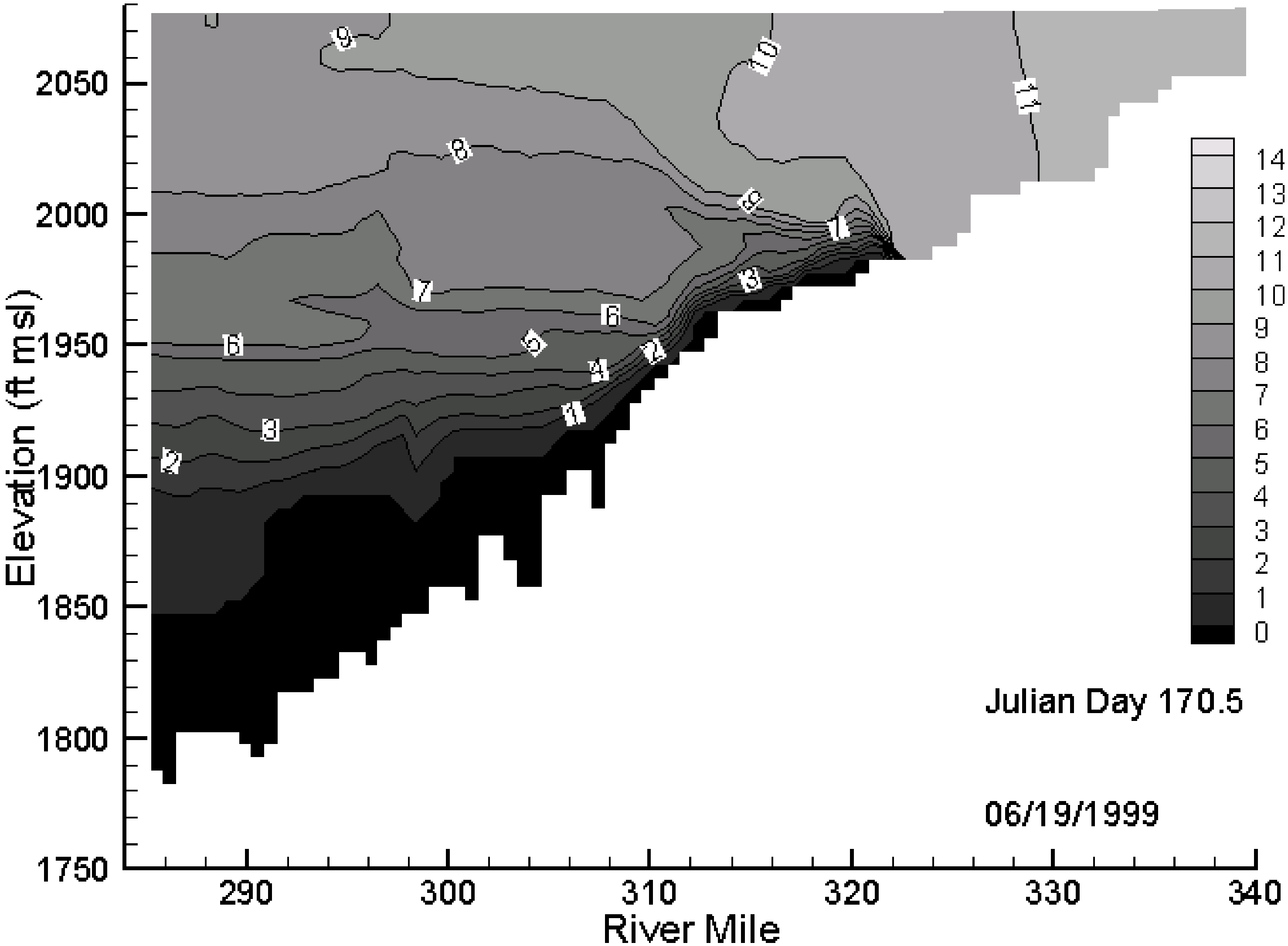

Figure 92. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

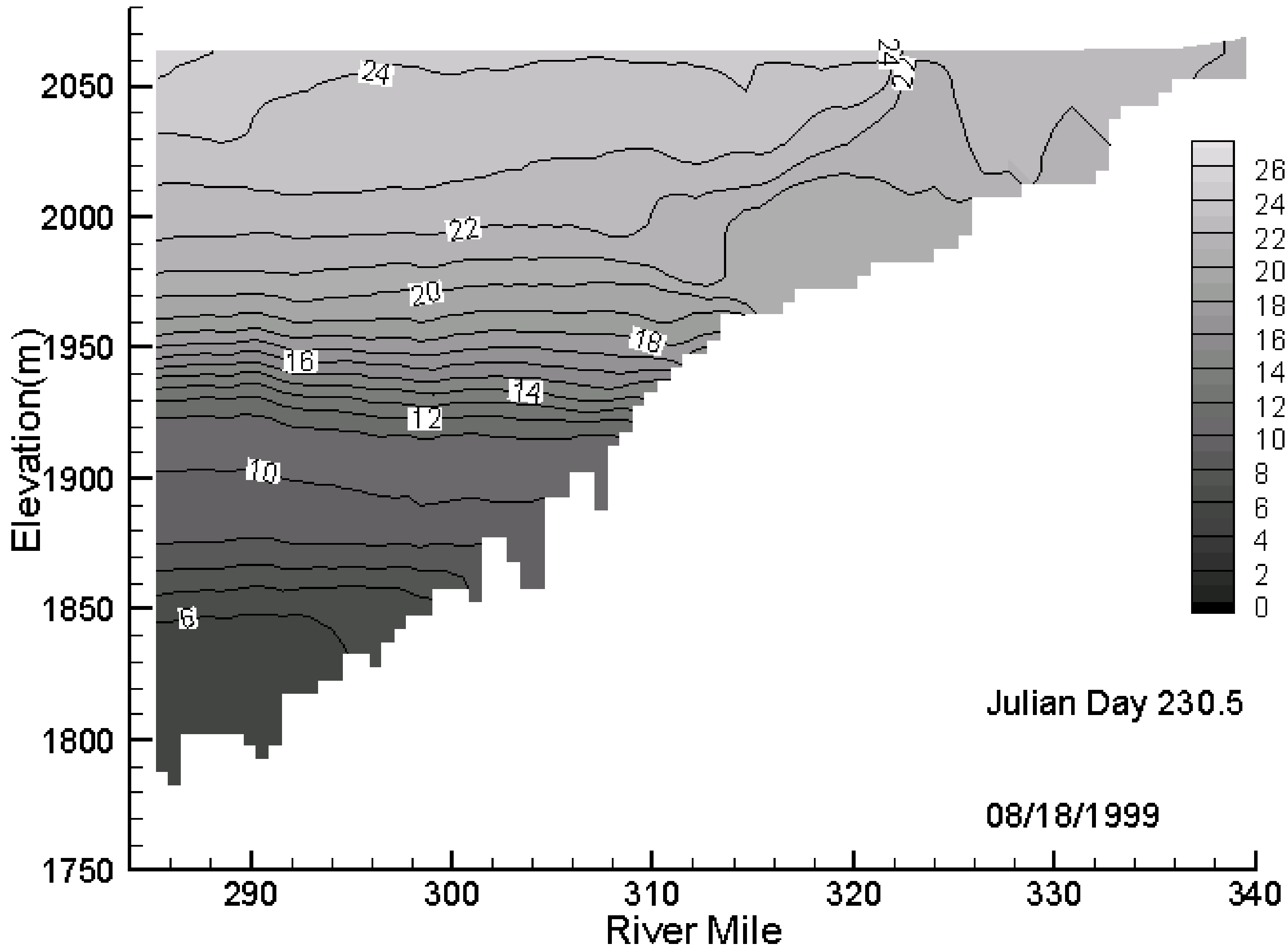

Figure 93. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

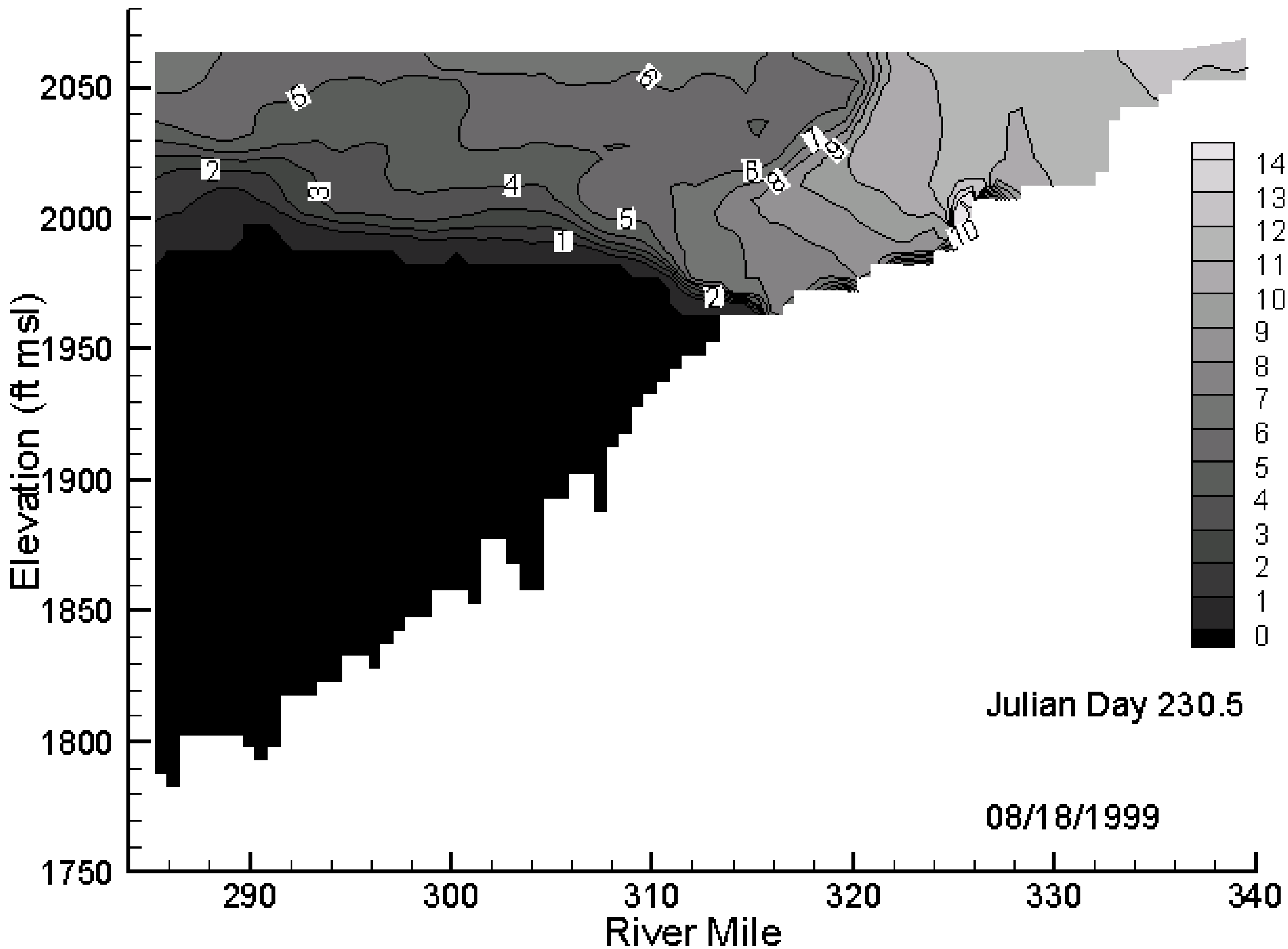

Figure 94. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

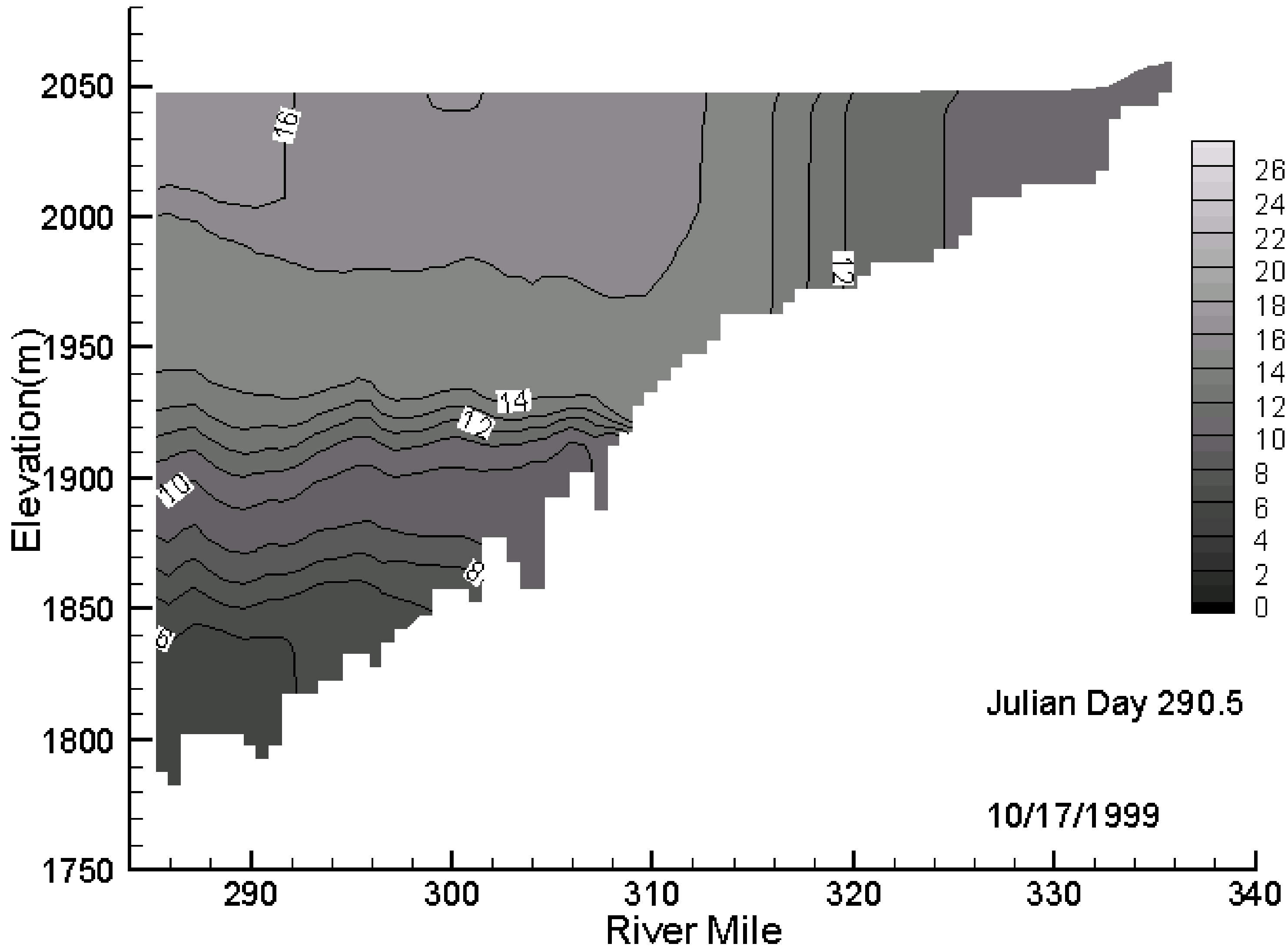

Figure 95. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

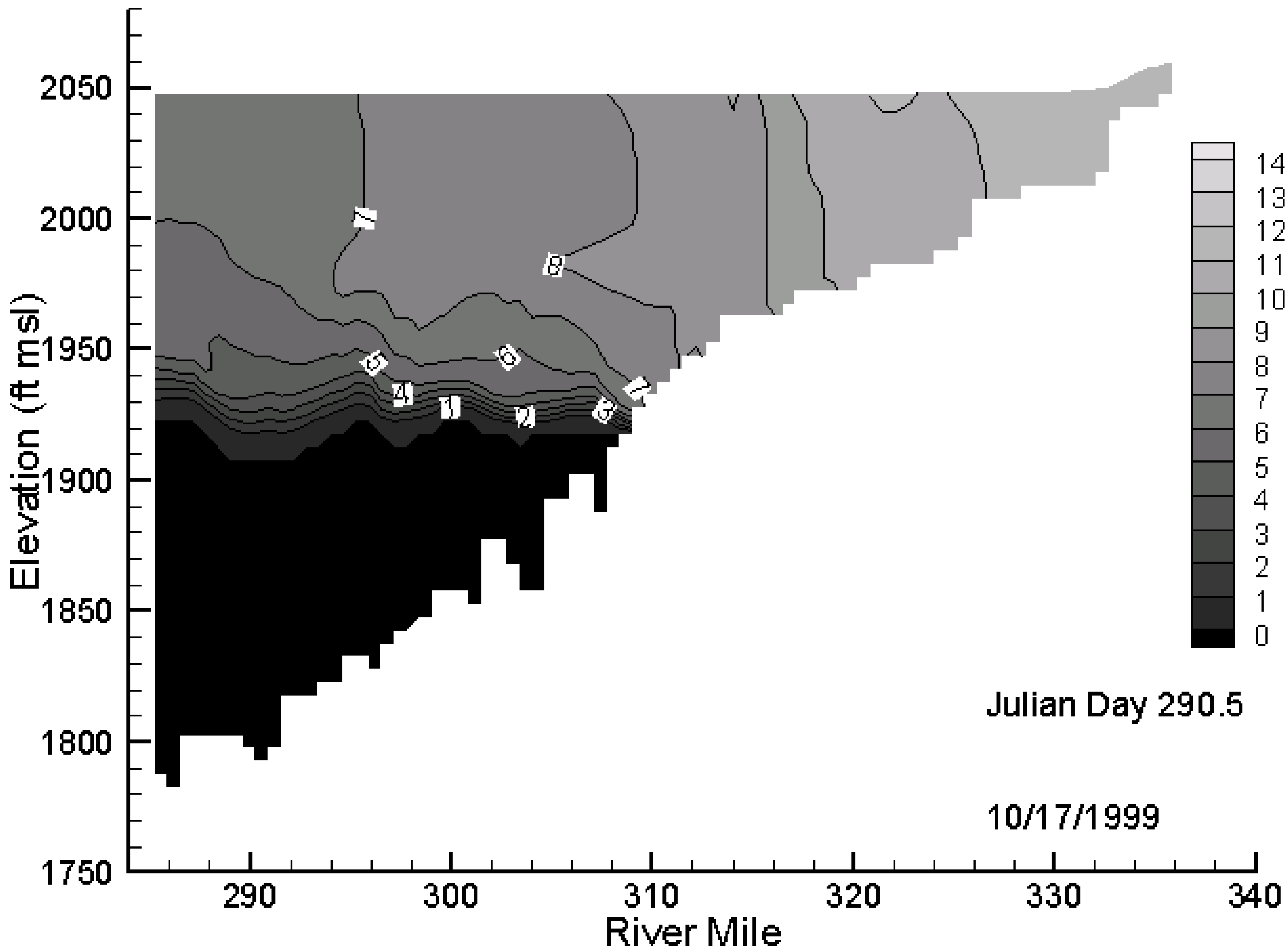

Figure 96. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

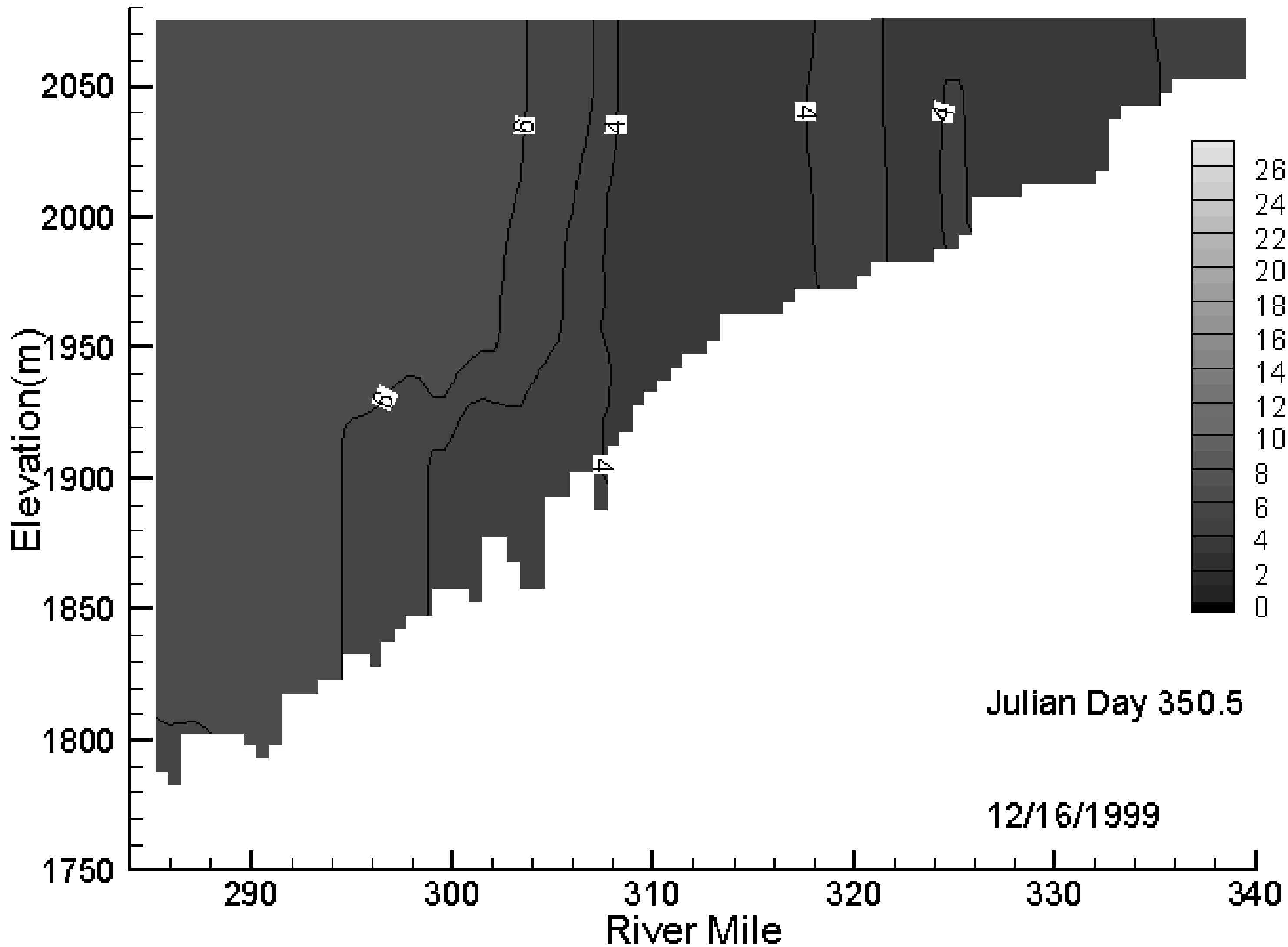

Figure 97. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

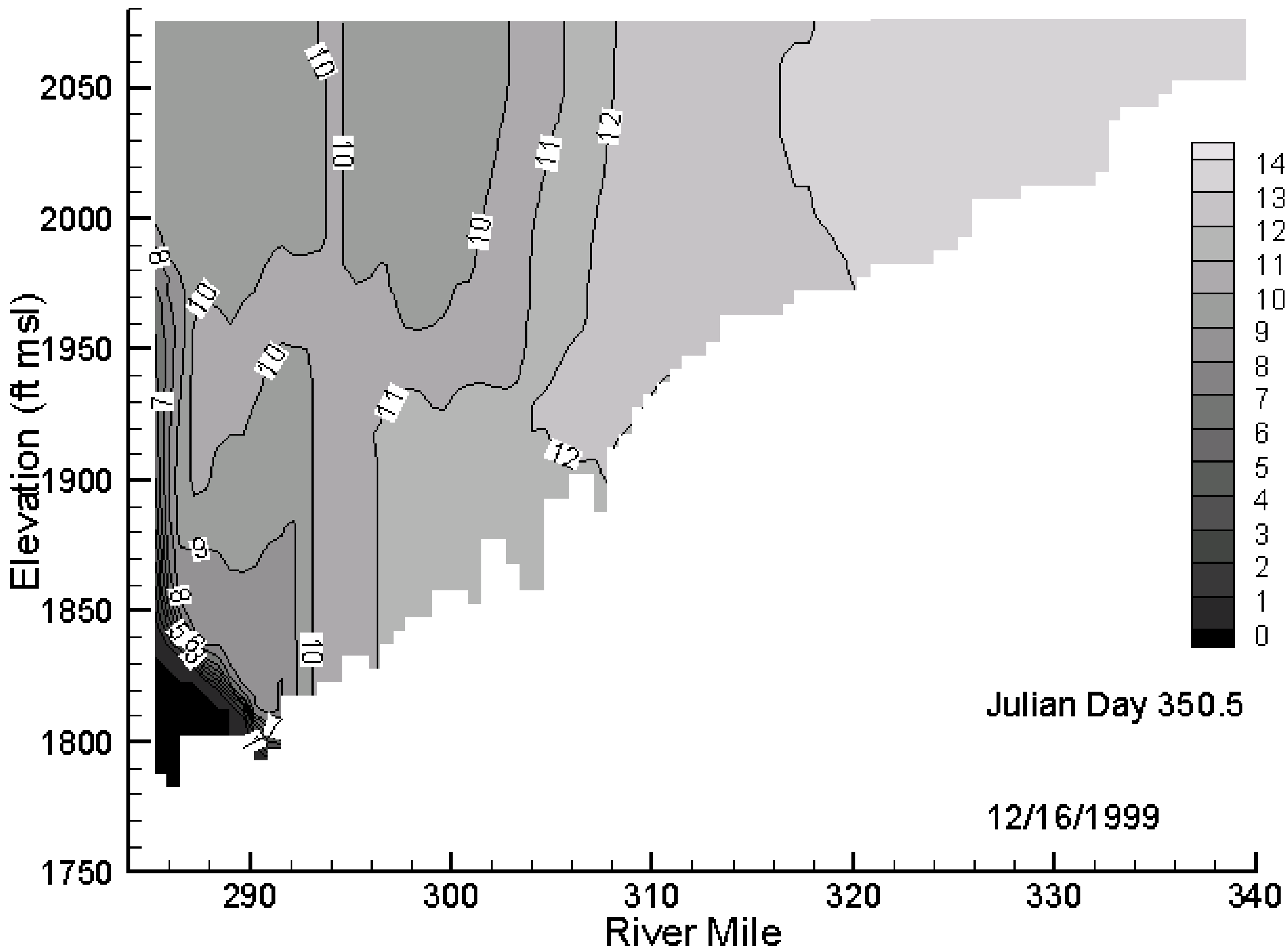

Figure 98. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

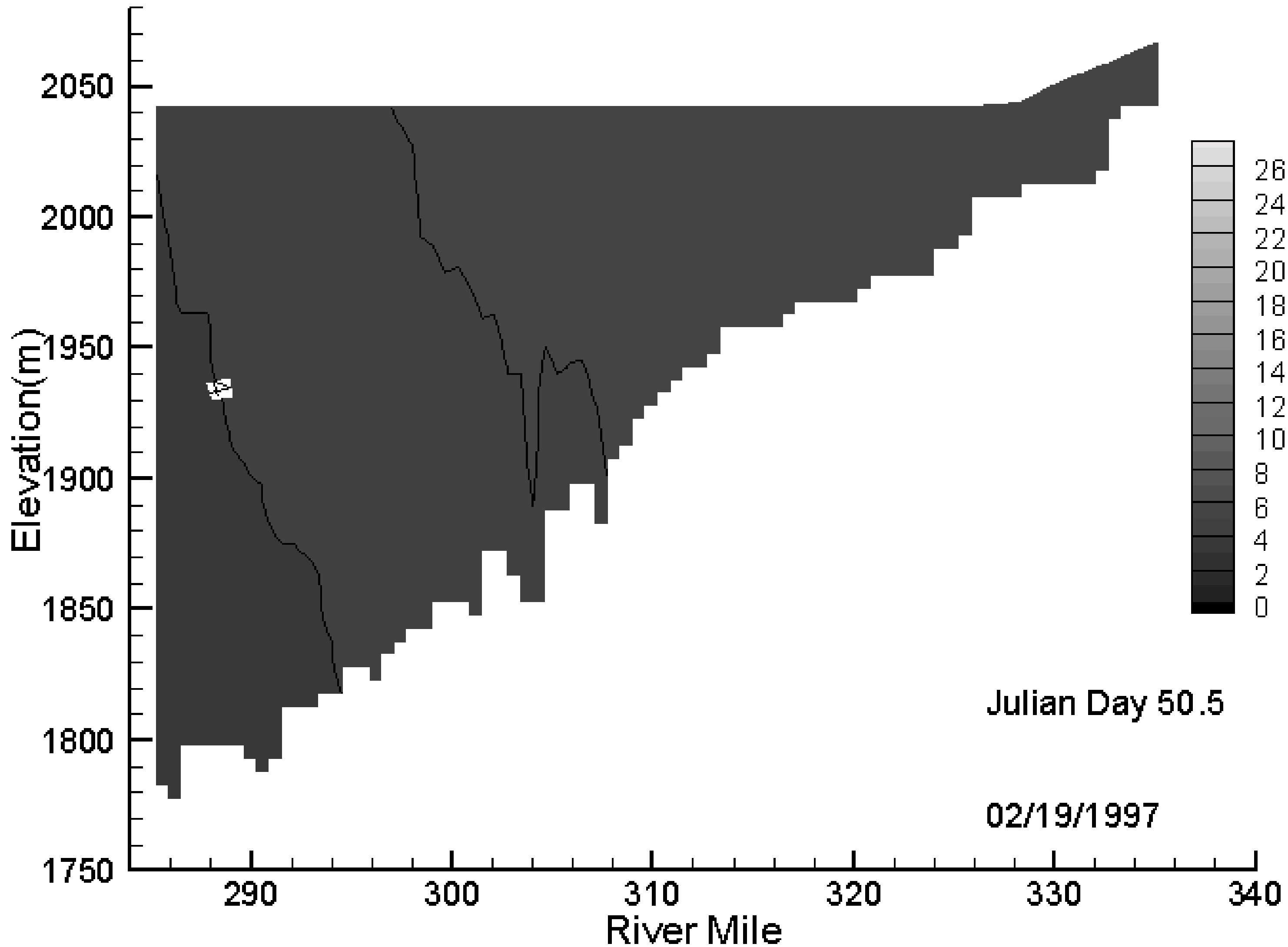

Figure 99. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

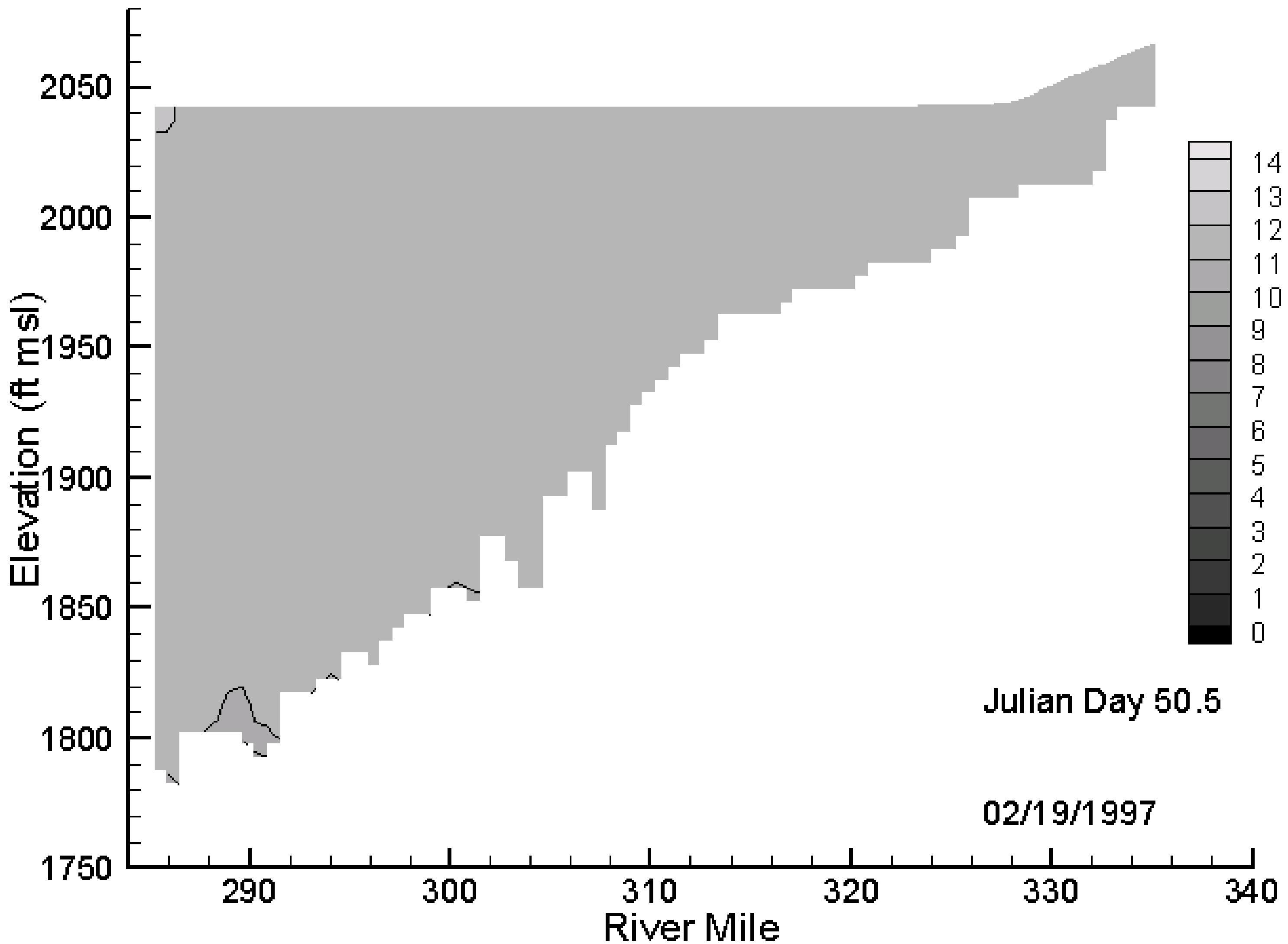

Figure 100. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

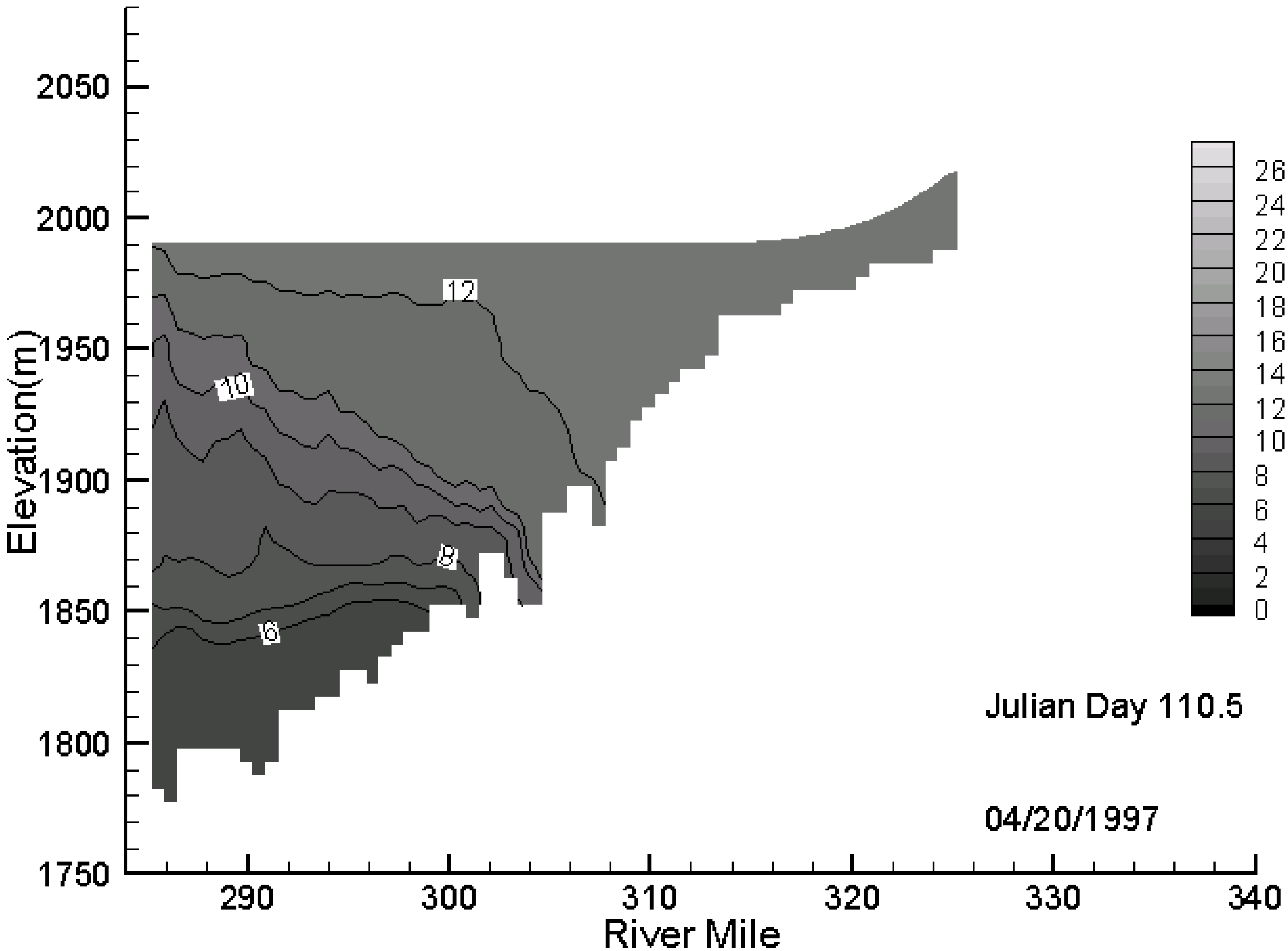

Figure 101. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

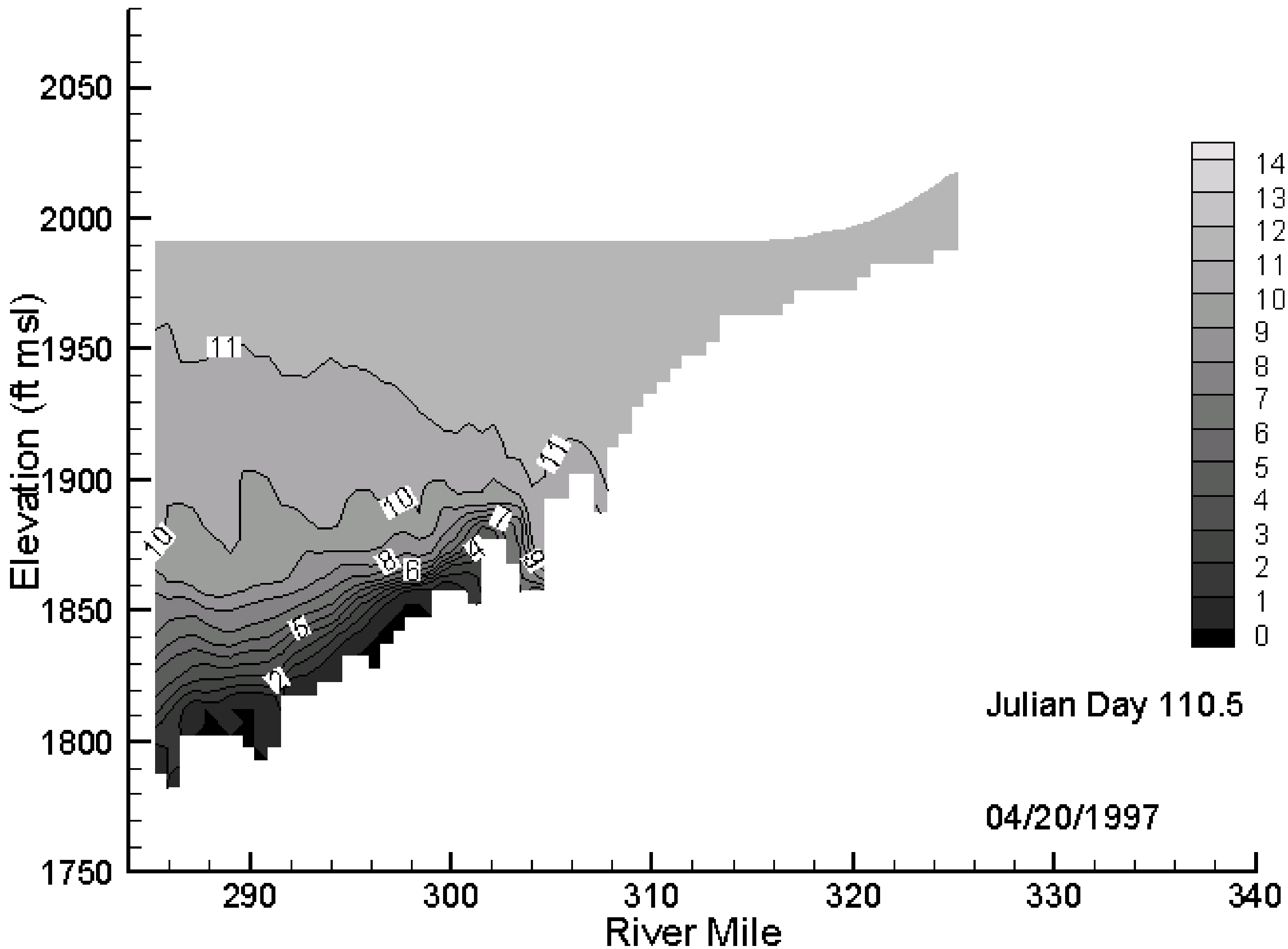

Figure 102. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

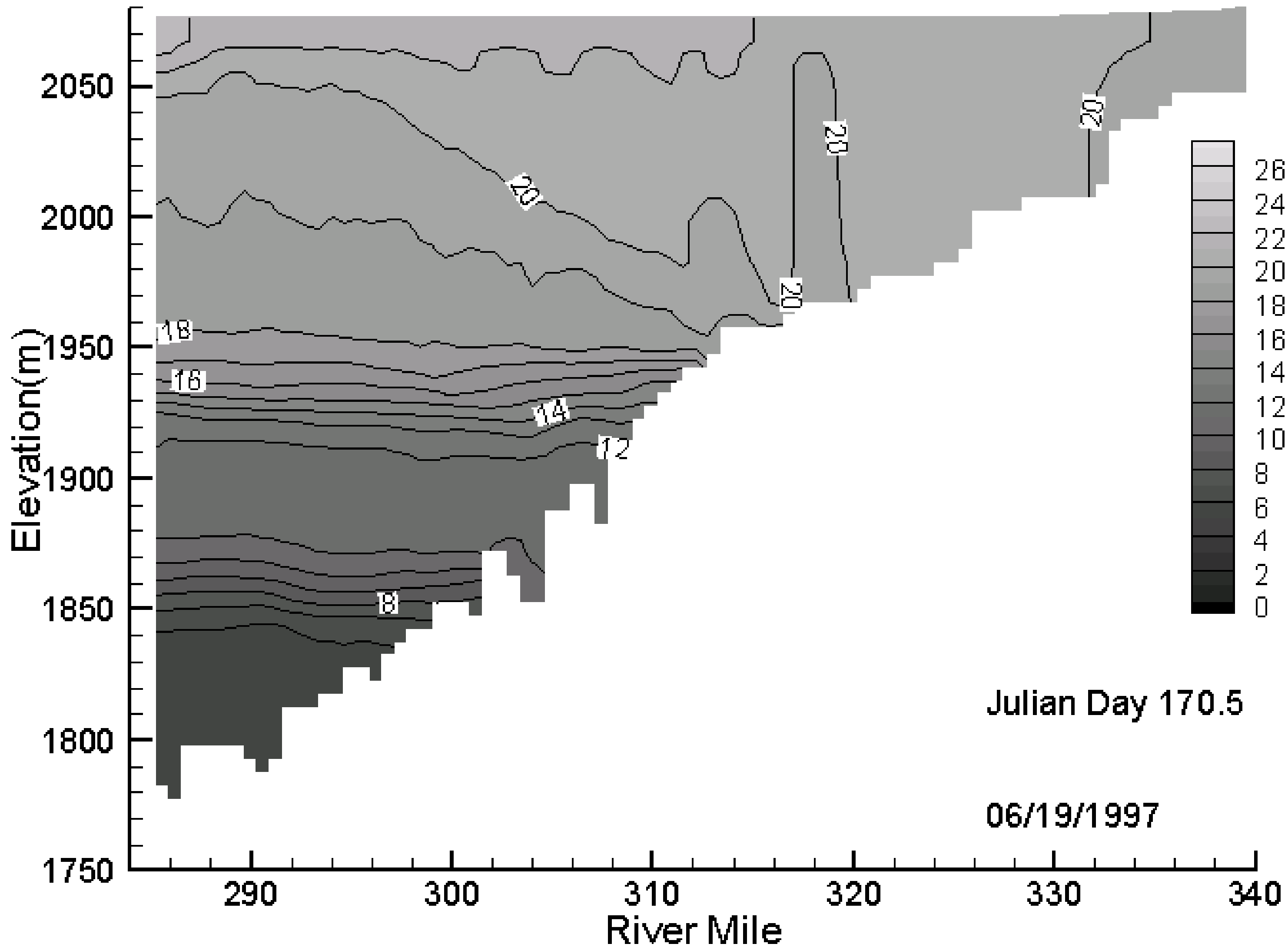

Figure 103. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

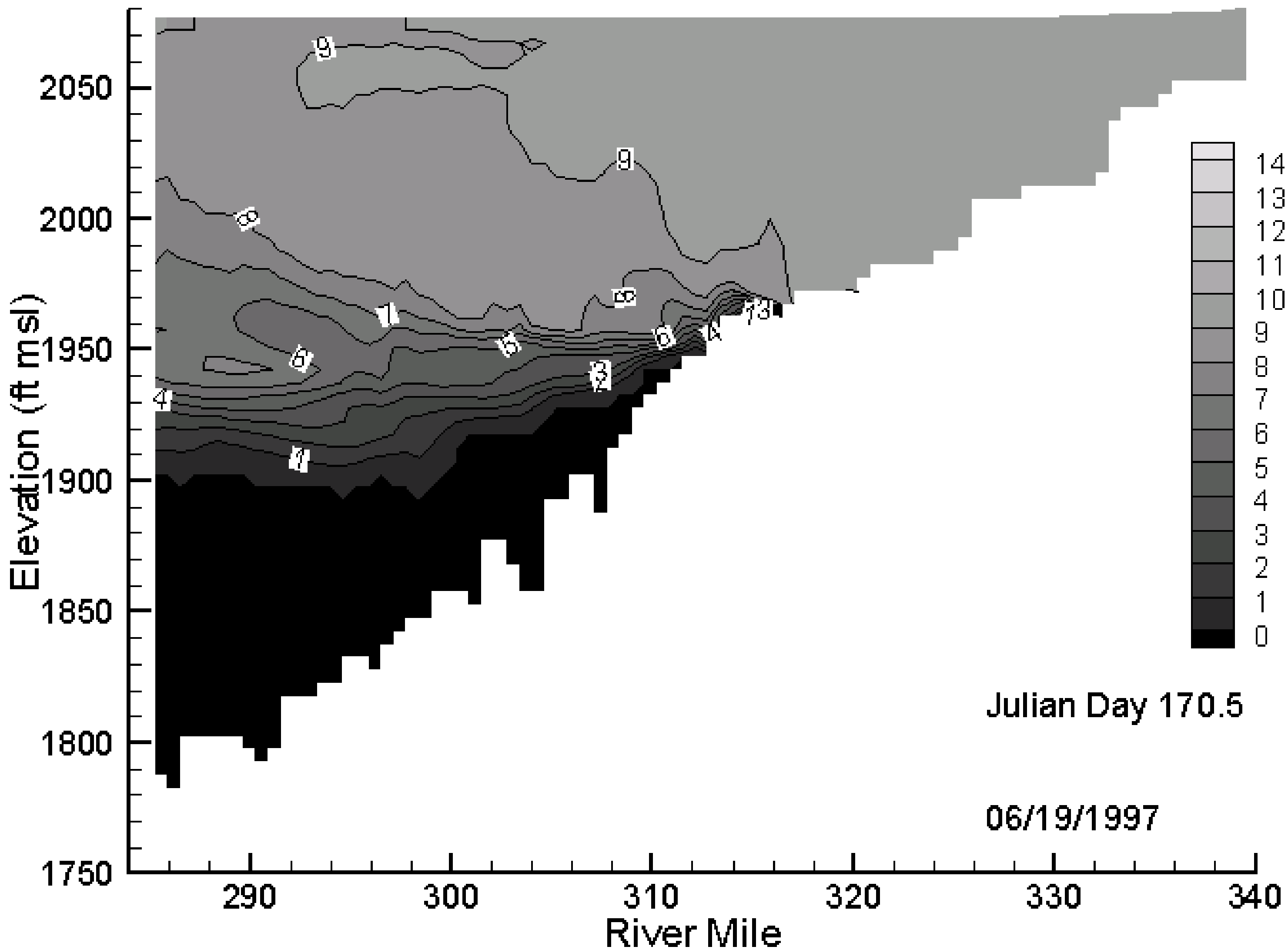

Figure 104. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

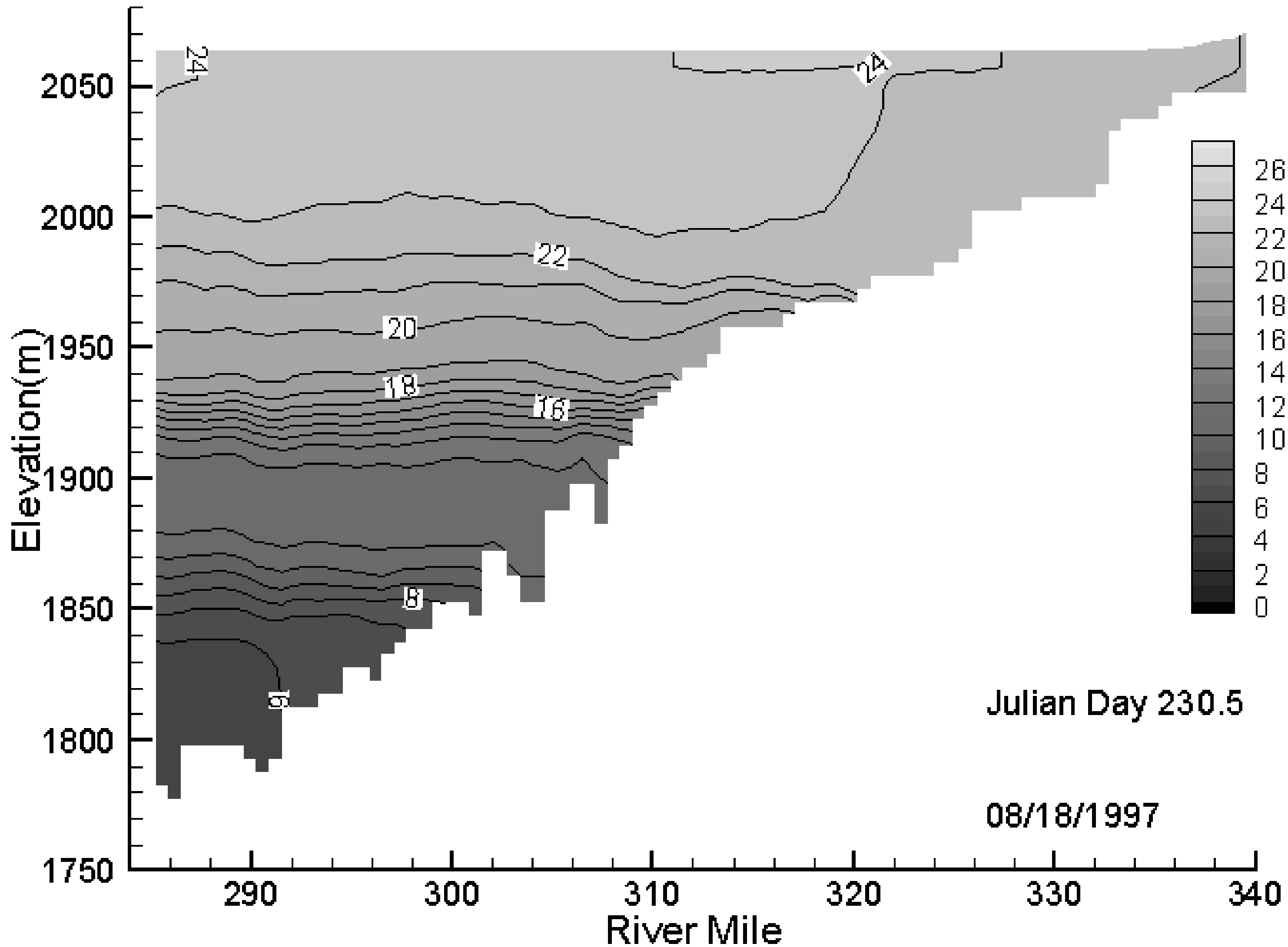

Figure 105. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

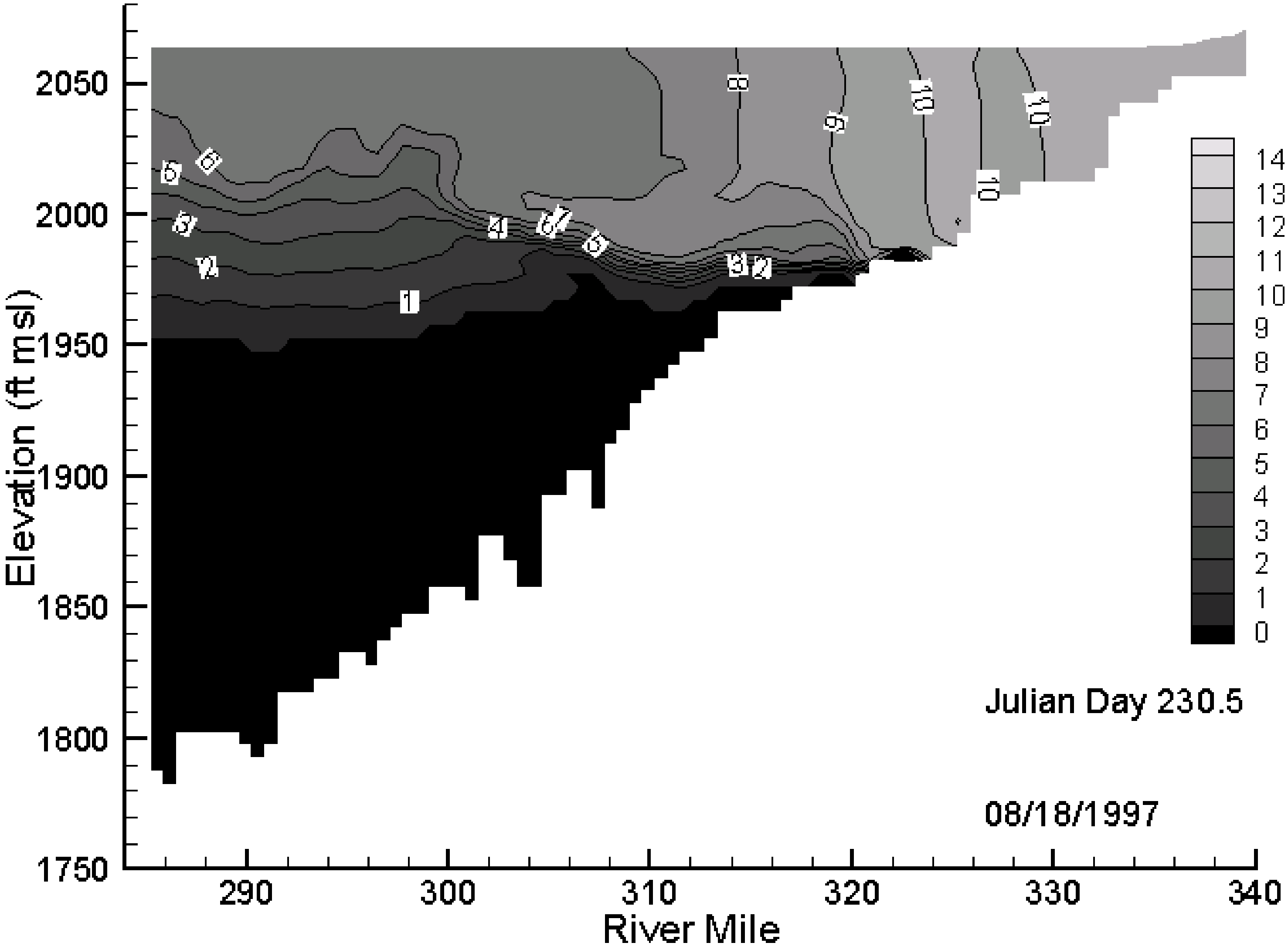

Figure 106. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

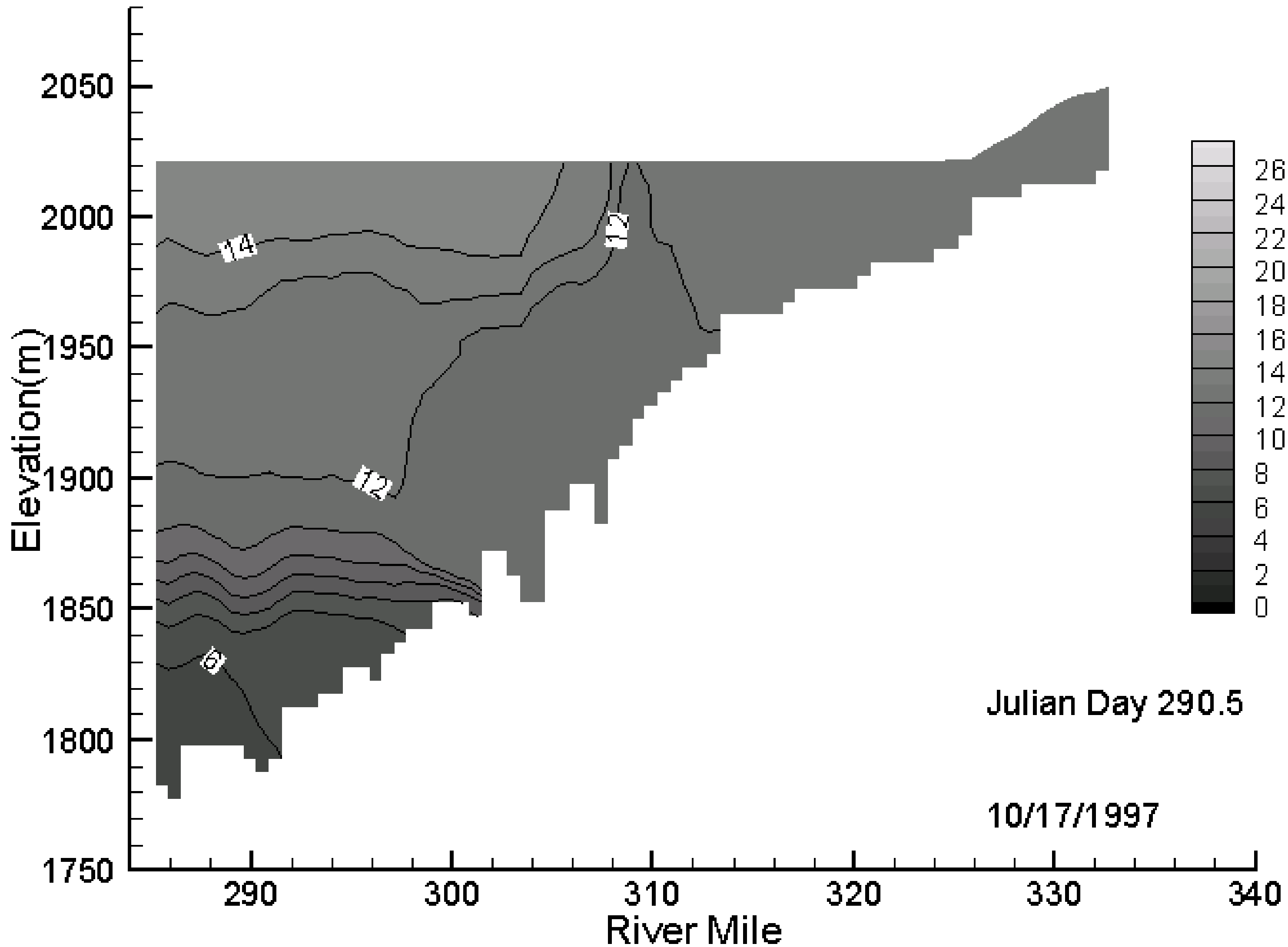

Figure 107. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

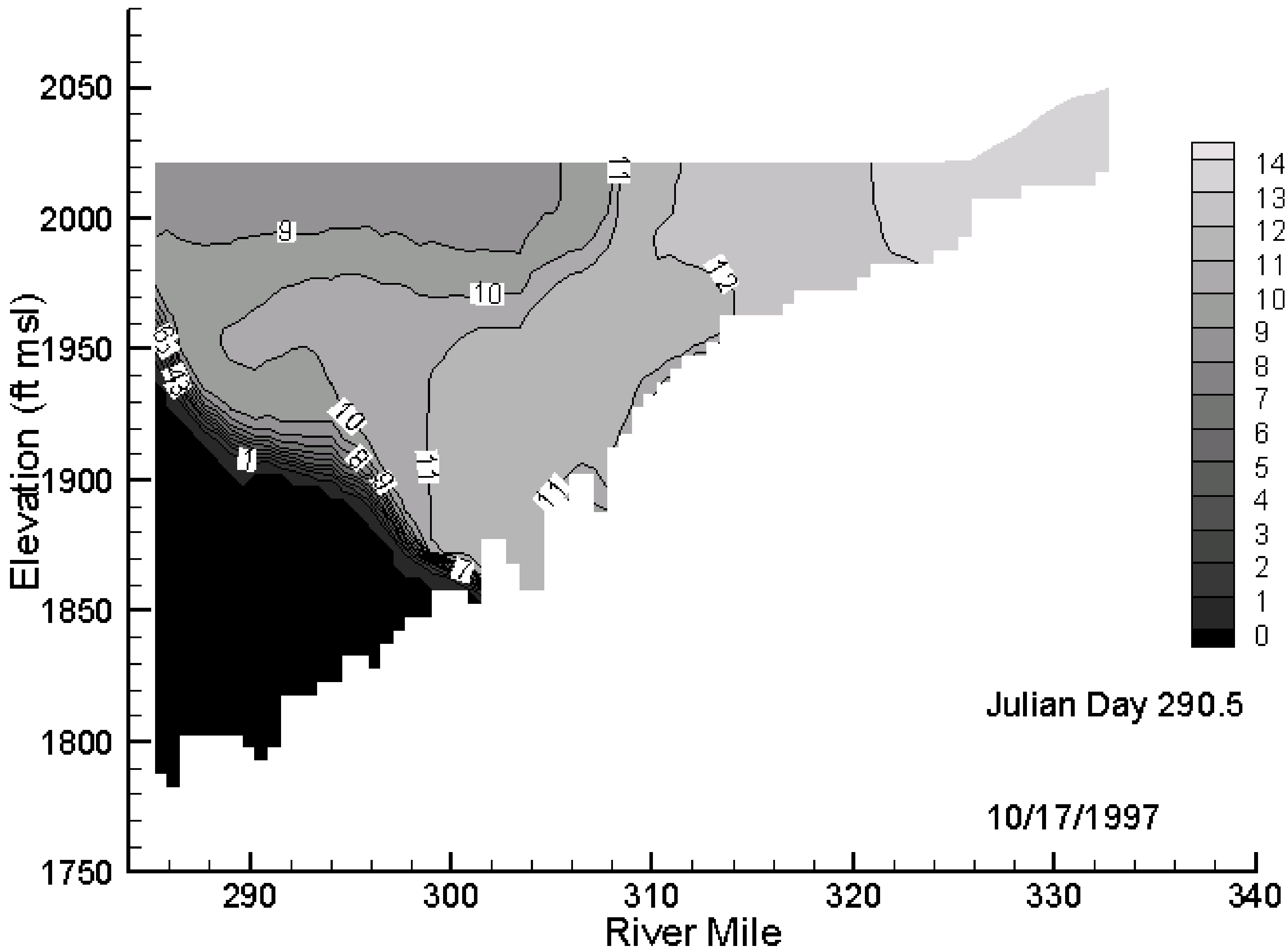

Figure 108. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

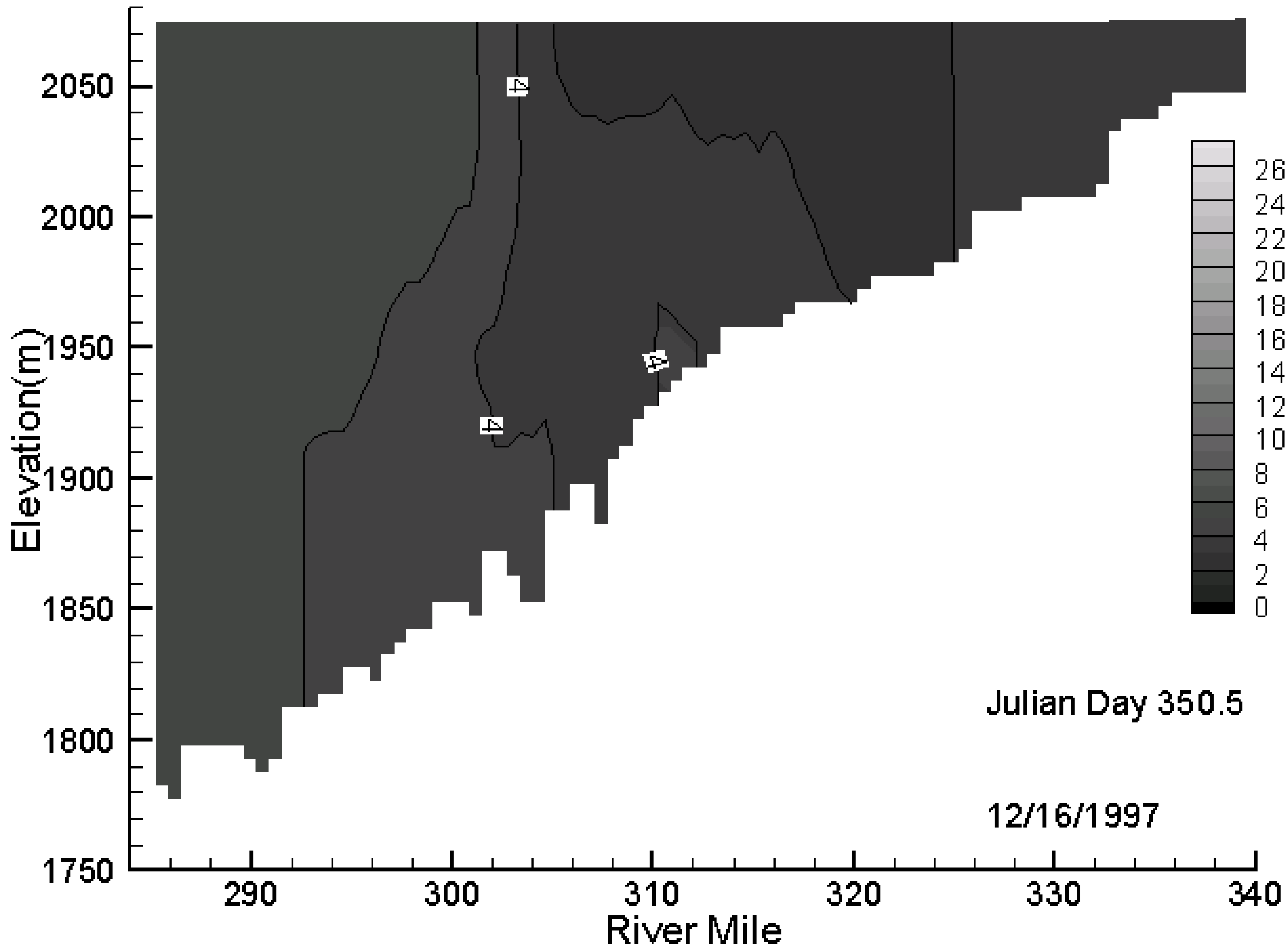

Figure 109. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

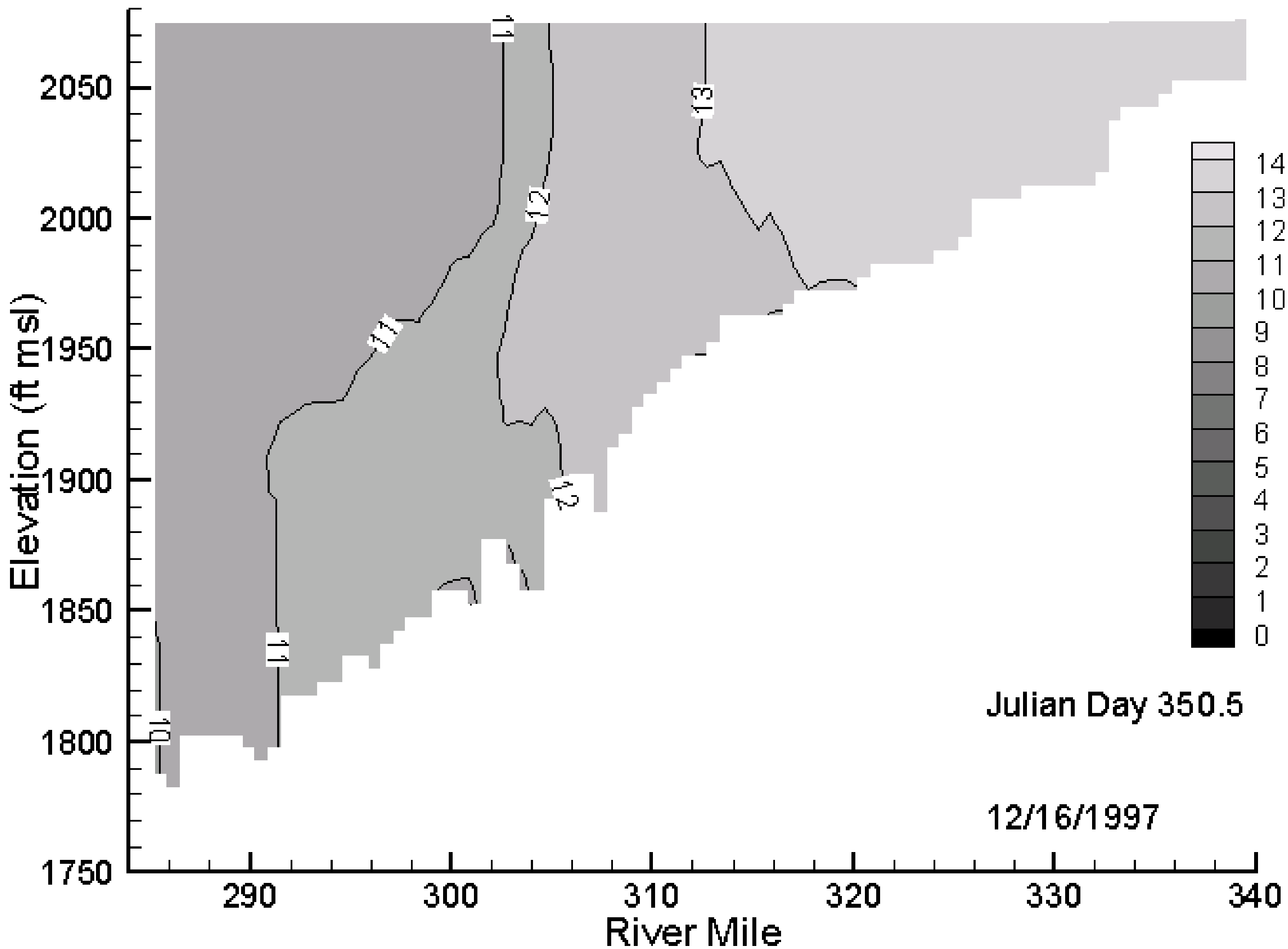

Figure 110. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under proposed operations with 1,125-tons/yr aeration at the proposed location.

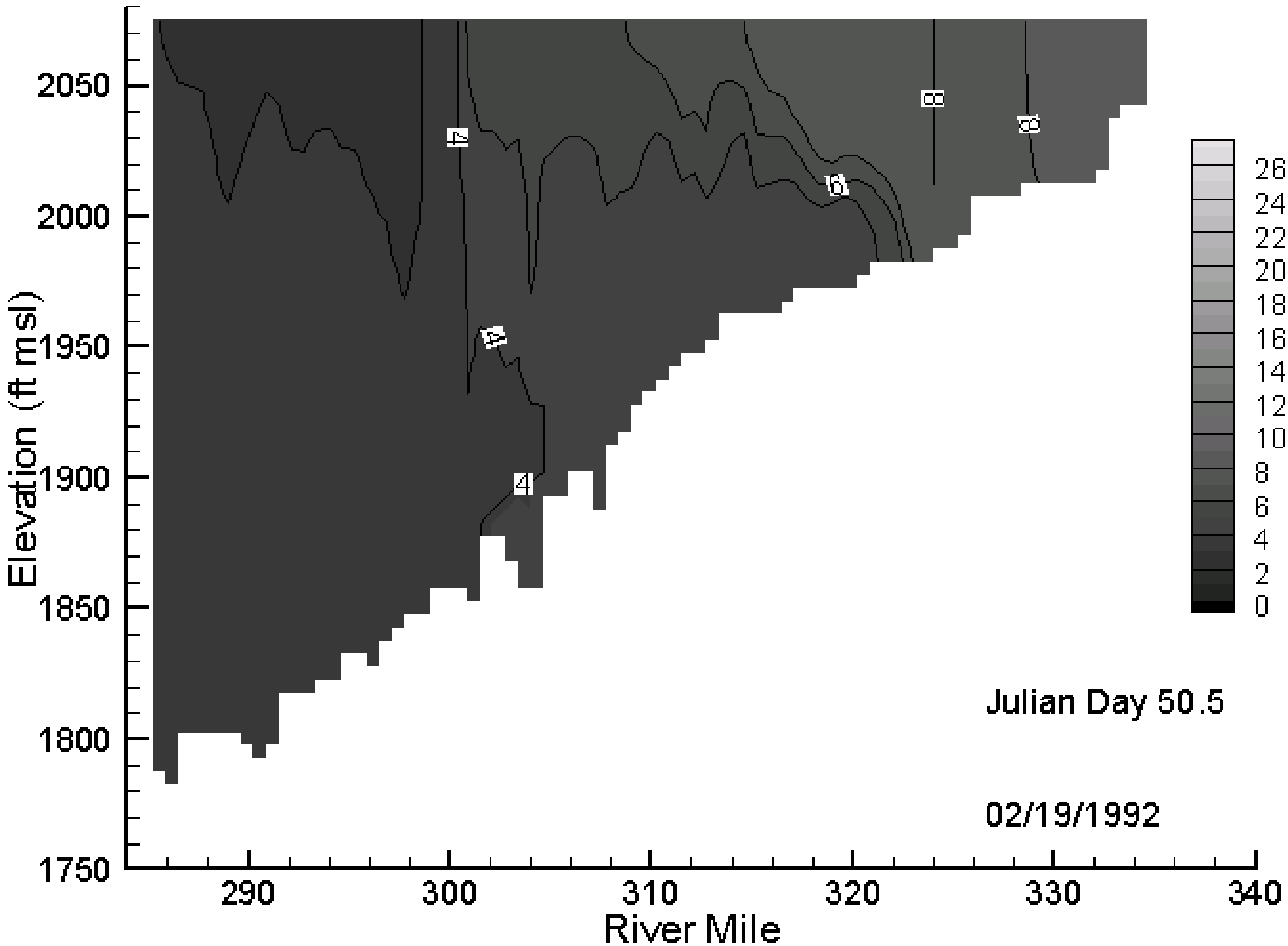

Figure 111. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

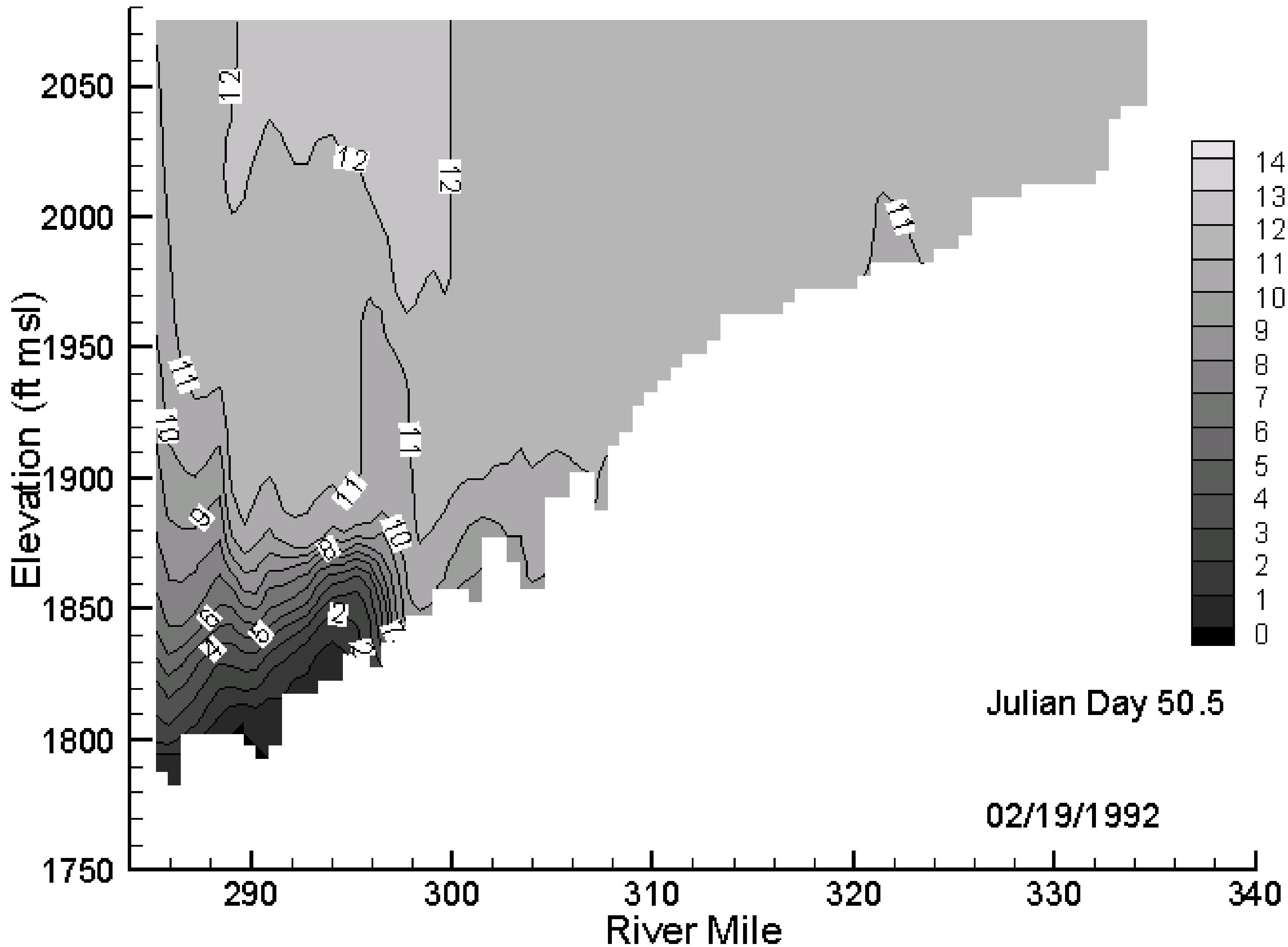

Figure 112. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

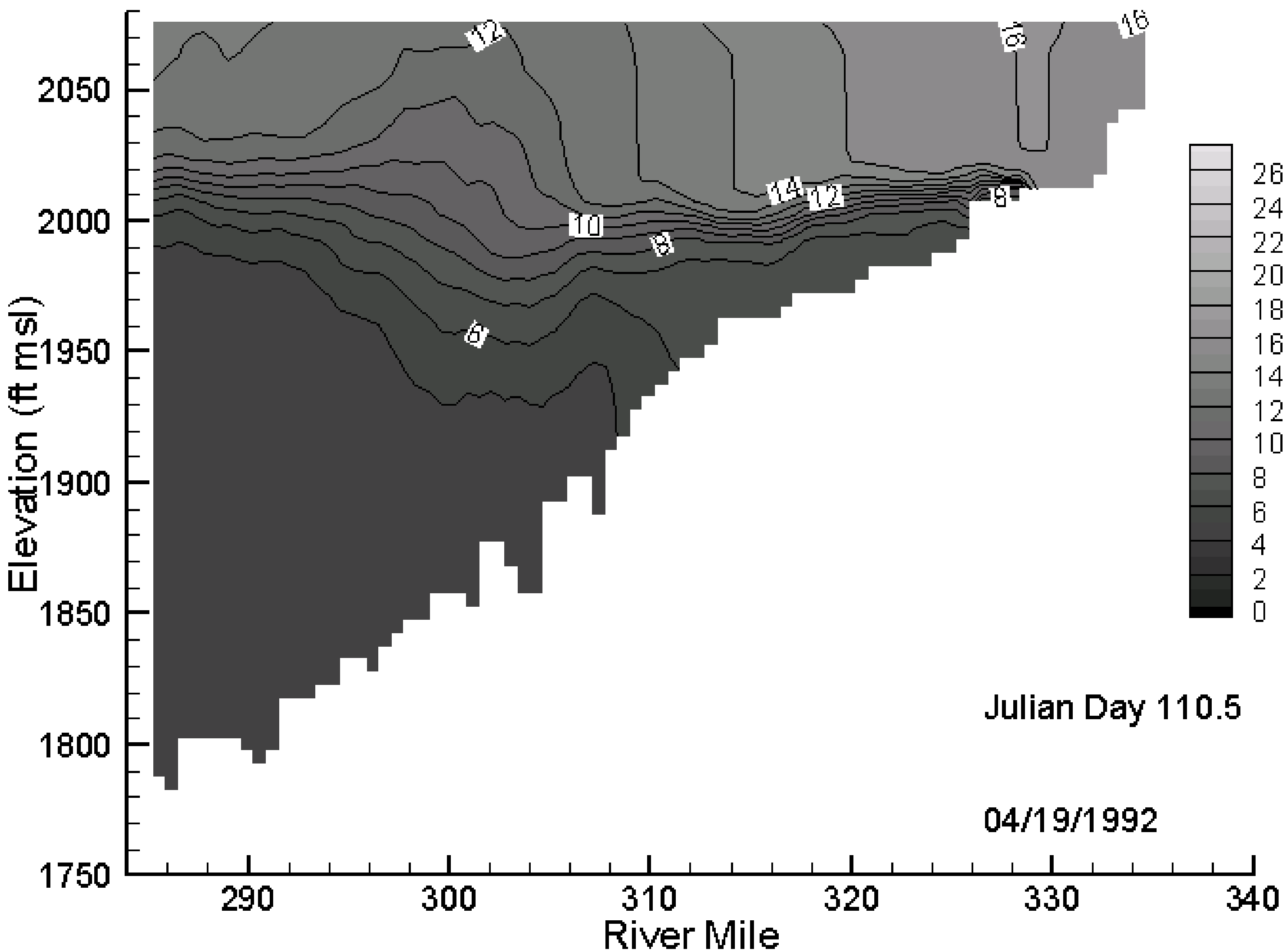

Figure 113. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

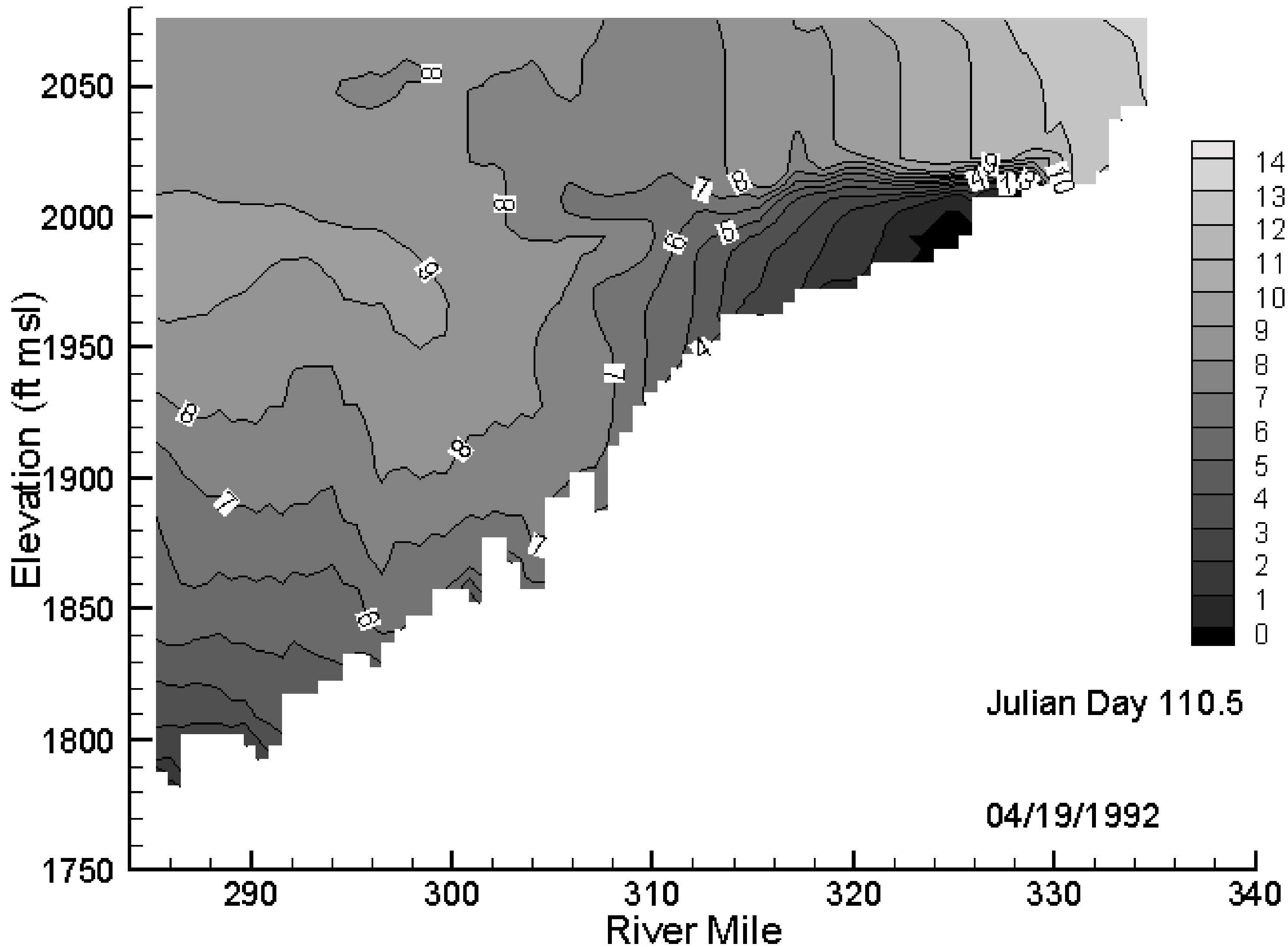

Figure 114. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

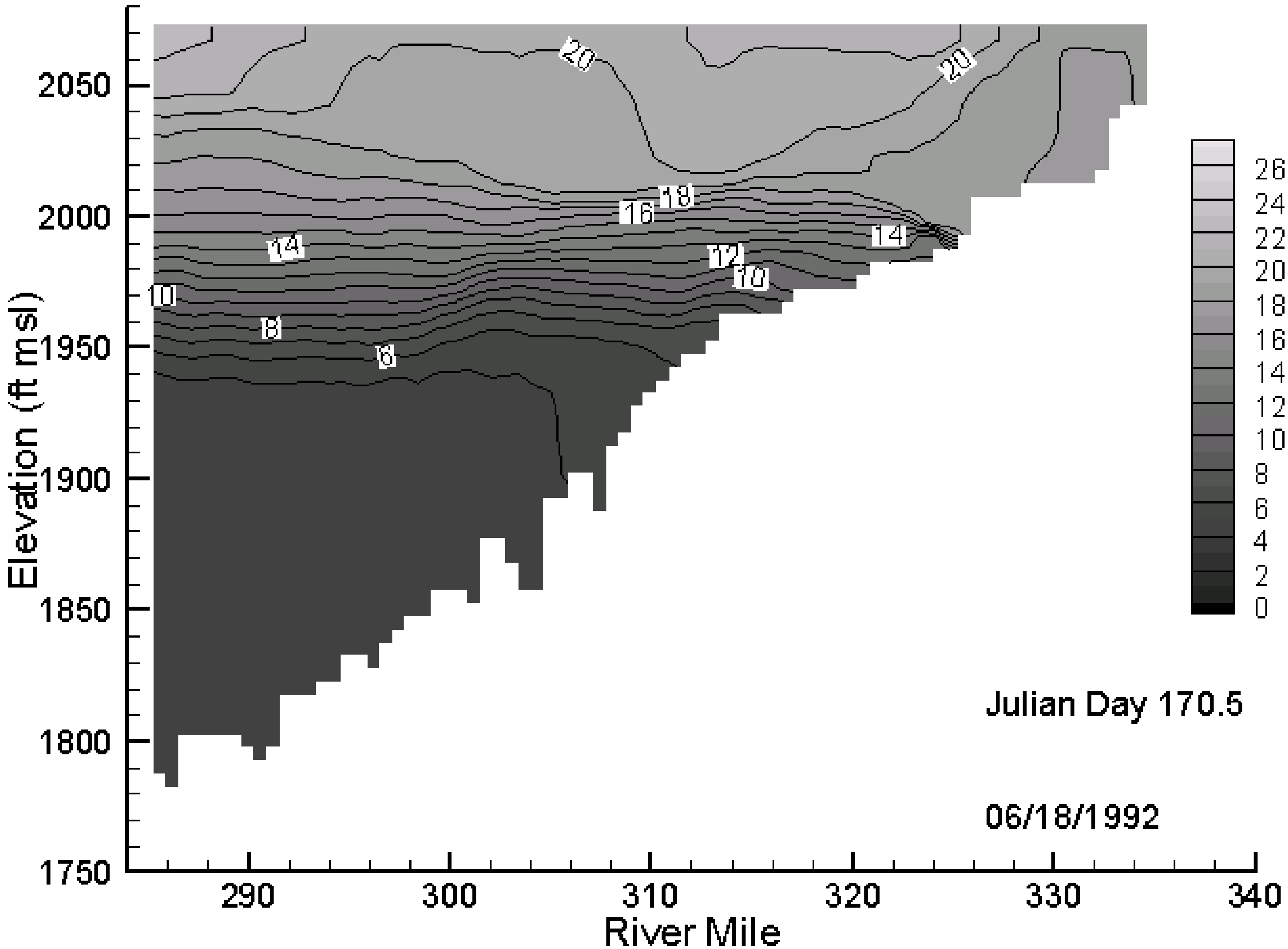

Figure 115. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

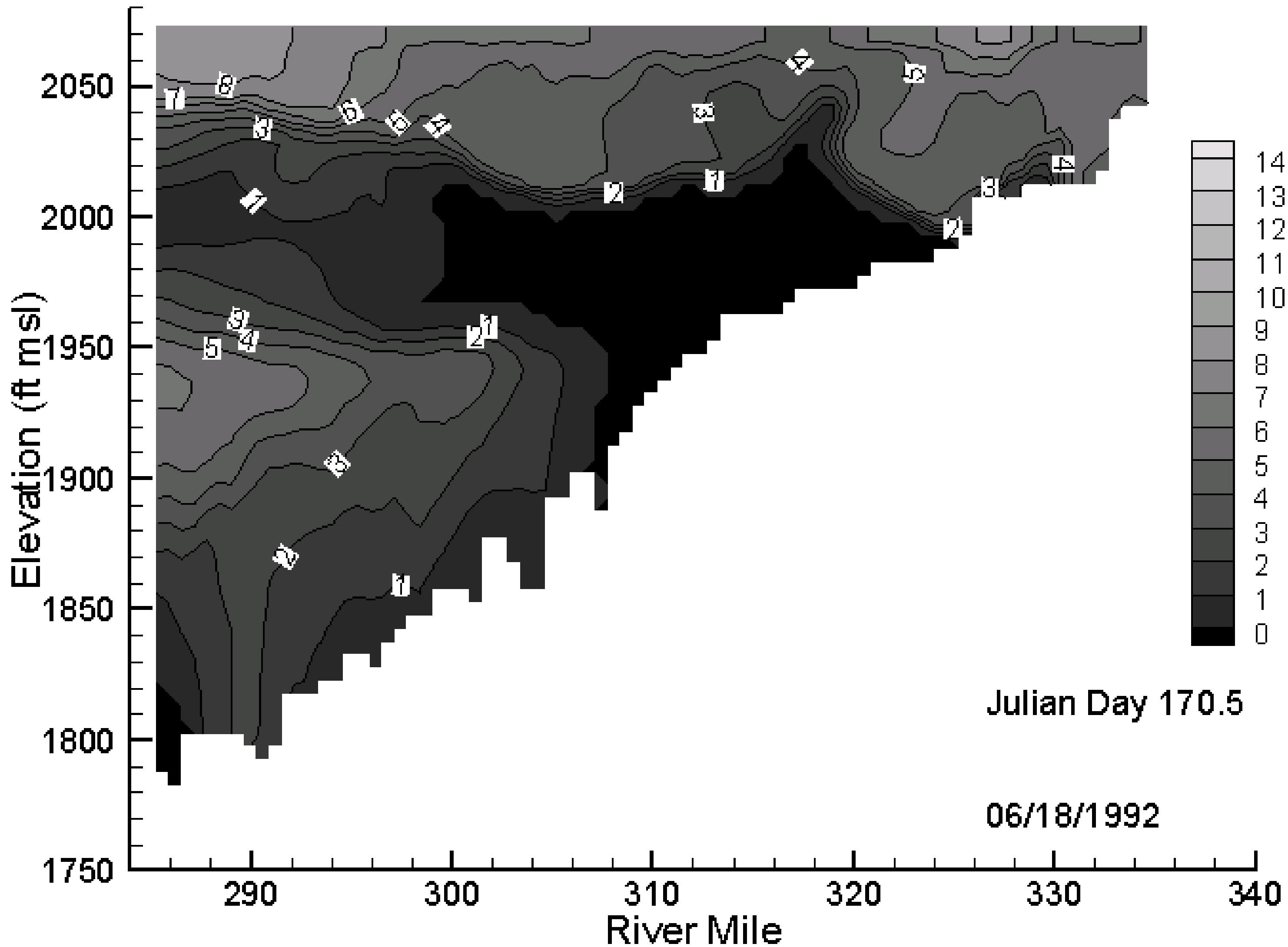

Figure 116. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

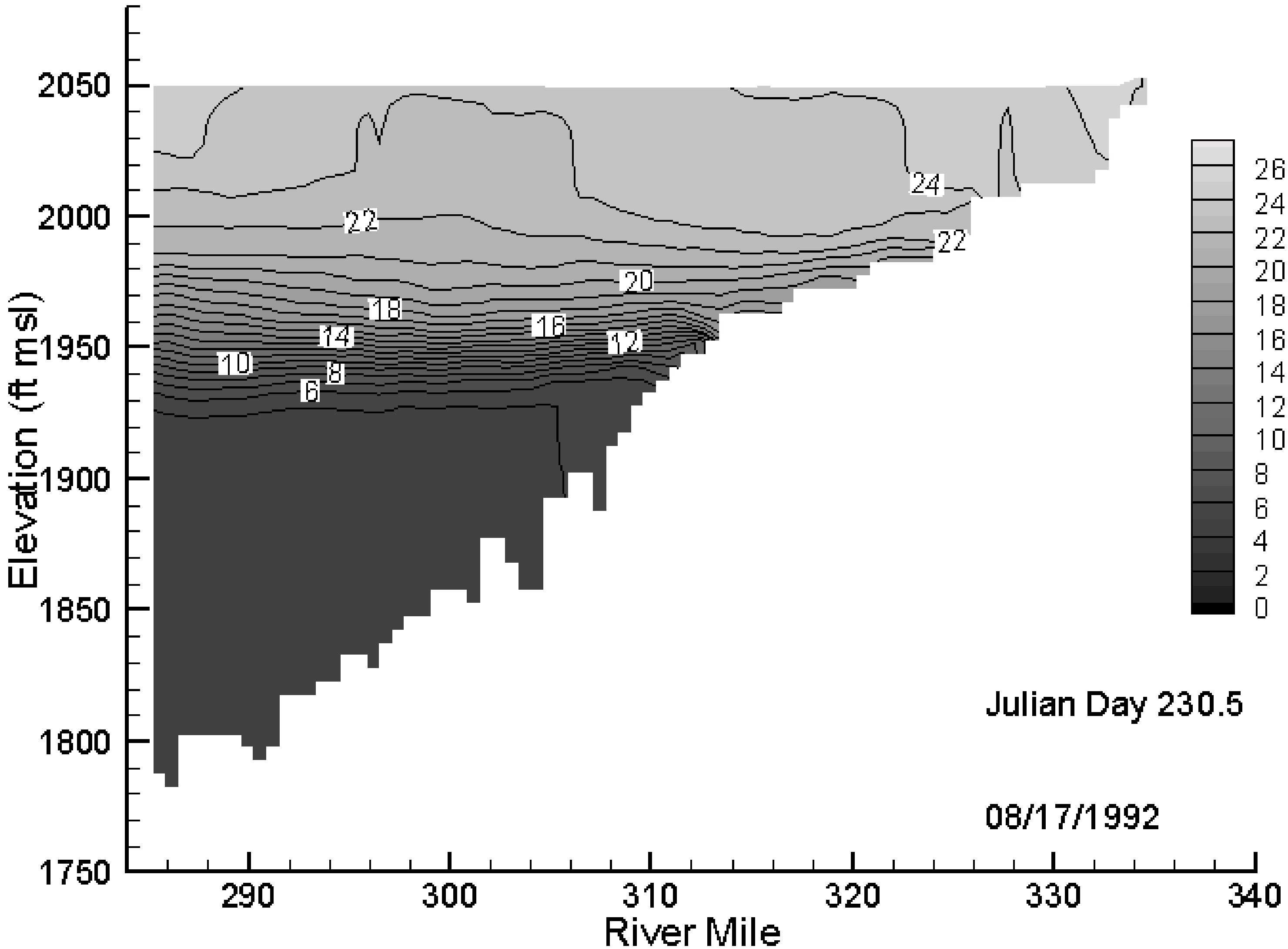

Figure 117. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

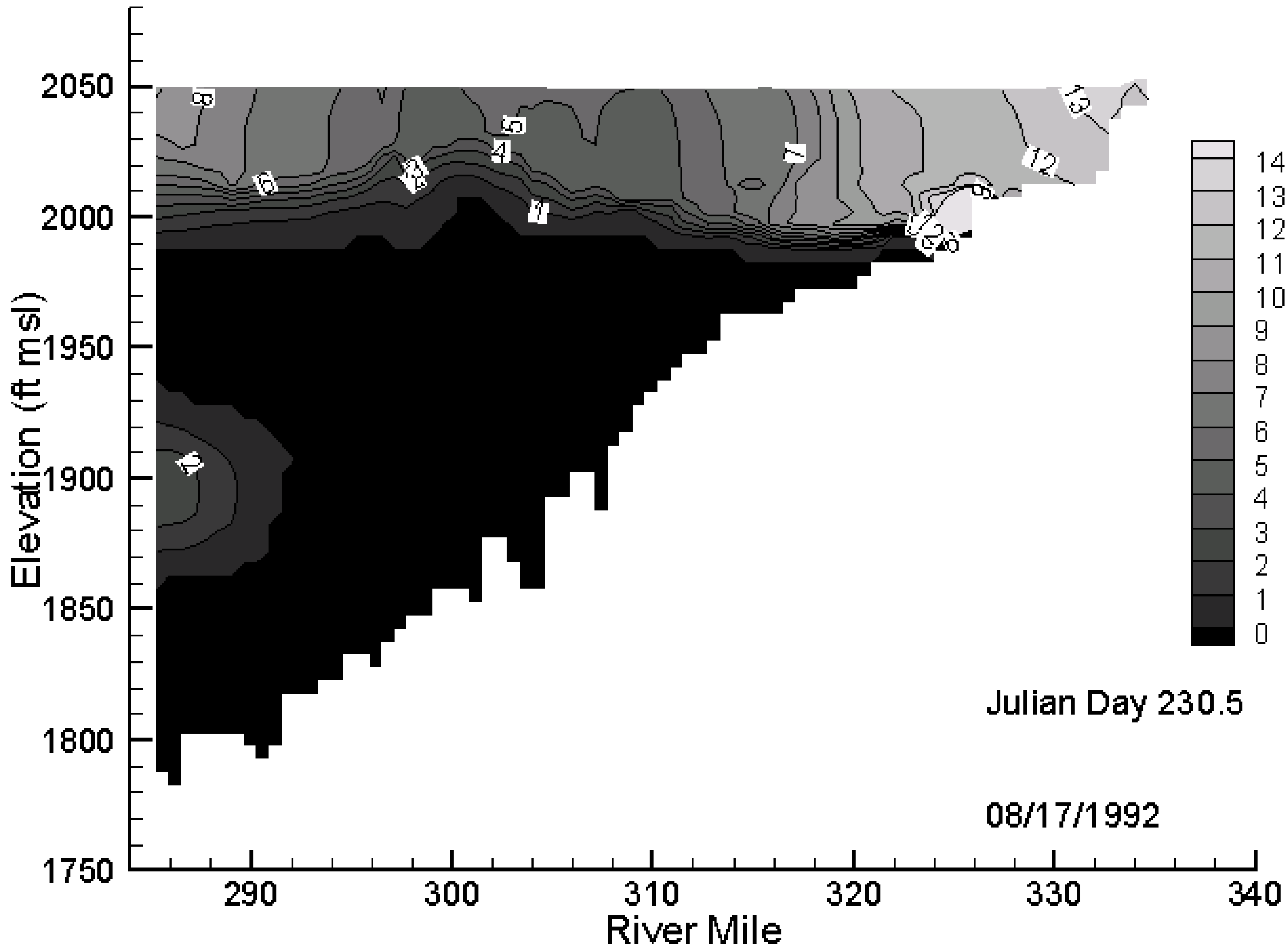

Figure 118. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

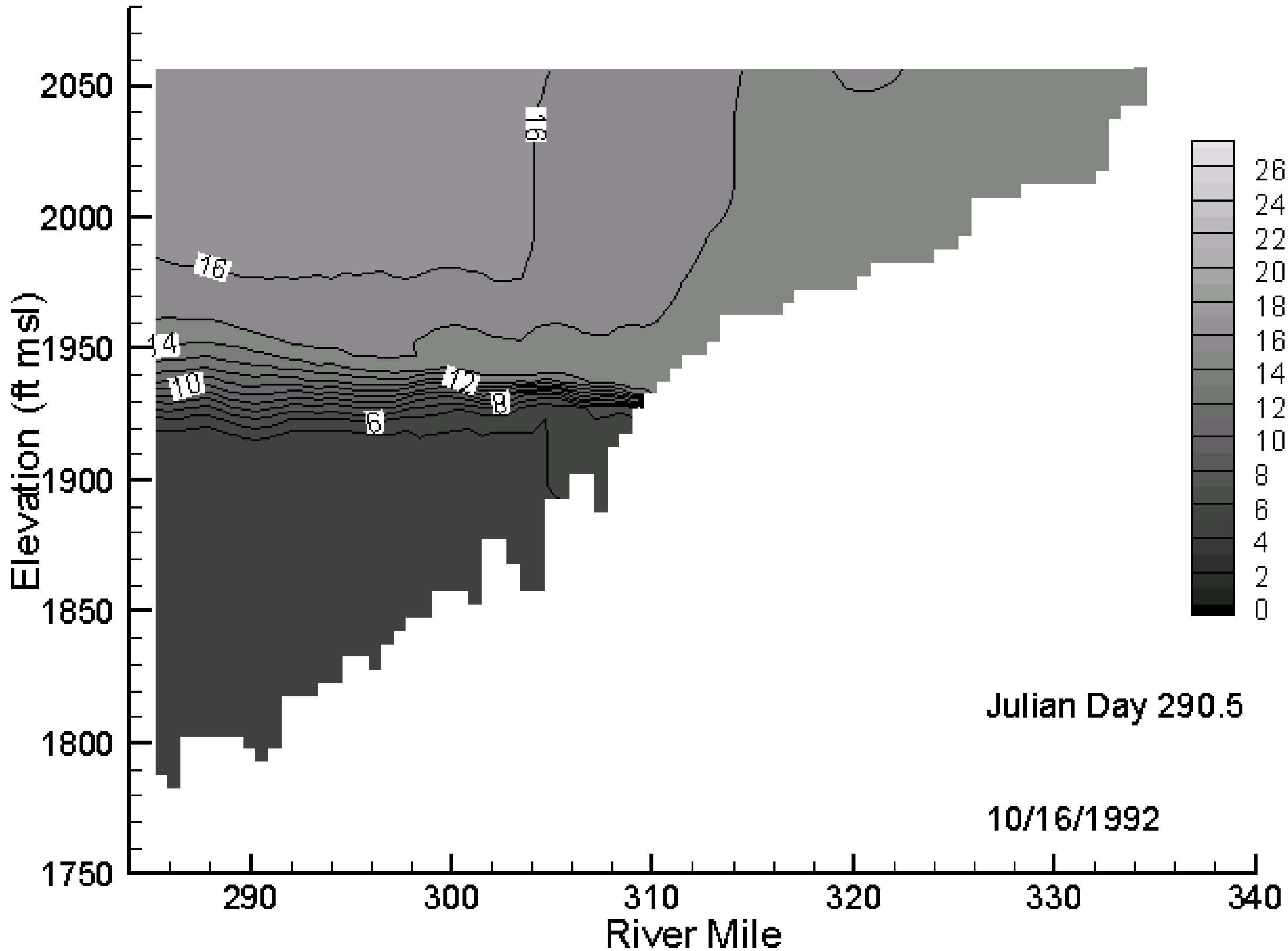

Figure 119. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

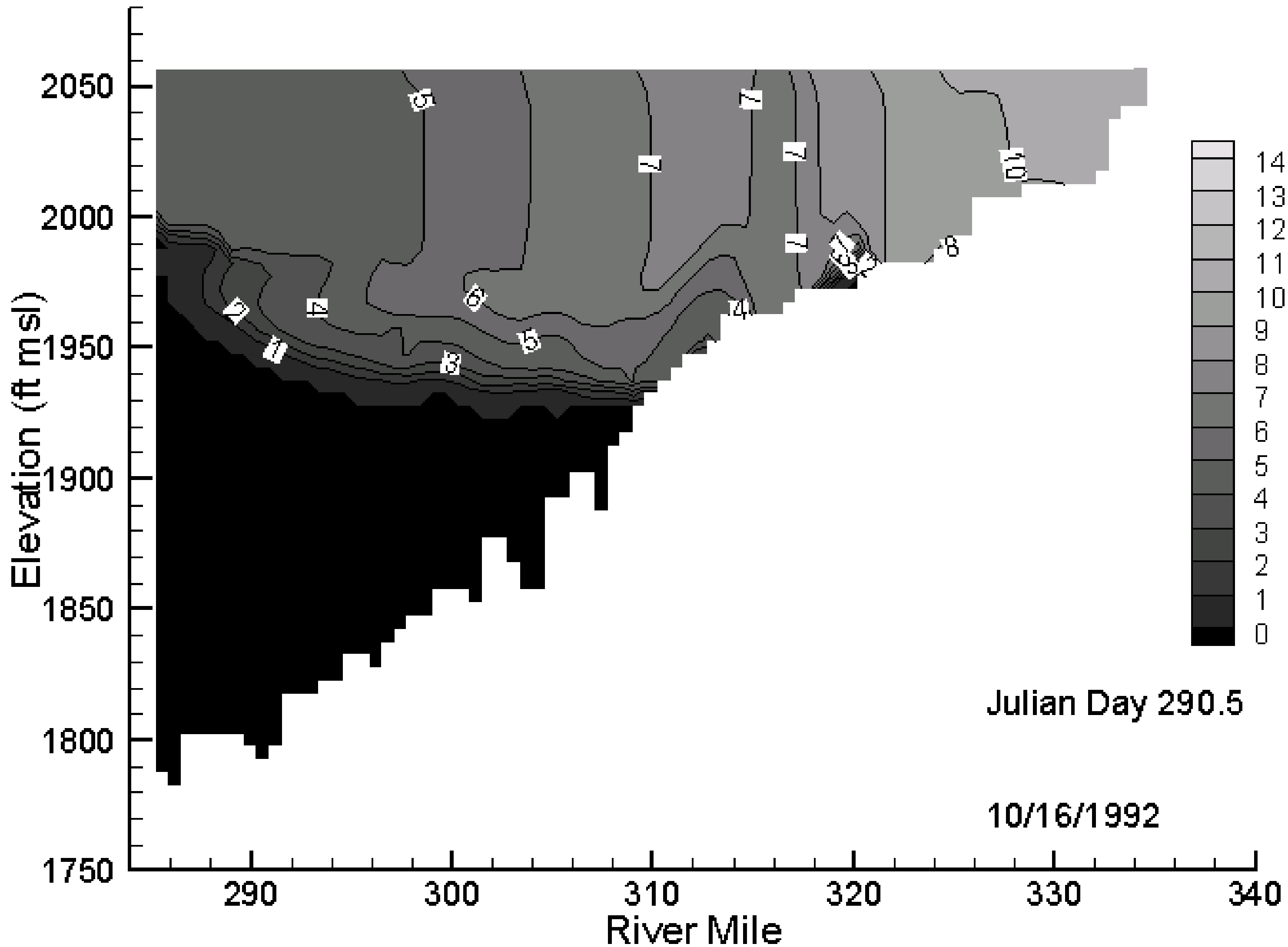

Figure 120. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

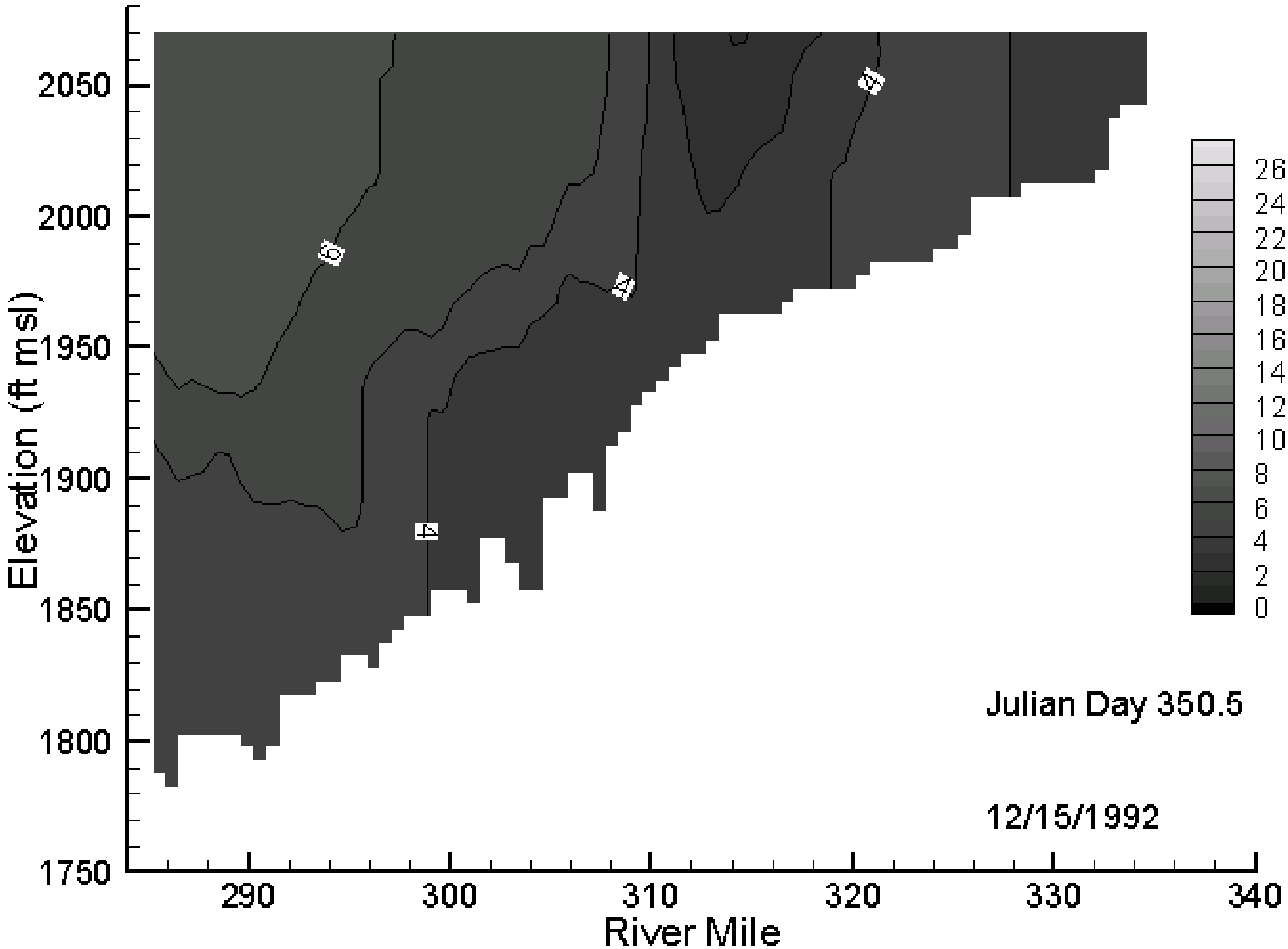

Figure 121. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

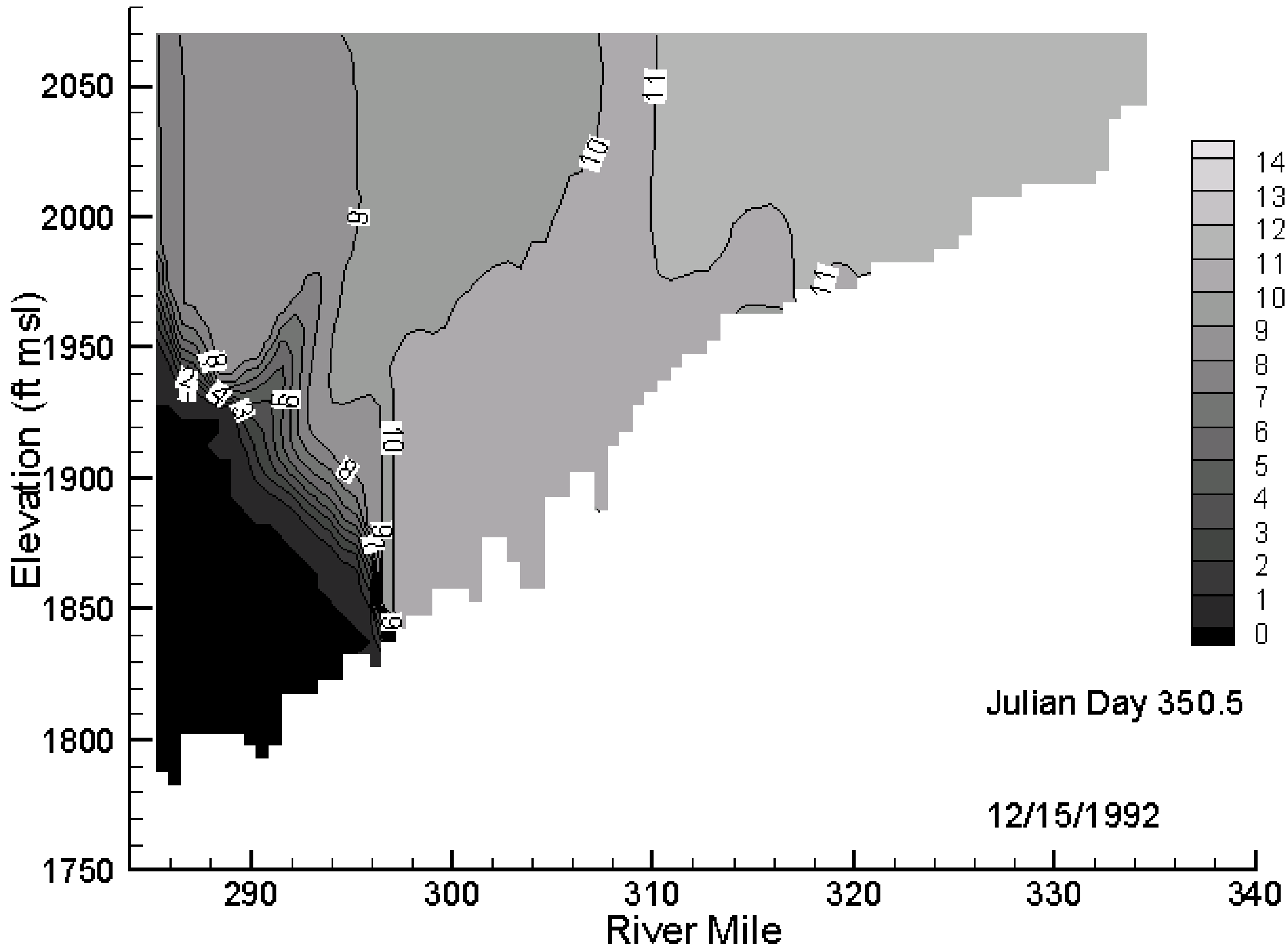

Figure 122. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

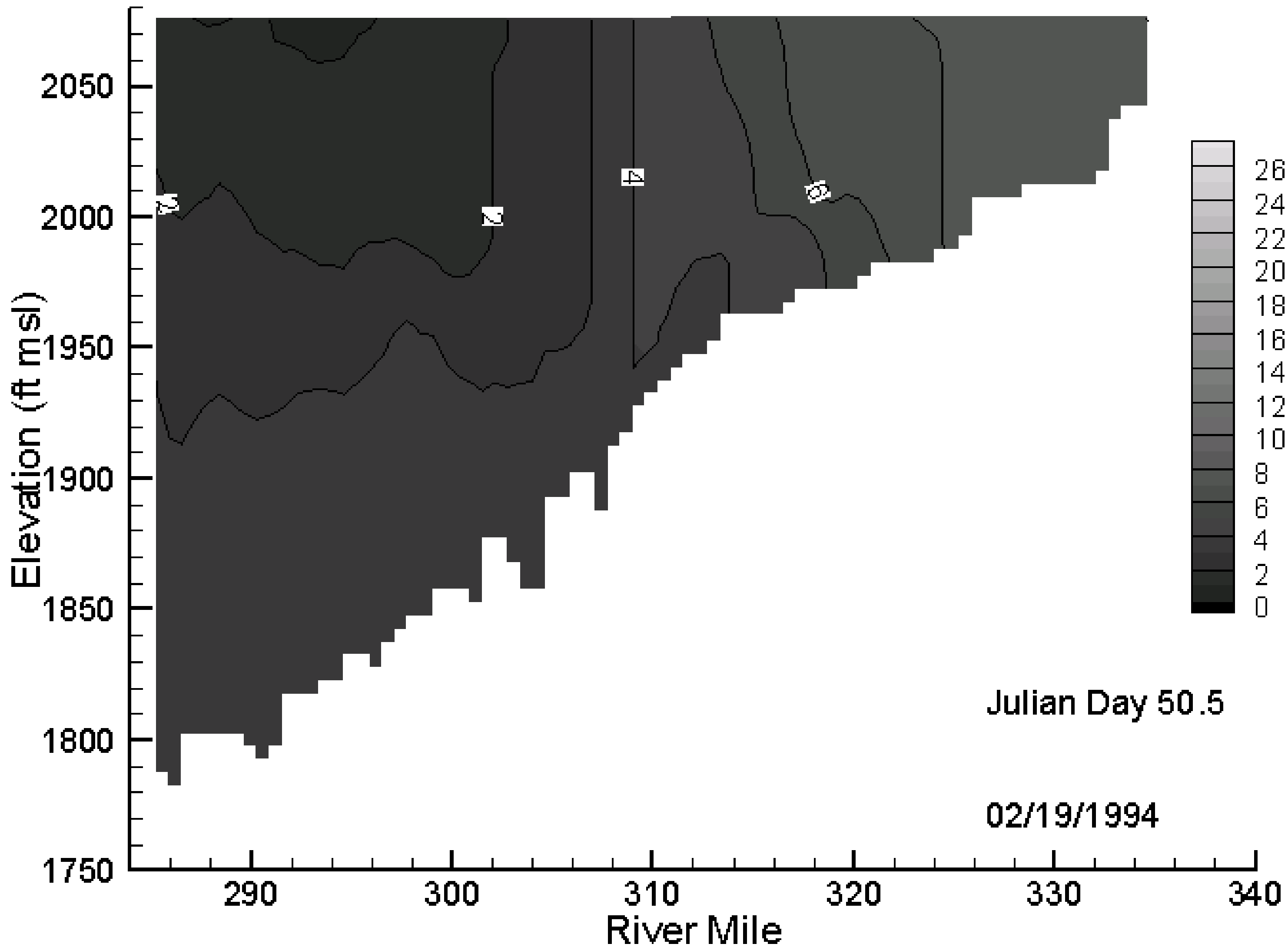

Figure 123. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

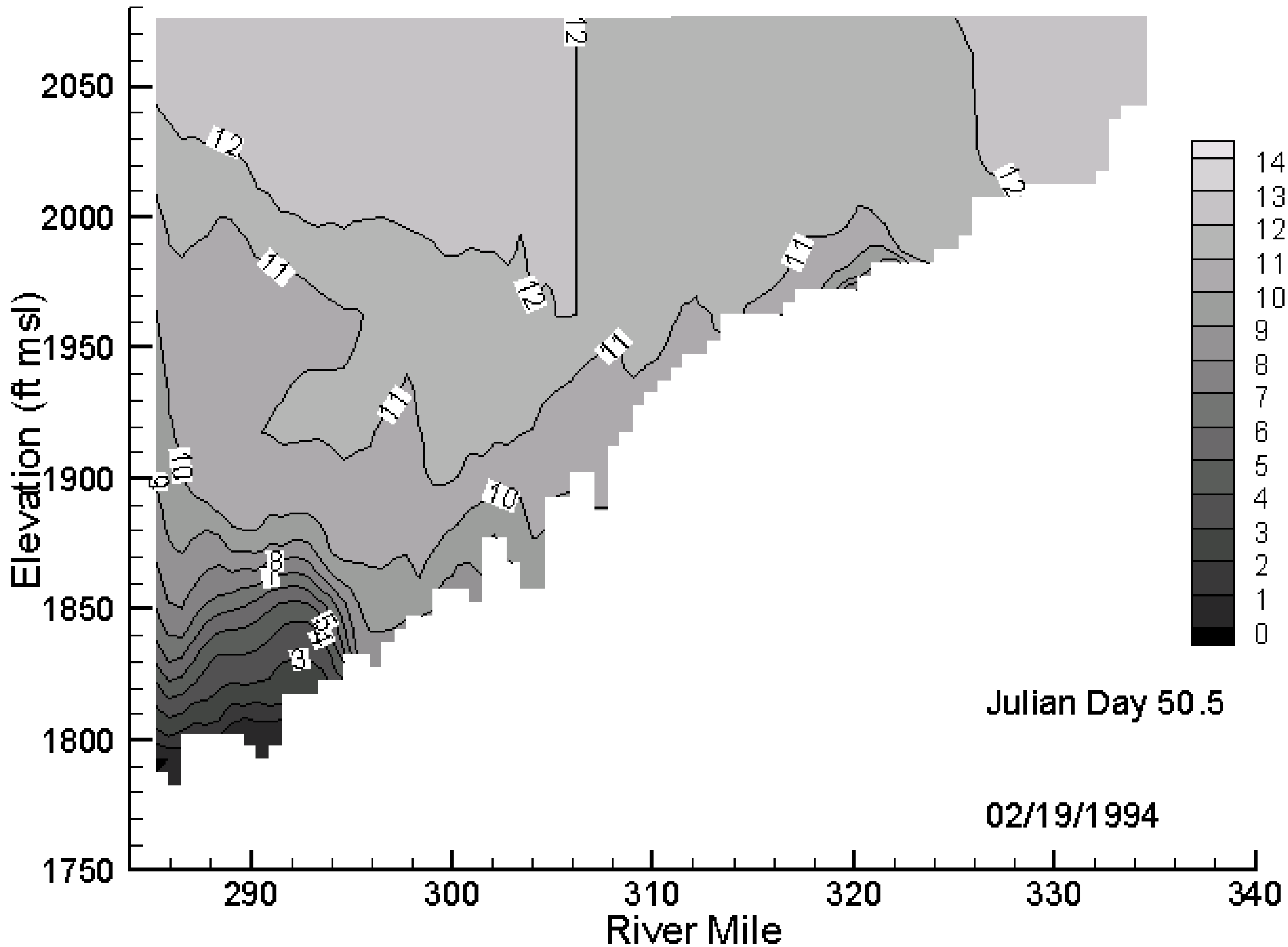

Figure 124. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

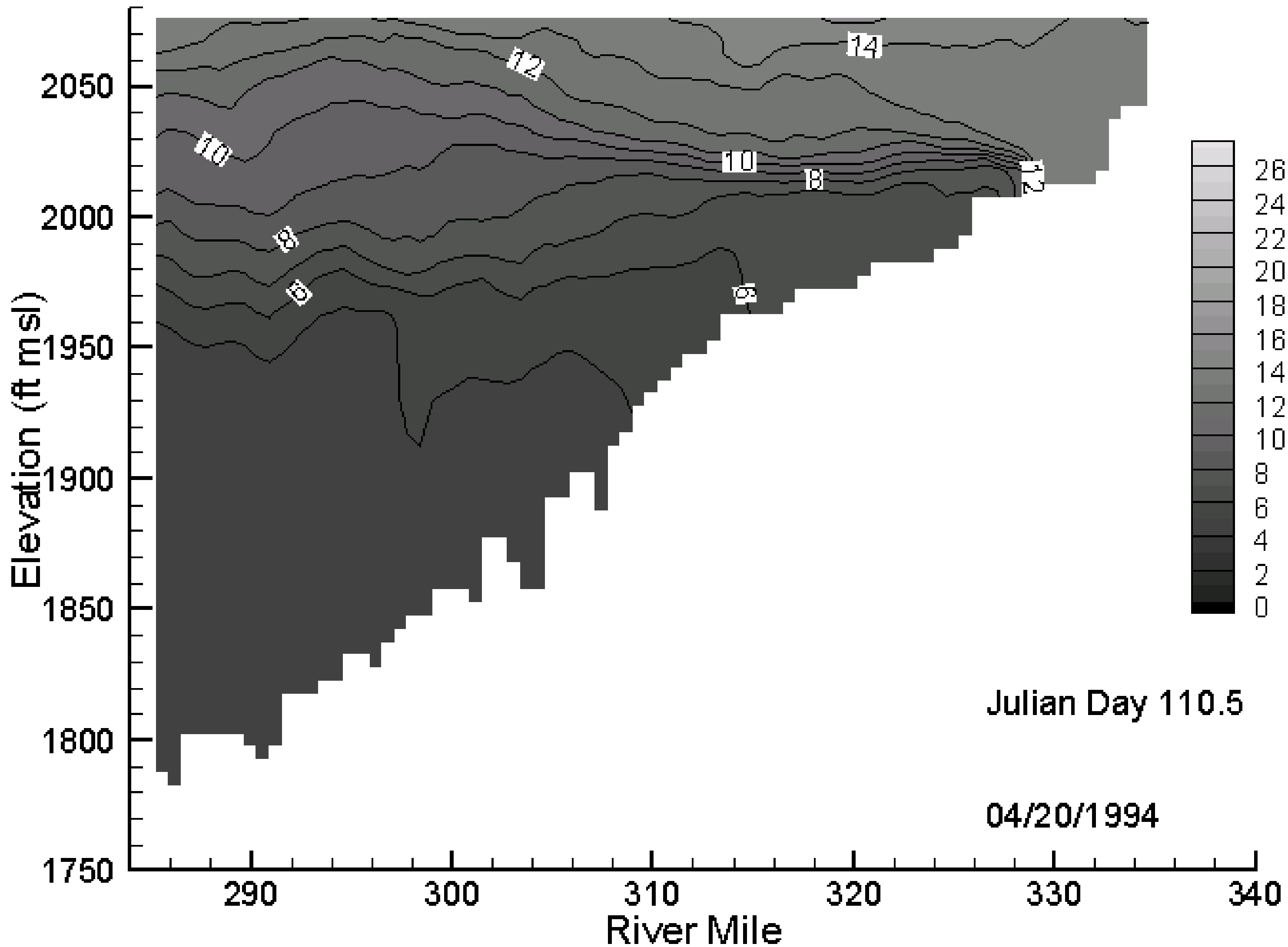

Figure 125. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

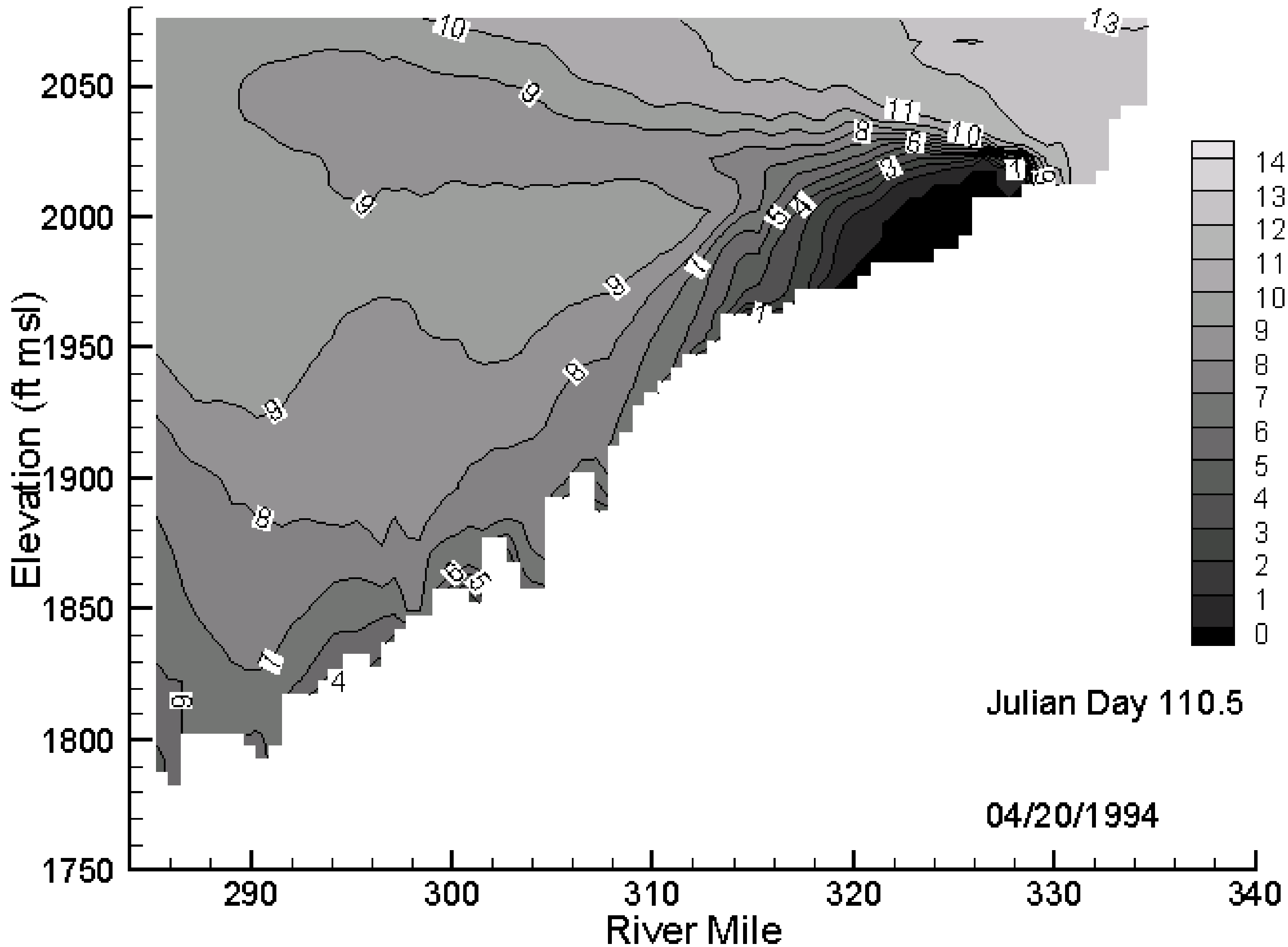

Figure 126. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

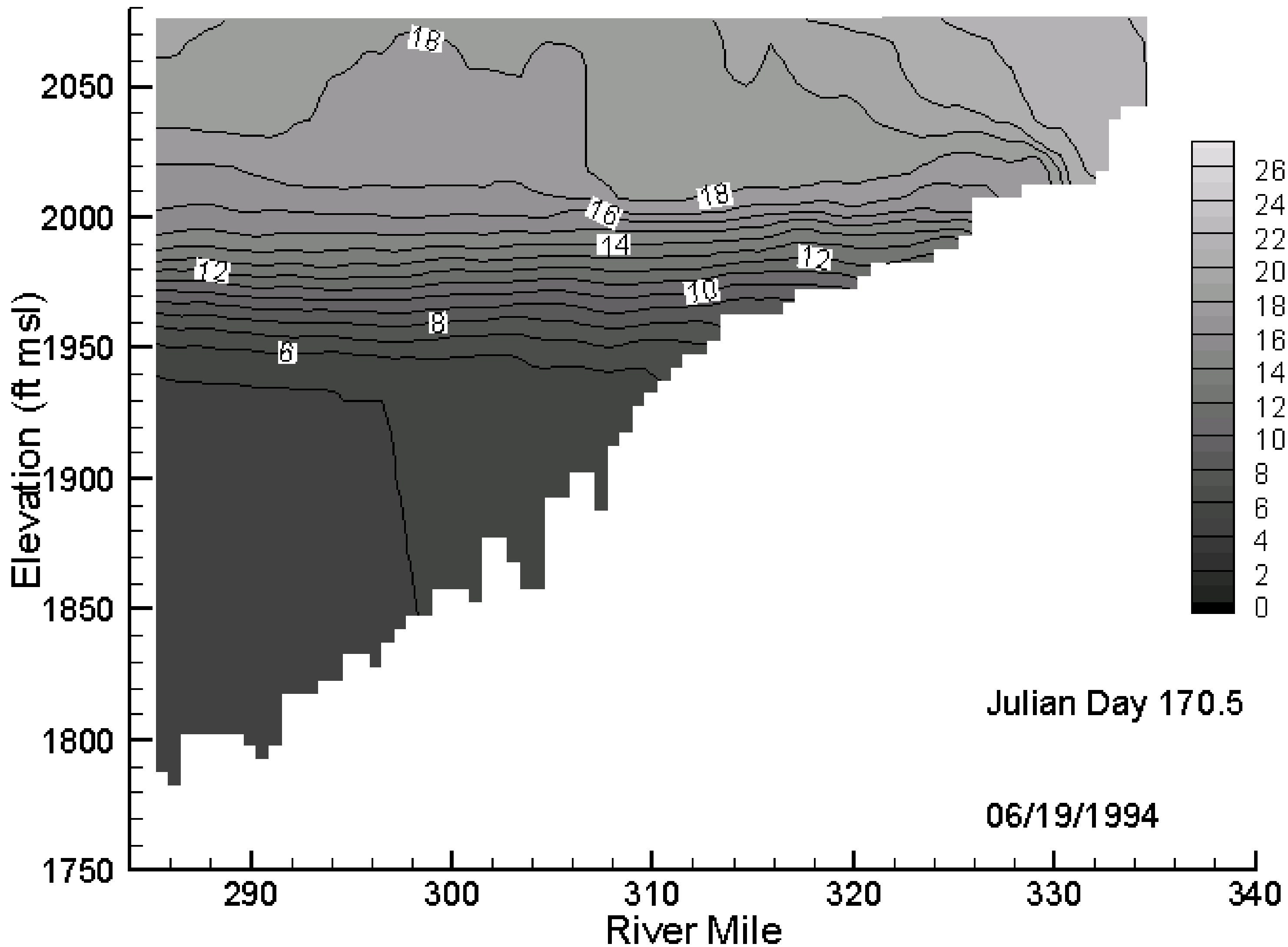

Figure 127. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

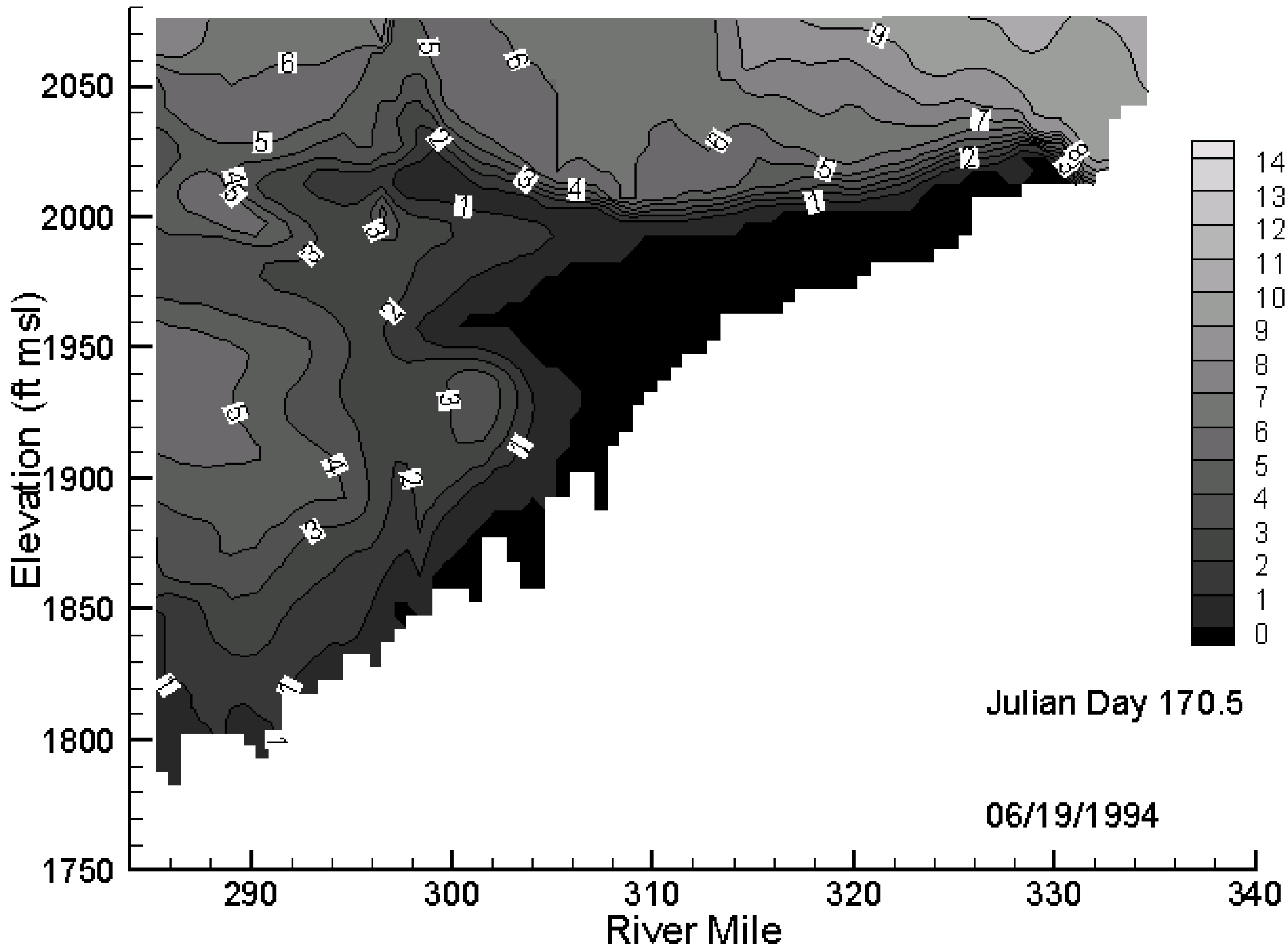

Figure 128. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

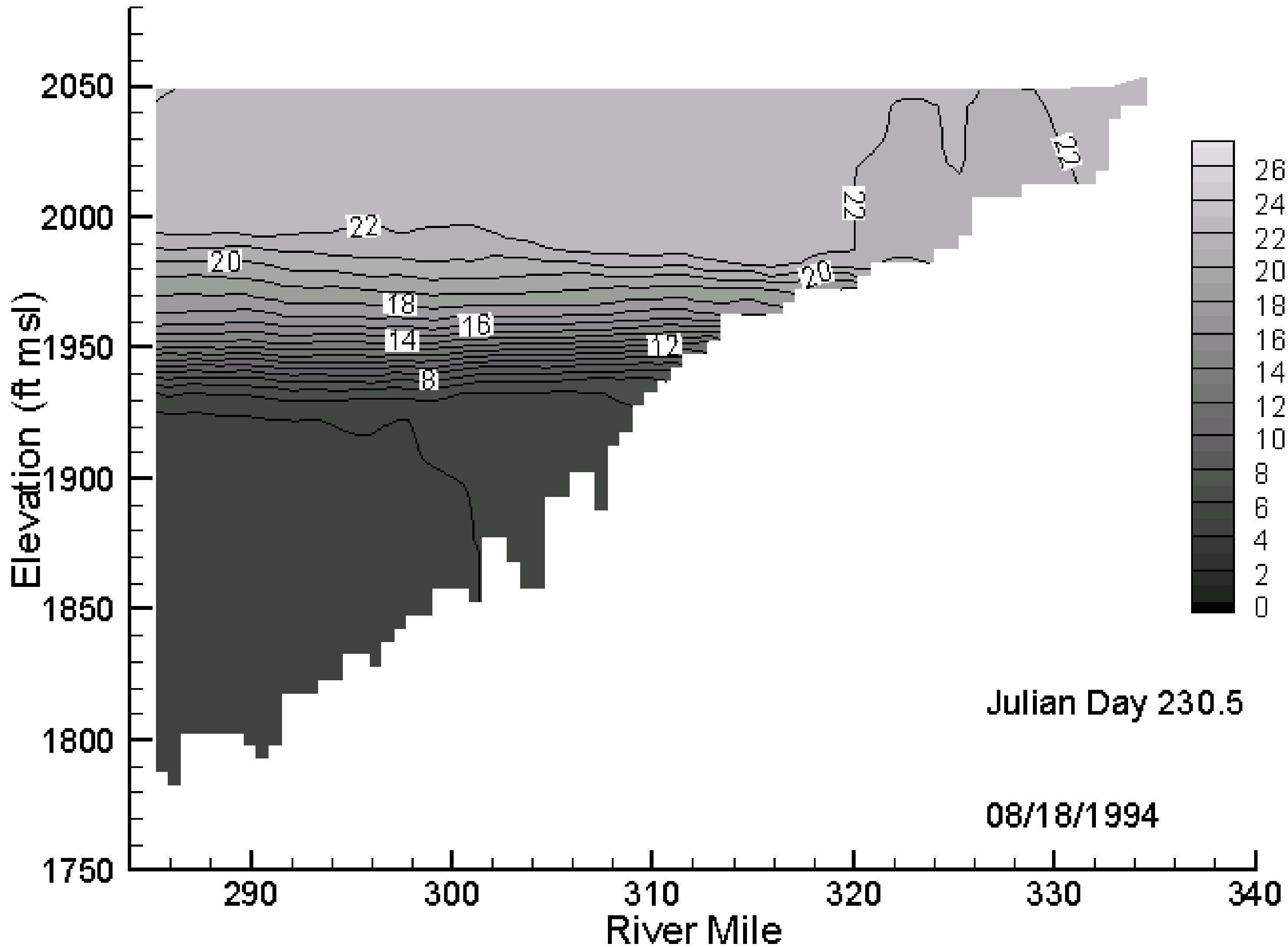

Figure 129. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

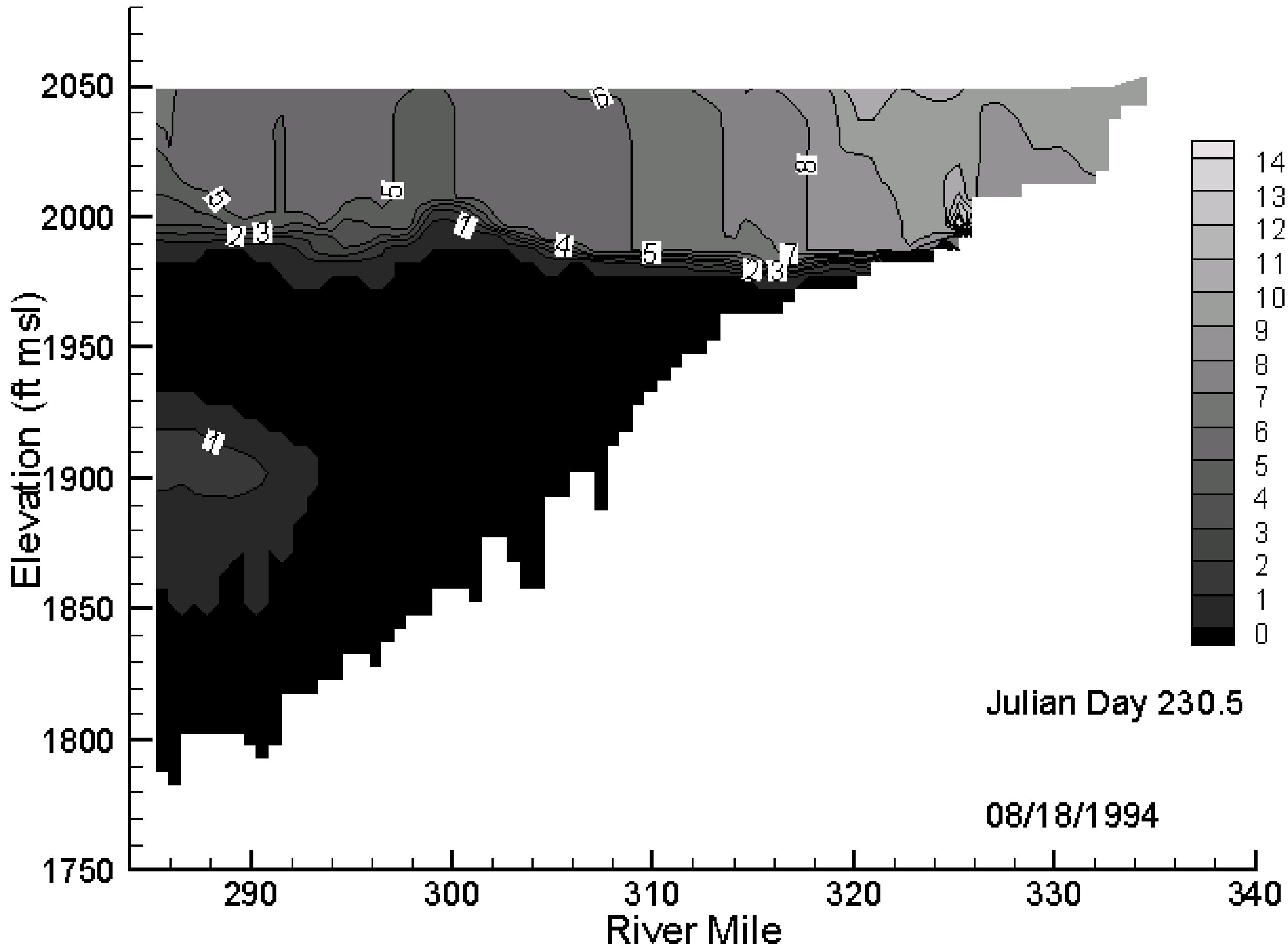

Figure 130. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

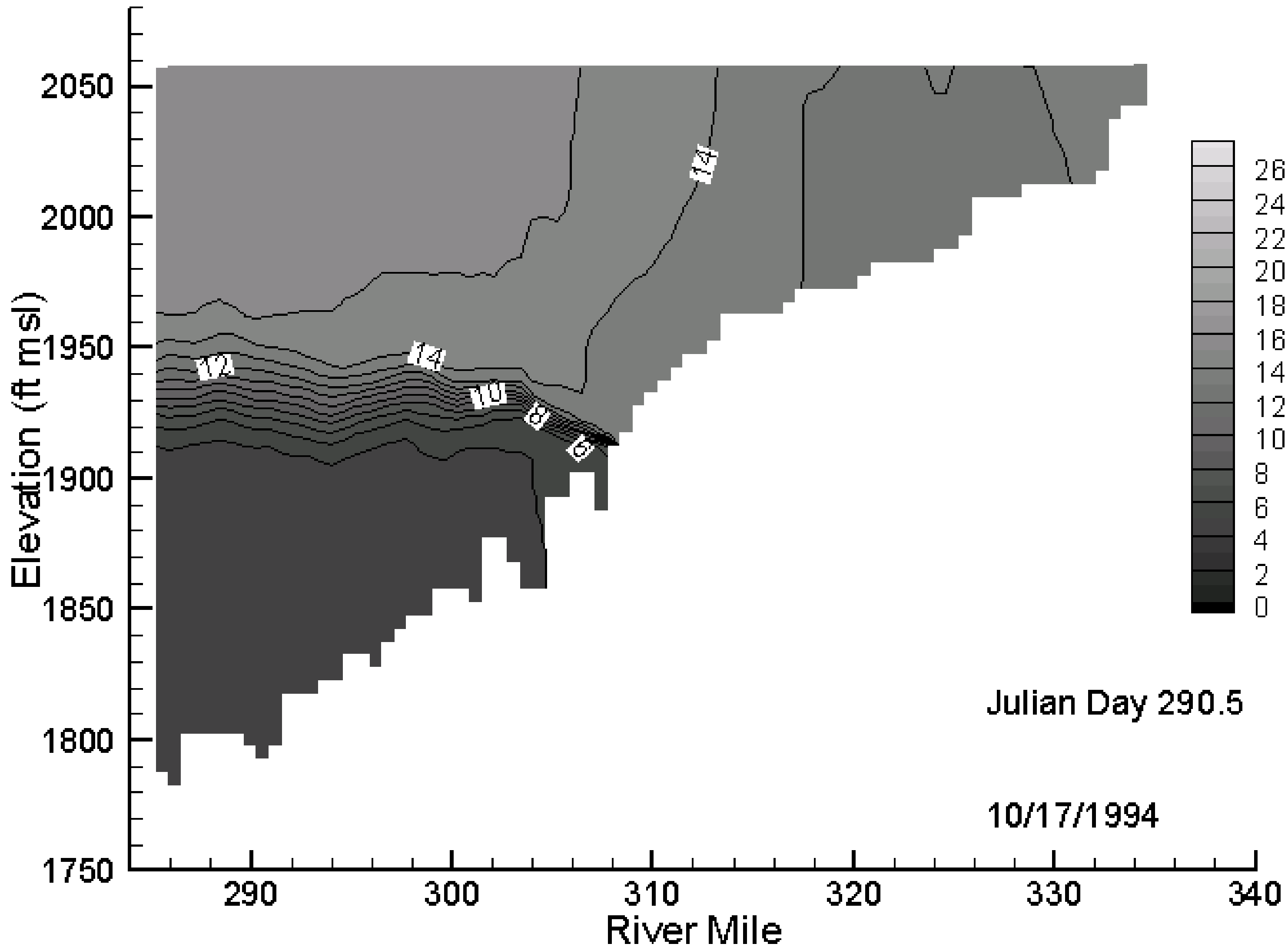

Figure 131. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

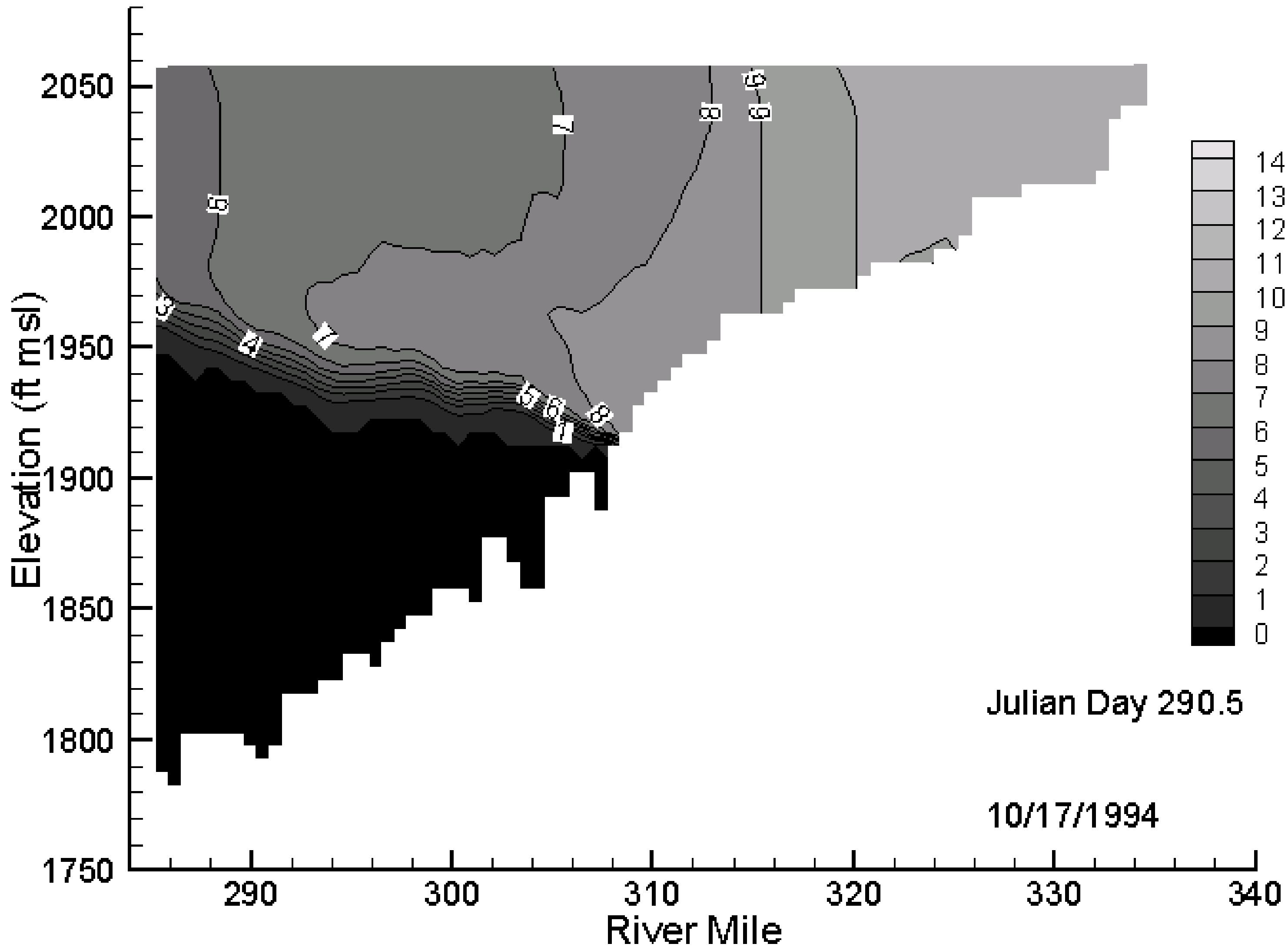

Figure 132. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

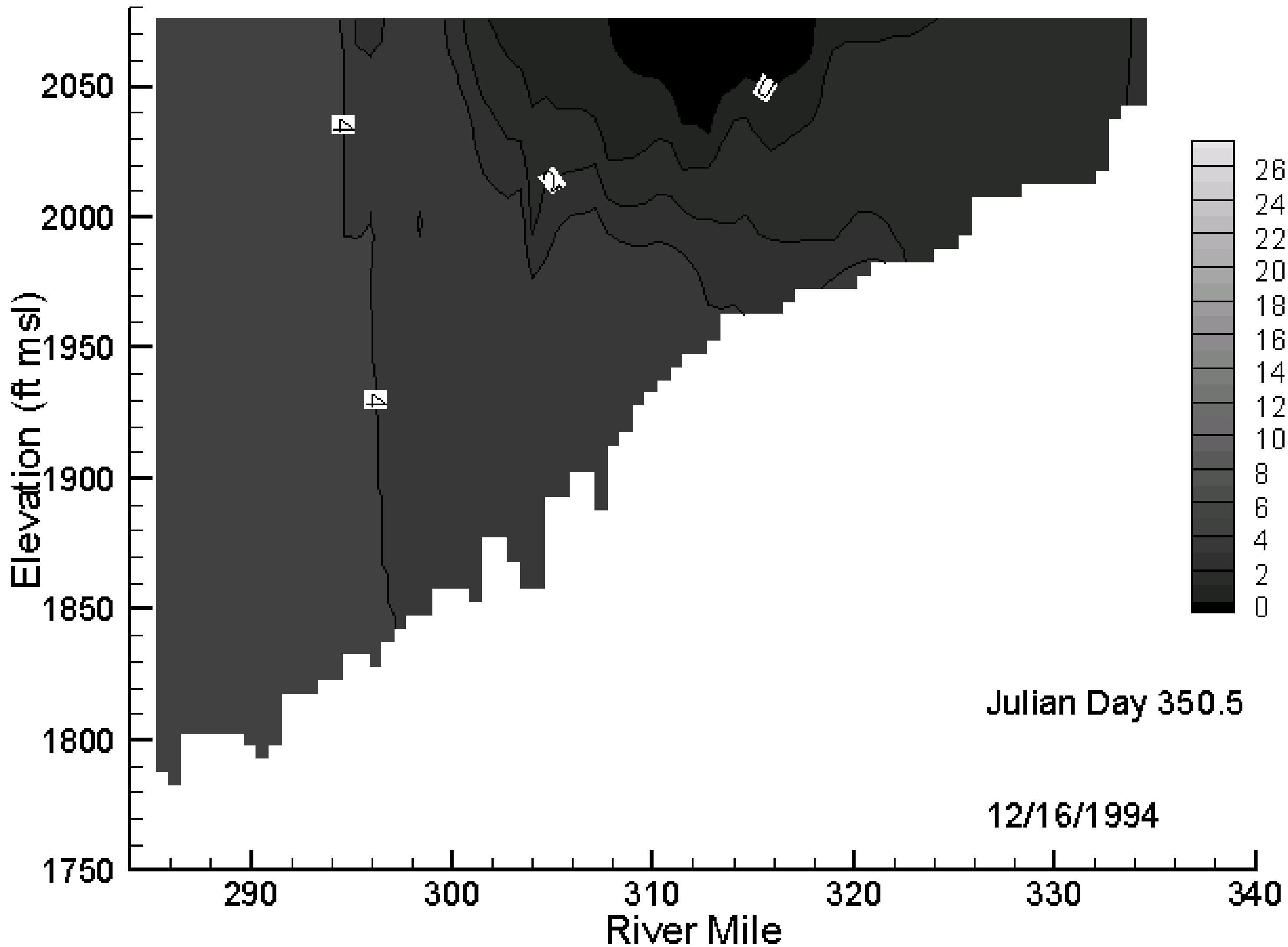

Figure 133. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

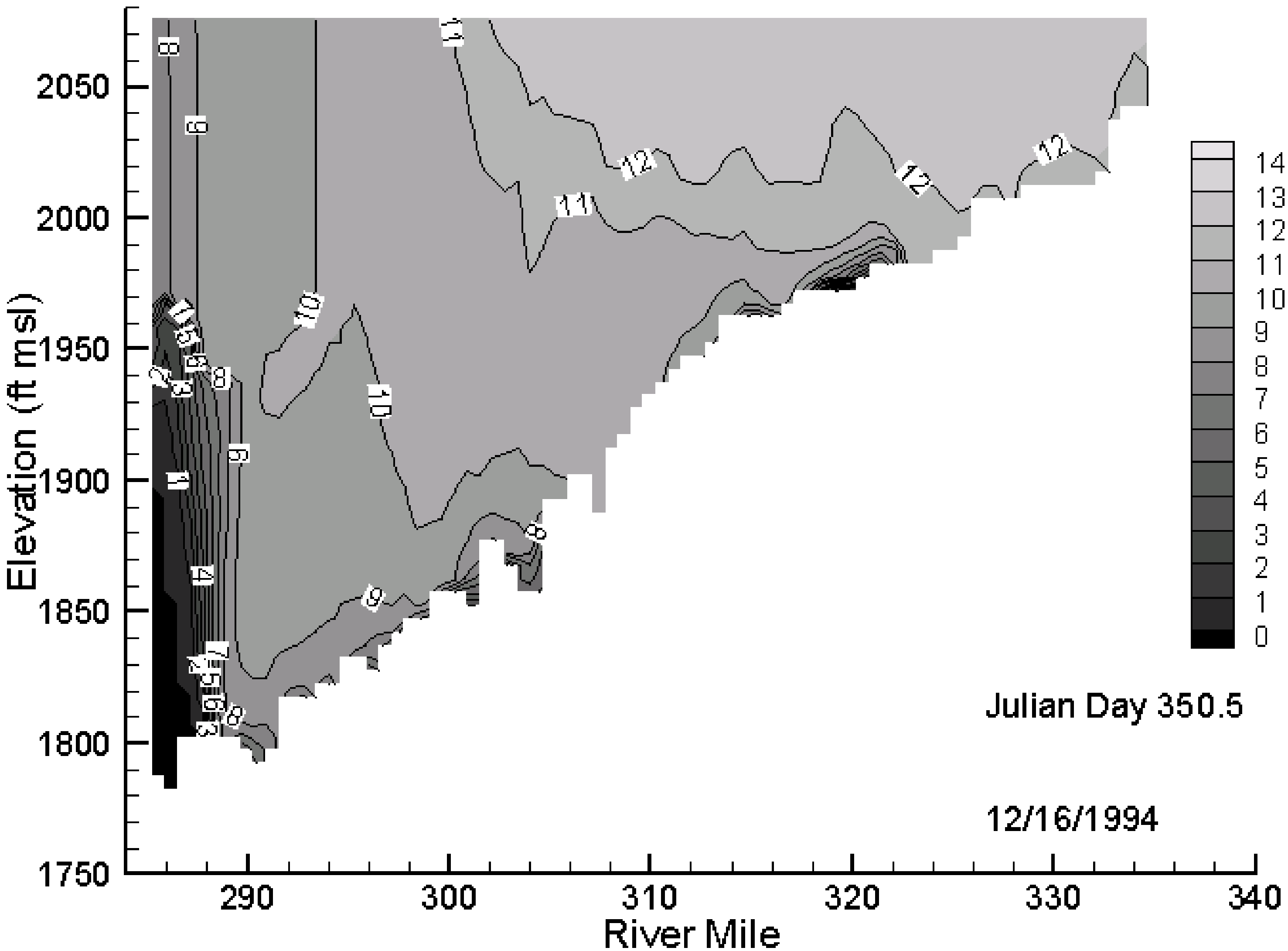

Figure 134. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

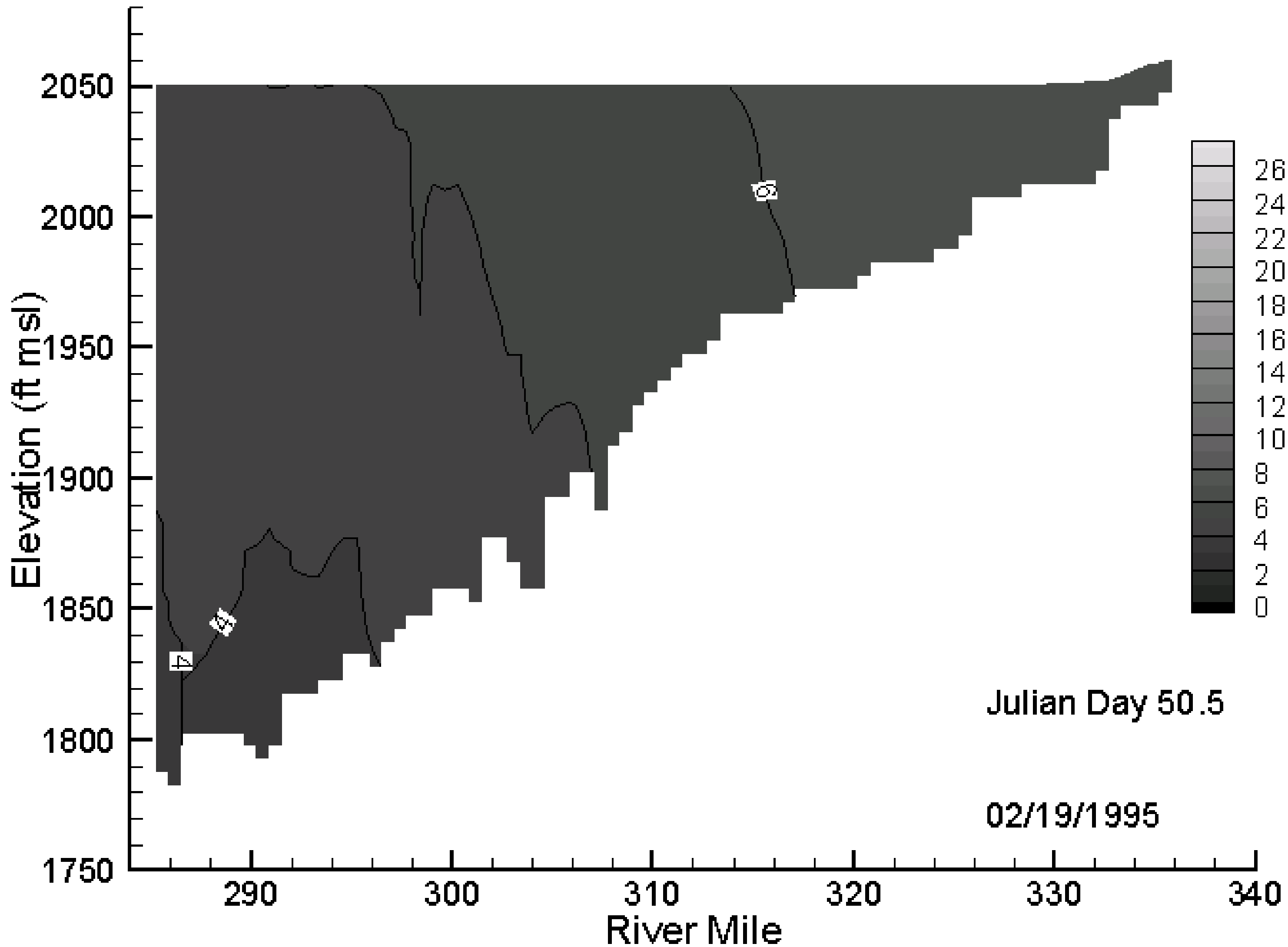

Figure 135. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

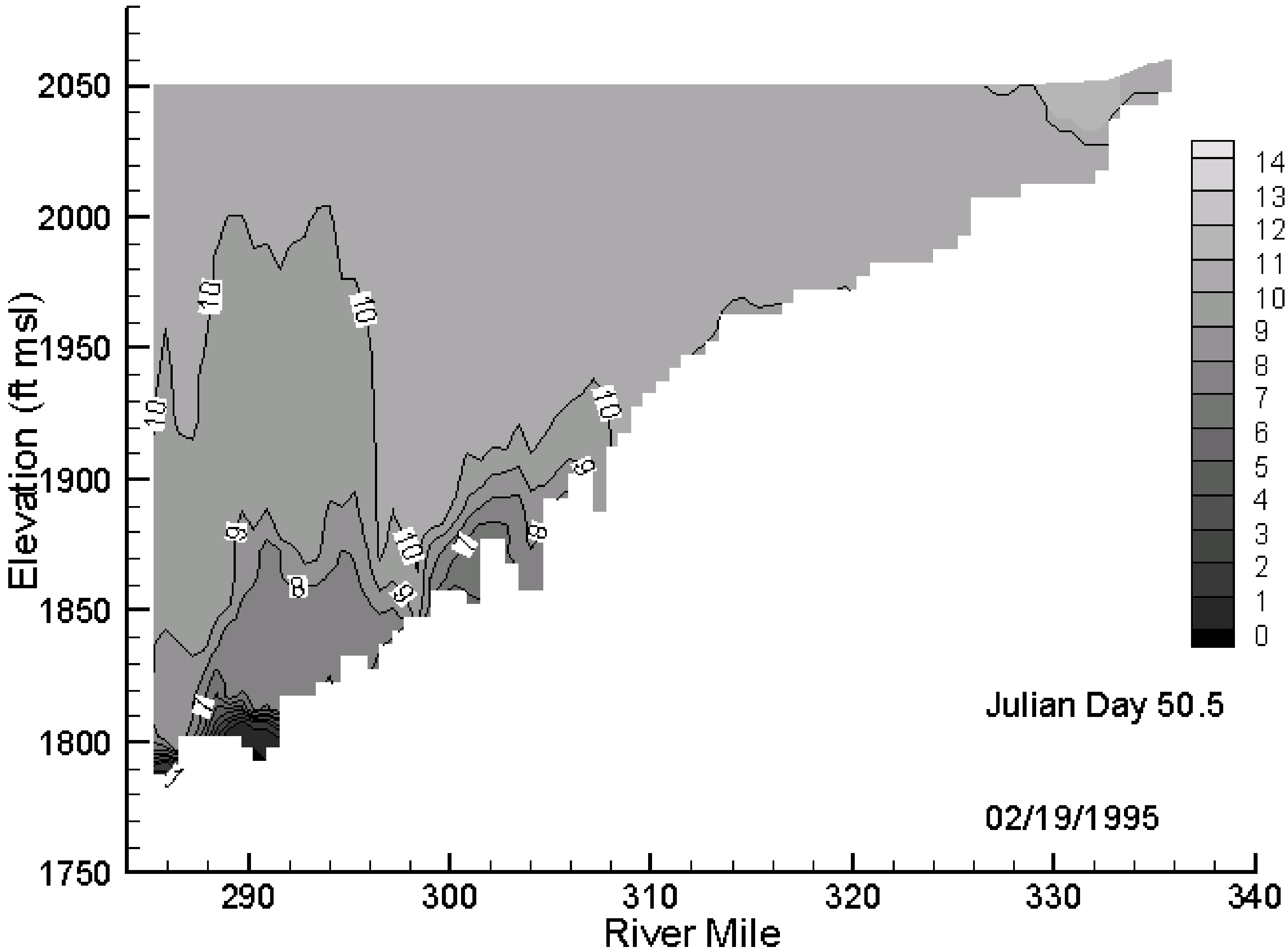

Figure 136. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

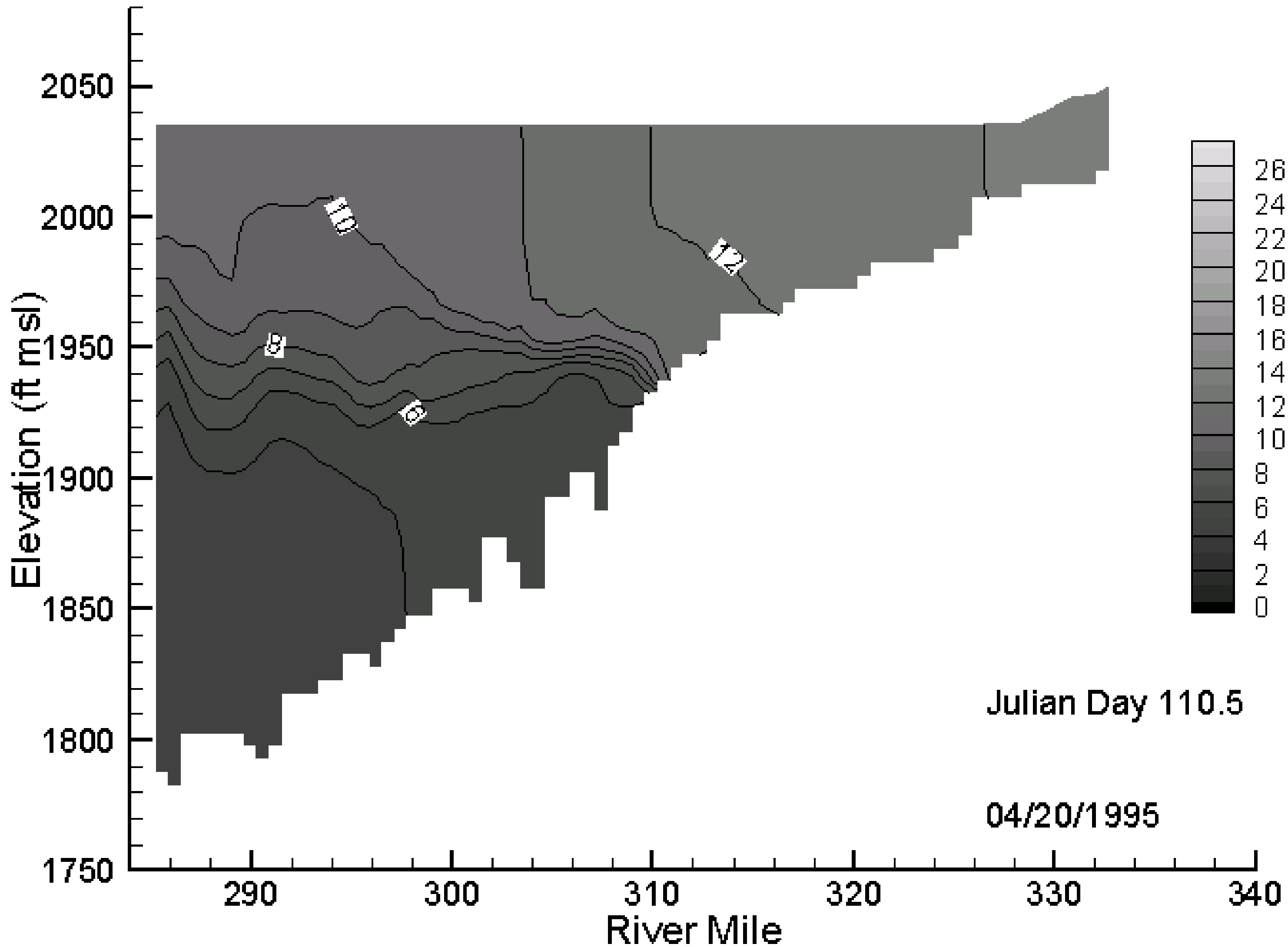

Figure 137. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

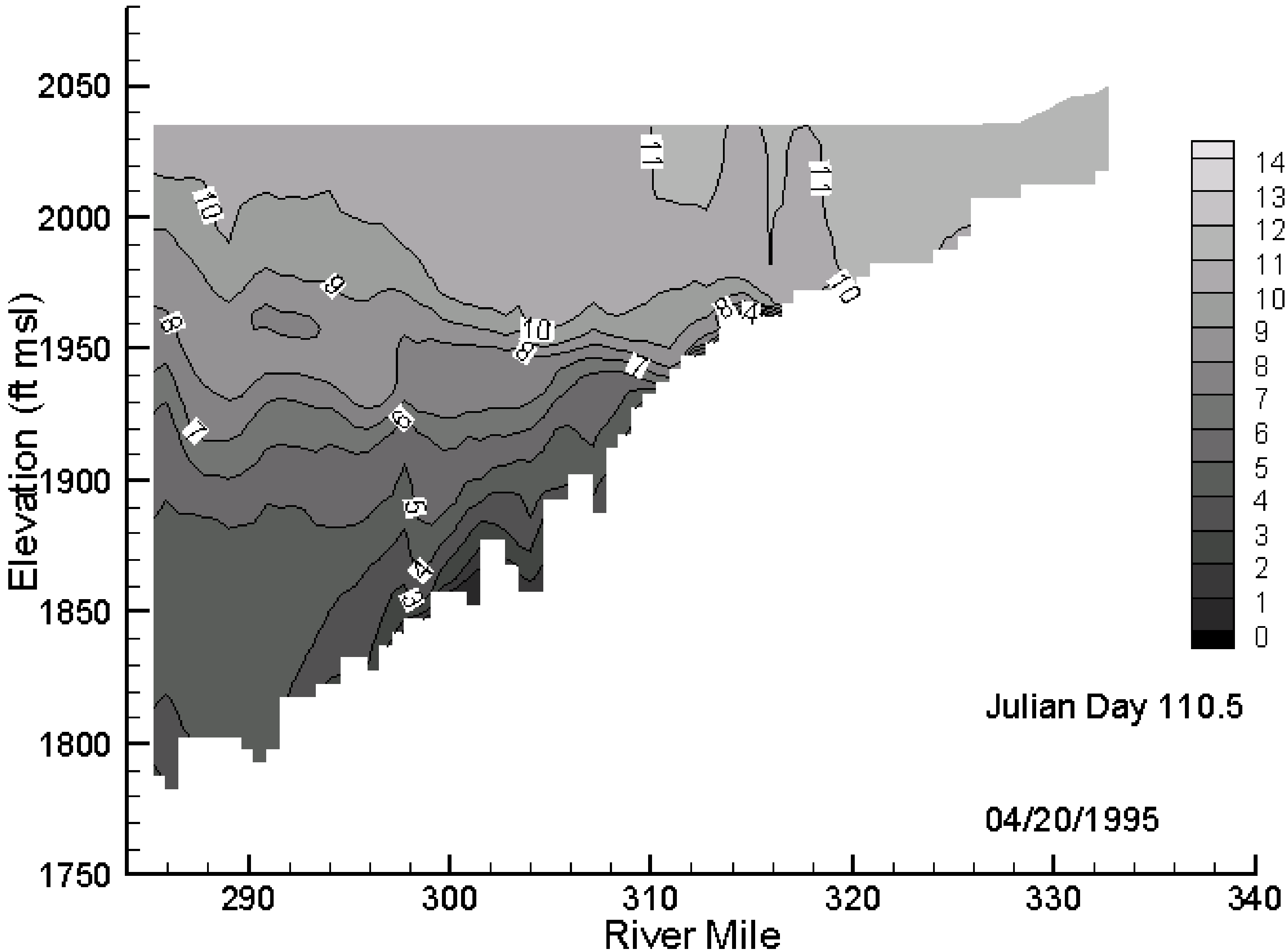

Figure 138. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

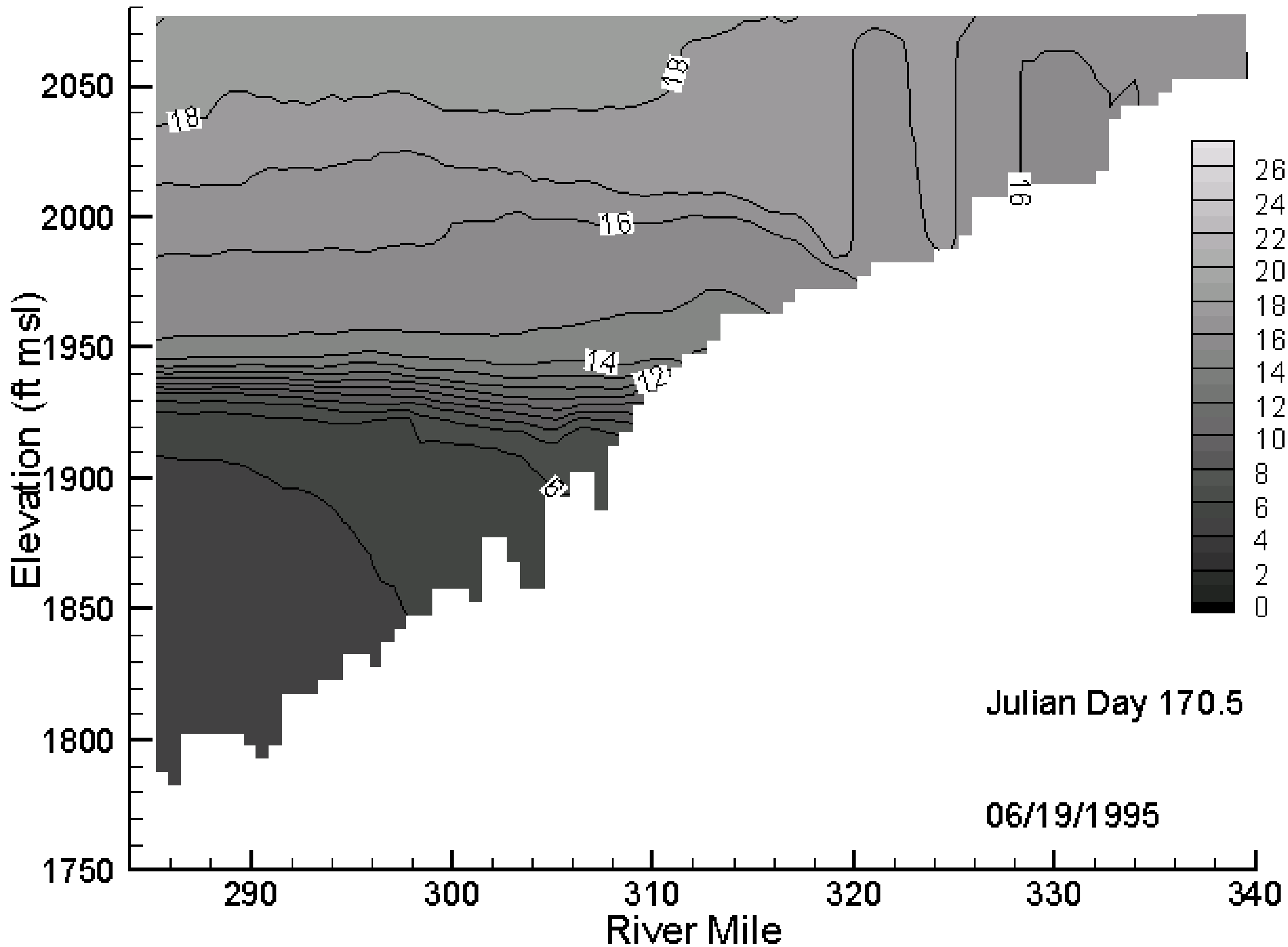

Figure 139. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

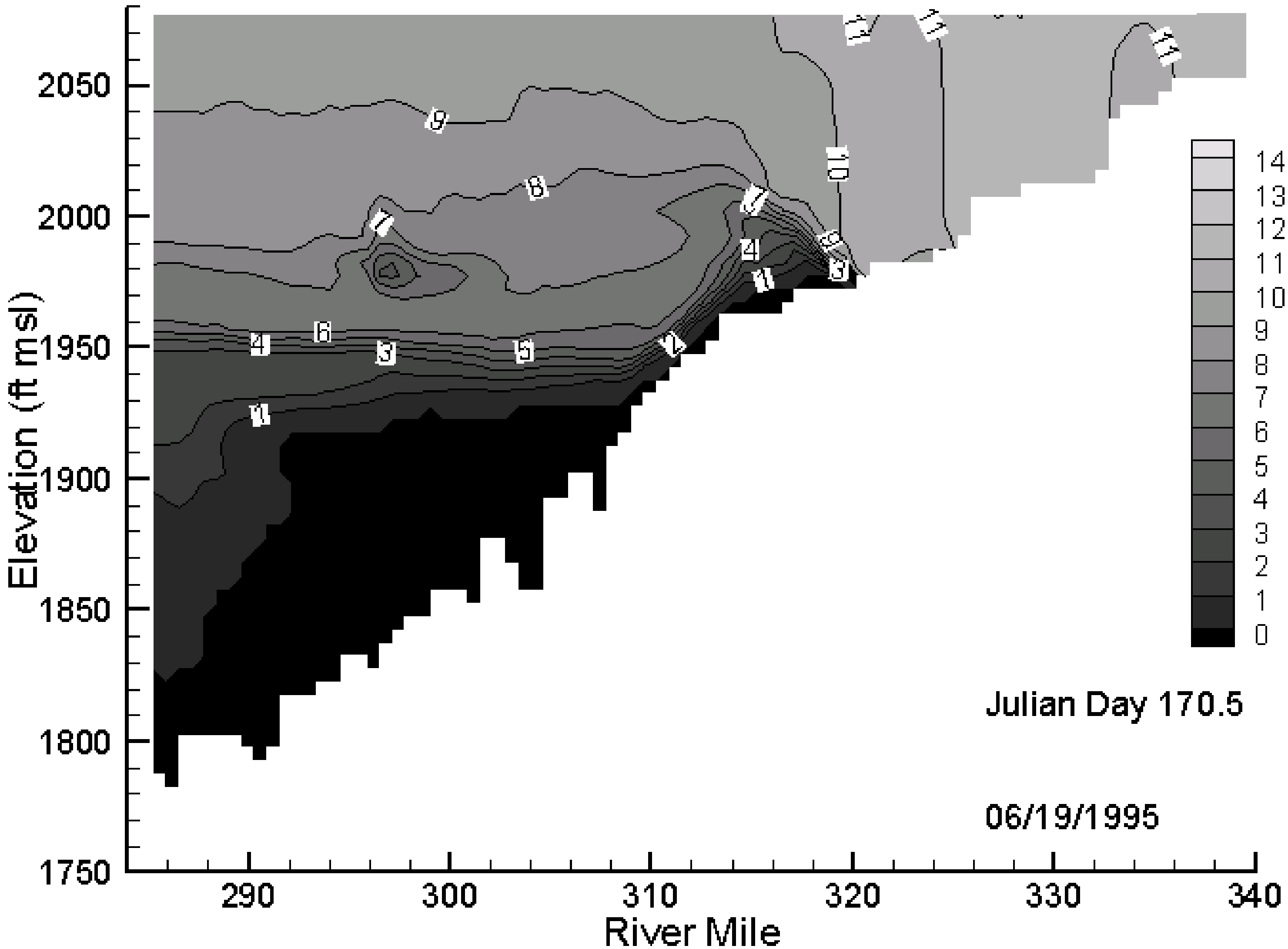

Figure 140. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

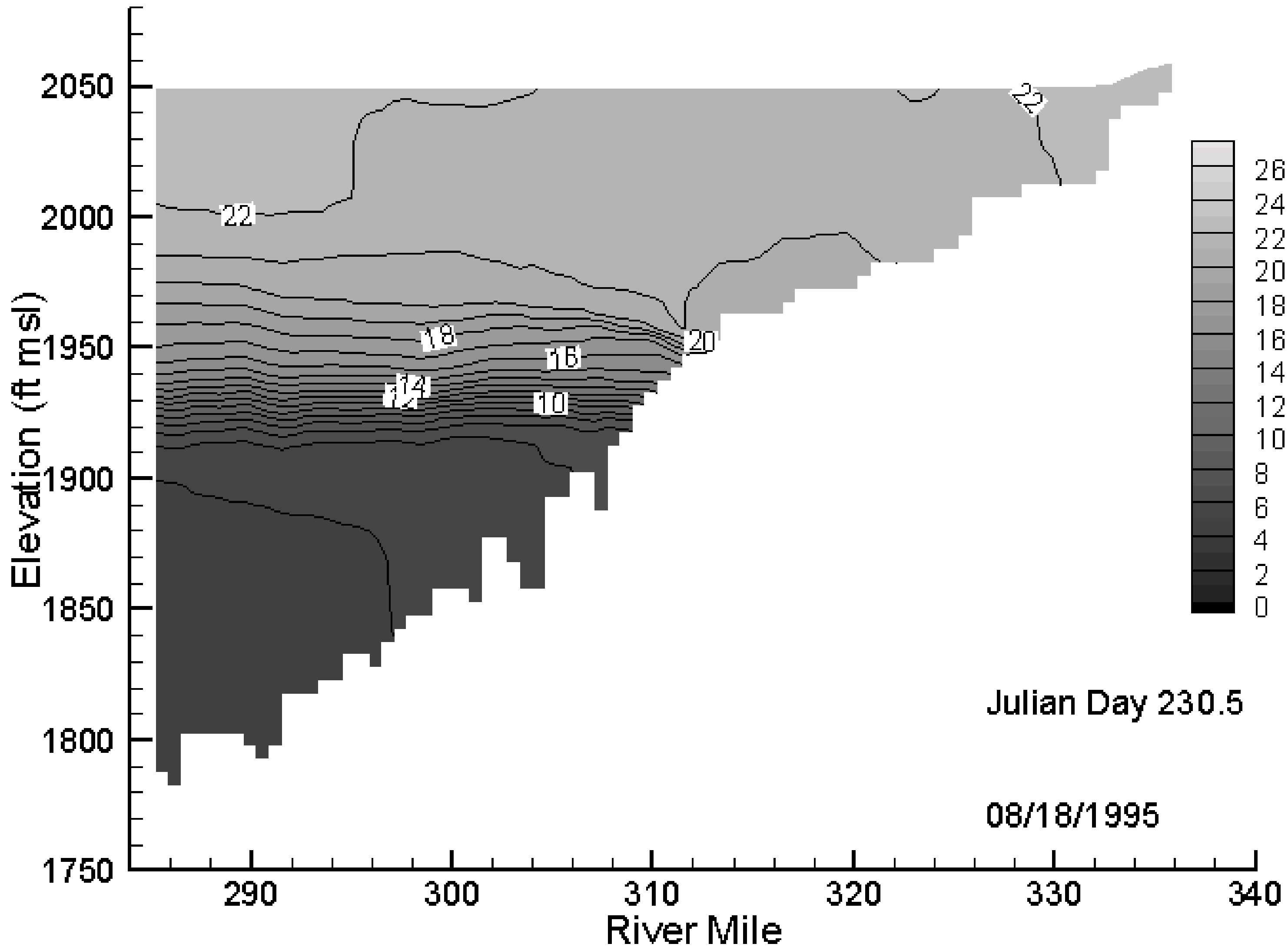

Figure 141. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

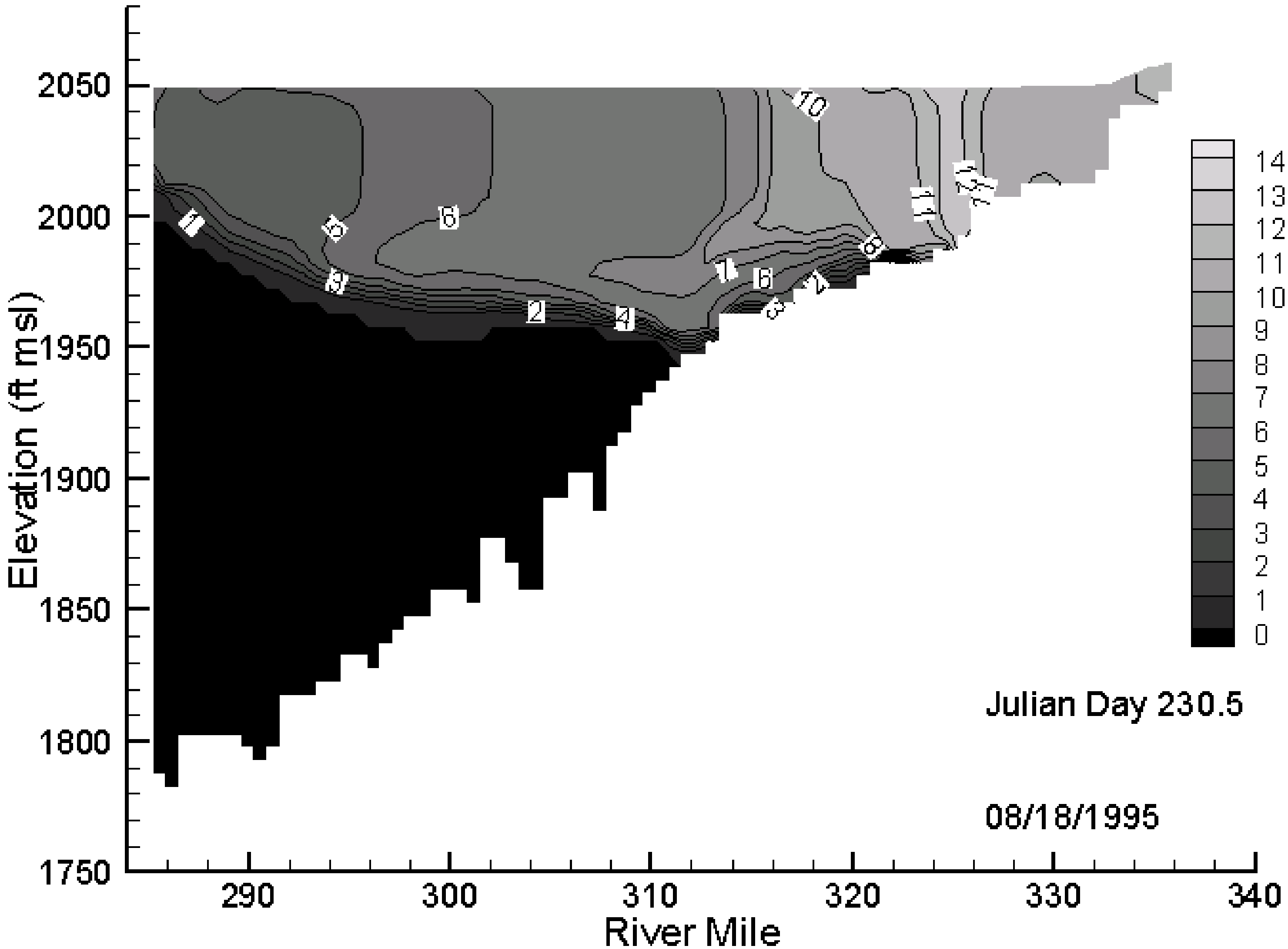

Figure 142. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

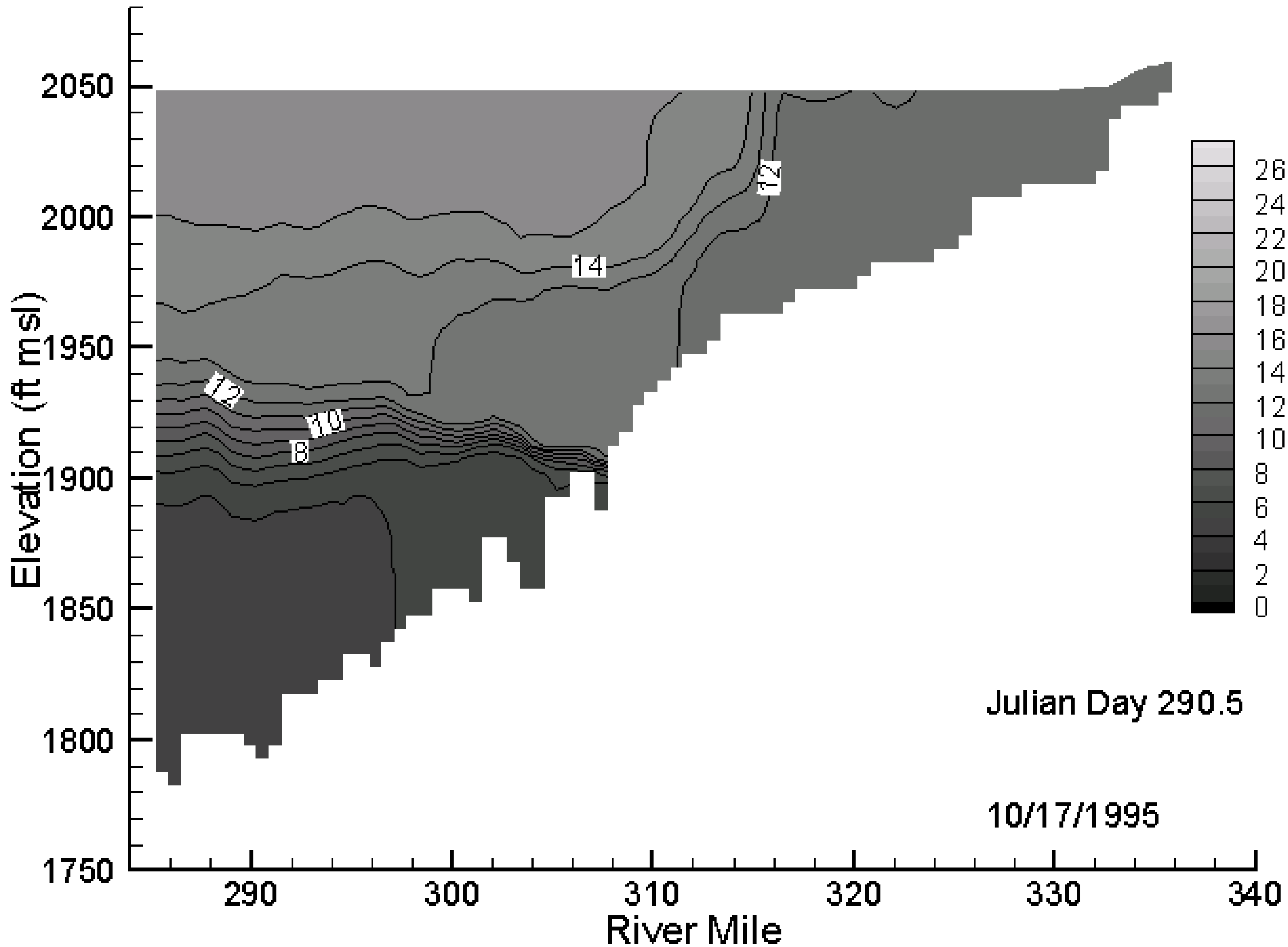

Figure 143. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

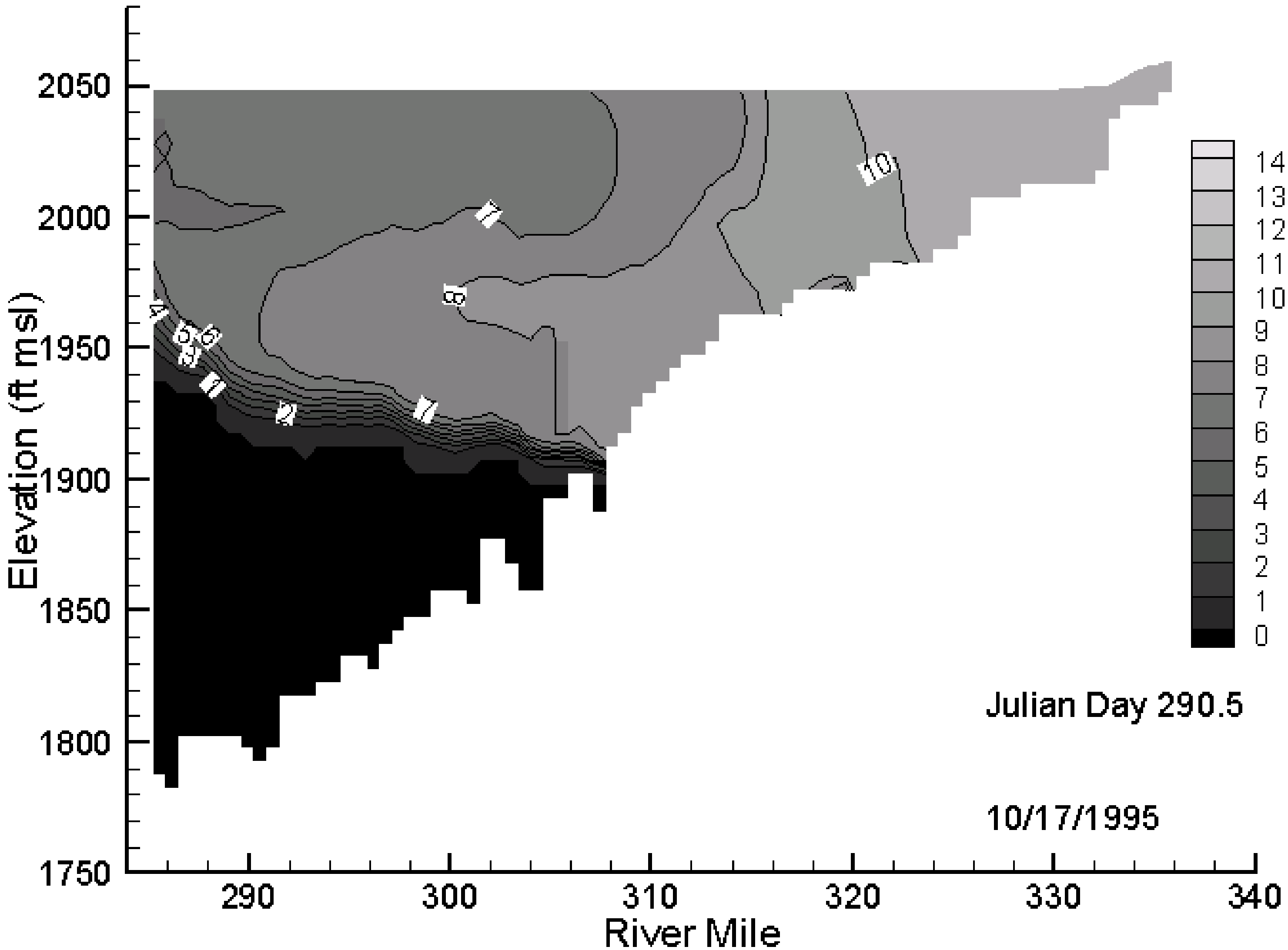

Figure 144. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

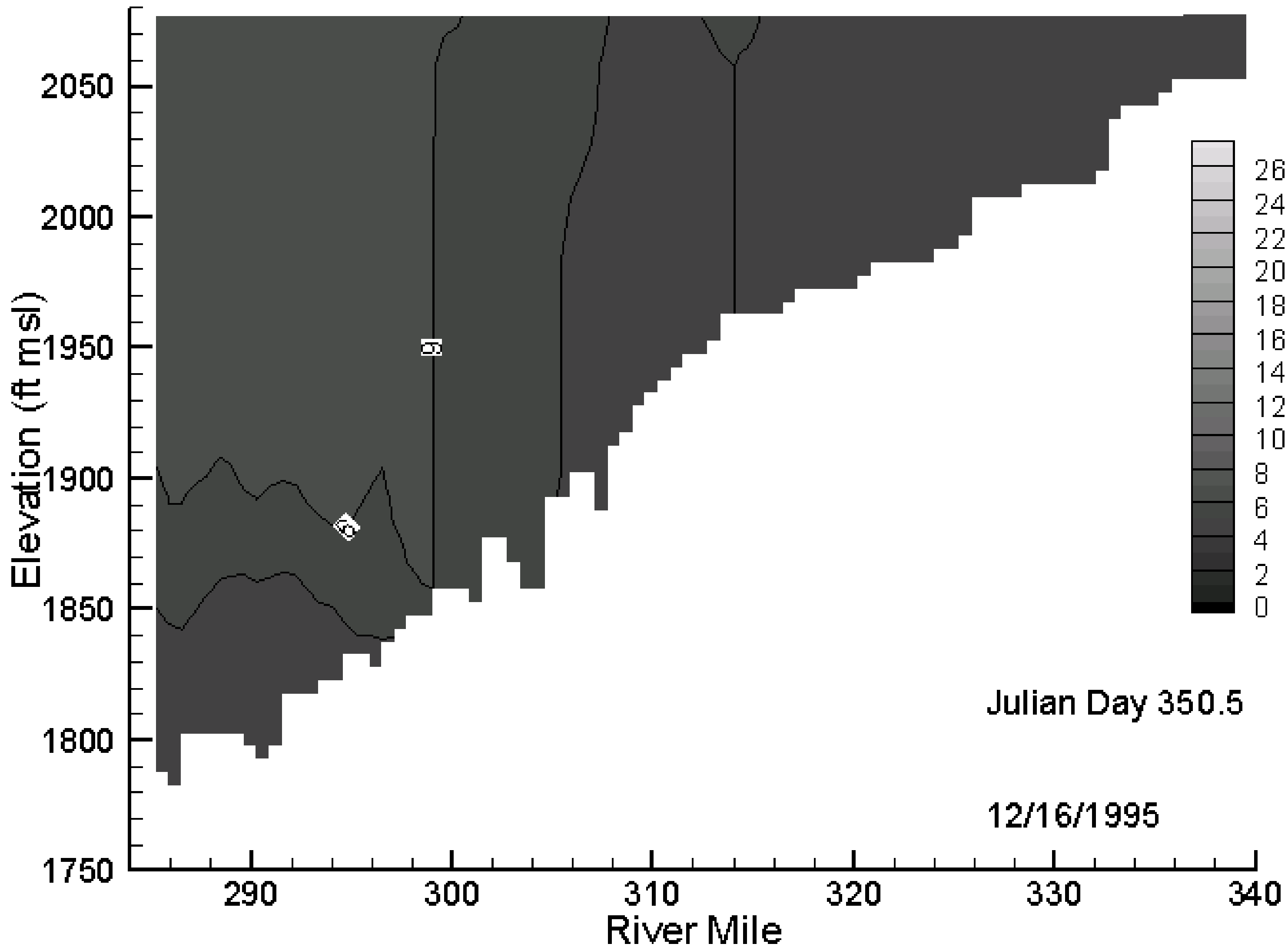

Figure 145. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

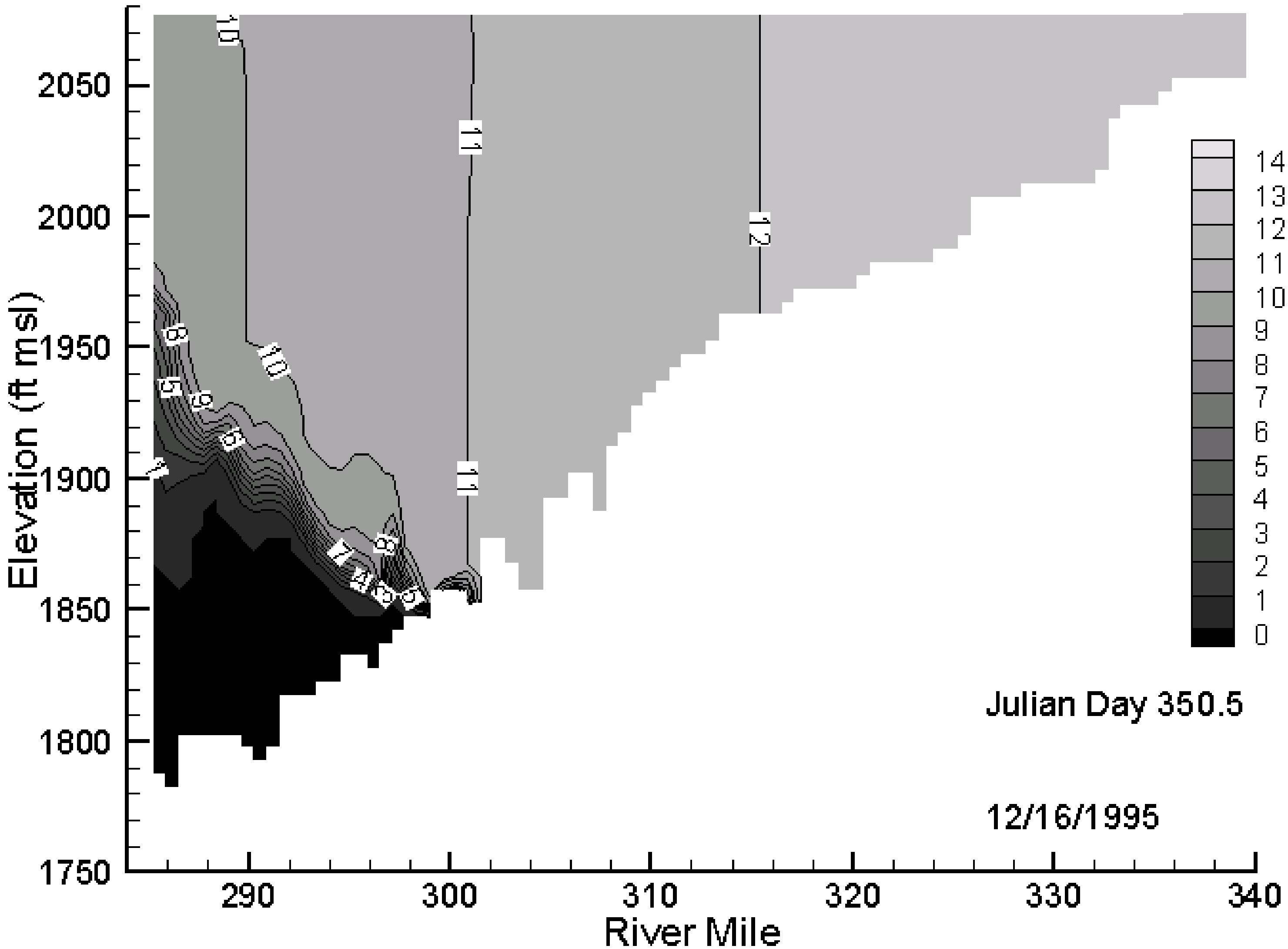

Figure 146. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

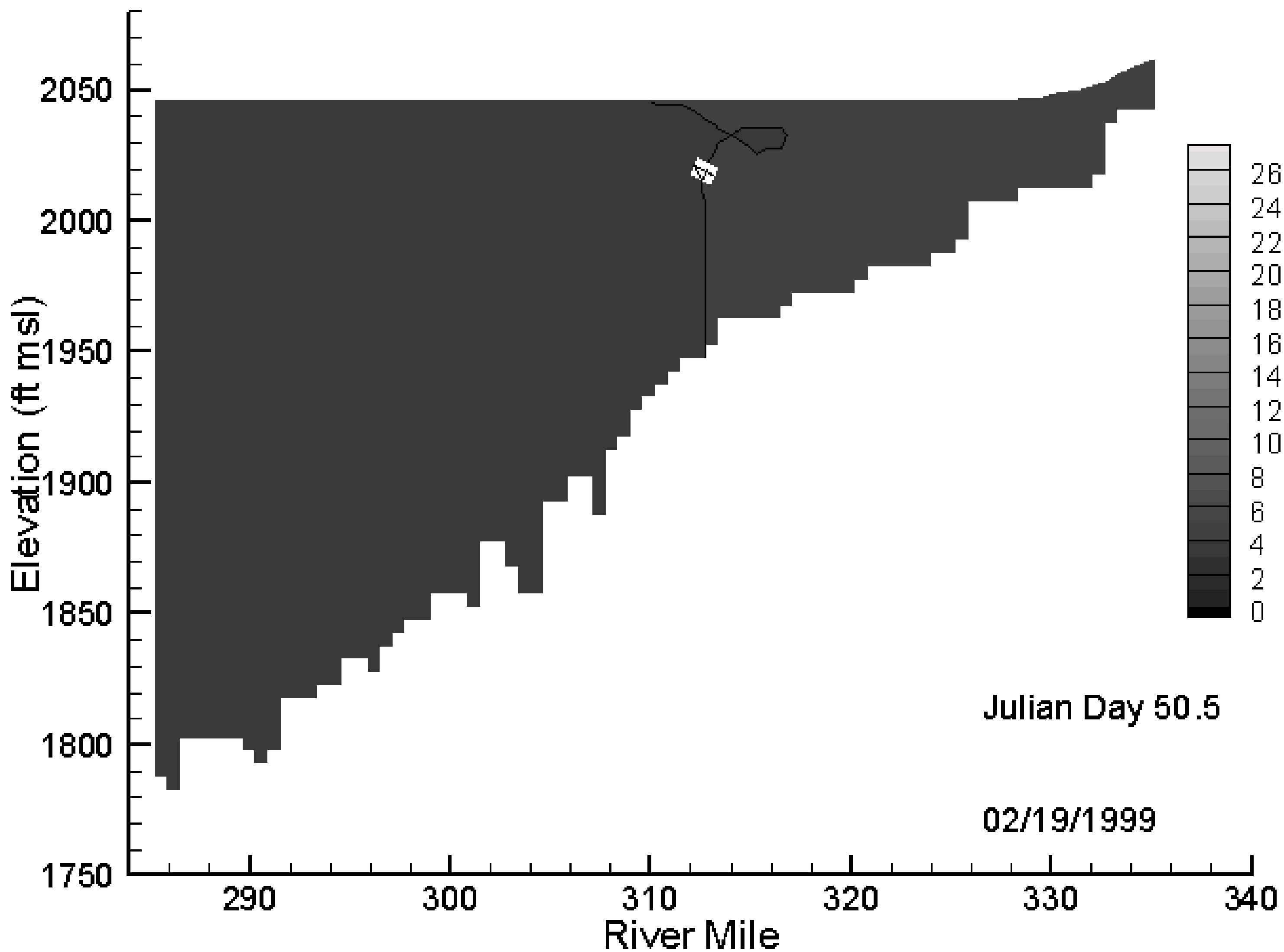

Figure 147. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

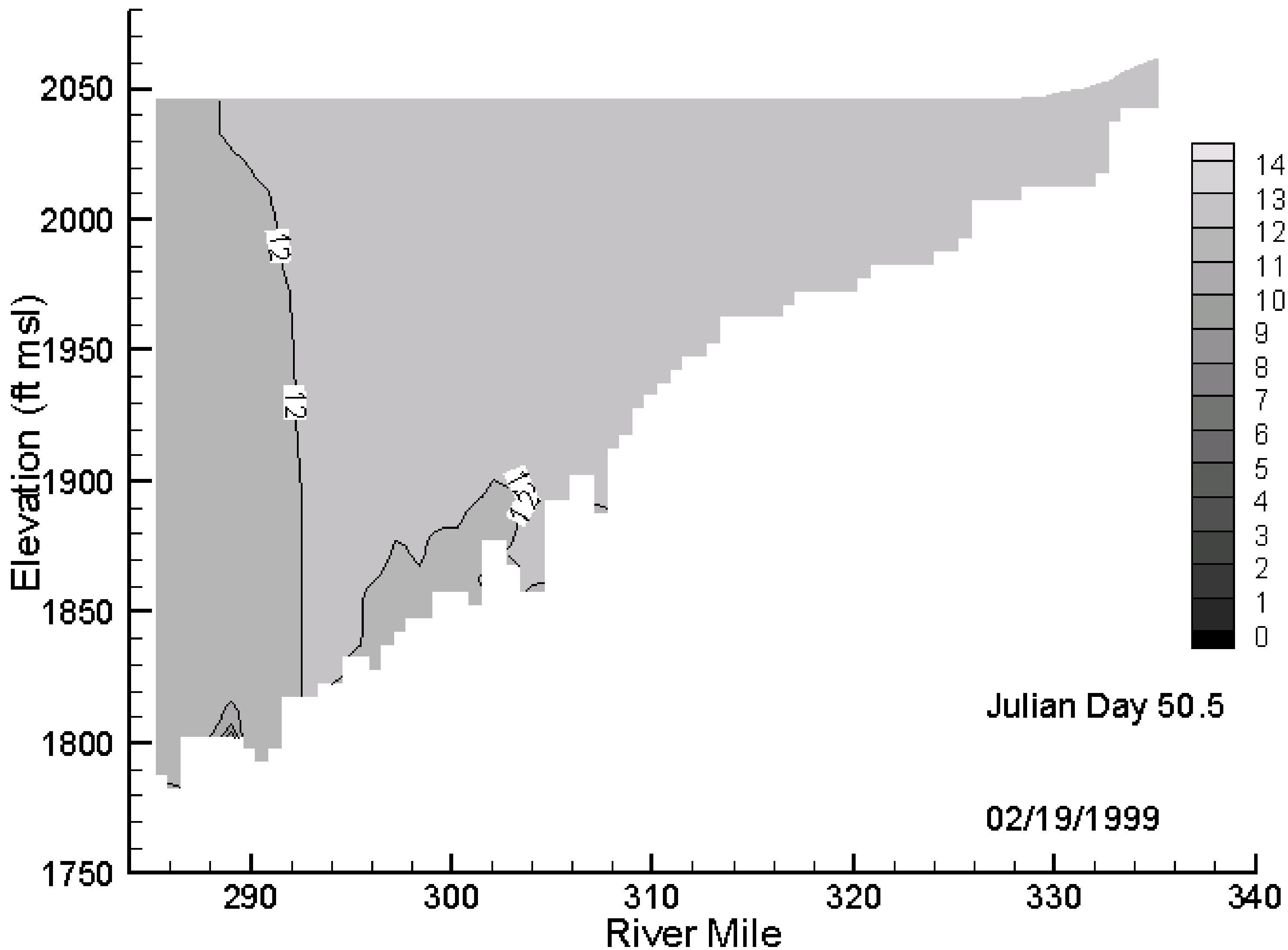

Figure 148. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

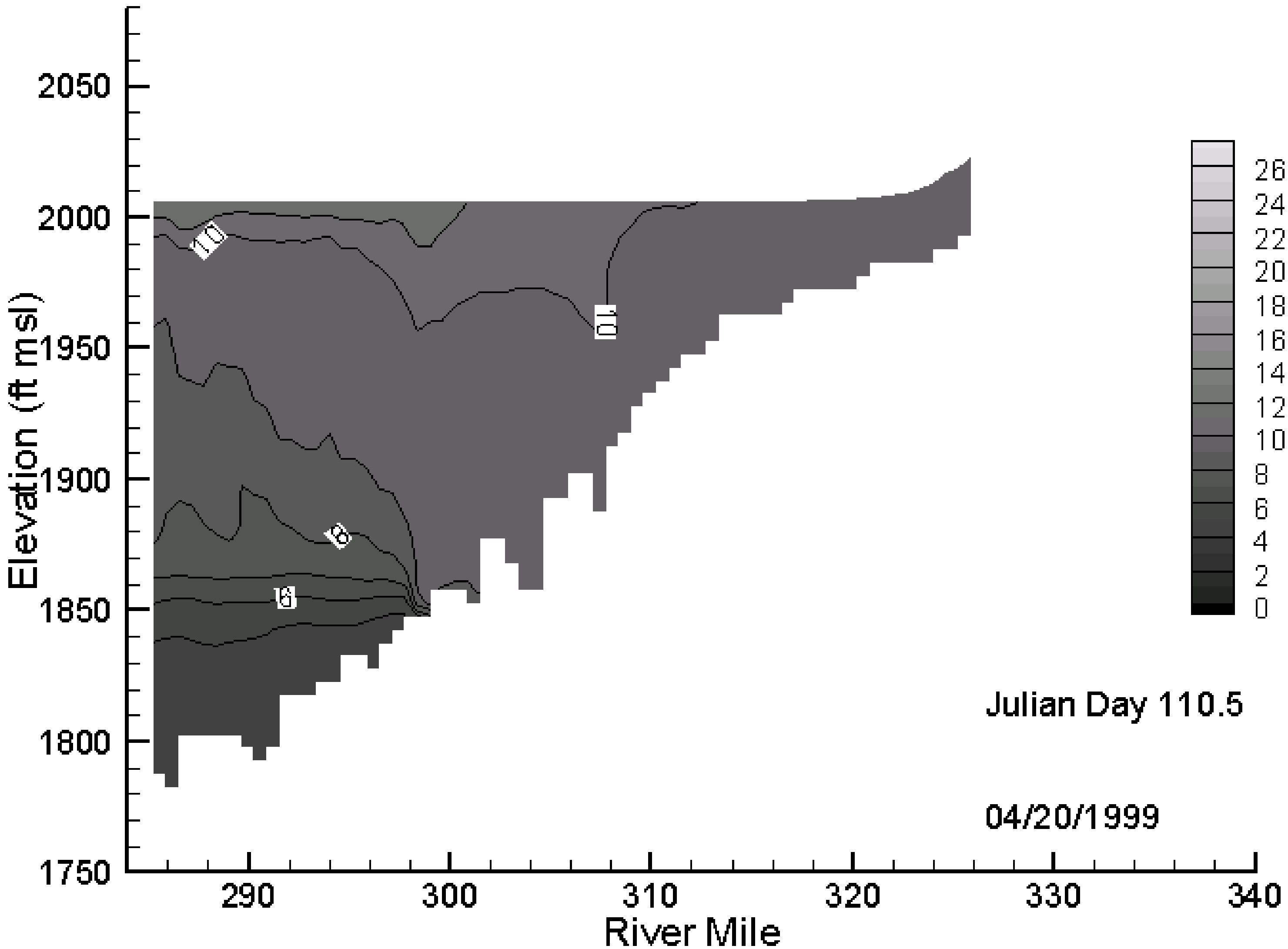

Figure 149. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

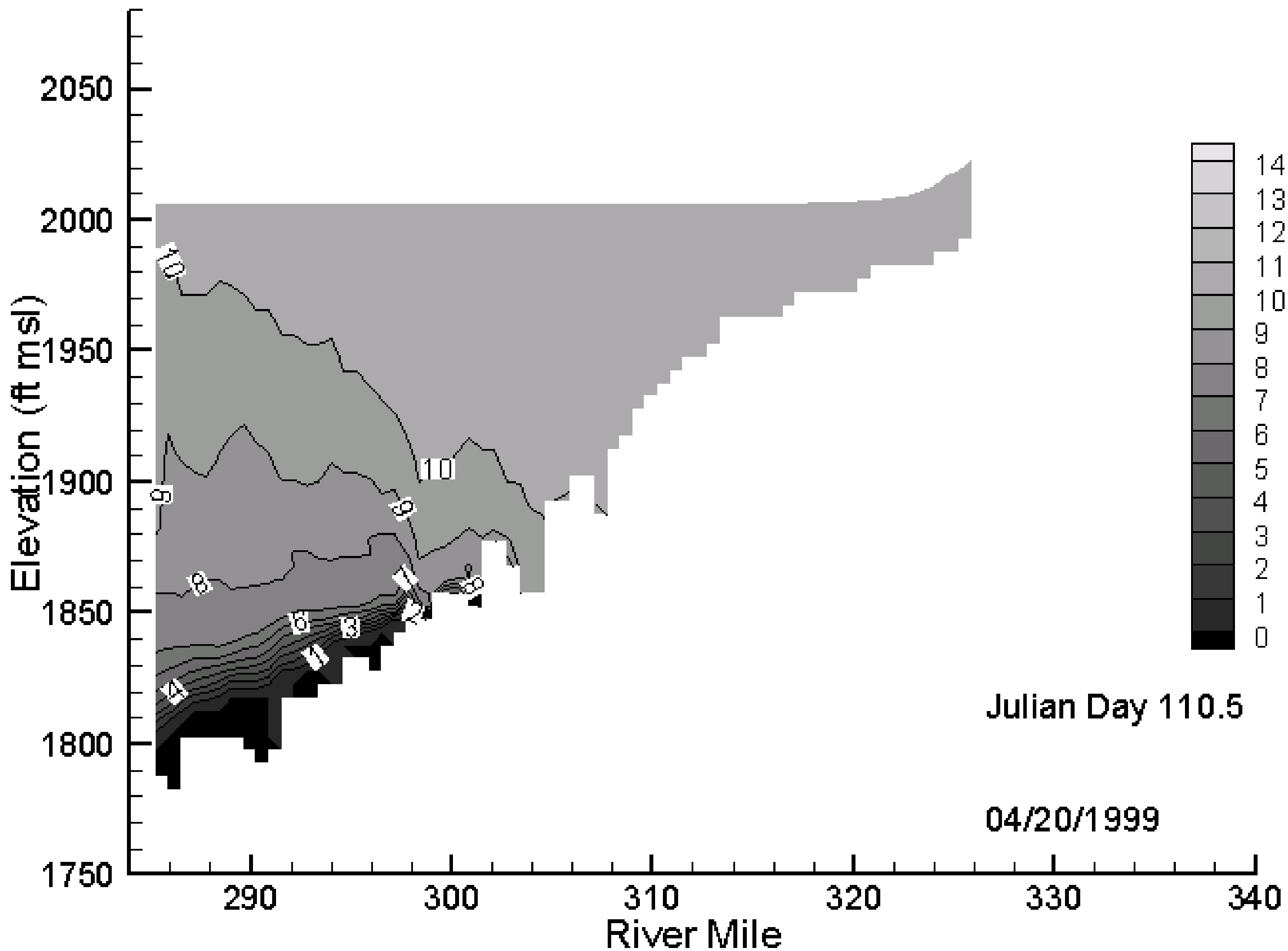

Figure 150. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

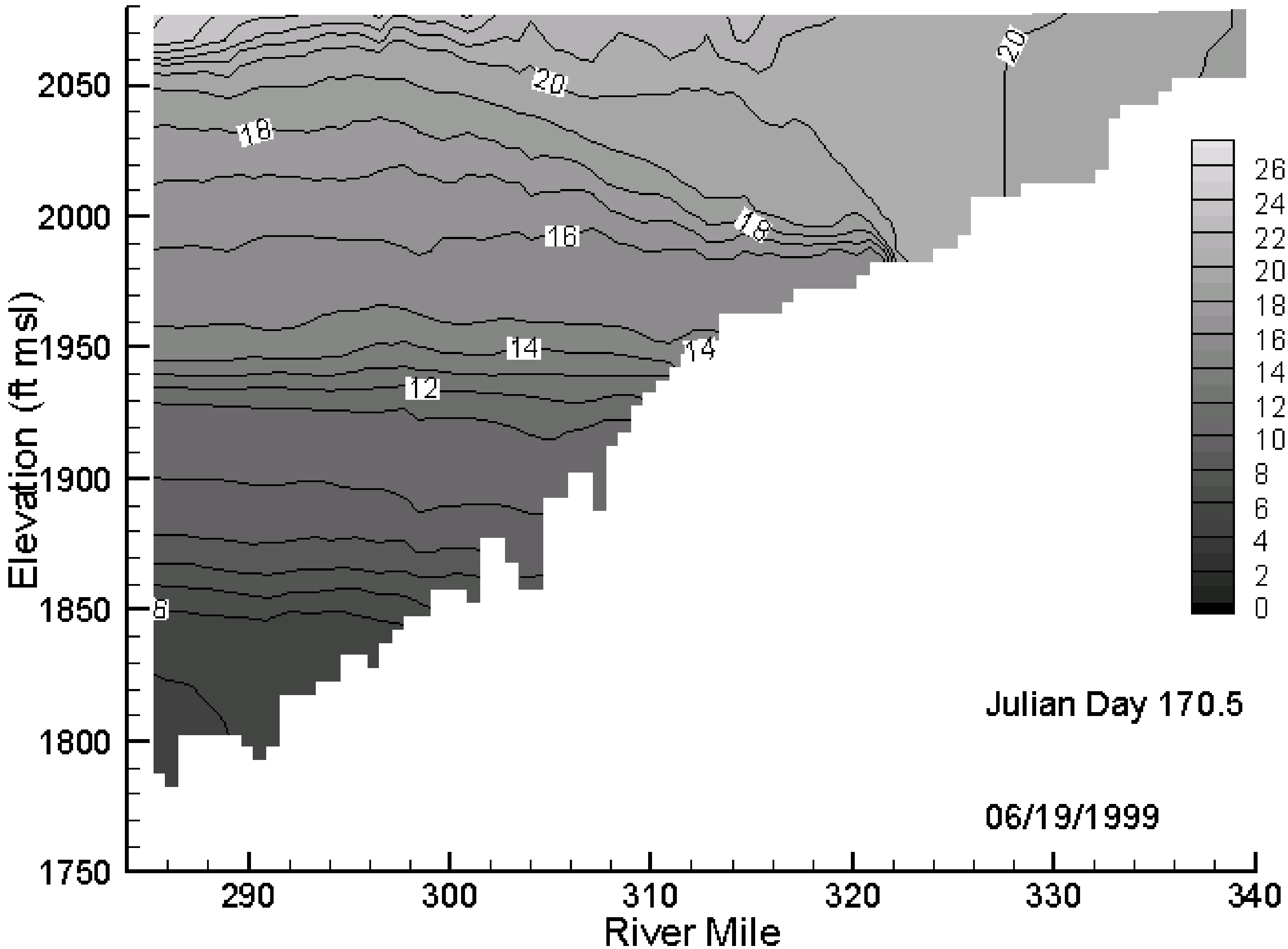

Figure 151. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

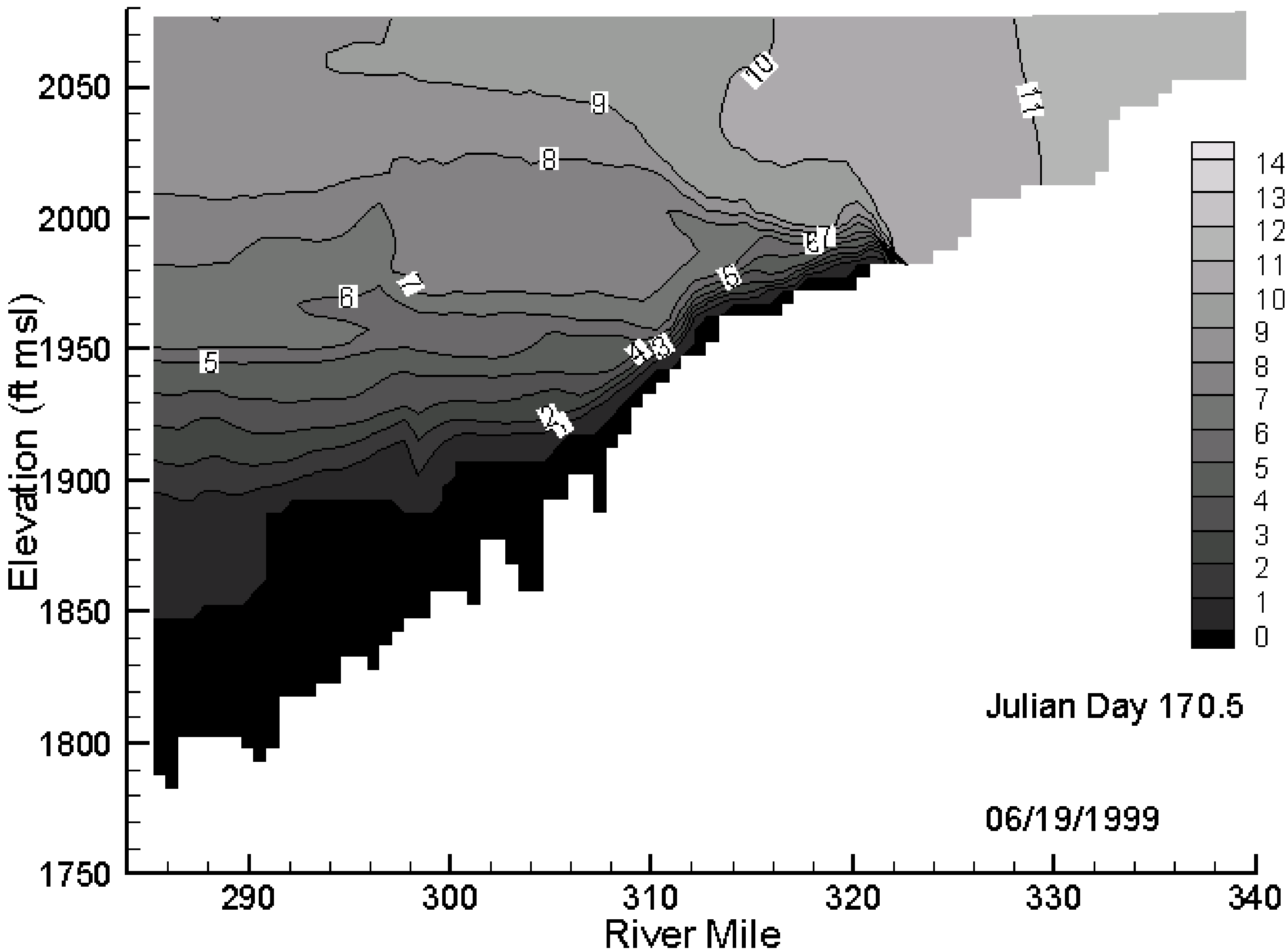

Figure 152. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

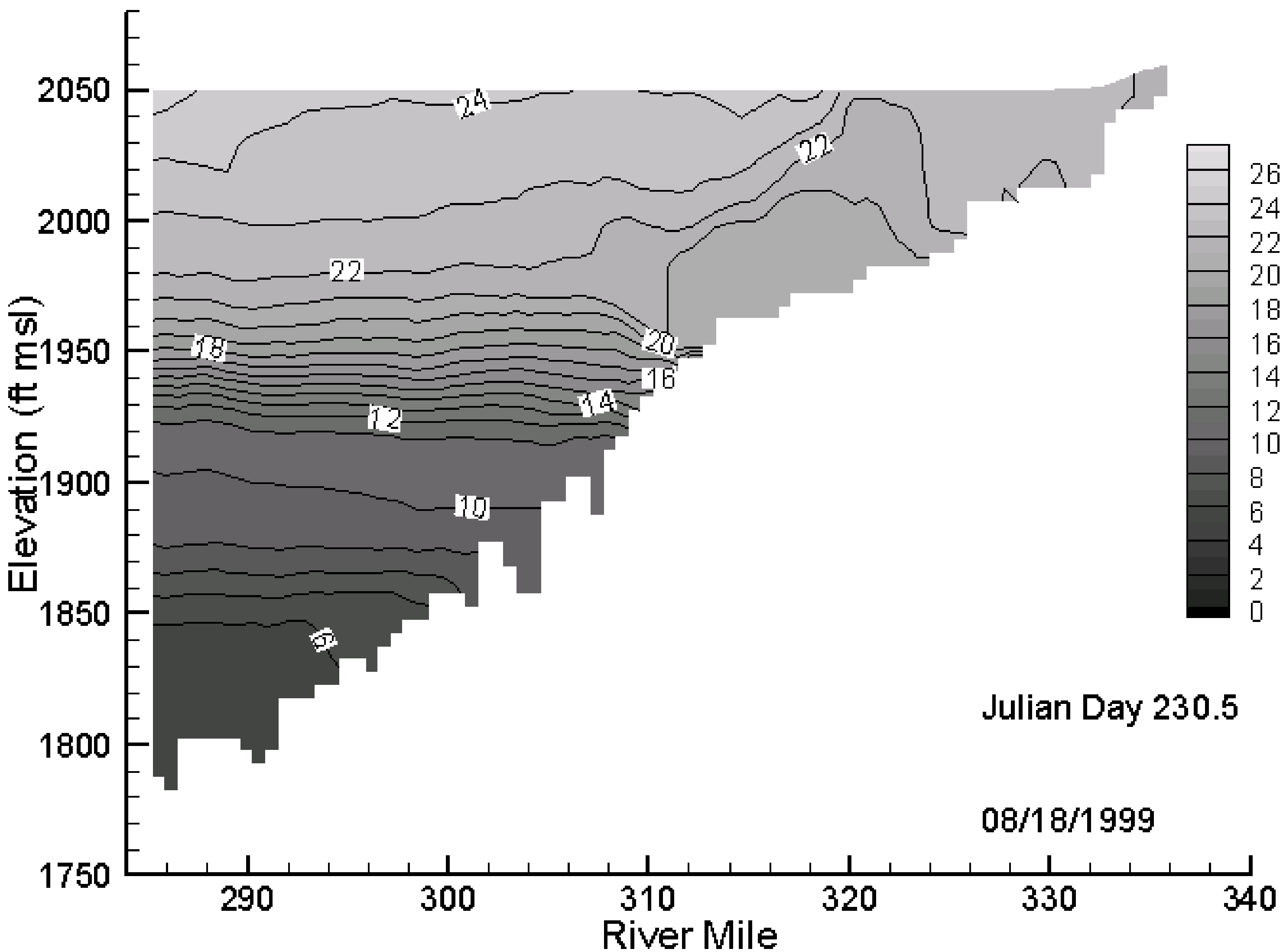

Figure 153. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

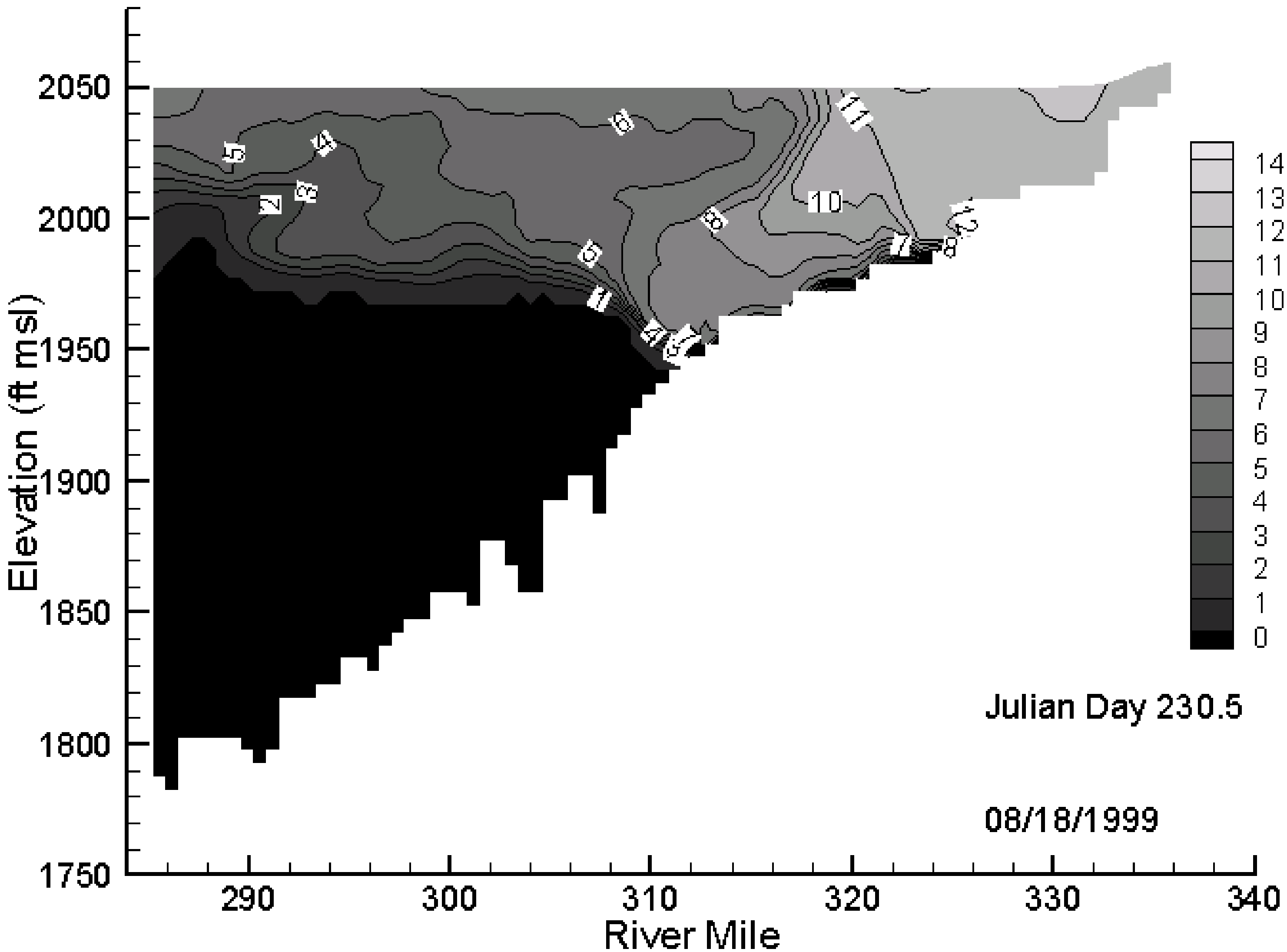

Figure 154. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

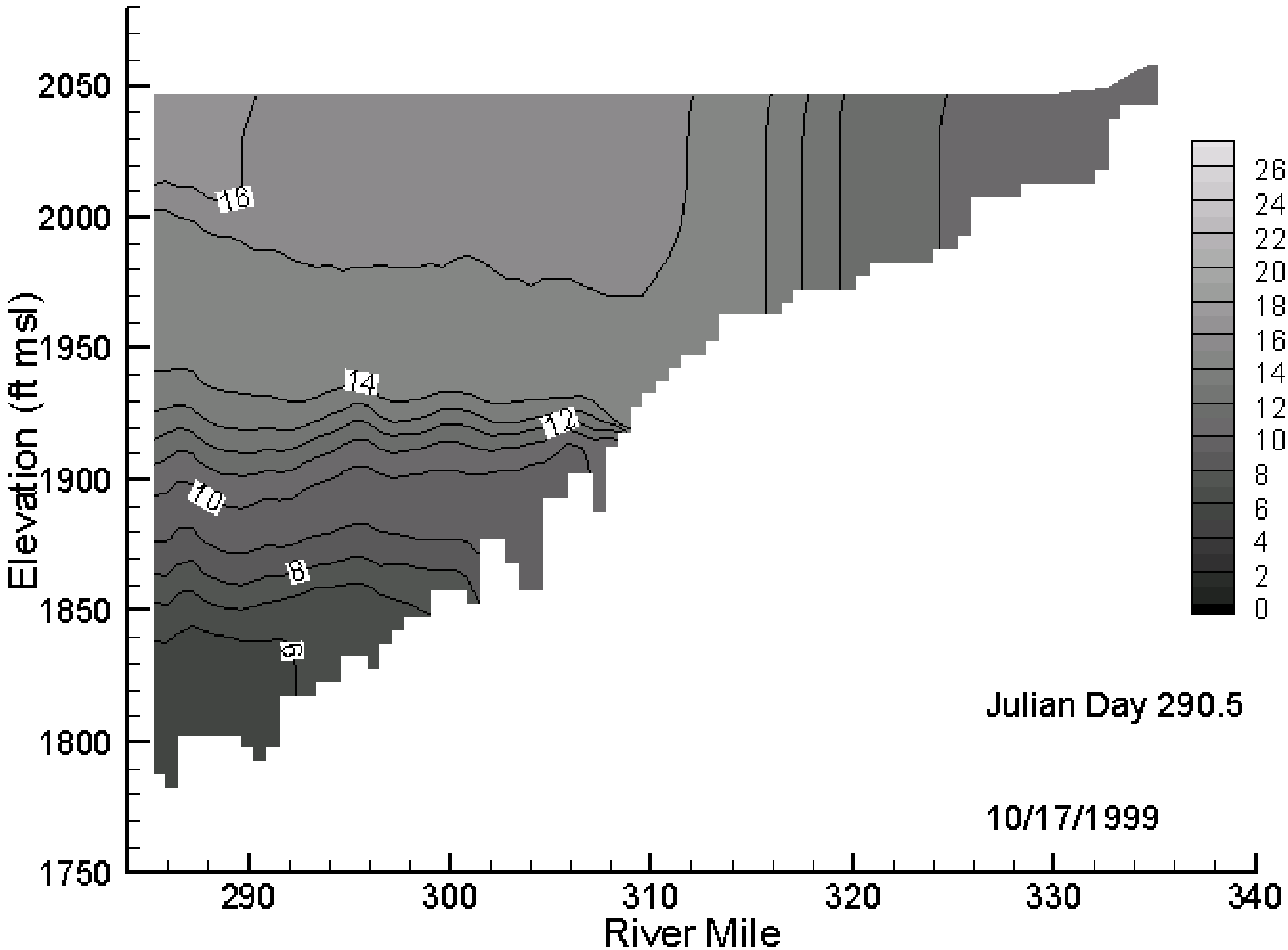

Figure 155. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

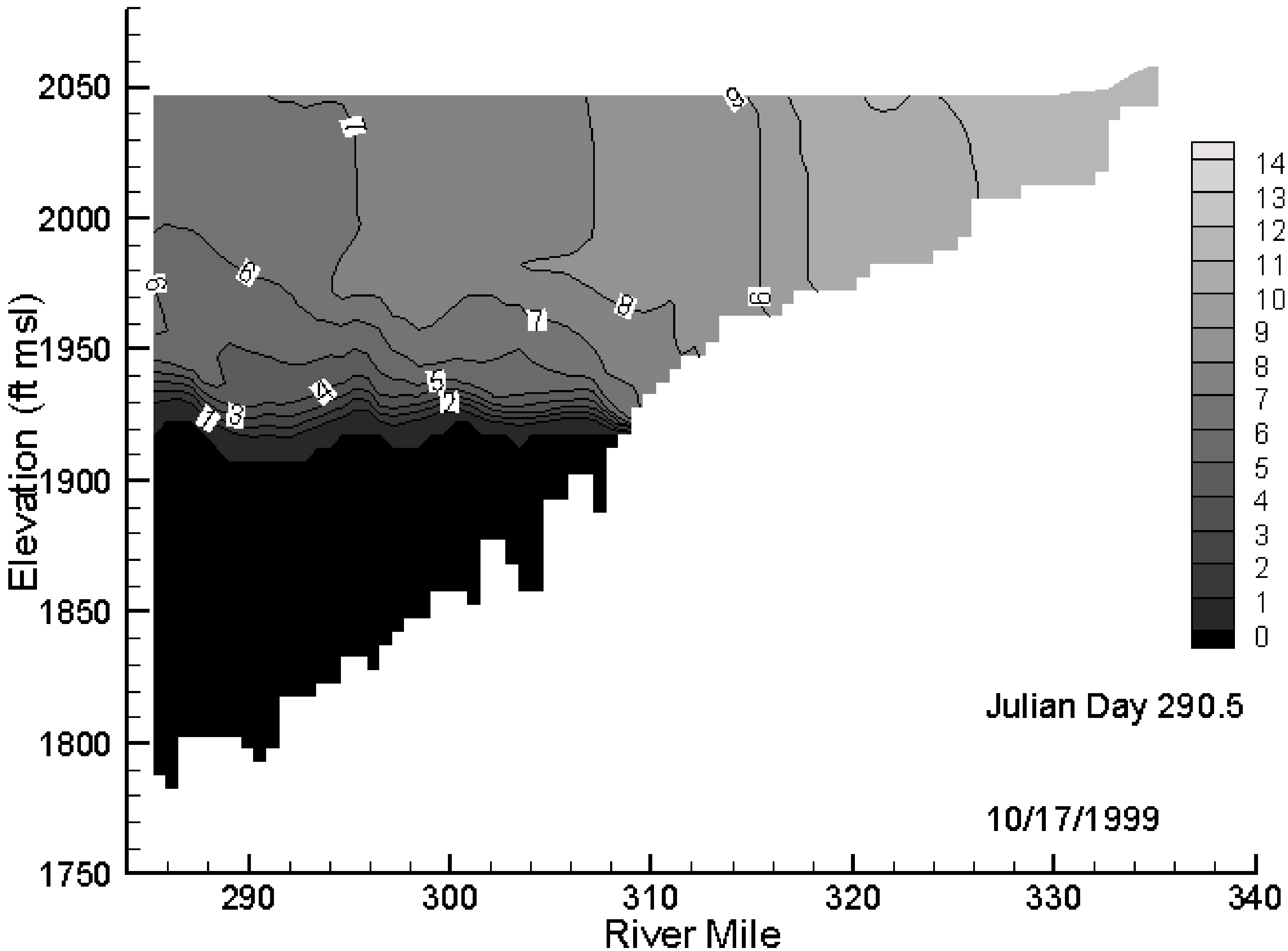

Figure 156. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

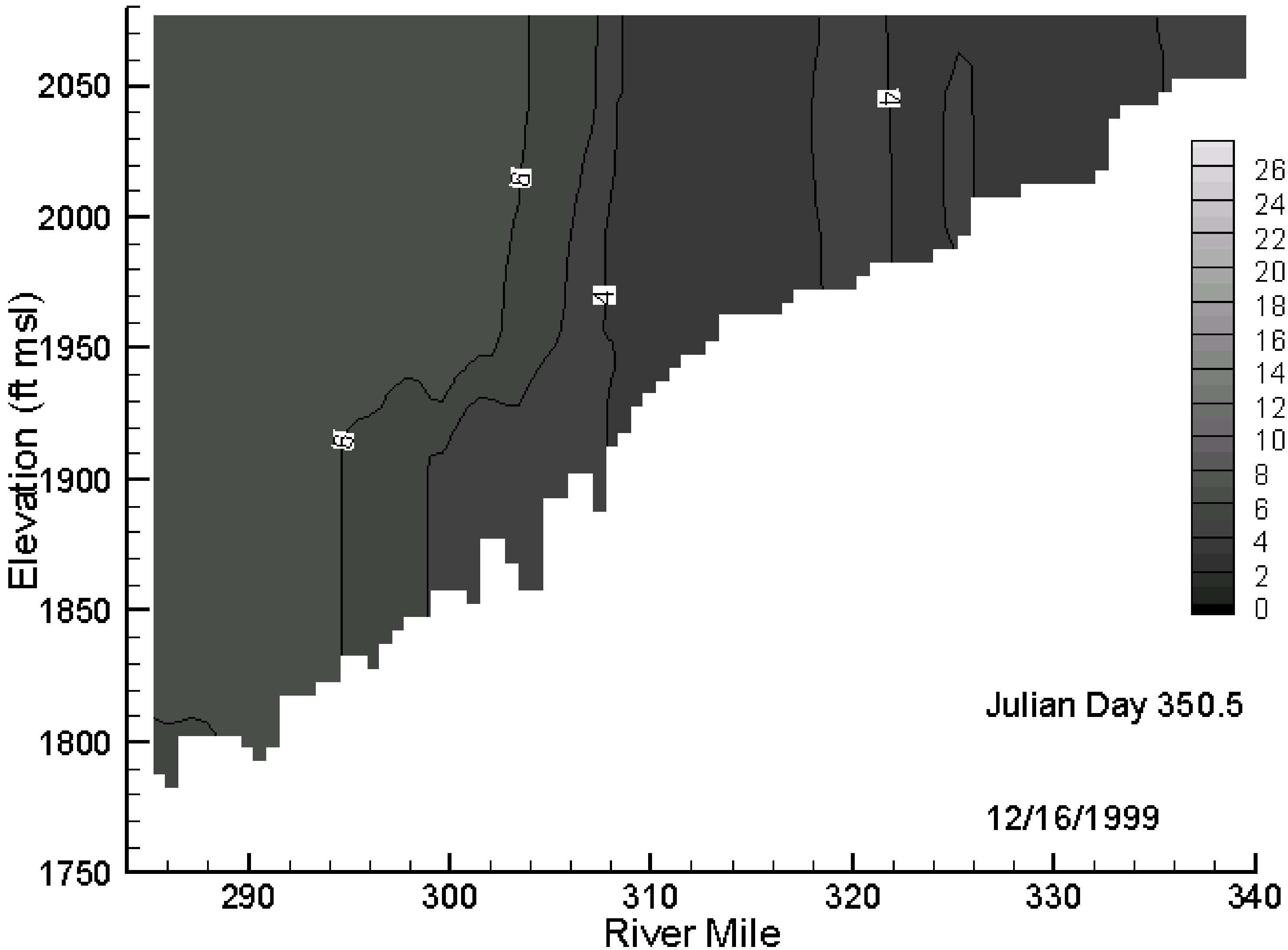

Figure 157. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

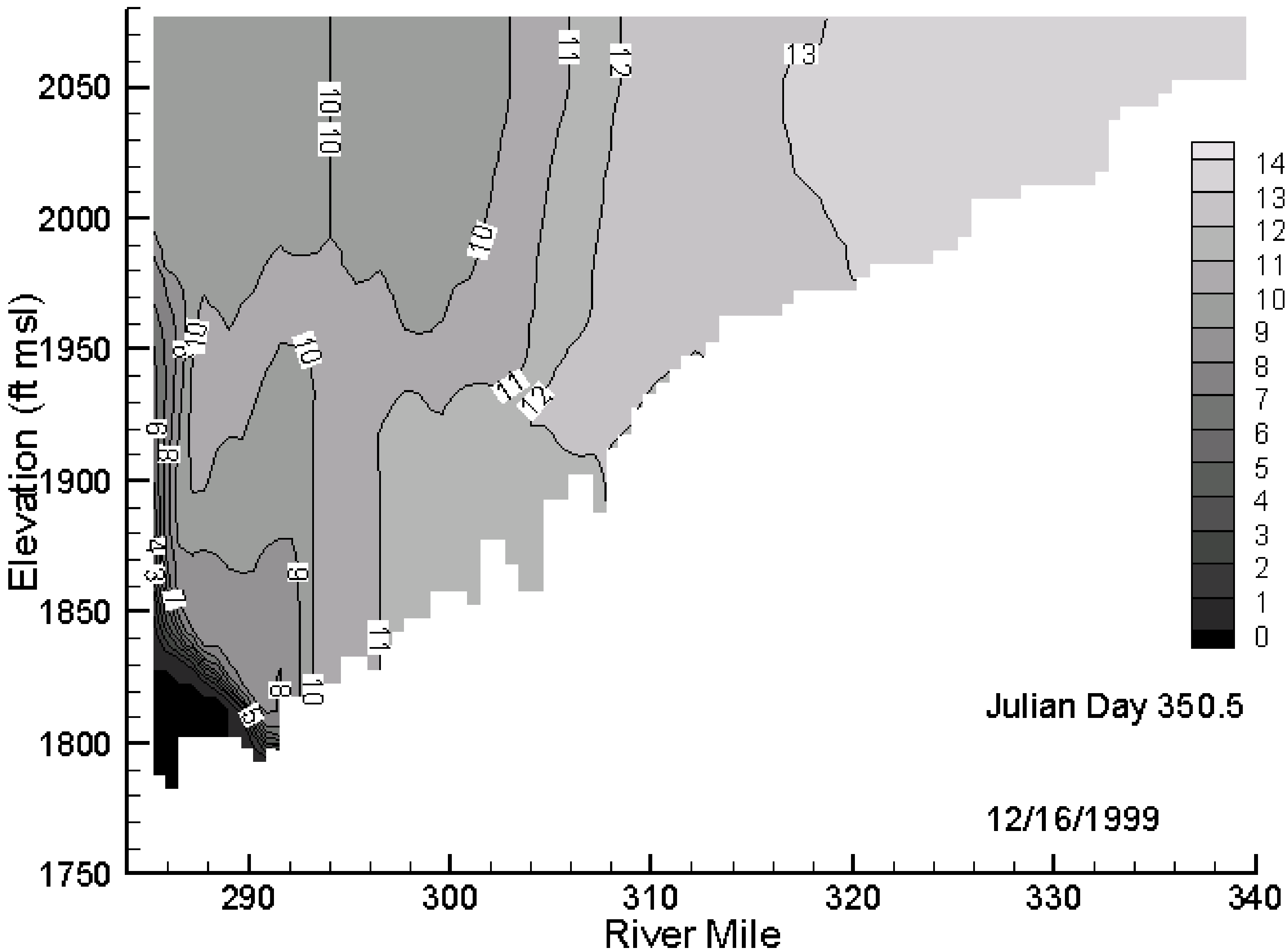

Figure 158. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

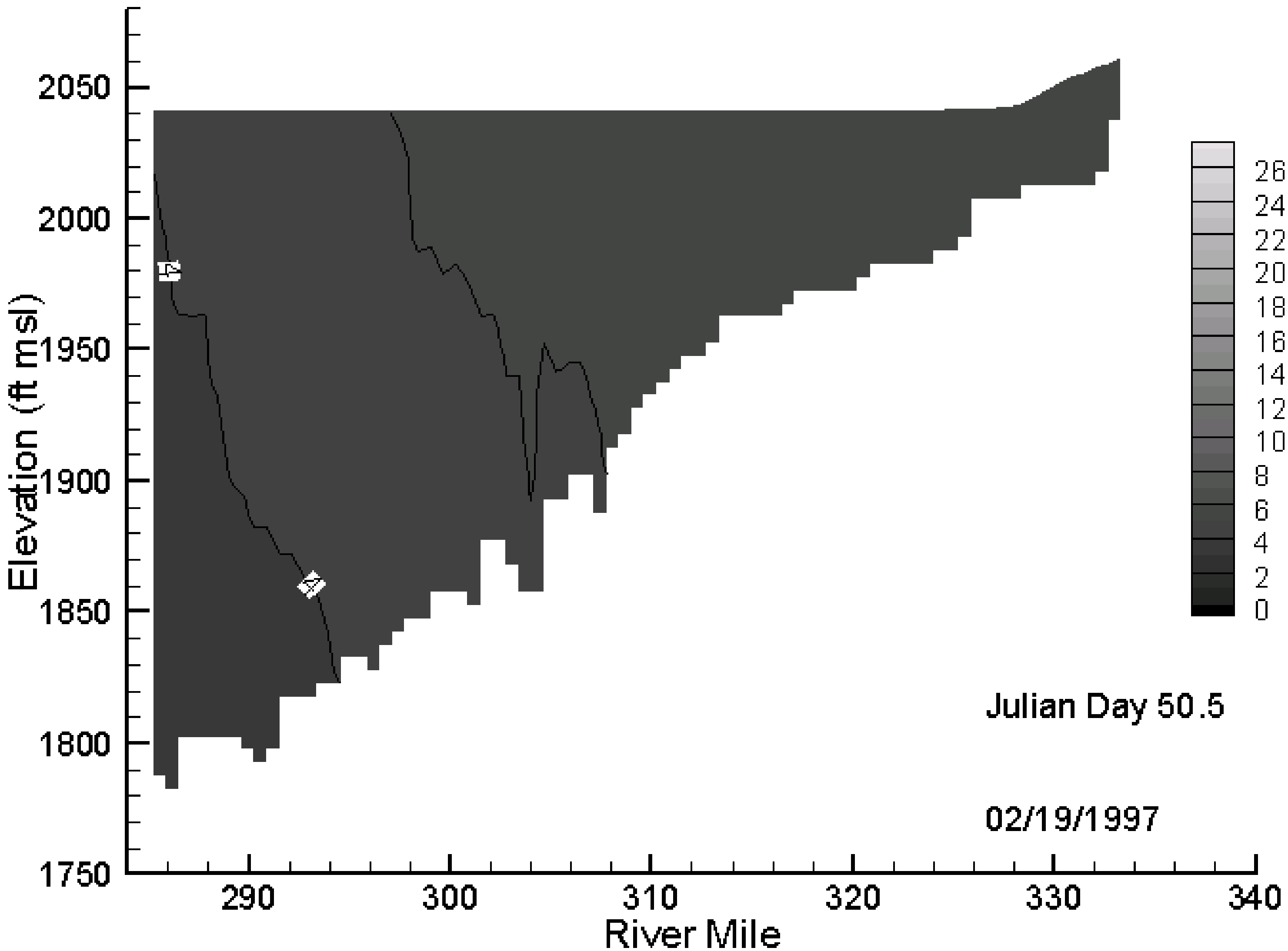

Figure 159. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

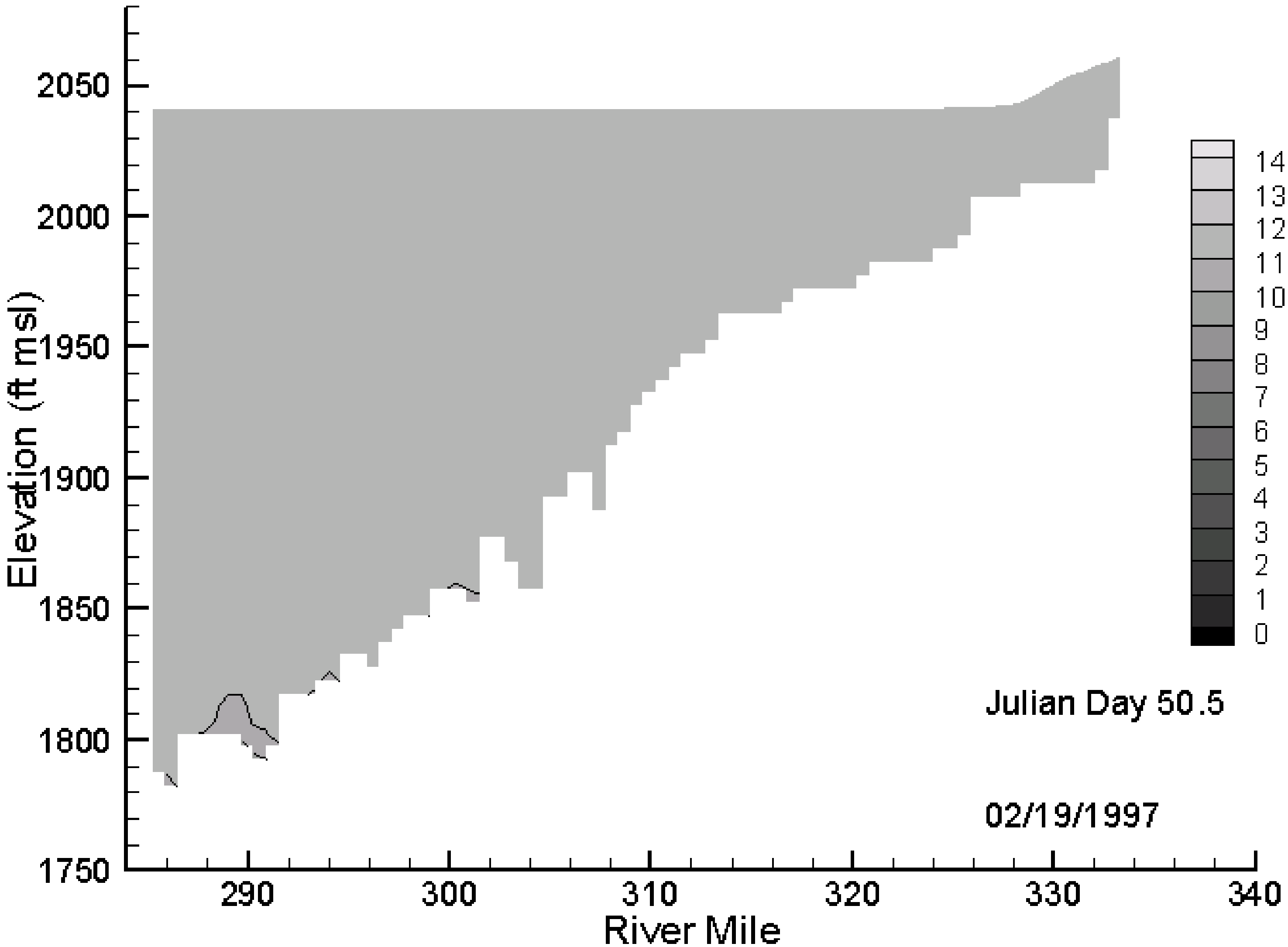

Figure 160. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

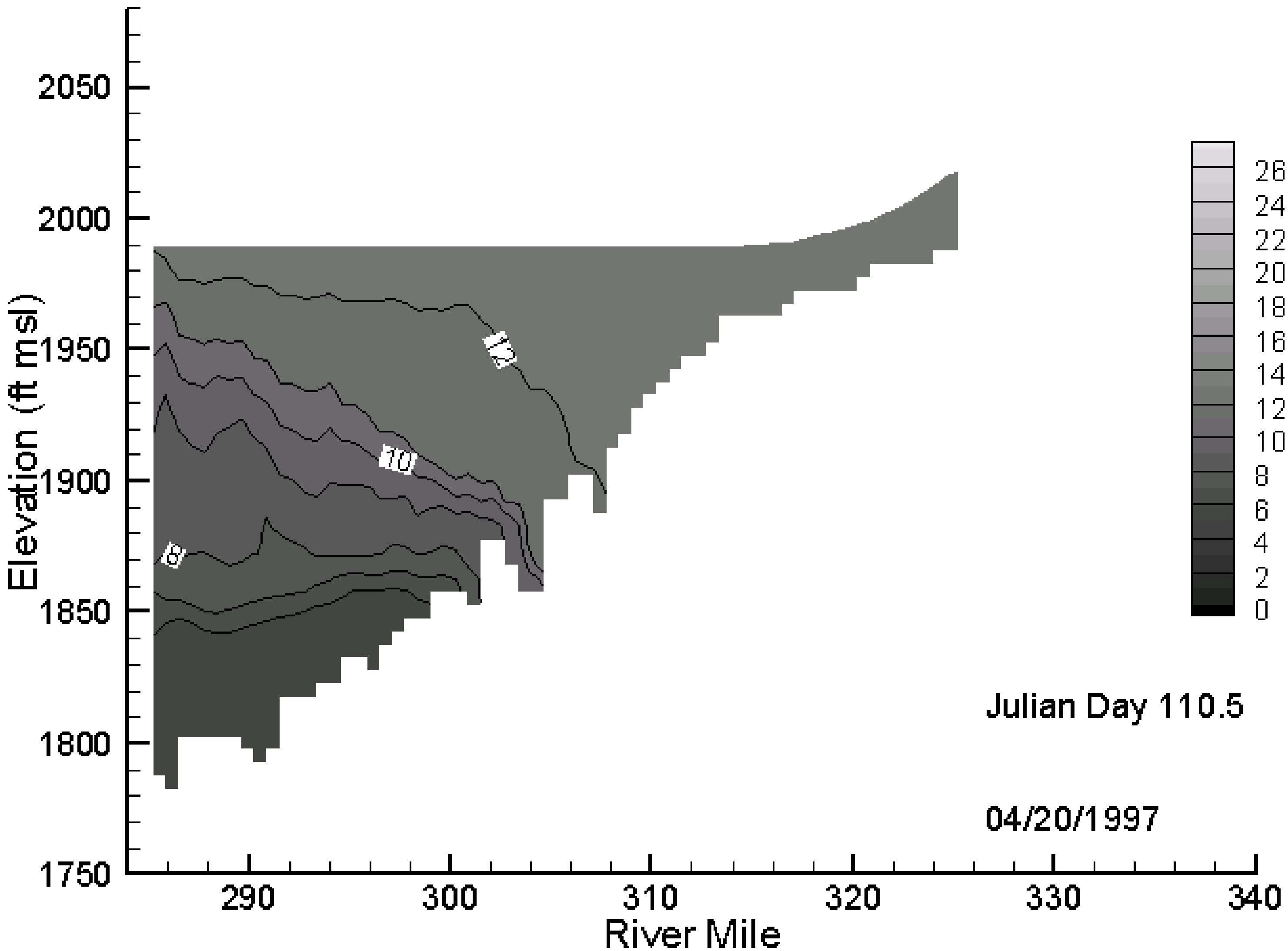

Figure 161. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

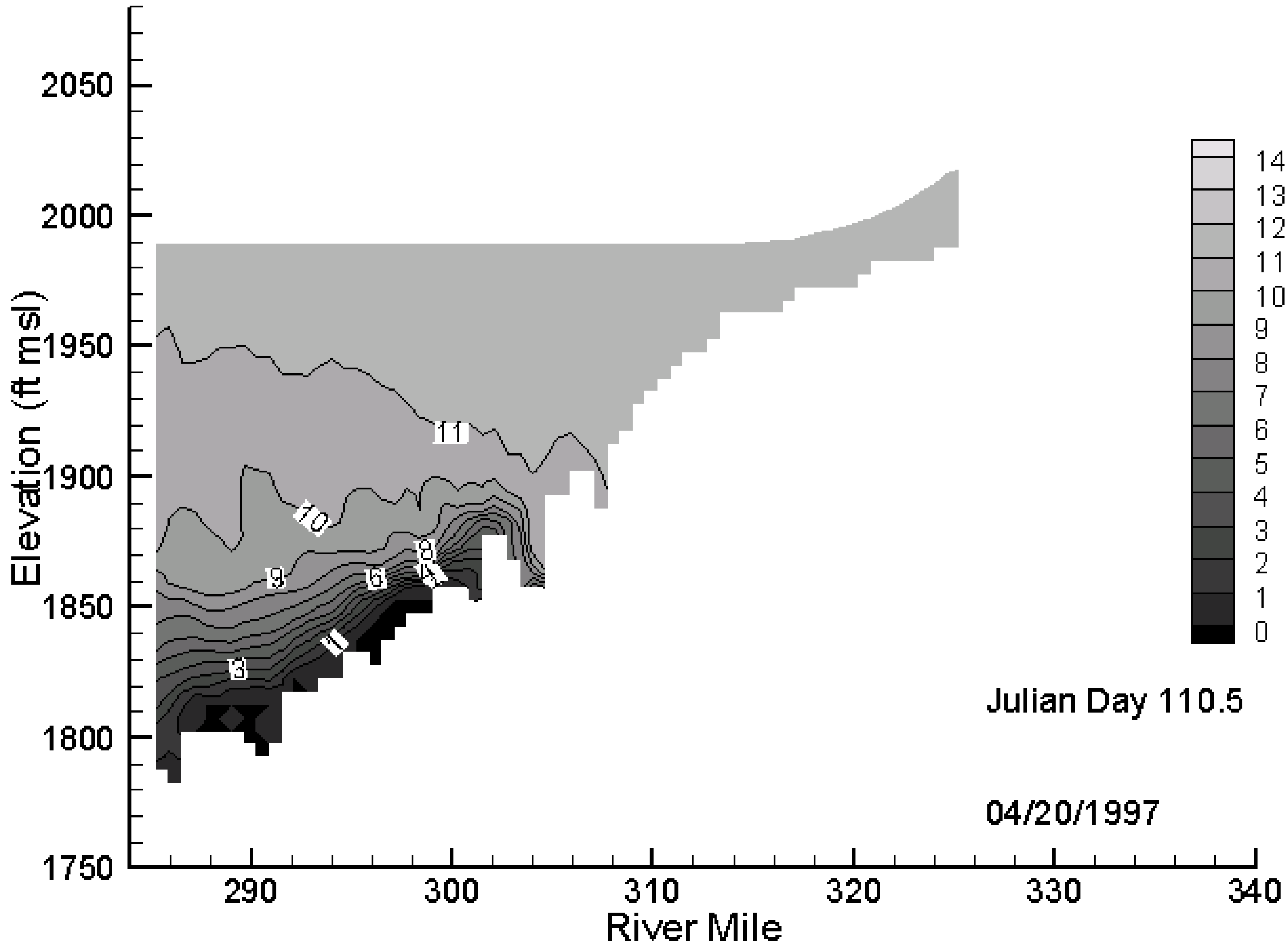

Figure 162. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

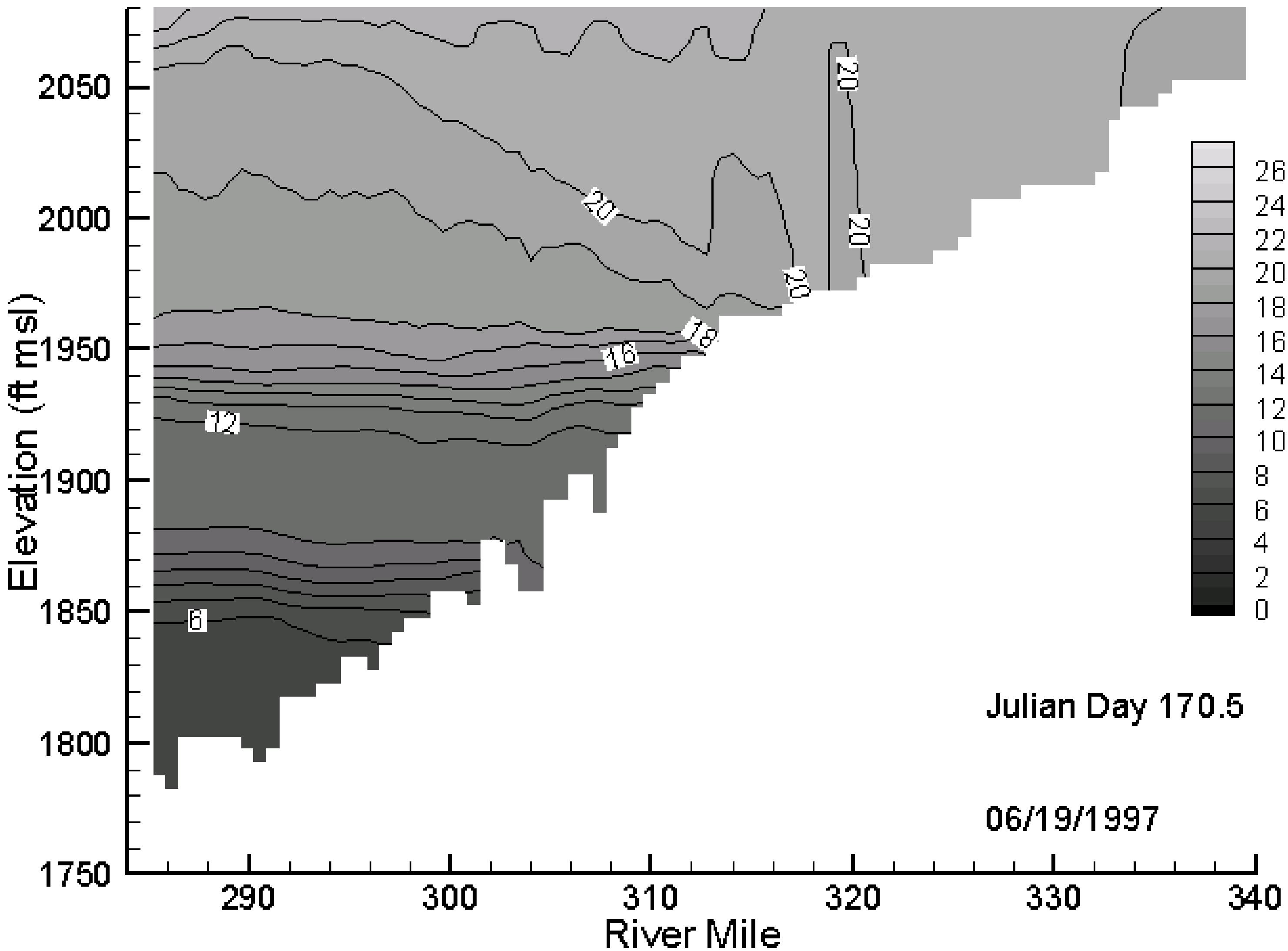

Figure 163. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

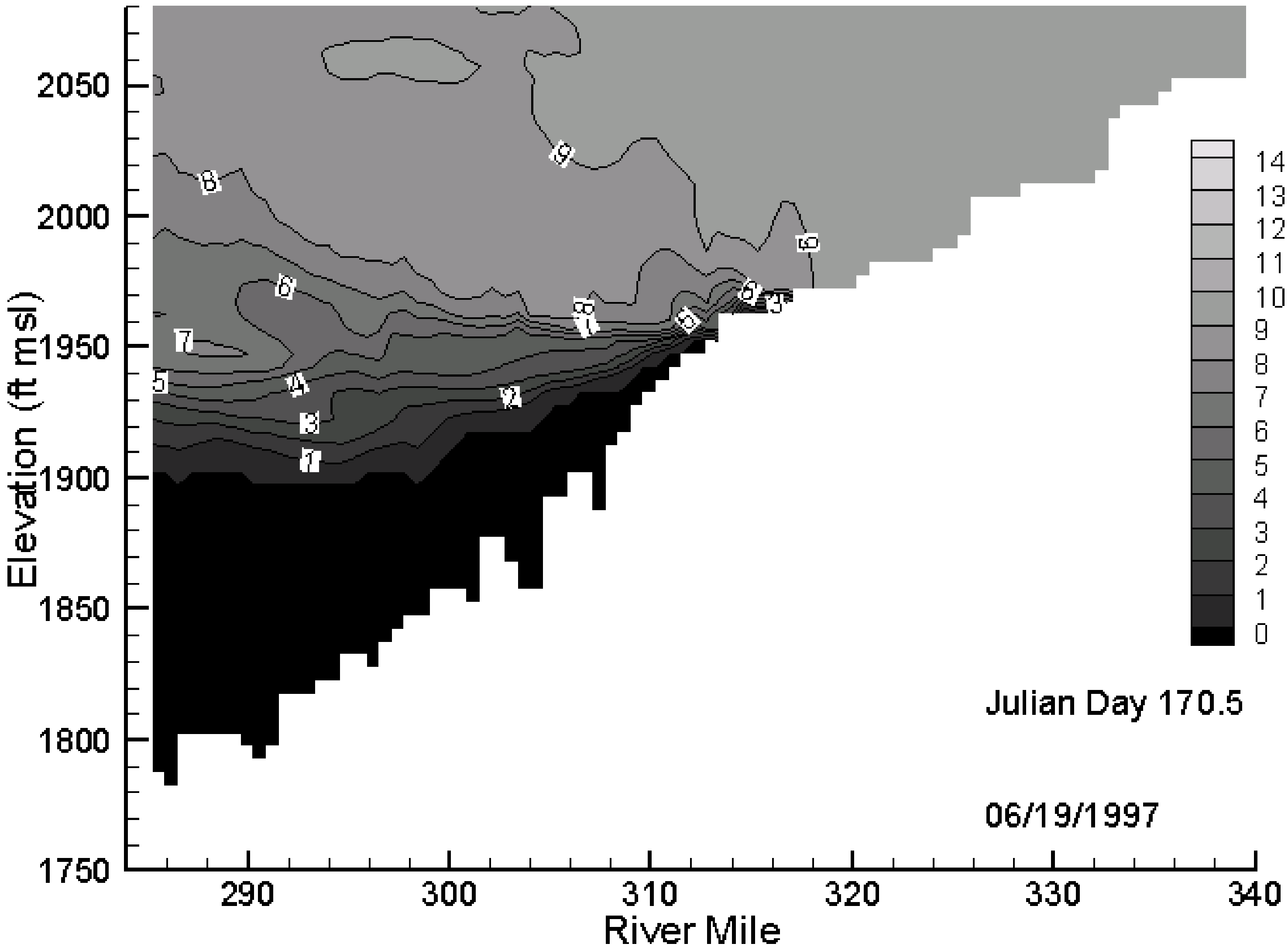

Figure 164. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

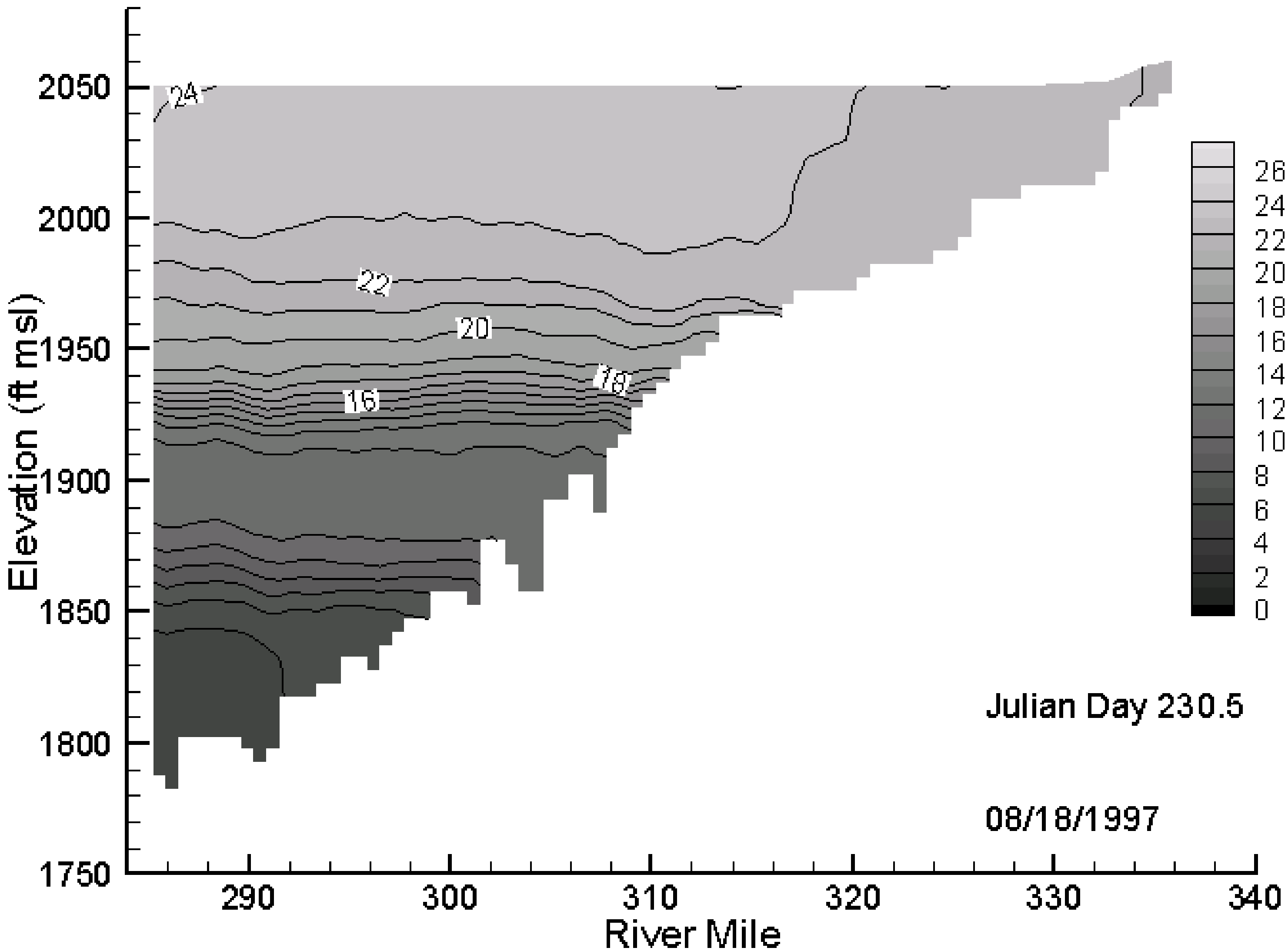

Figure 165. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

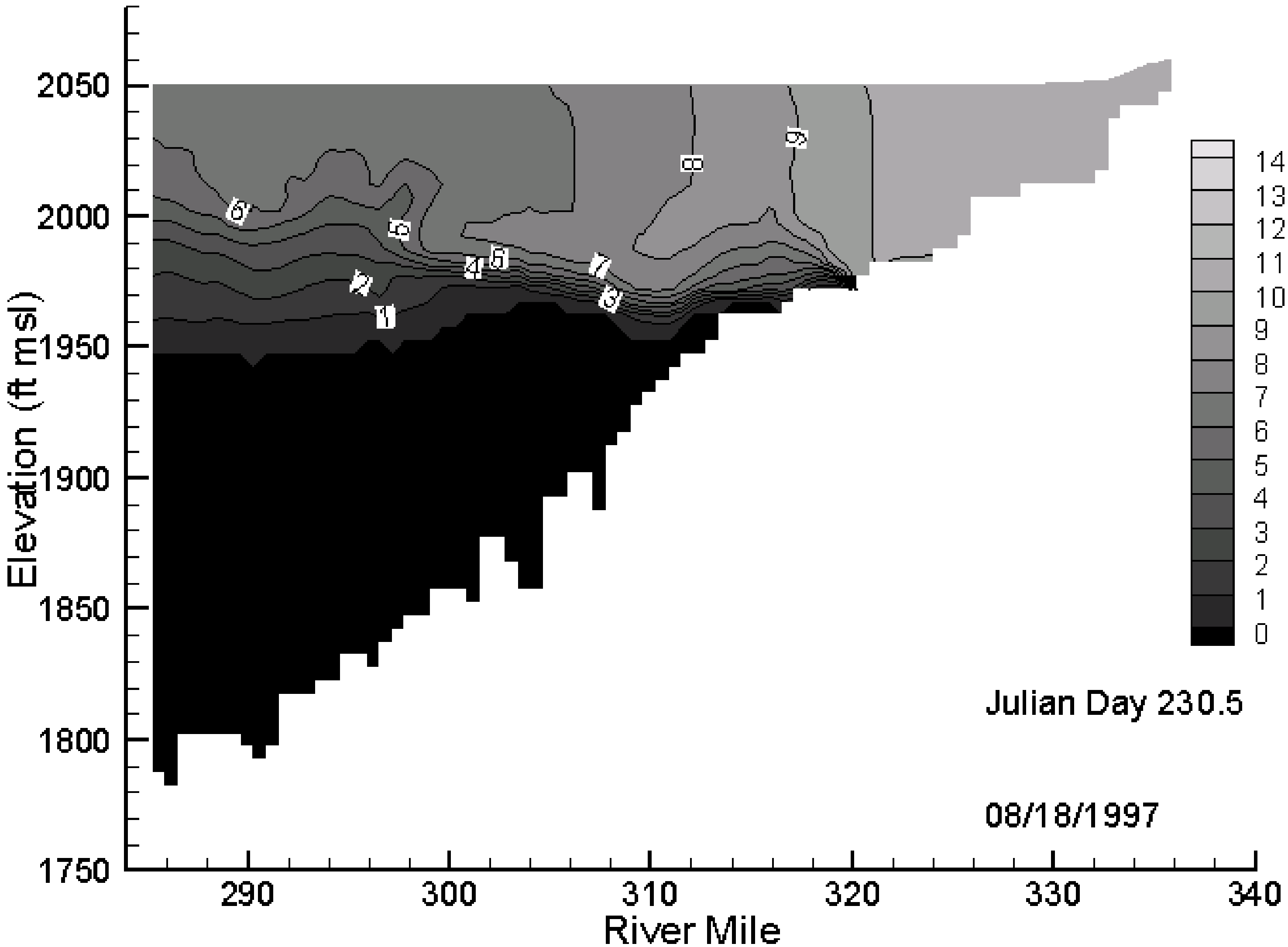

Figure 166. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

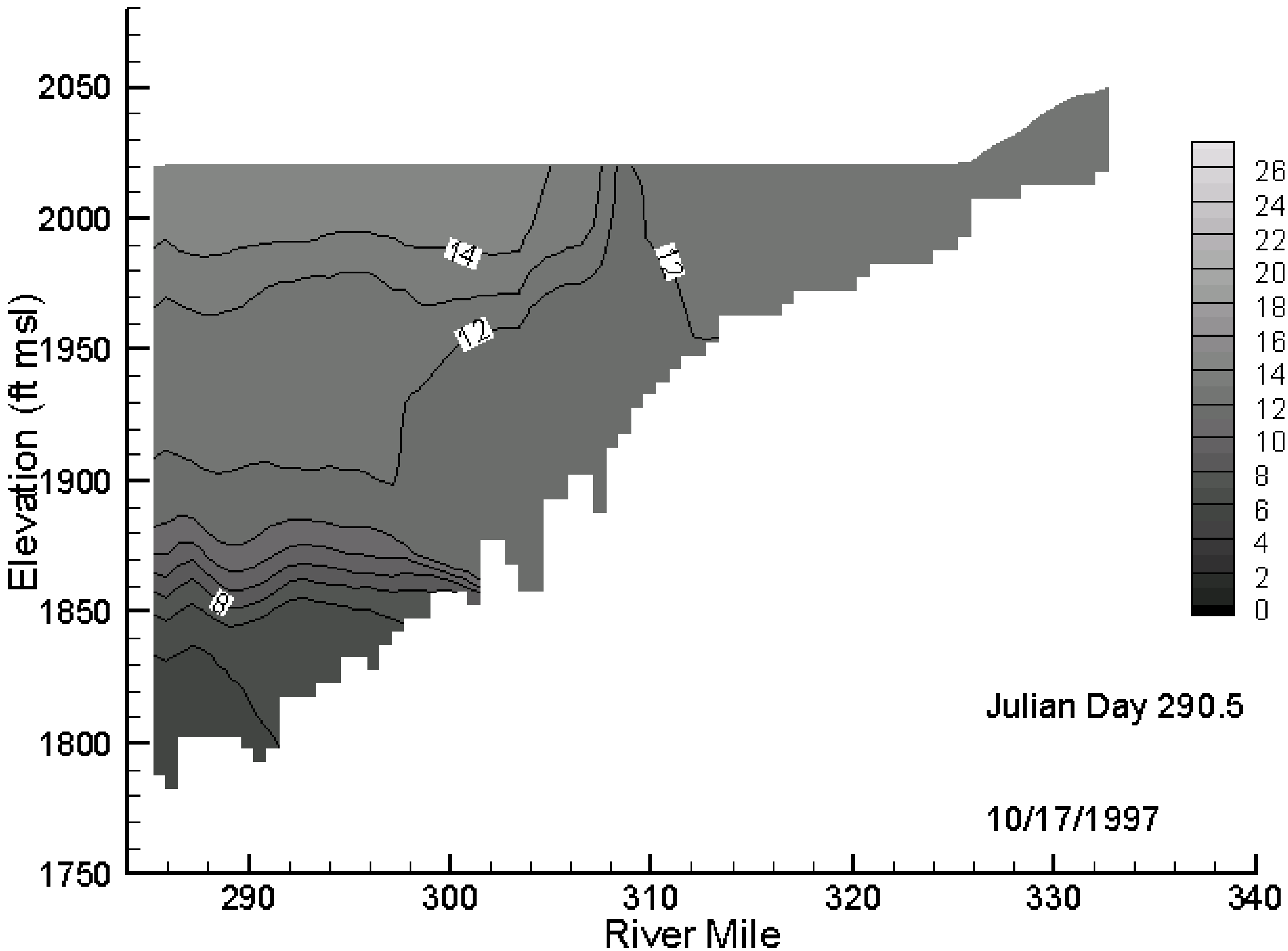

Figure 167. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

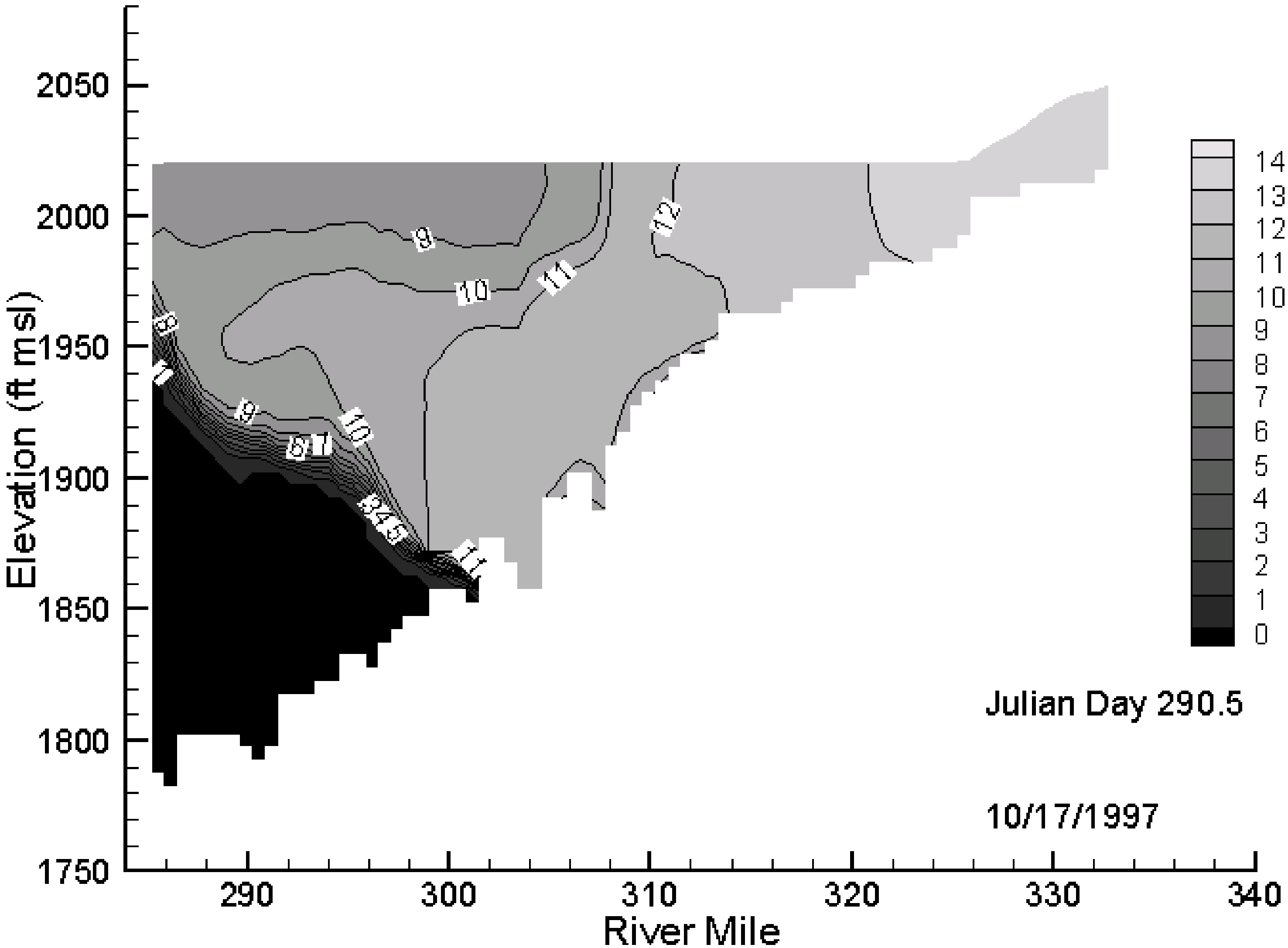

Figure 168. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

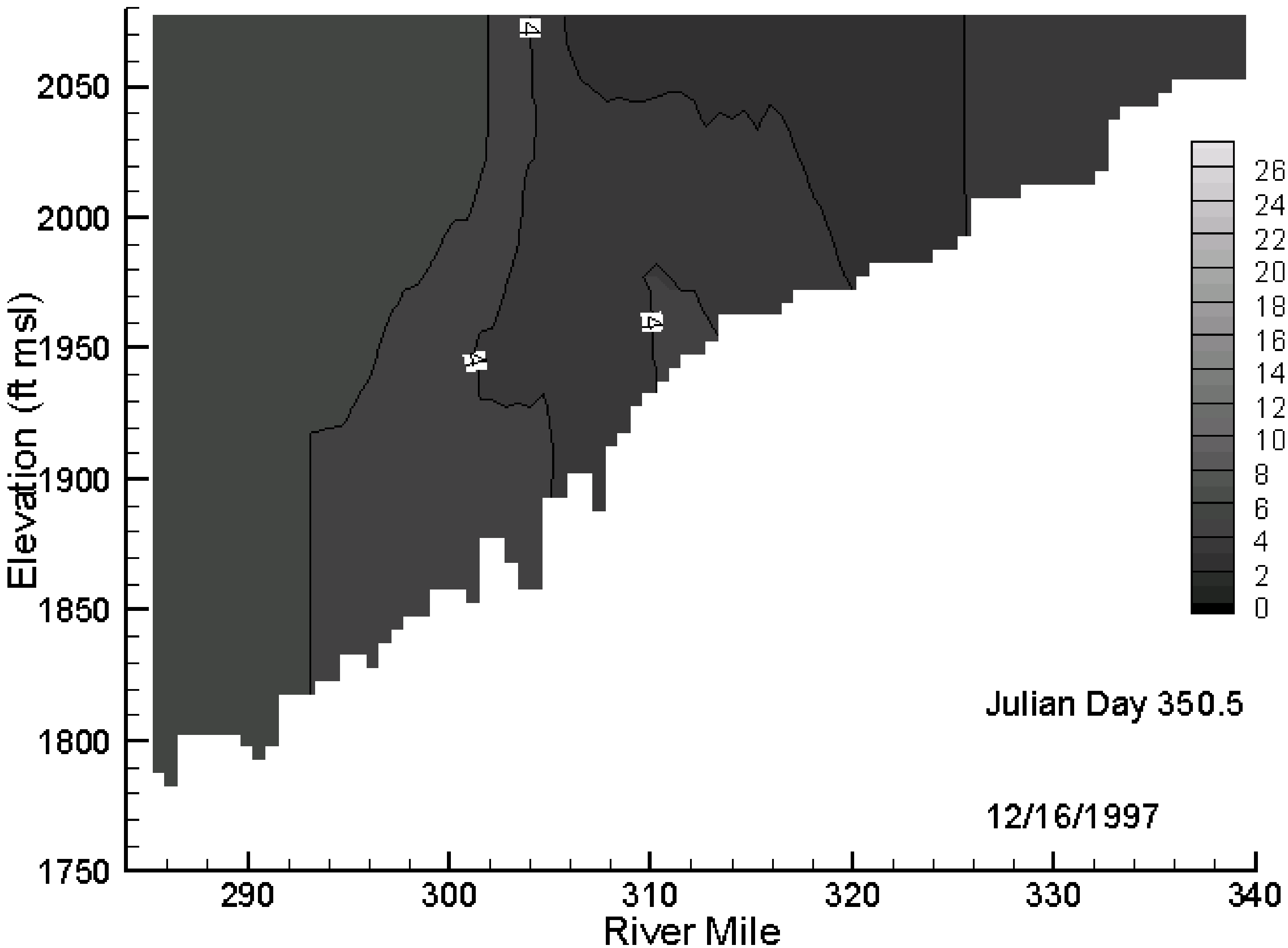

Figure 169. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-2 operations.

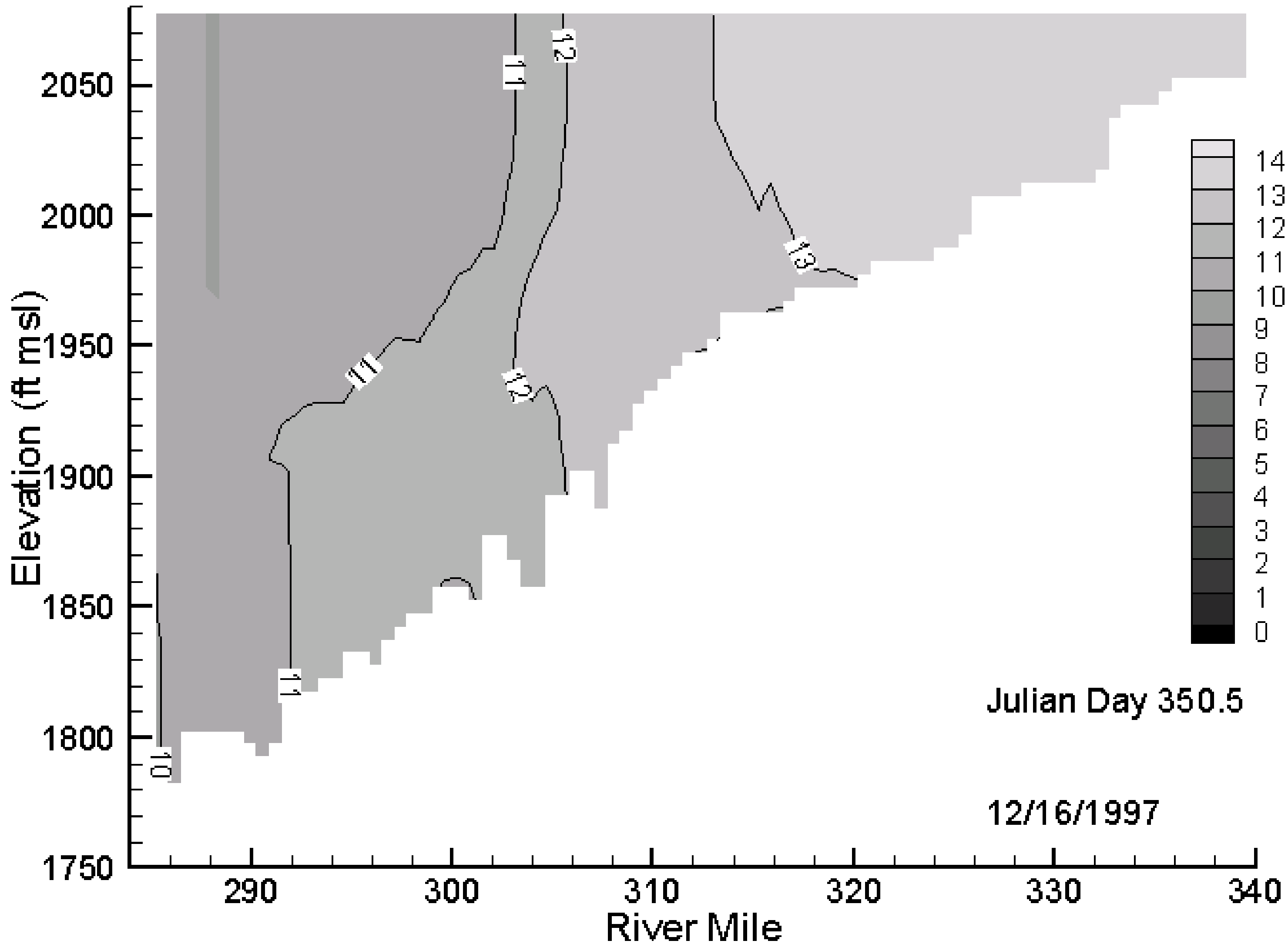

Figure 170. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-2 operations.

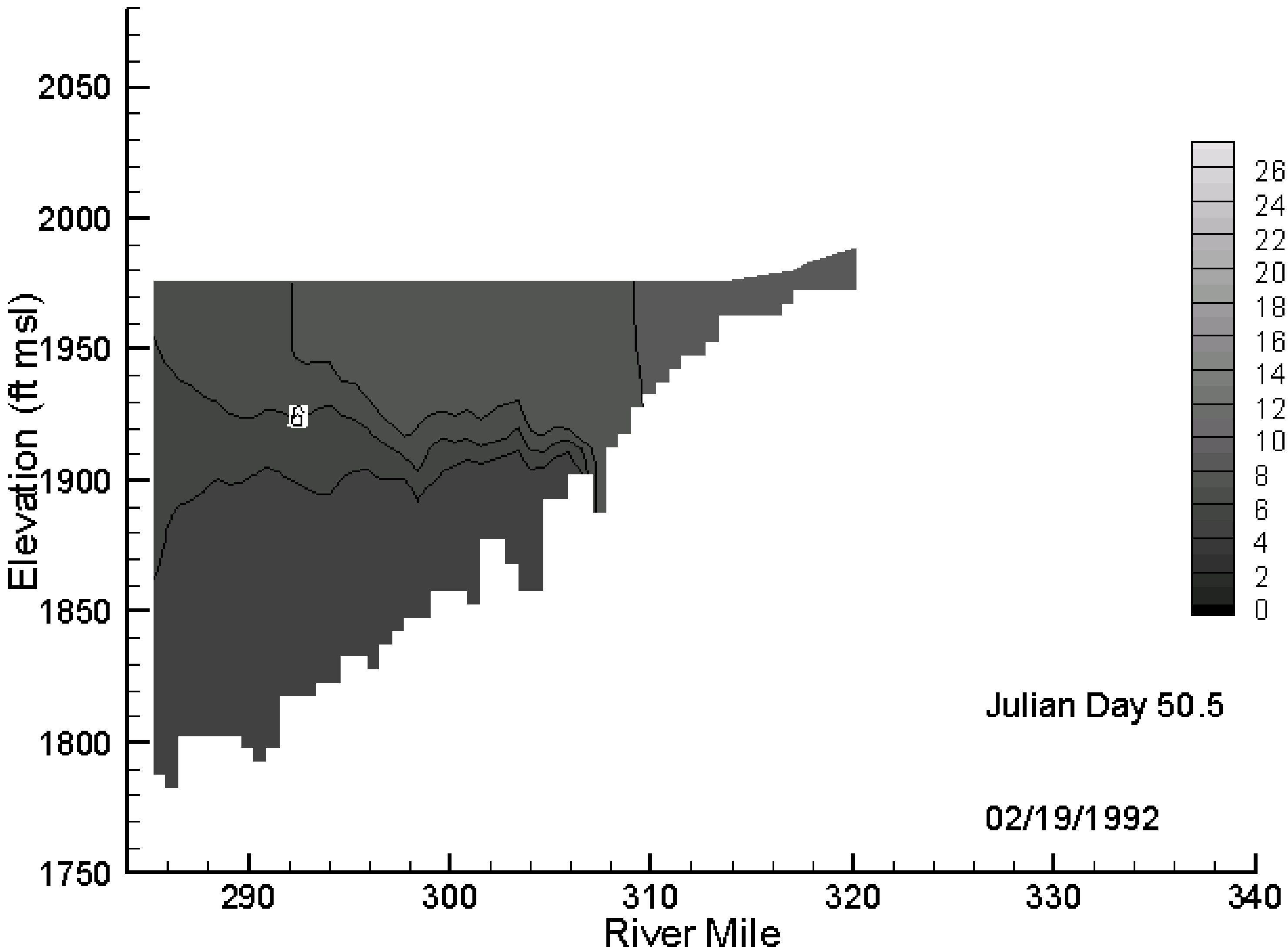

Figure 171. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

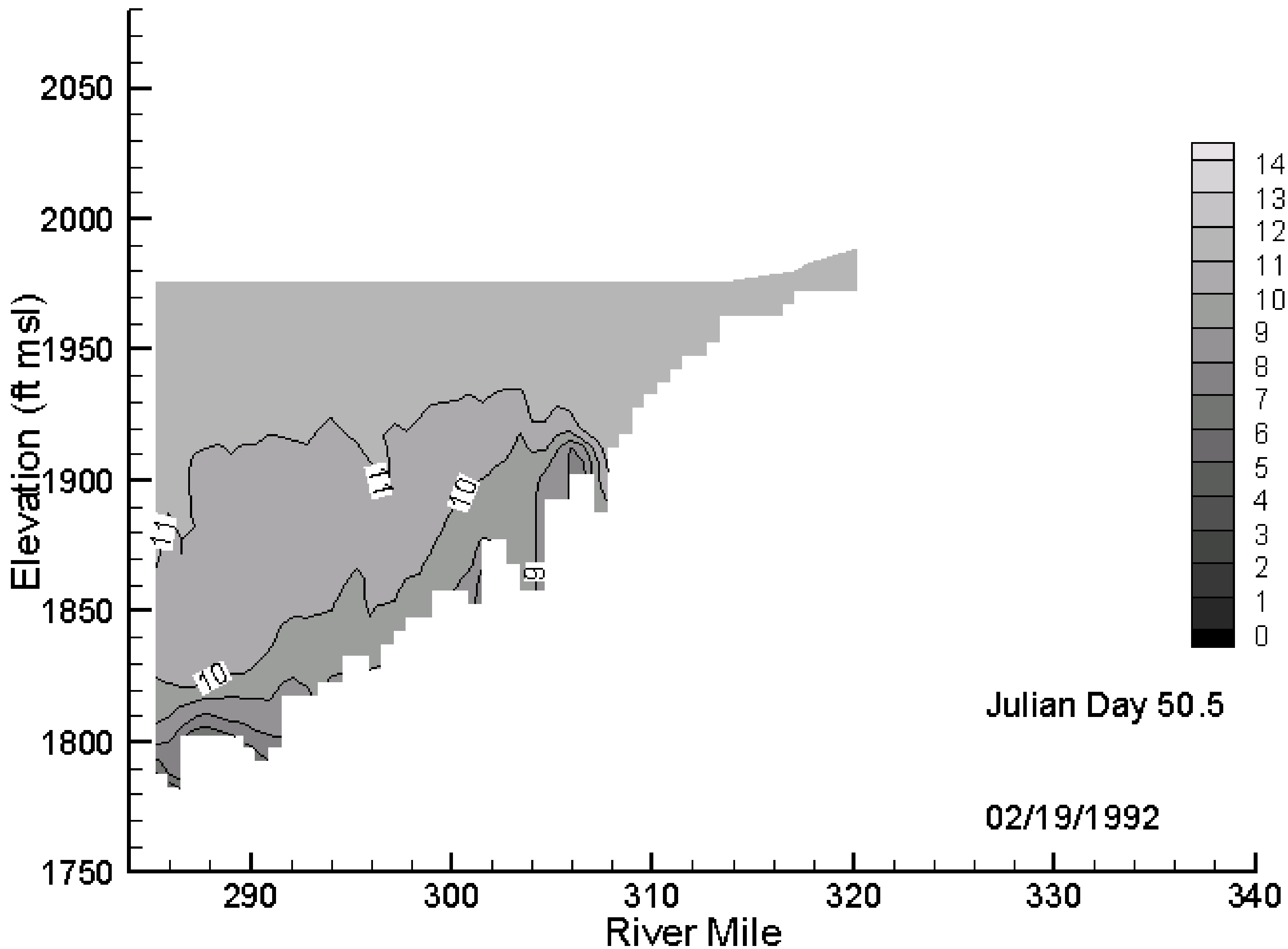

Figure 172. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

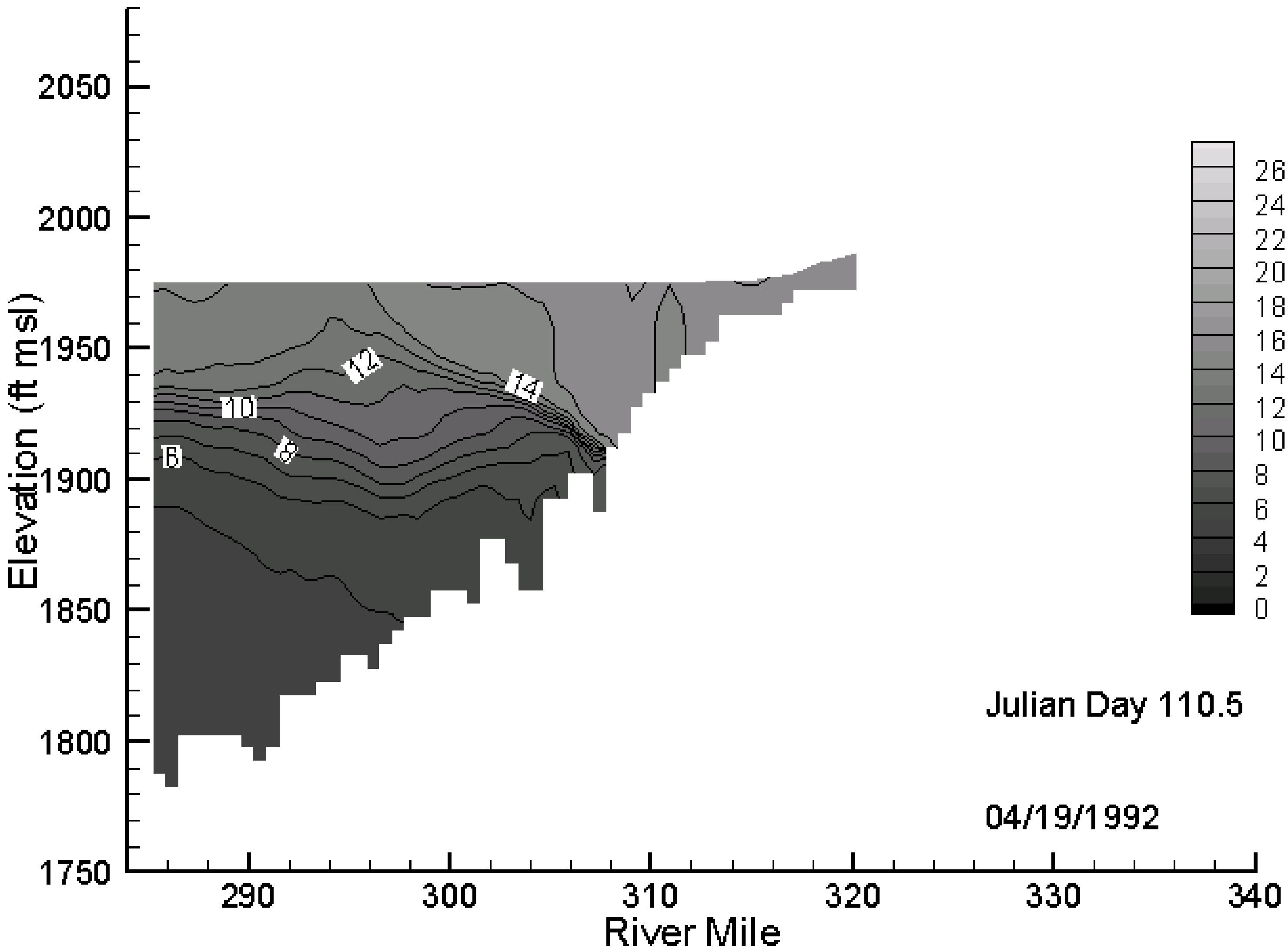

Figure 173. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

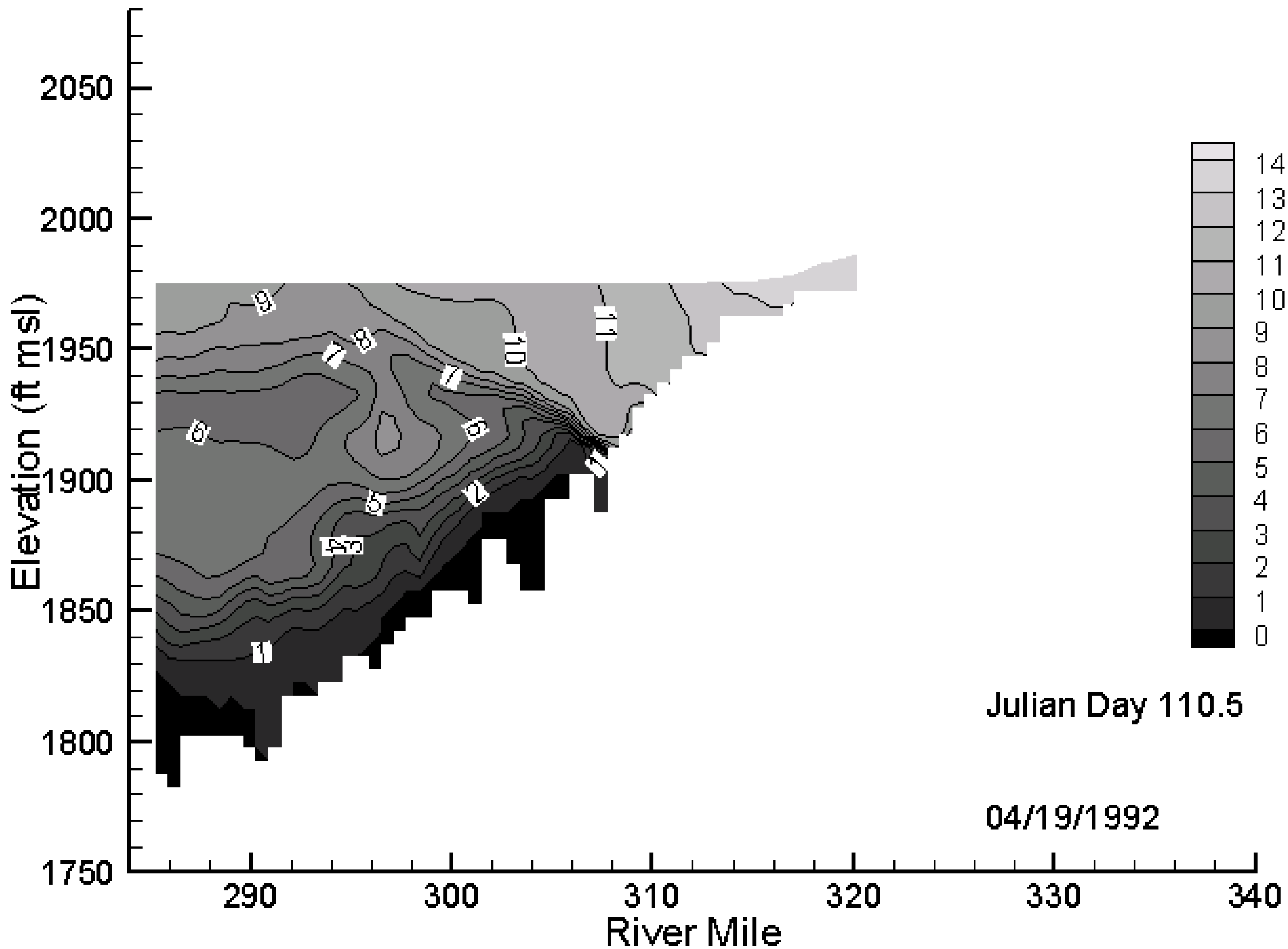

Figure 174. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

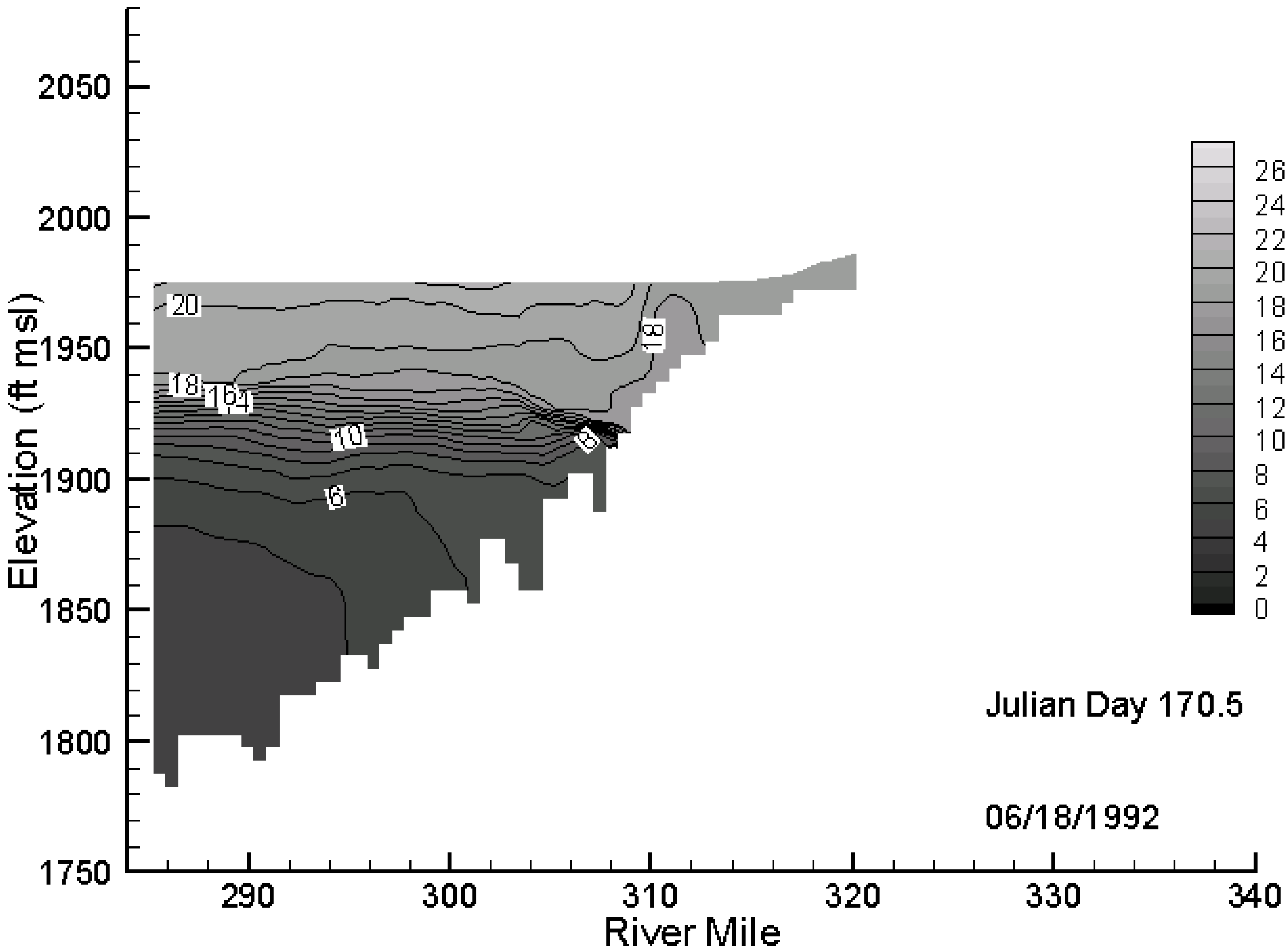

Figure 175. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

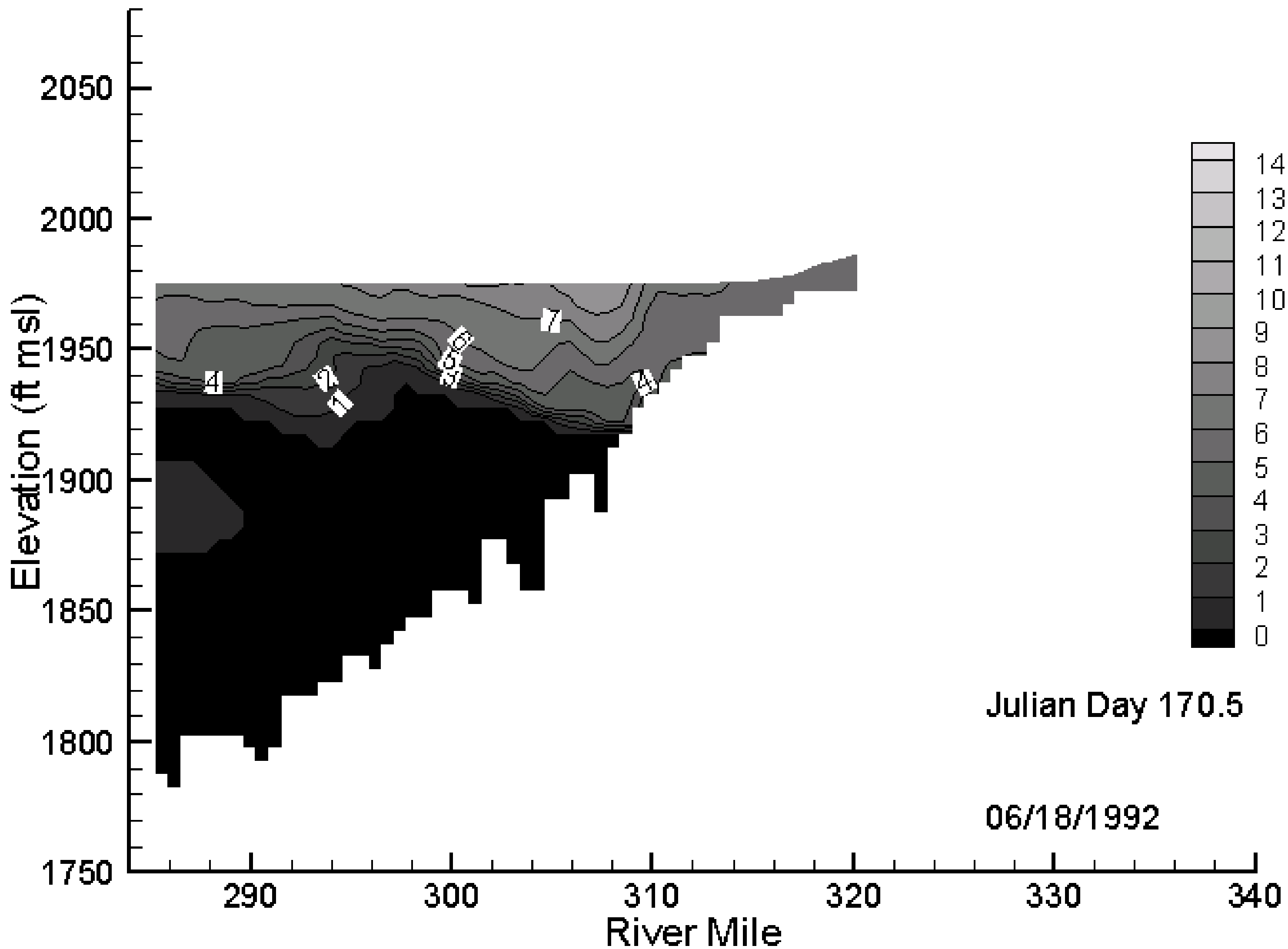

Figure 176. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

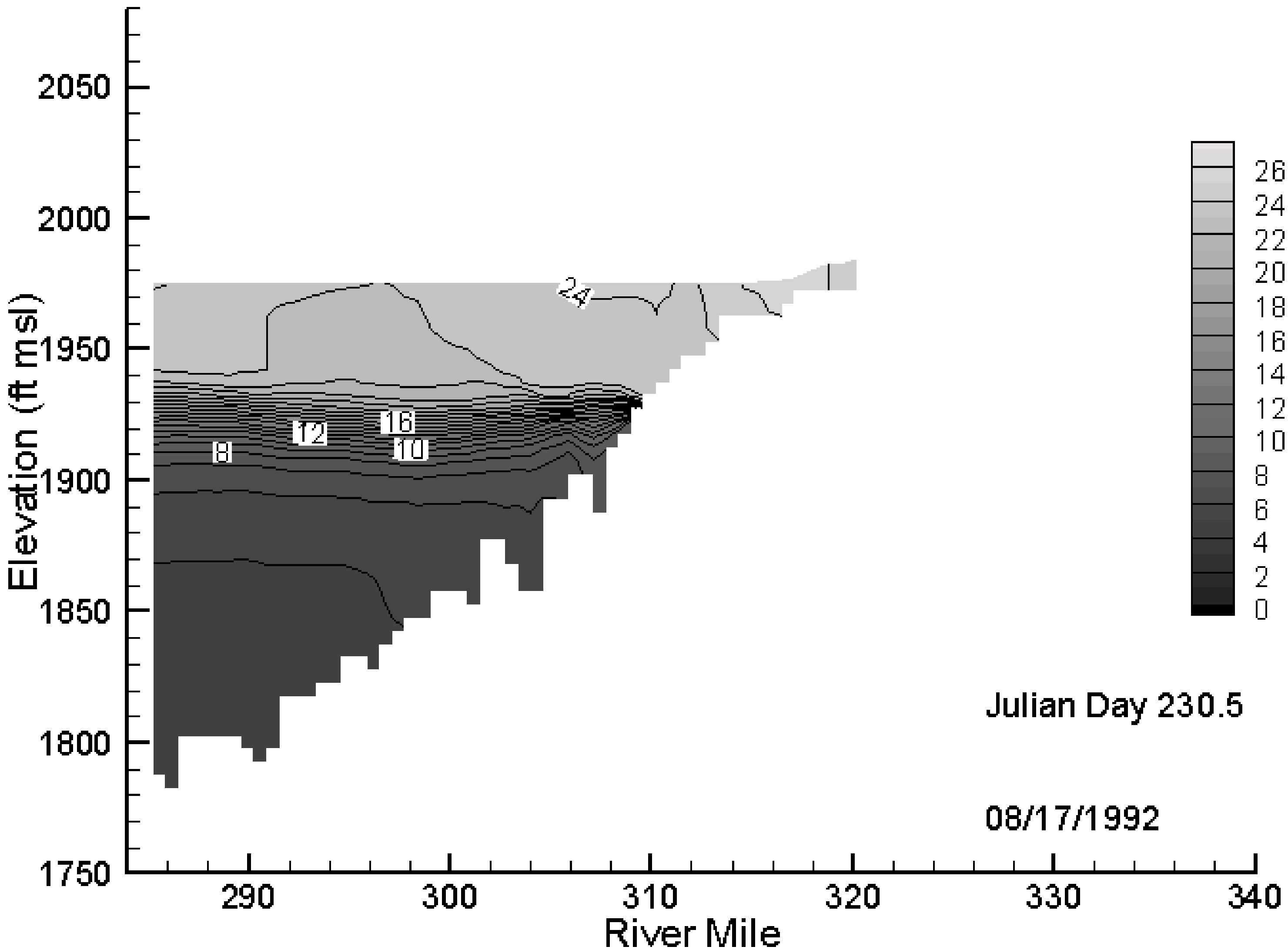

Figure 177. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

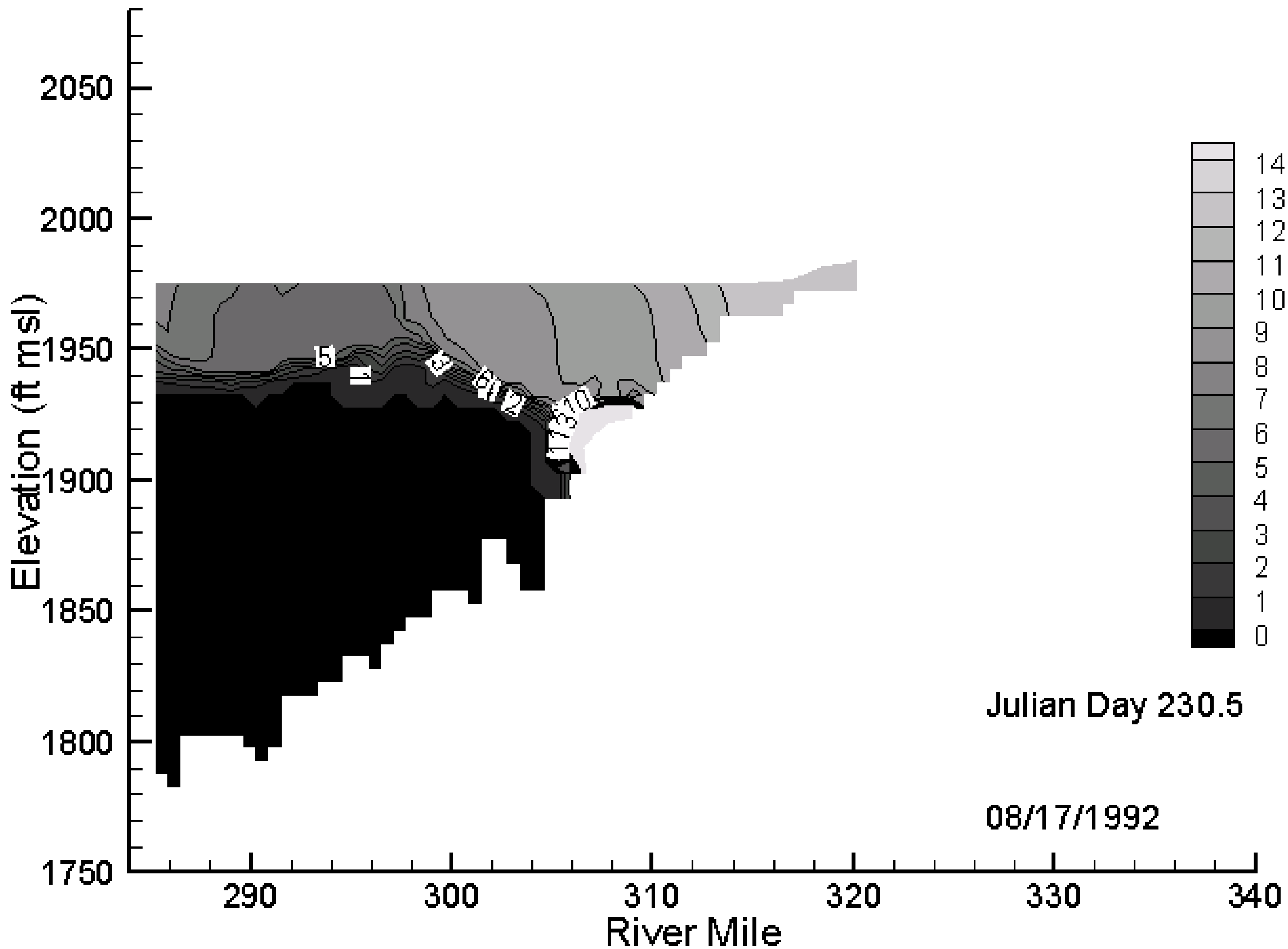

Figure 178. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

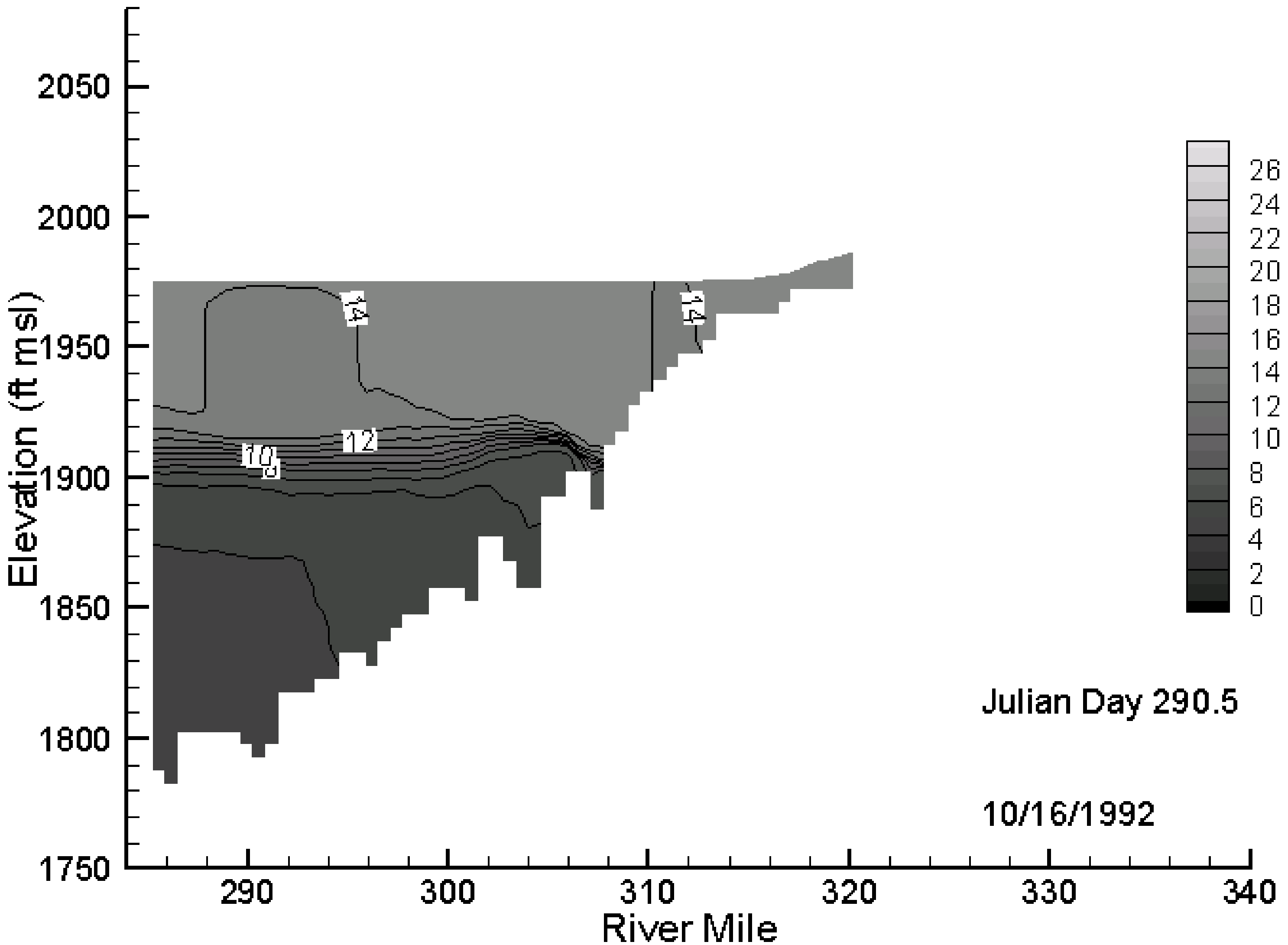

Figure 179. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

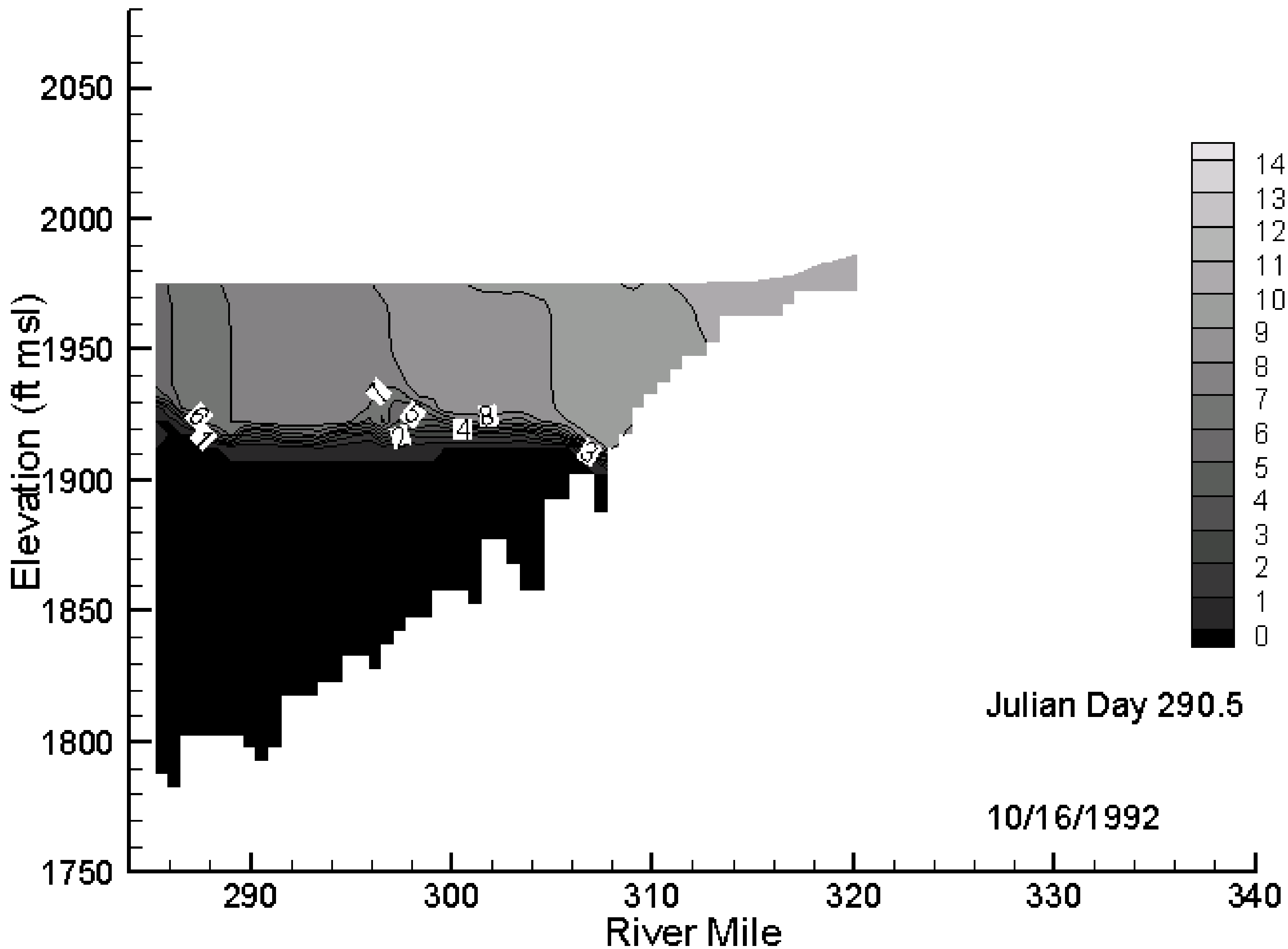

Figure 180. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

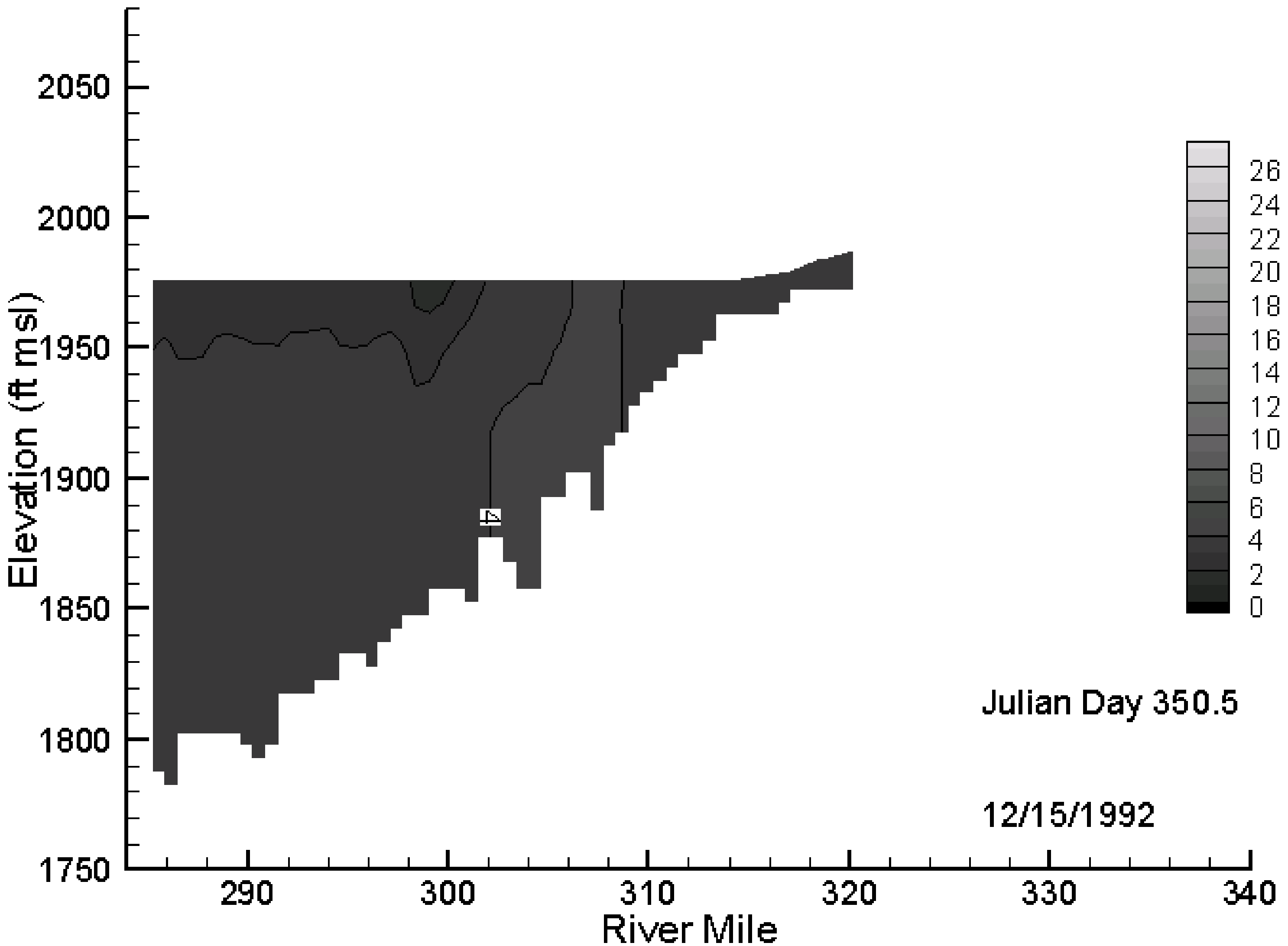

Figure 181. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

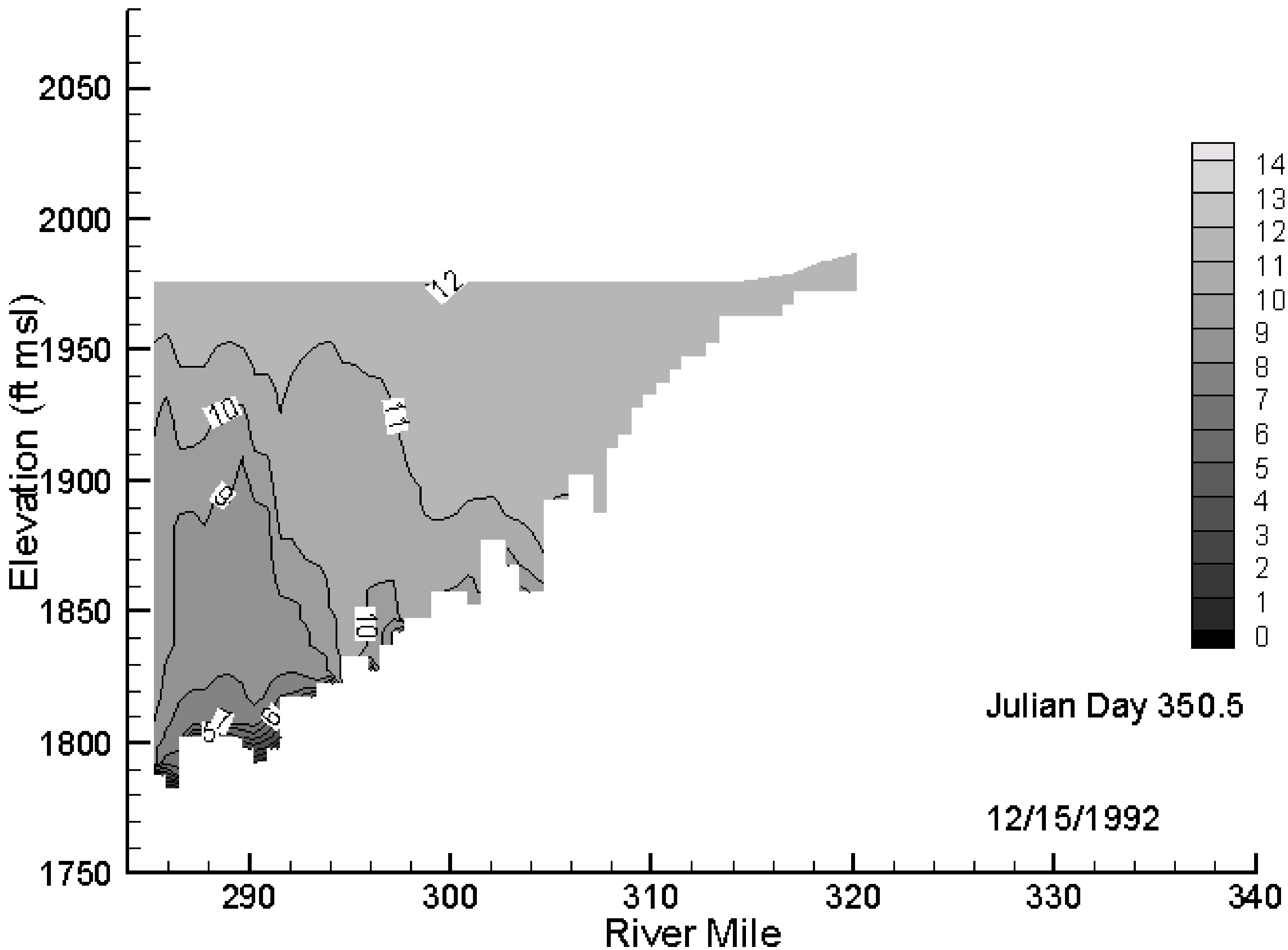

Figure 182. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

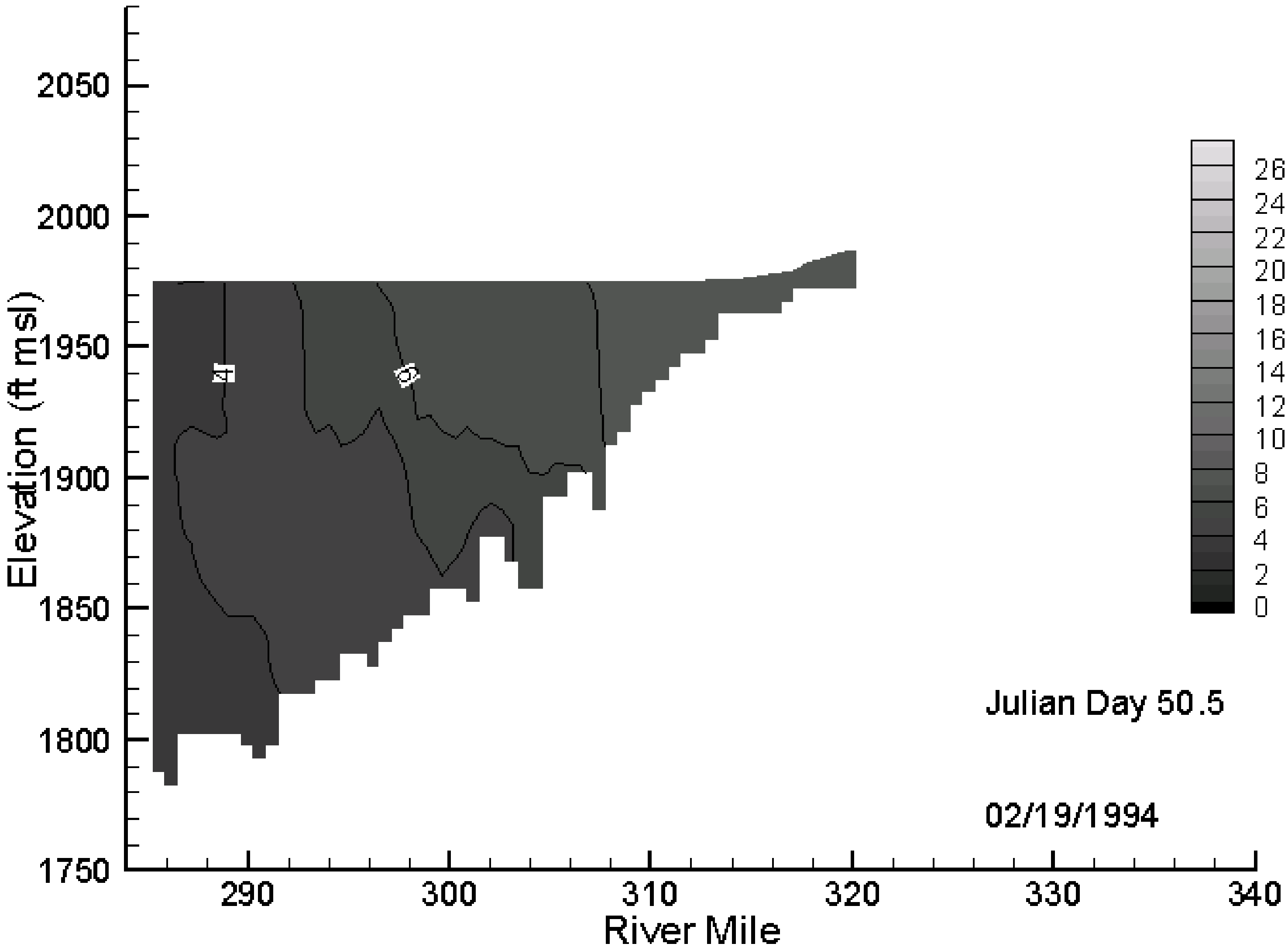

Figure 183. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

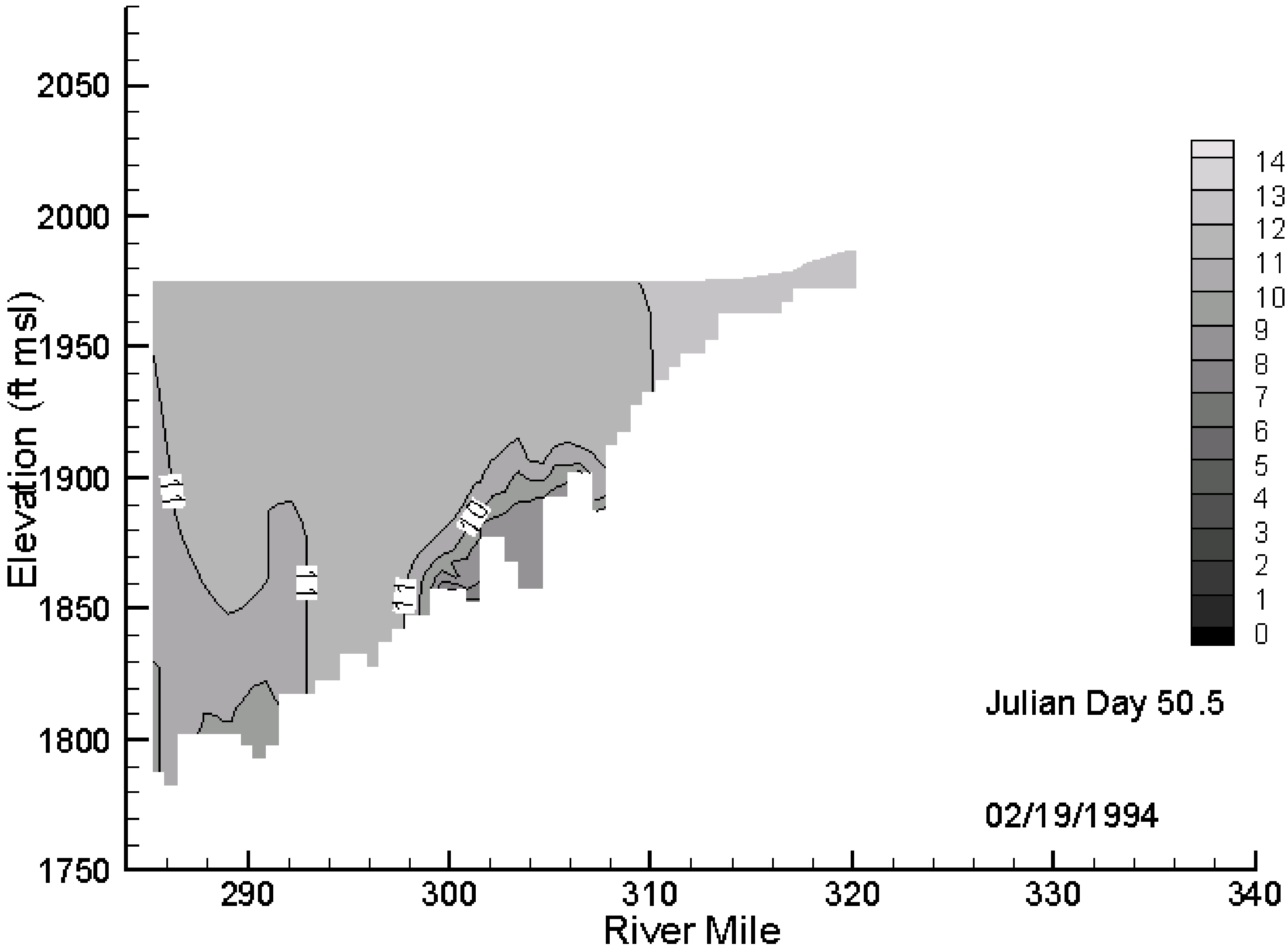

Figure 184. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

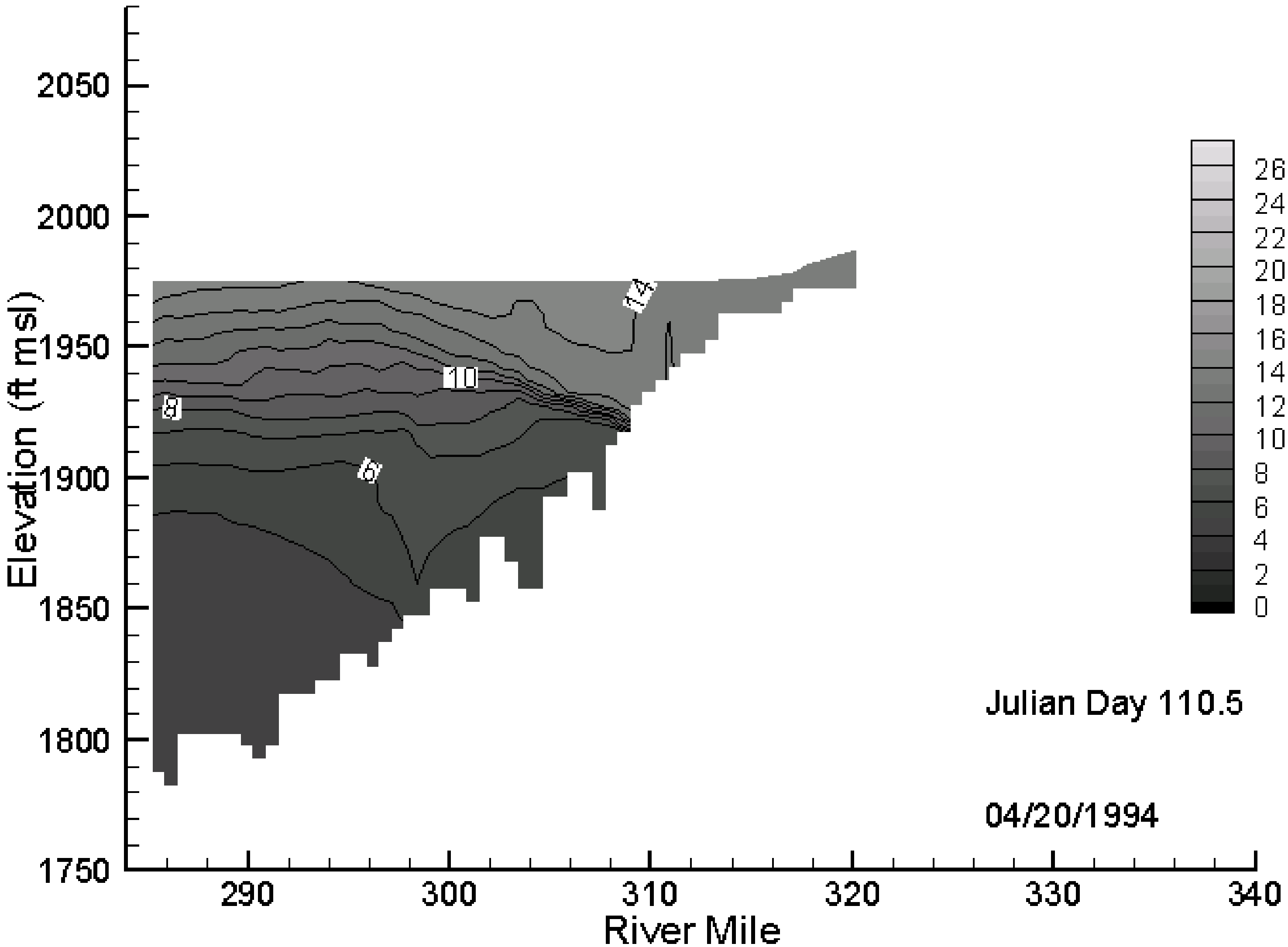

Figure 185. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

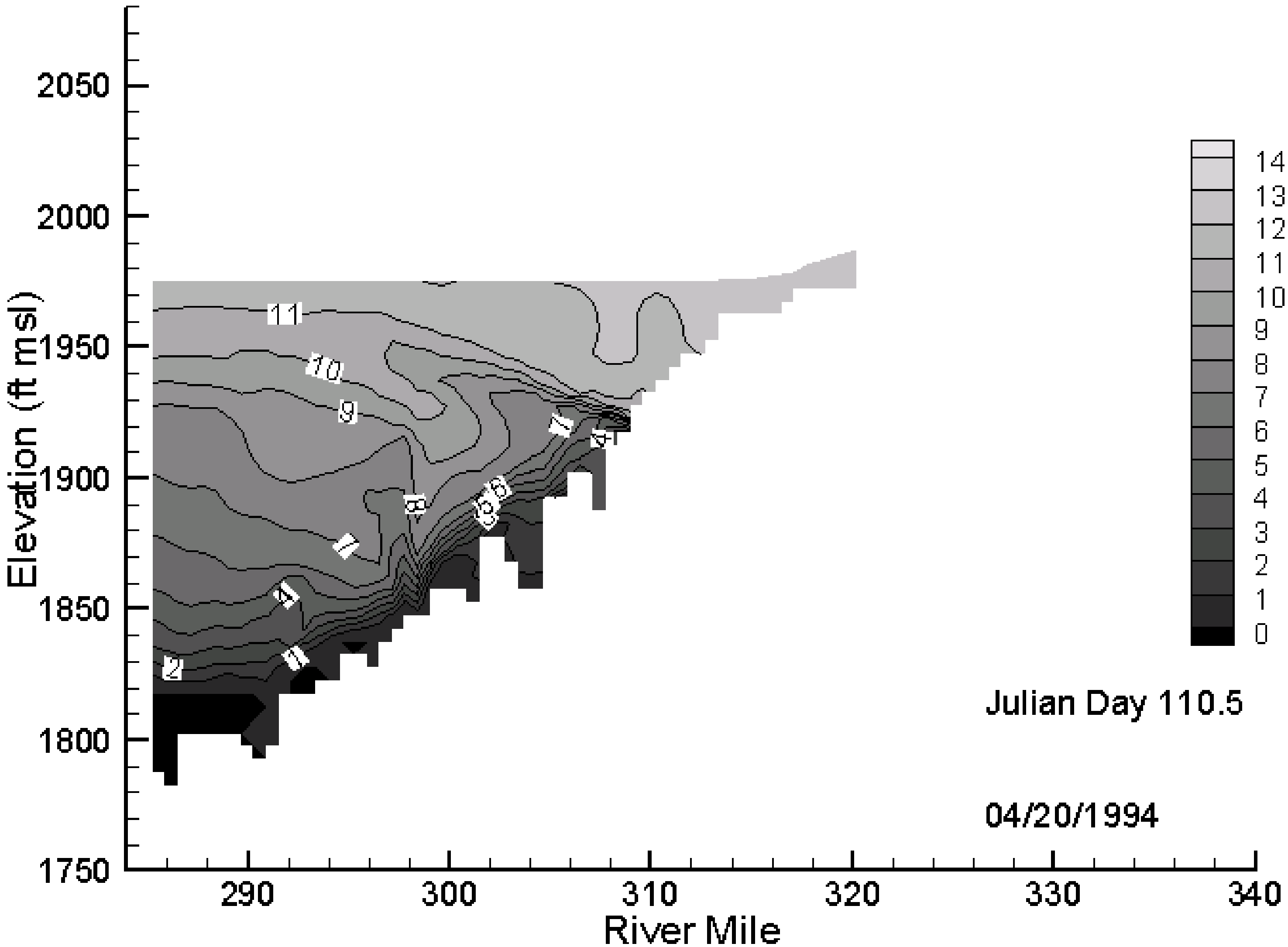

Figure 186. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

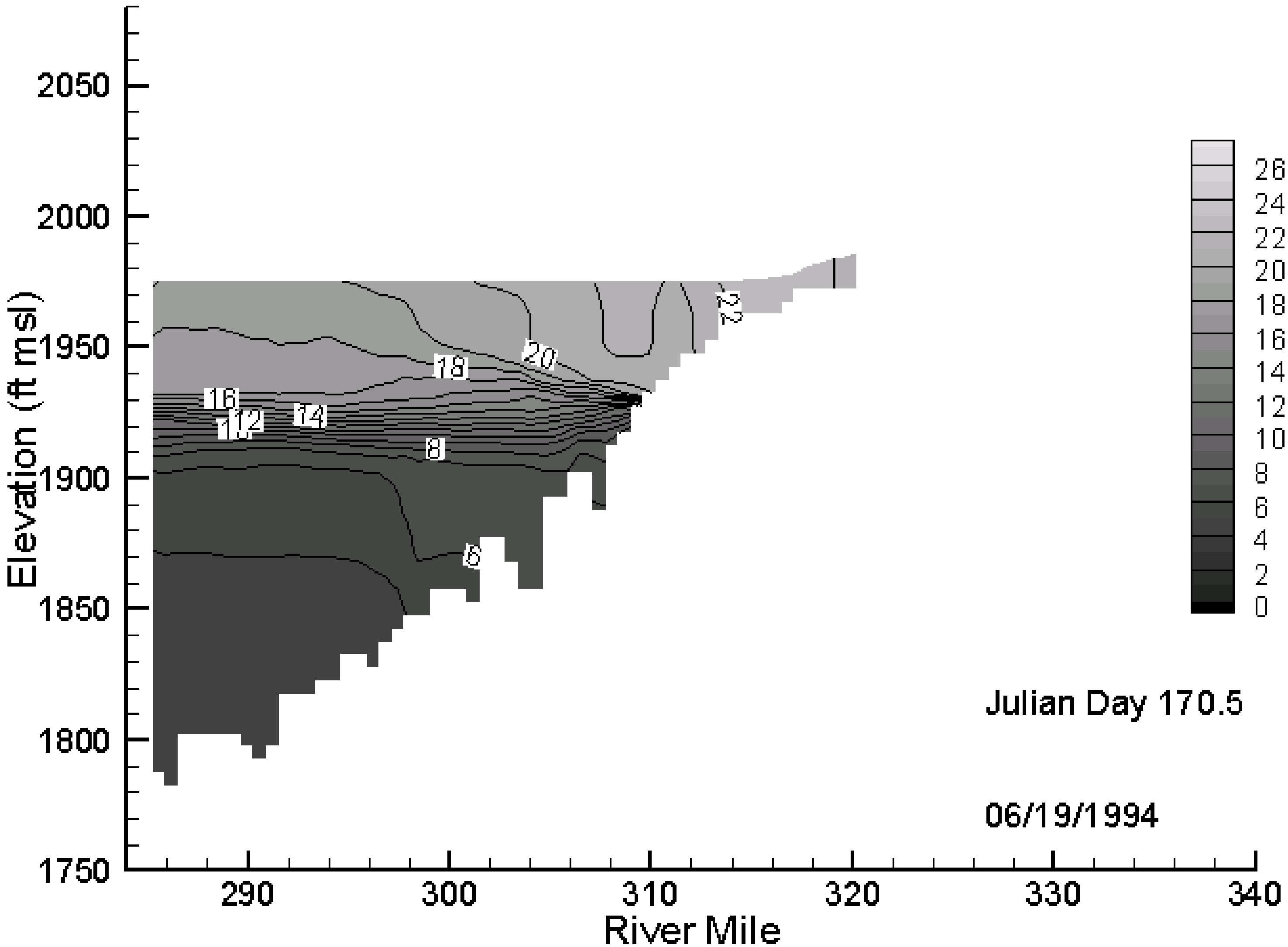

Figure 187. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

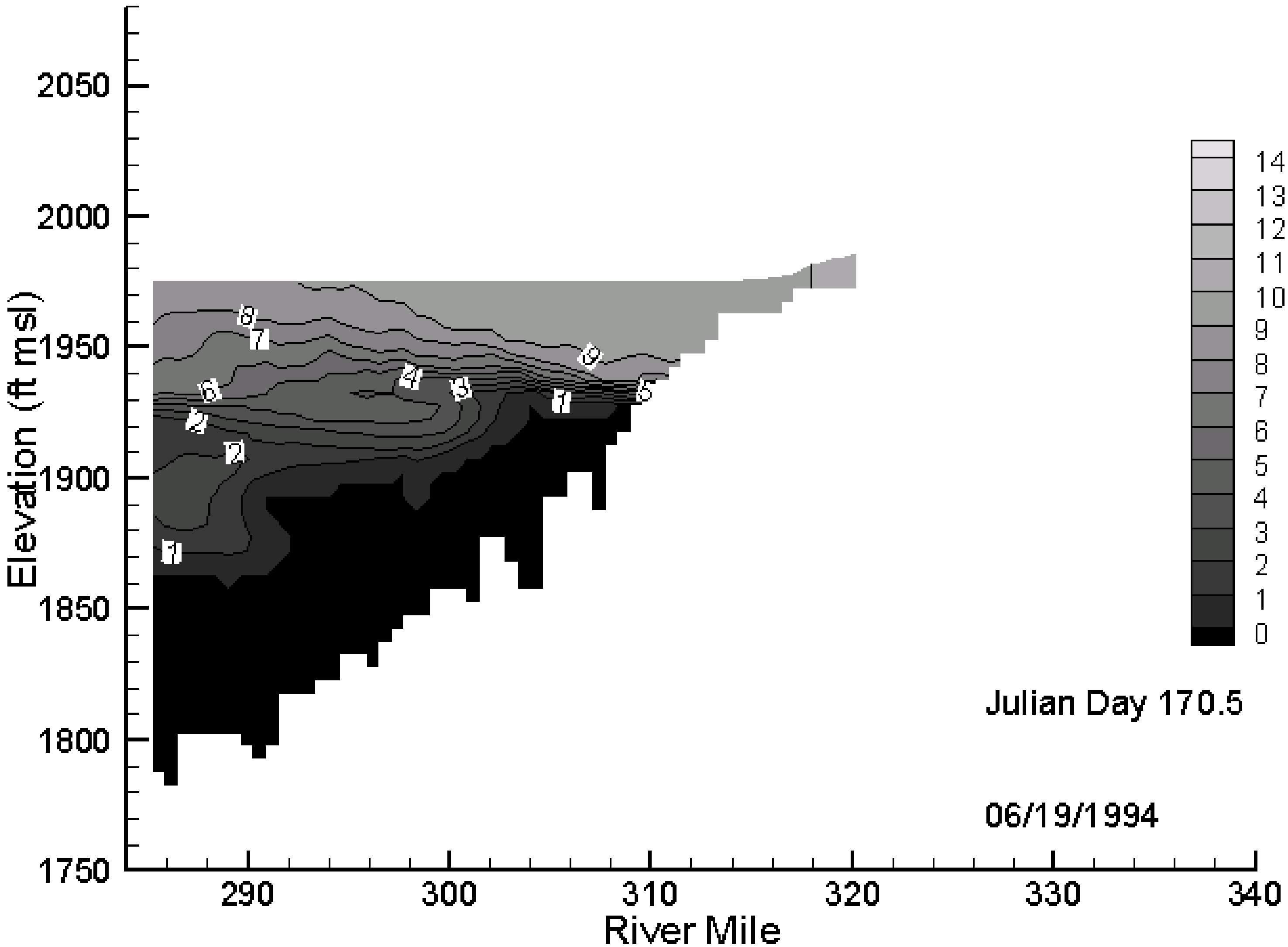

Figure 188. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

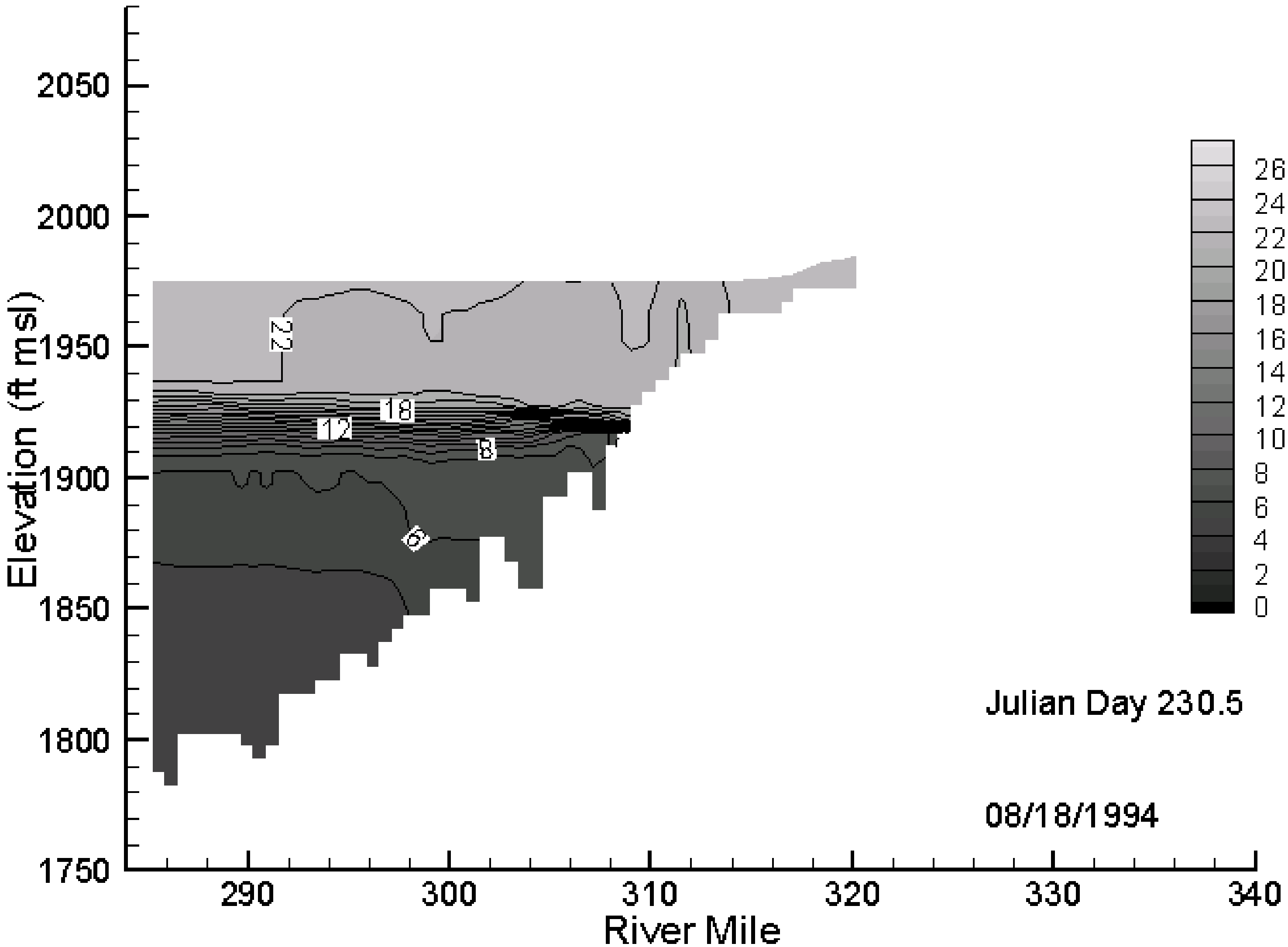

Figure 189. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

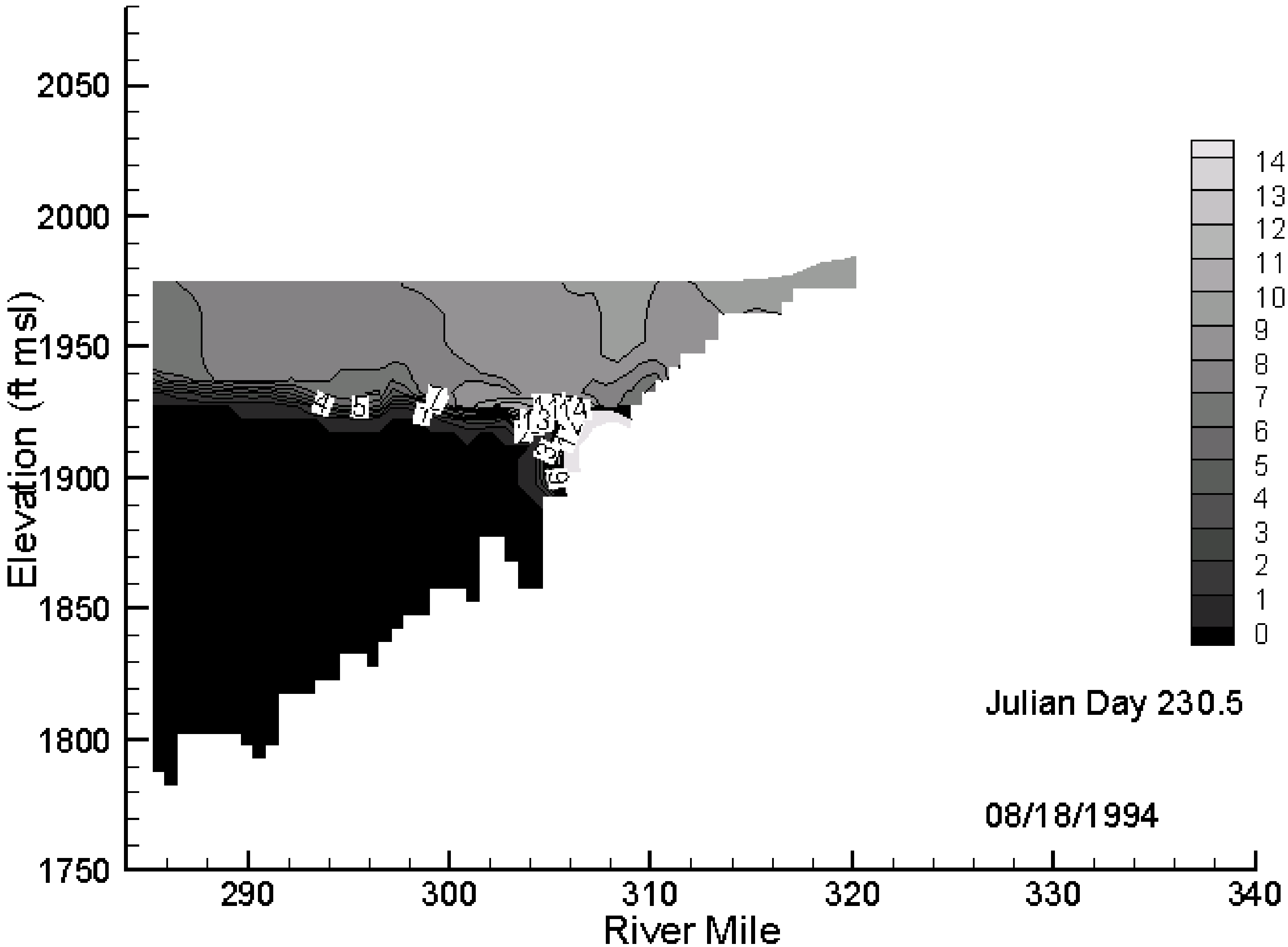

Figure 190. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

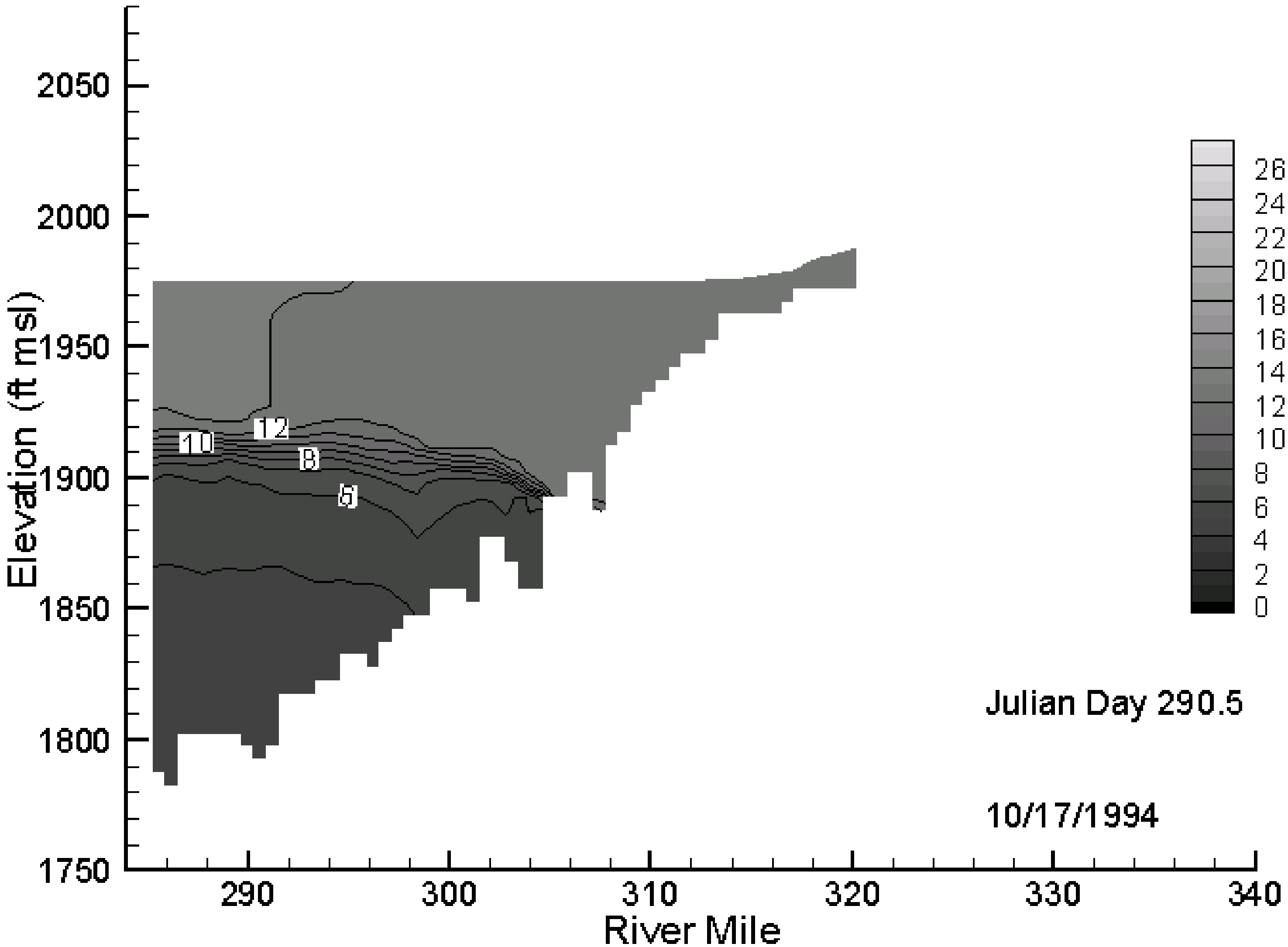

Figure 191. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

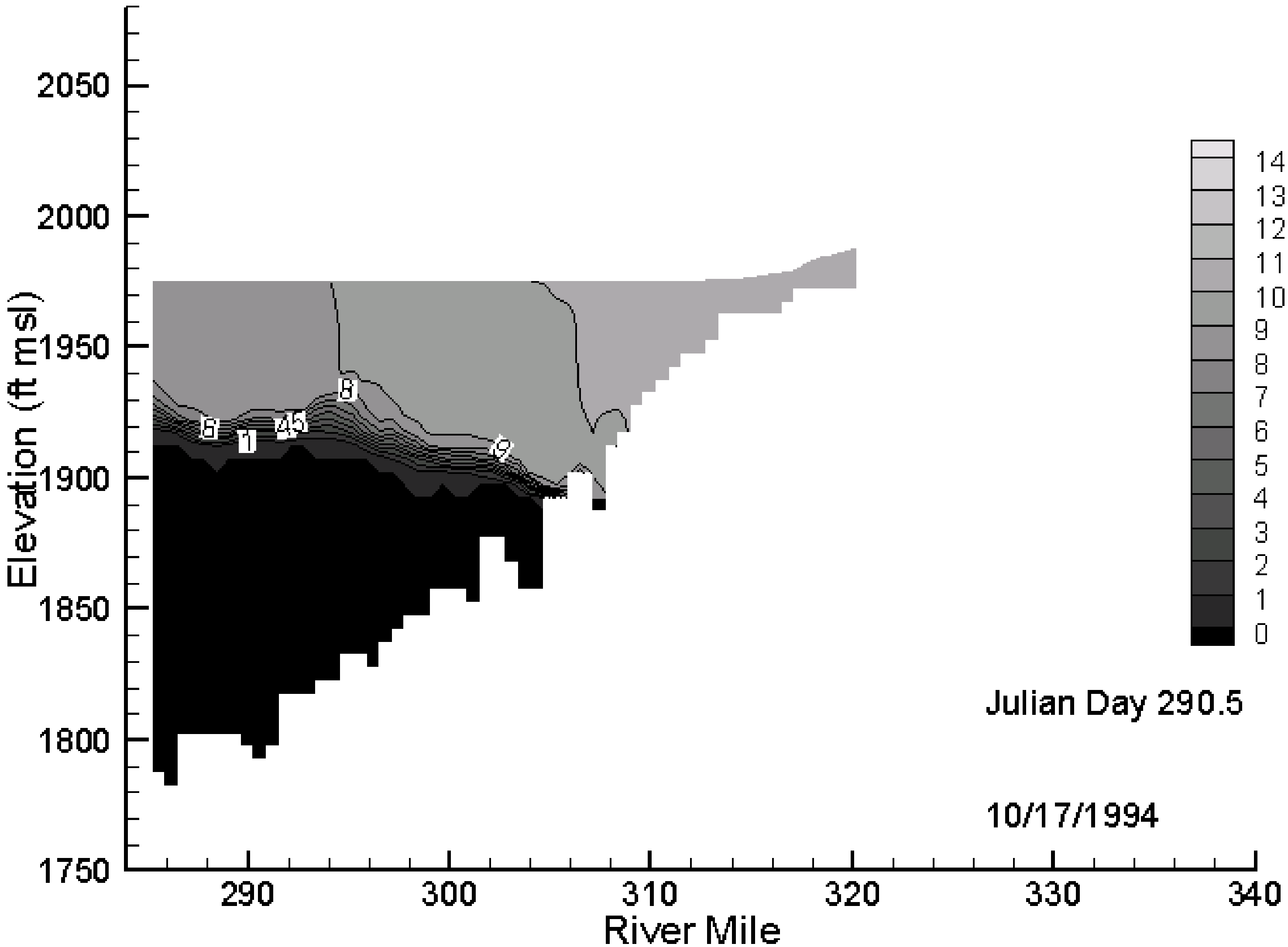

Figure 192. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

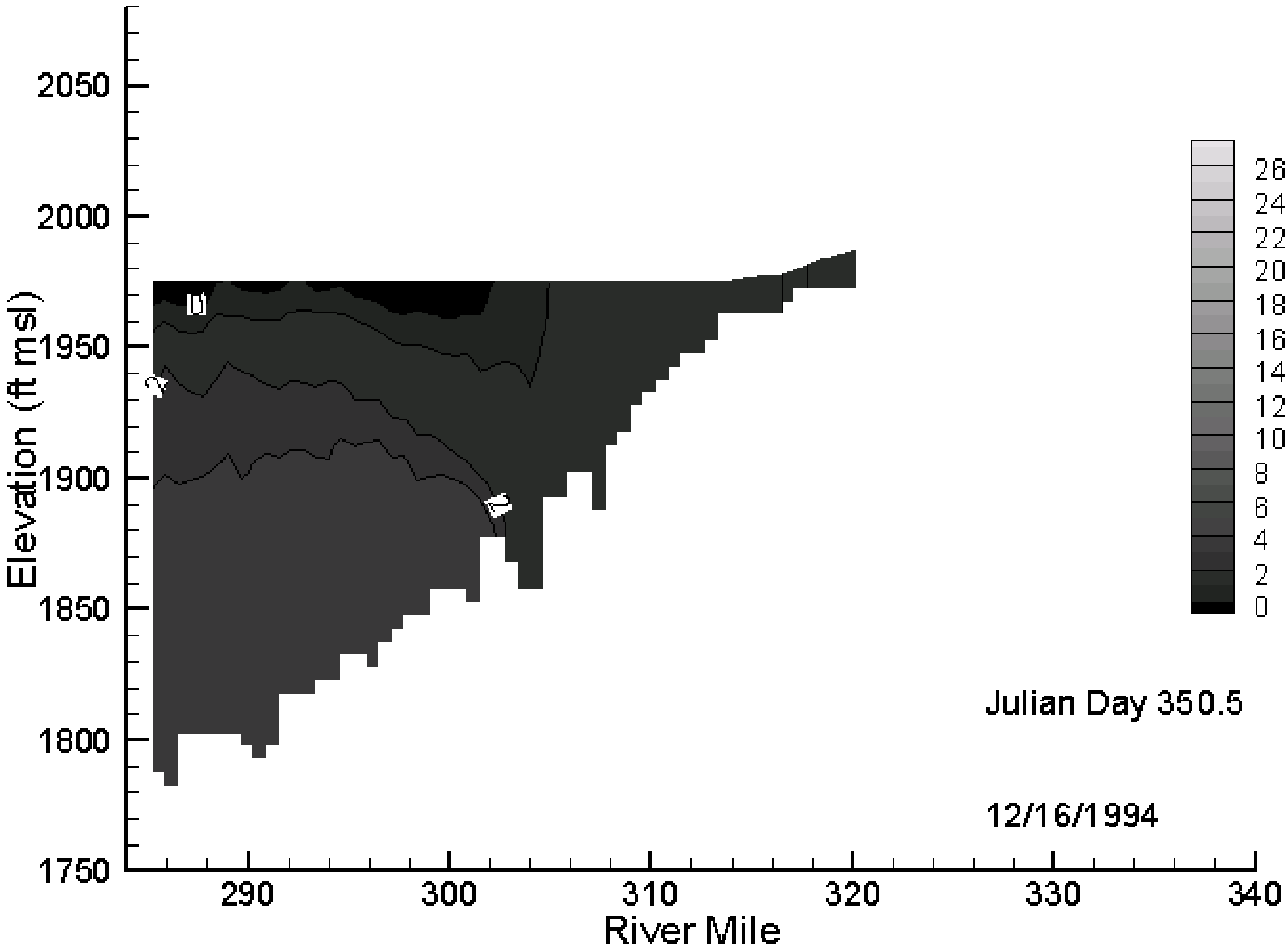

Figure 193. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

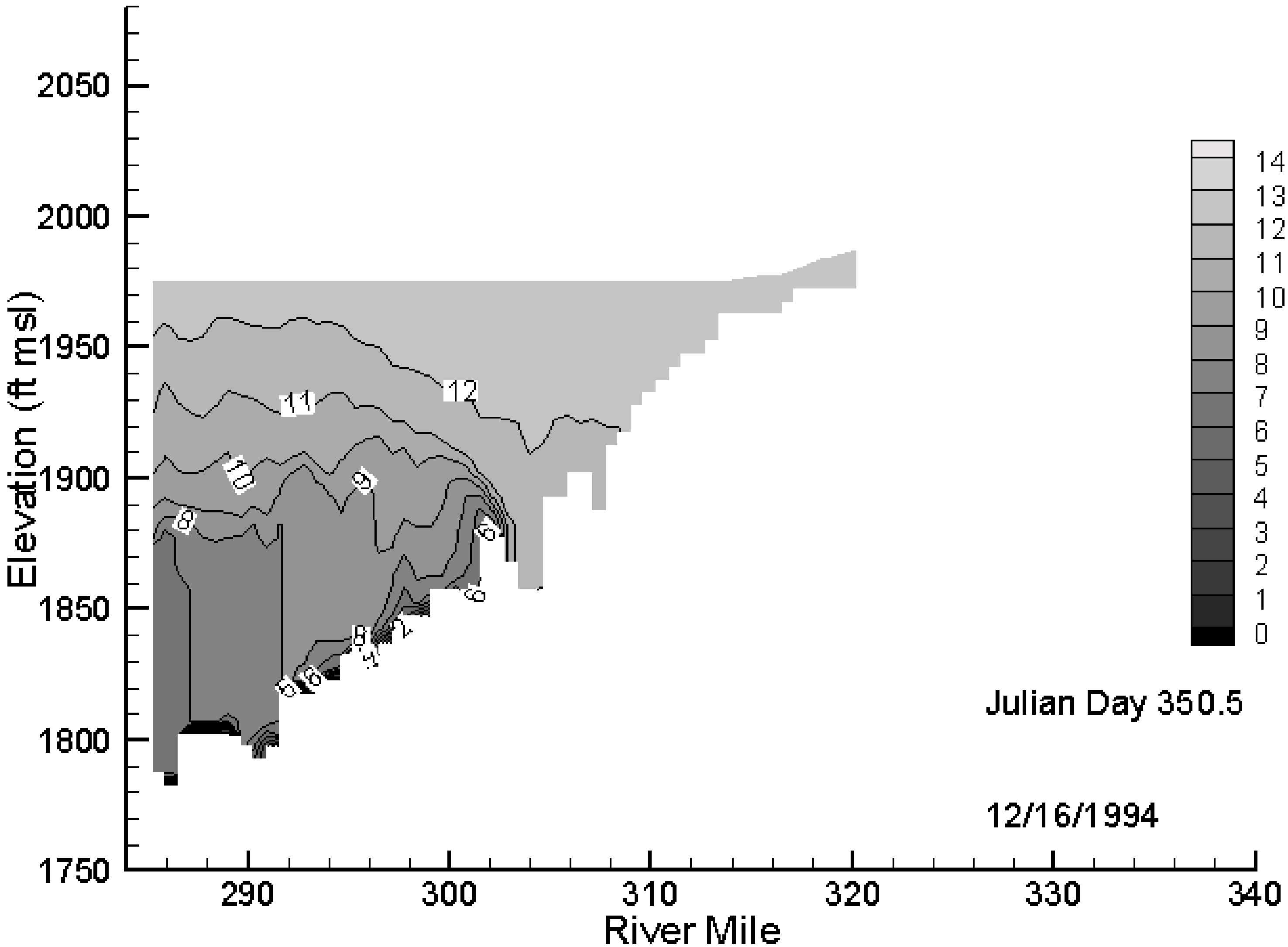

Figure 194. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

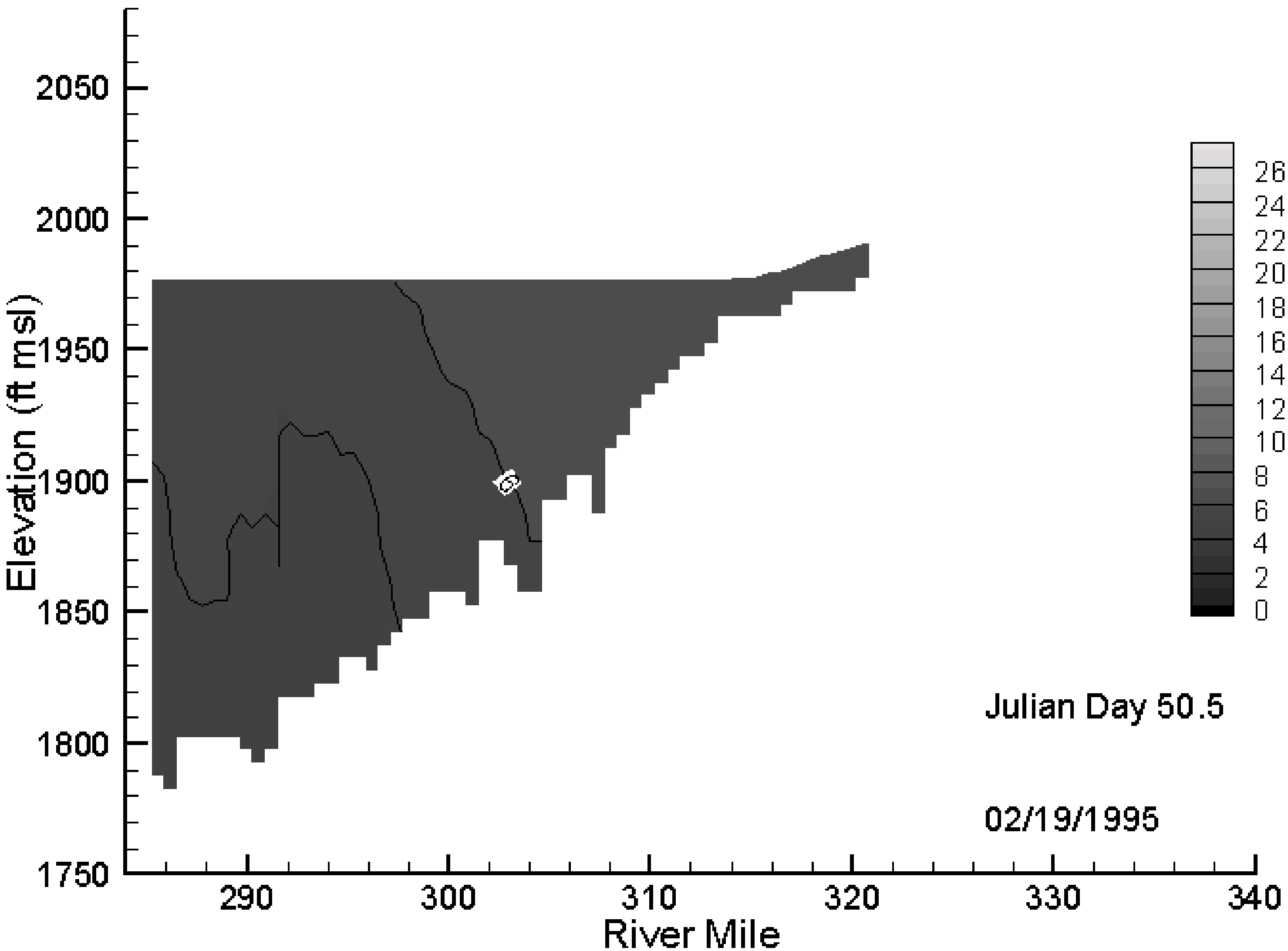

Figure 195. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

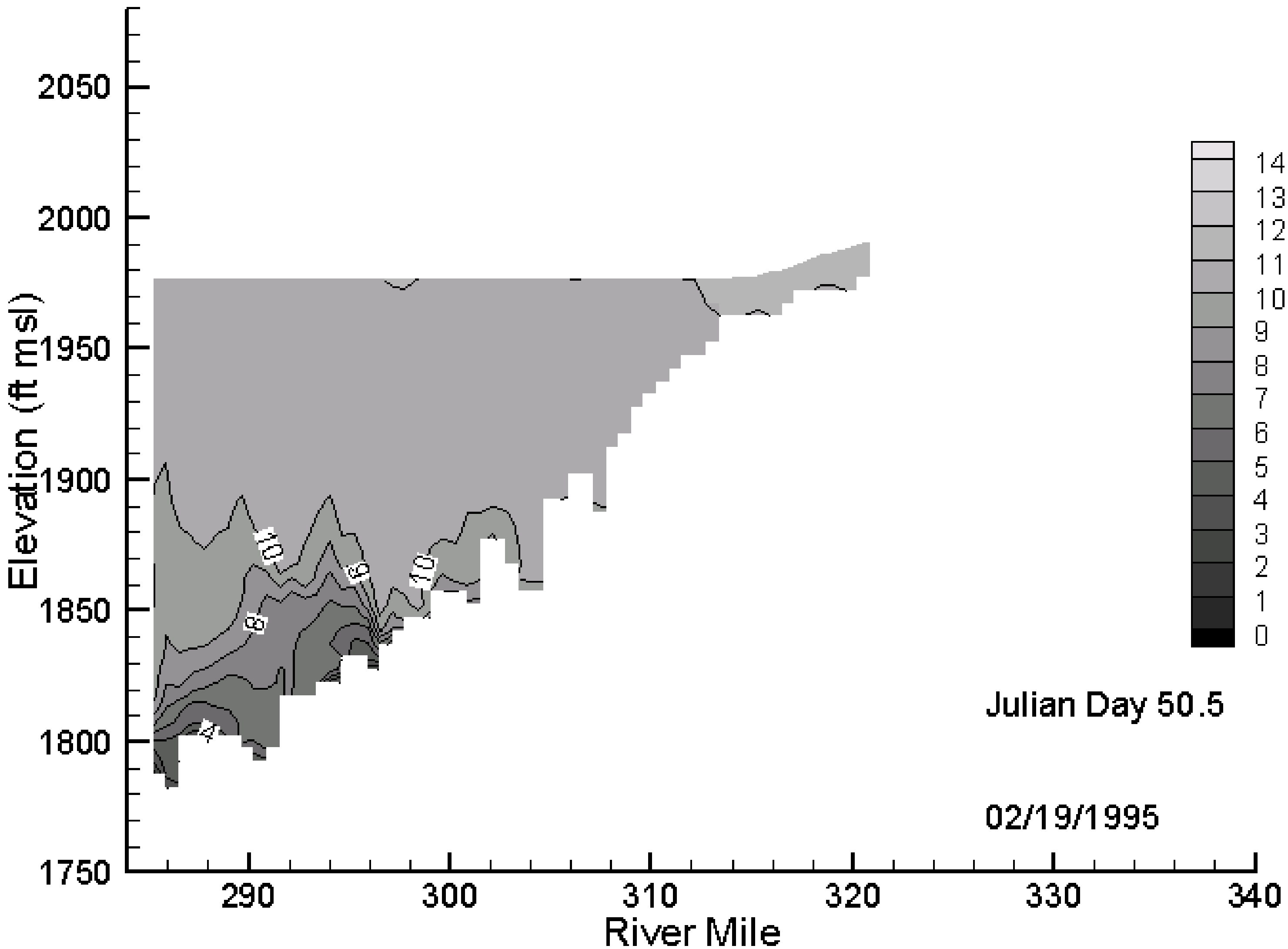

Figure 196. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

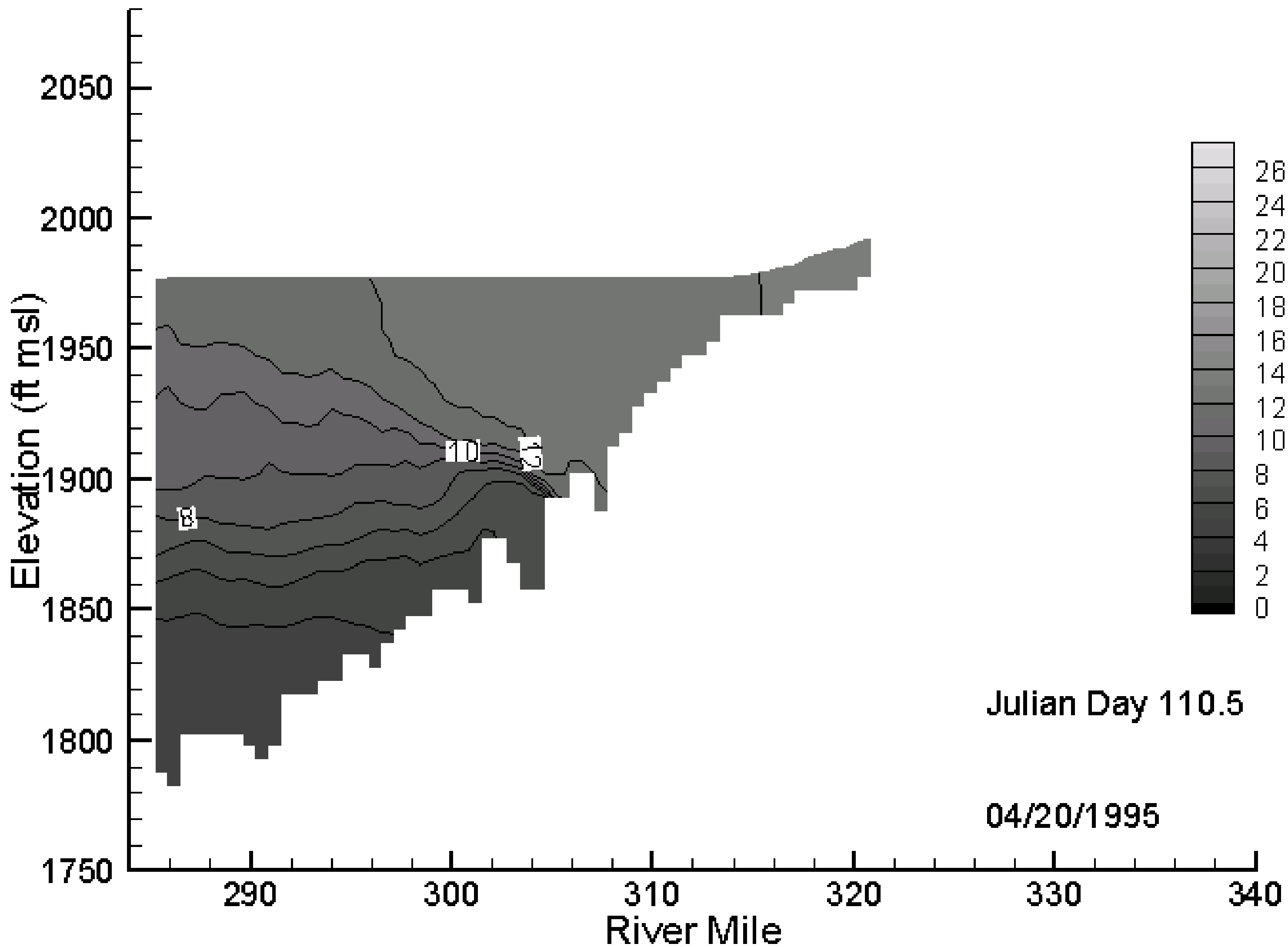

Figure 197. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

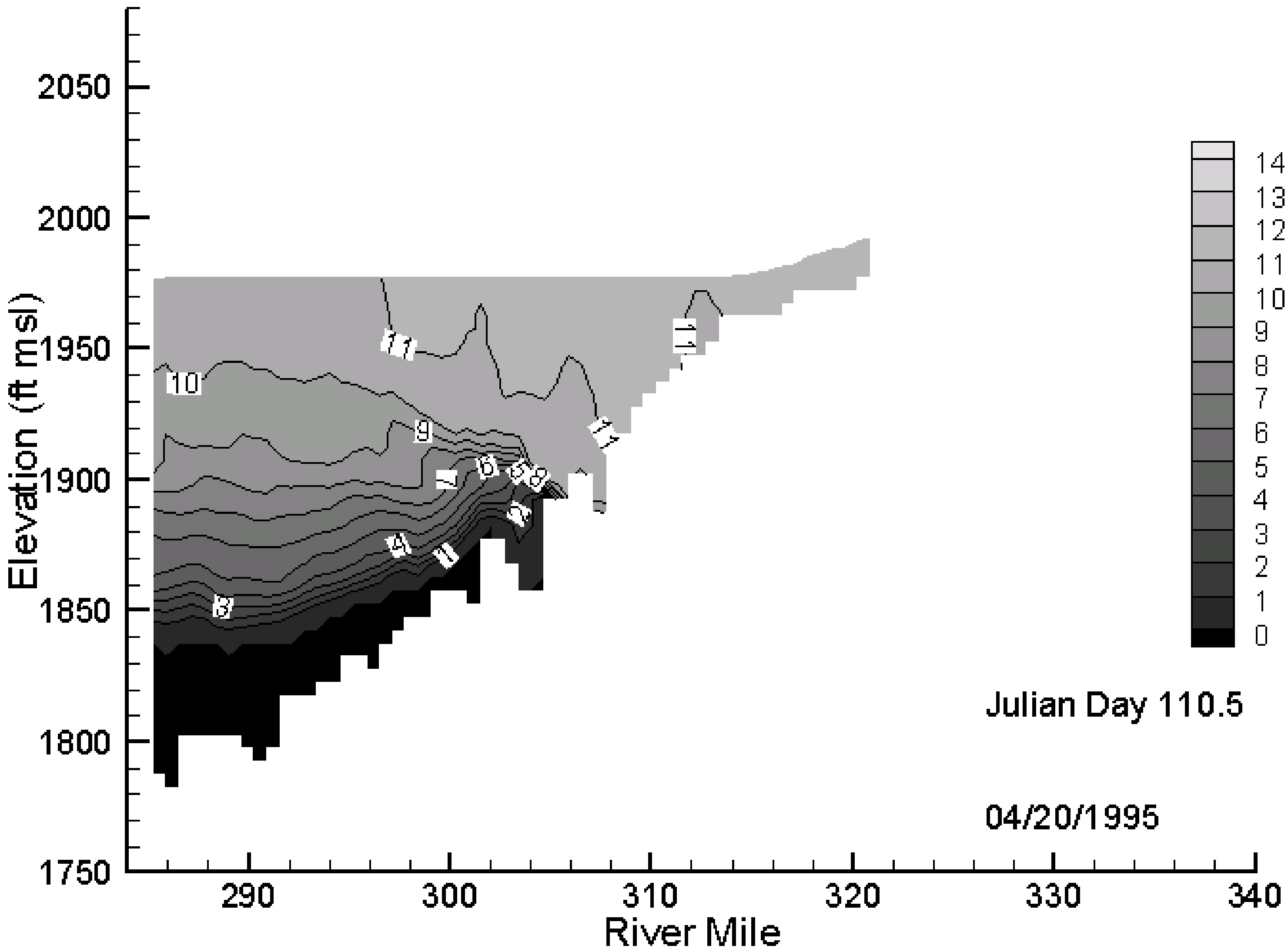

Figure 198. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

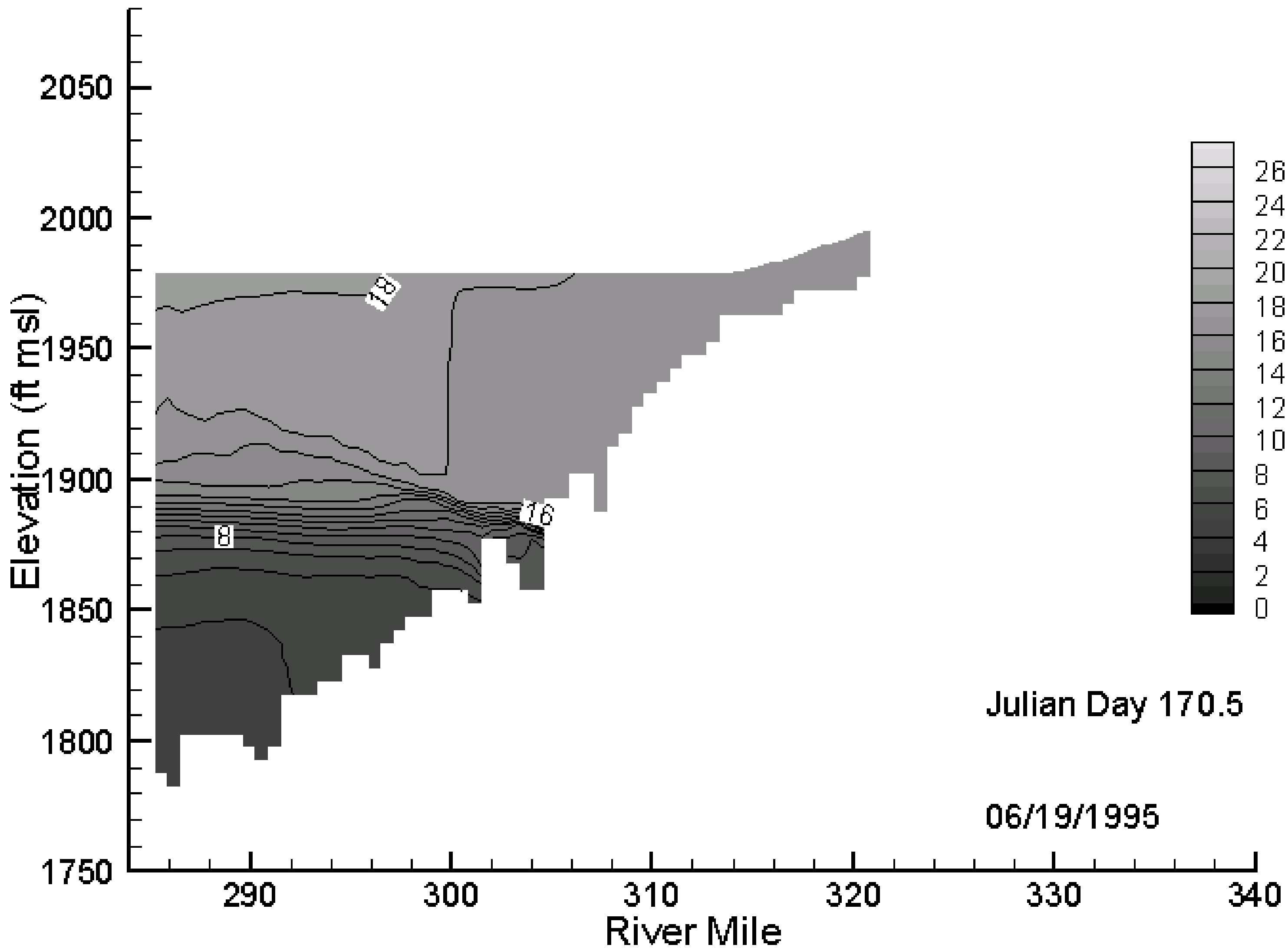

Figure 199. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

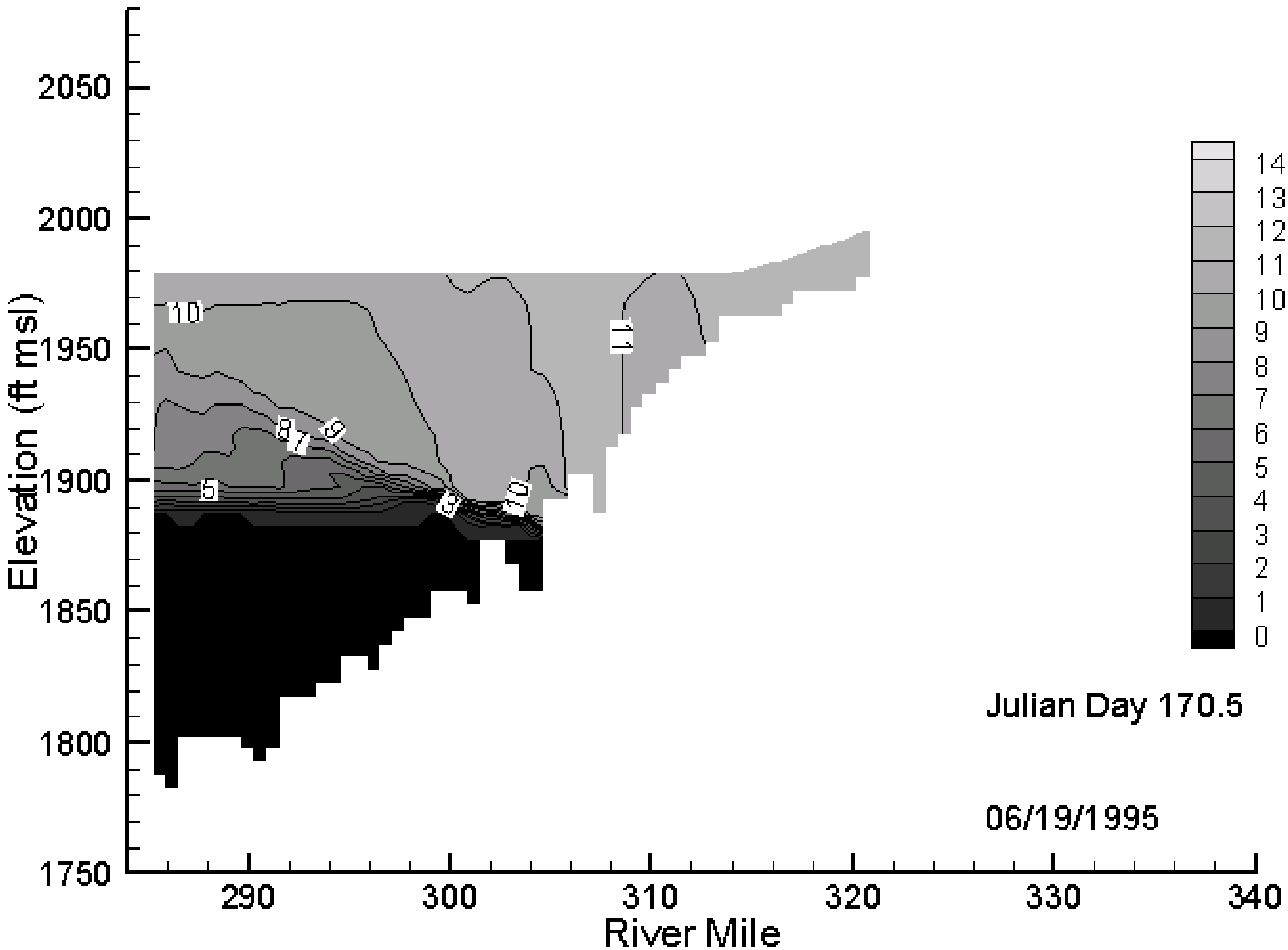

Figure 200. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

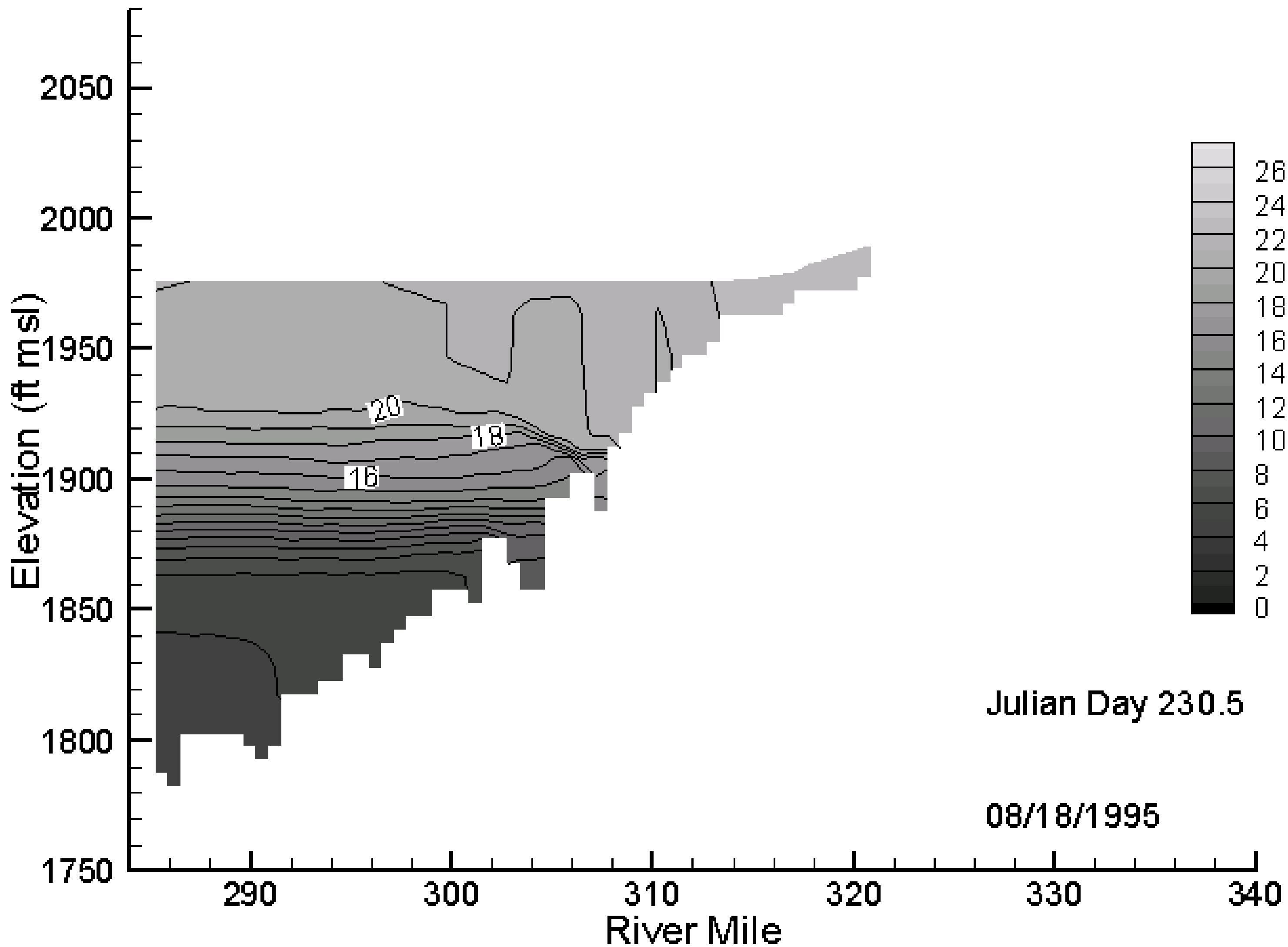

Figure 201. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

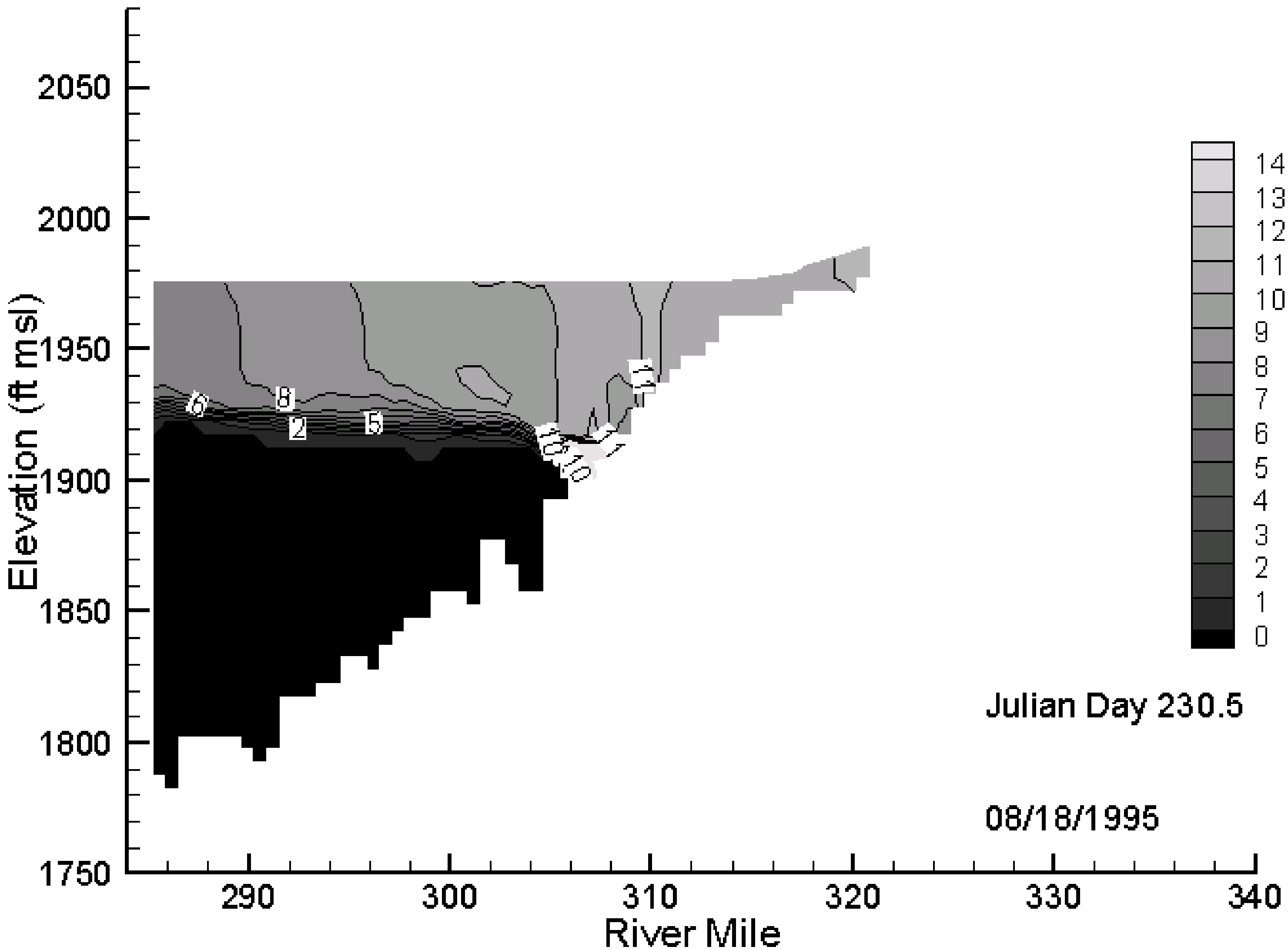

Figure 202. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

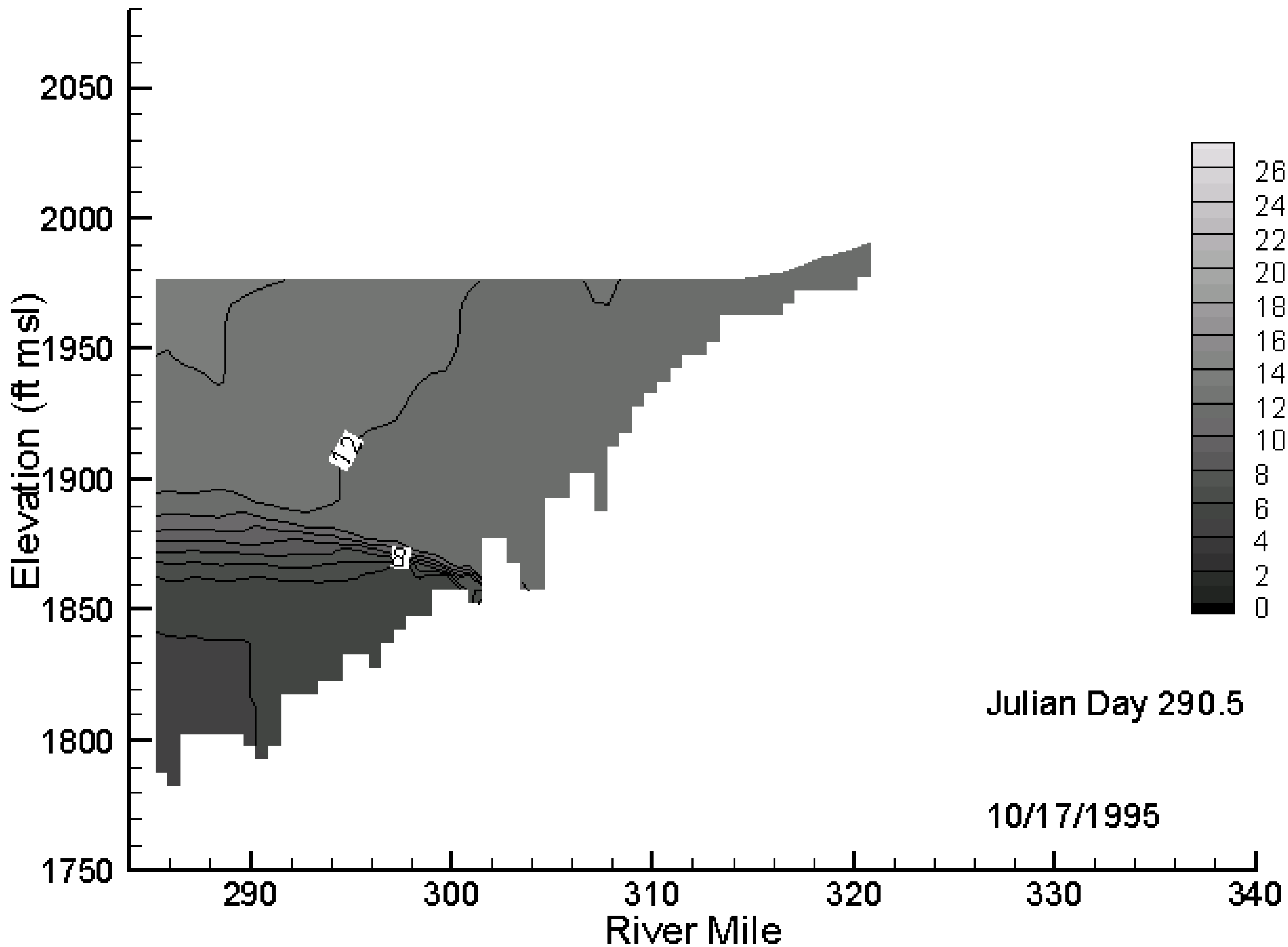

Figure 203. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

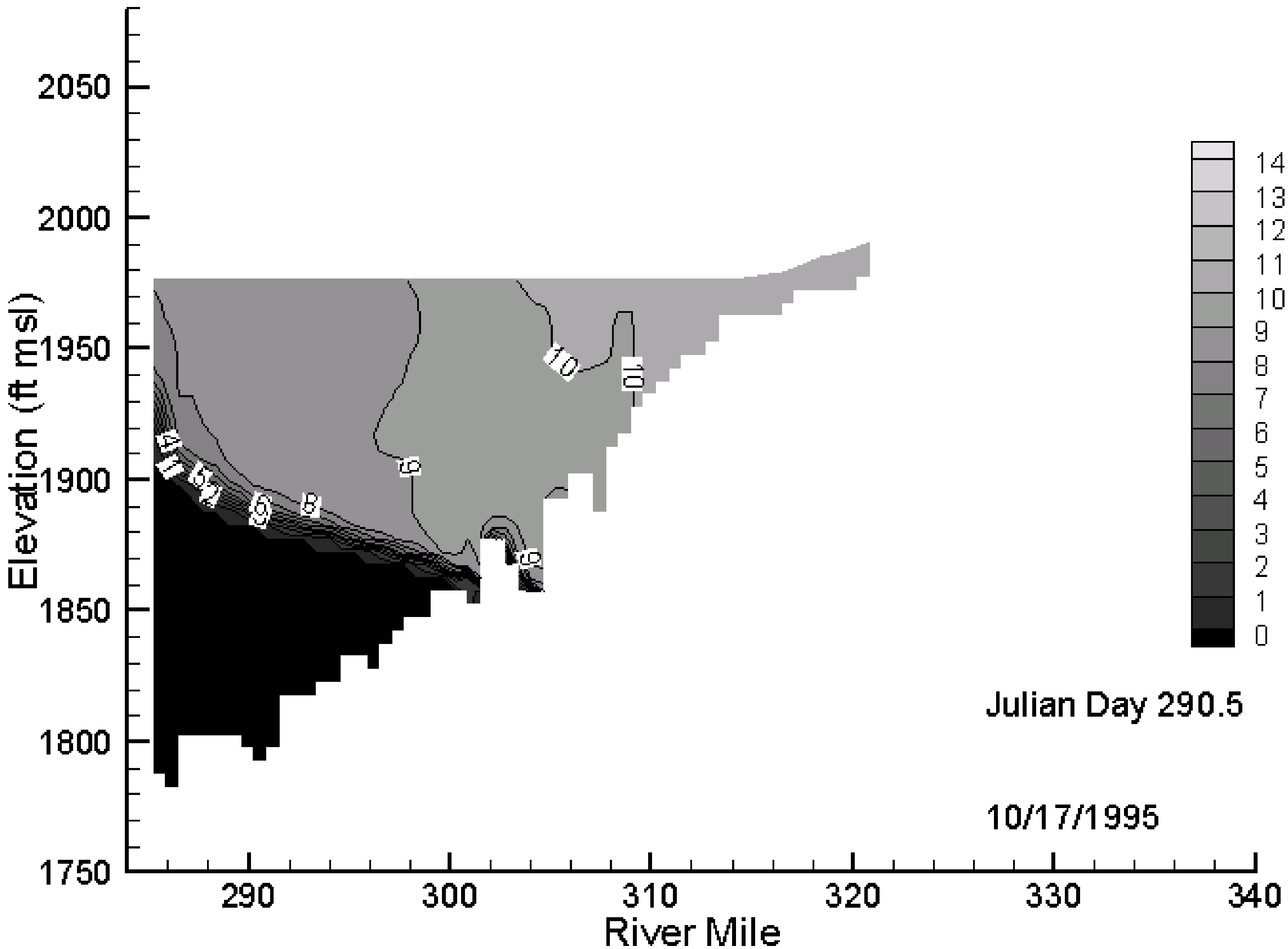

Figure 204. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

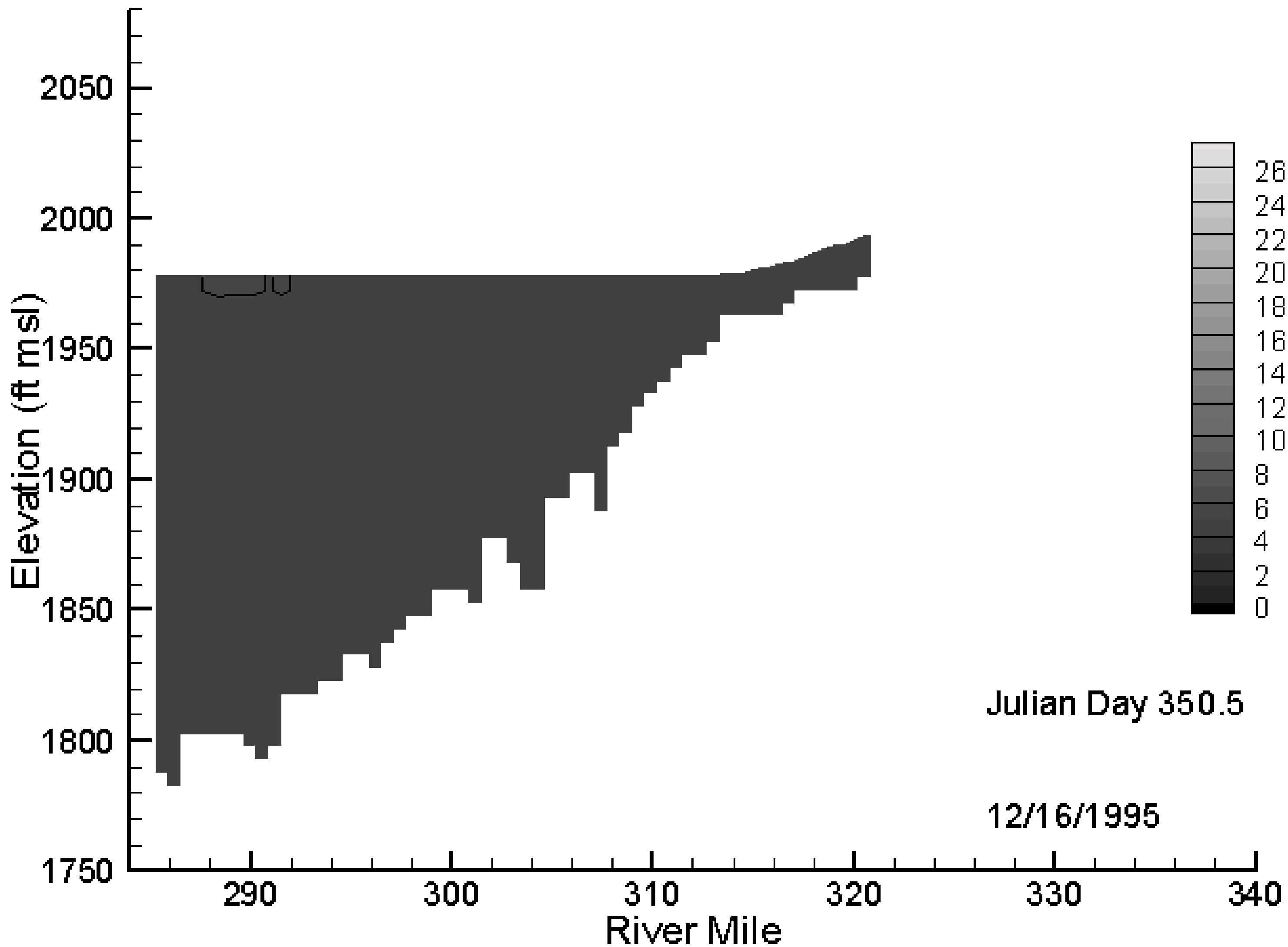

Figure 205. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

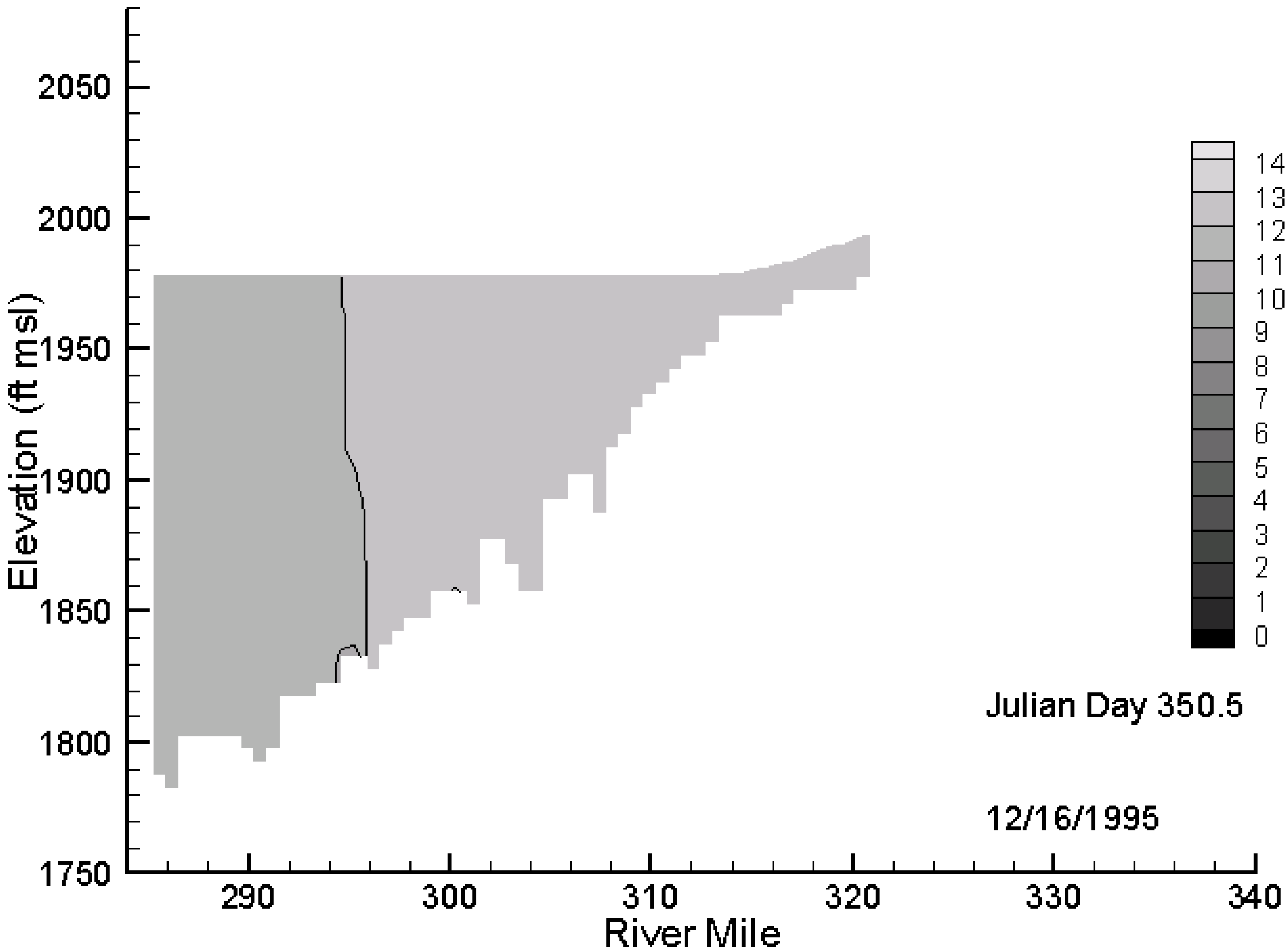

Figure 206. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

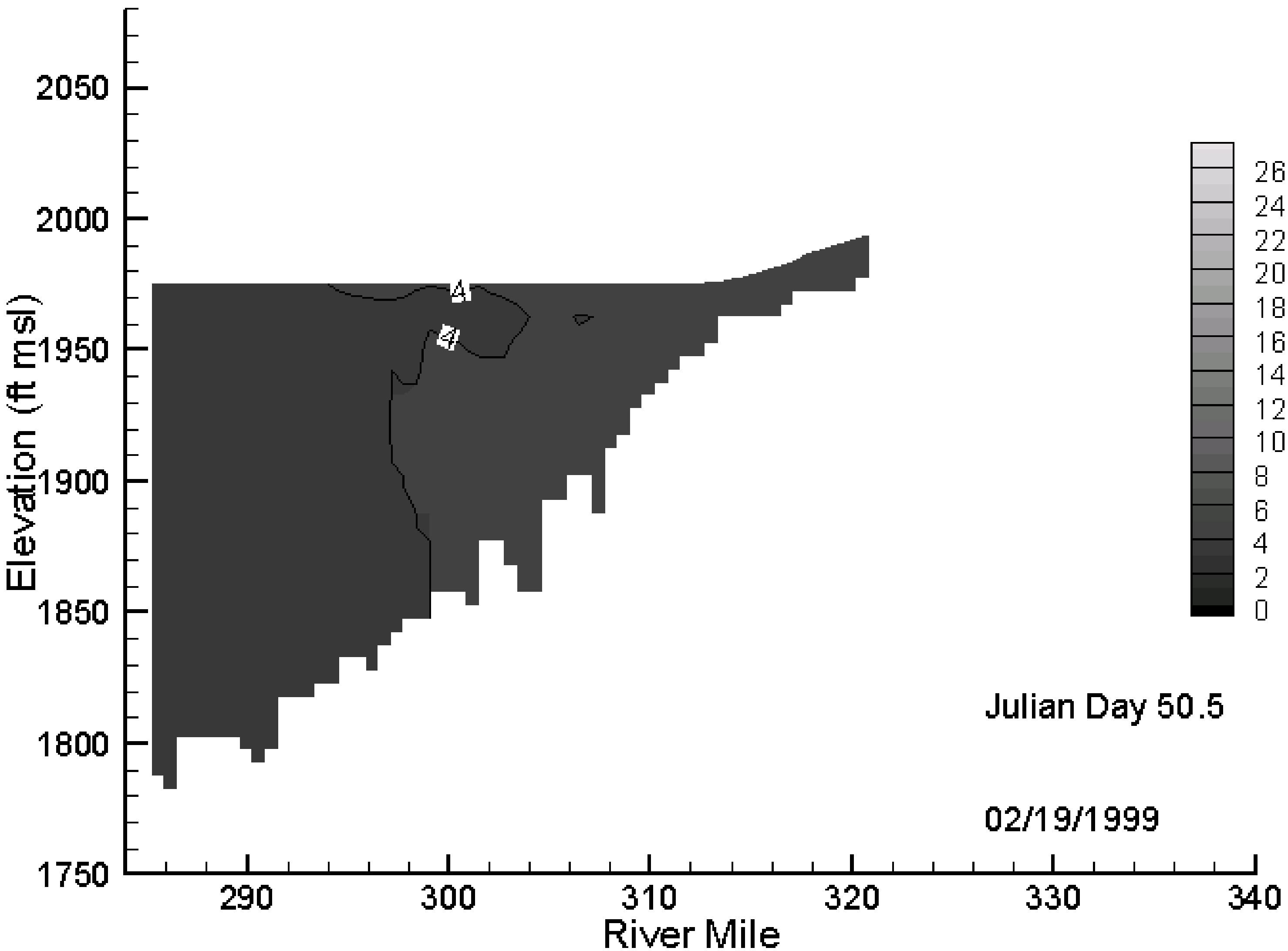

Figure 207. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

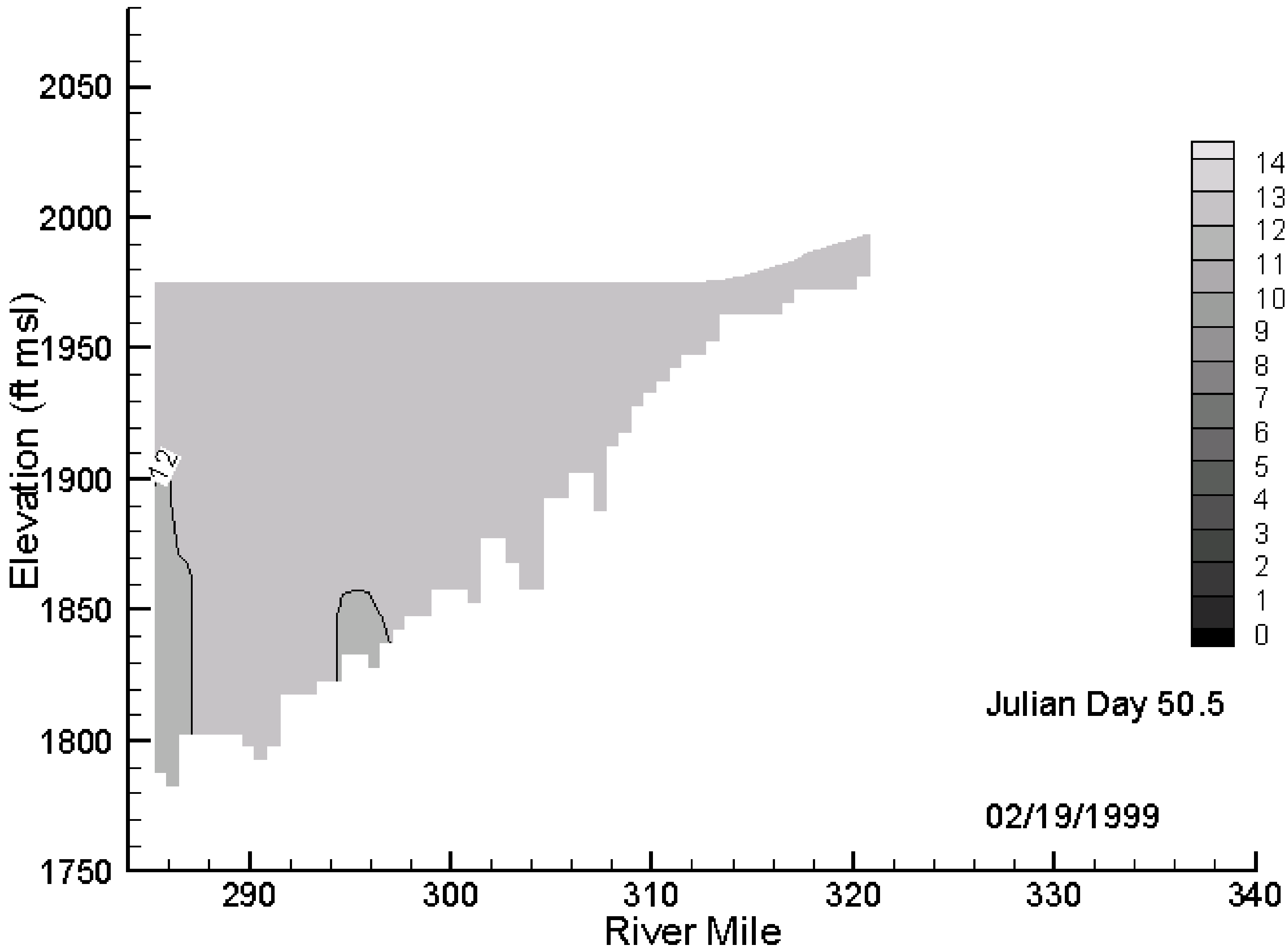

Figure 208. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

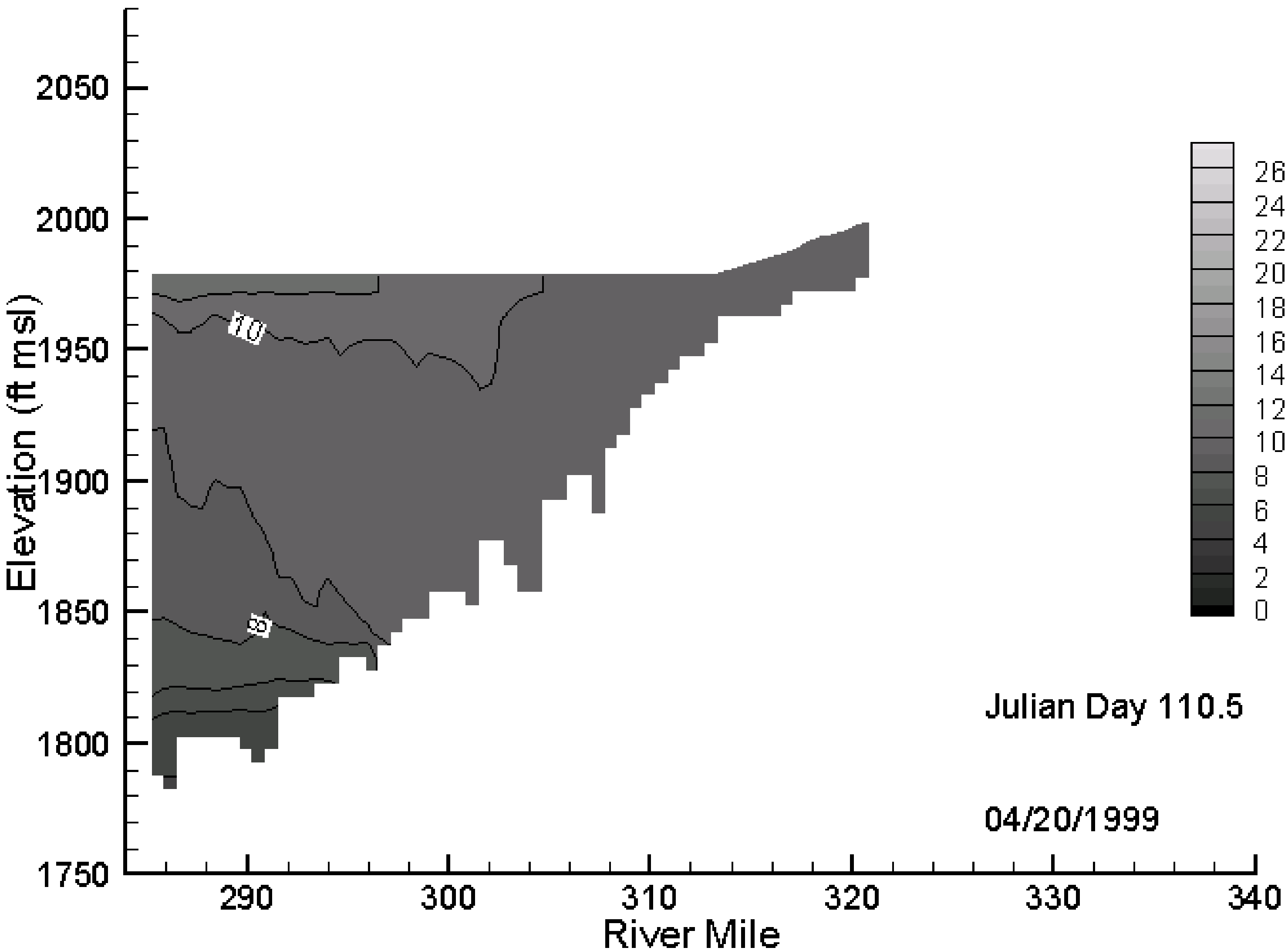

Figure 209. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

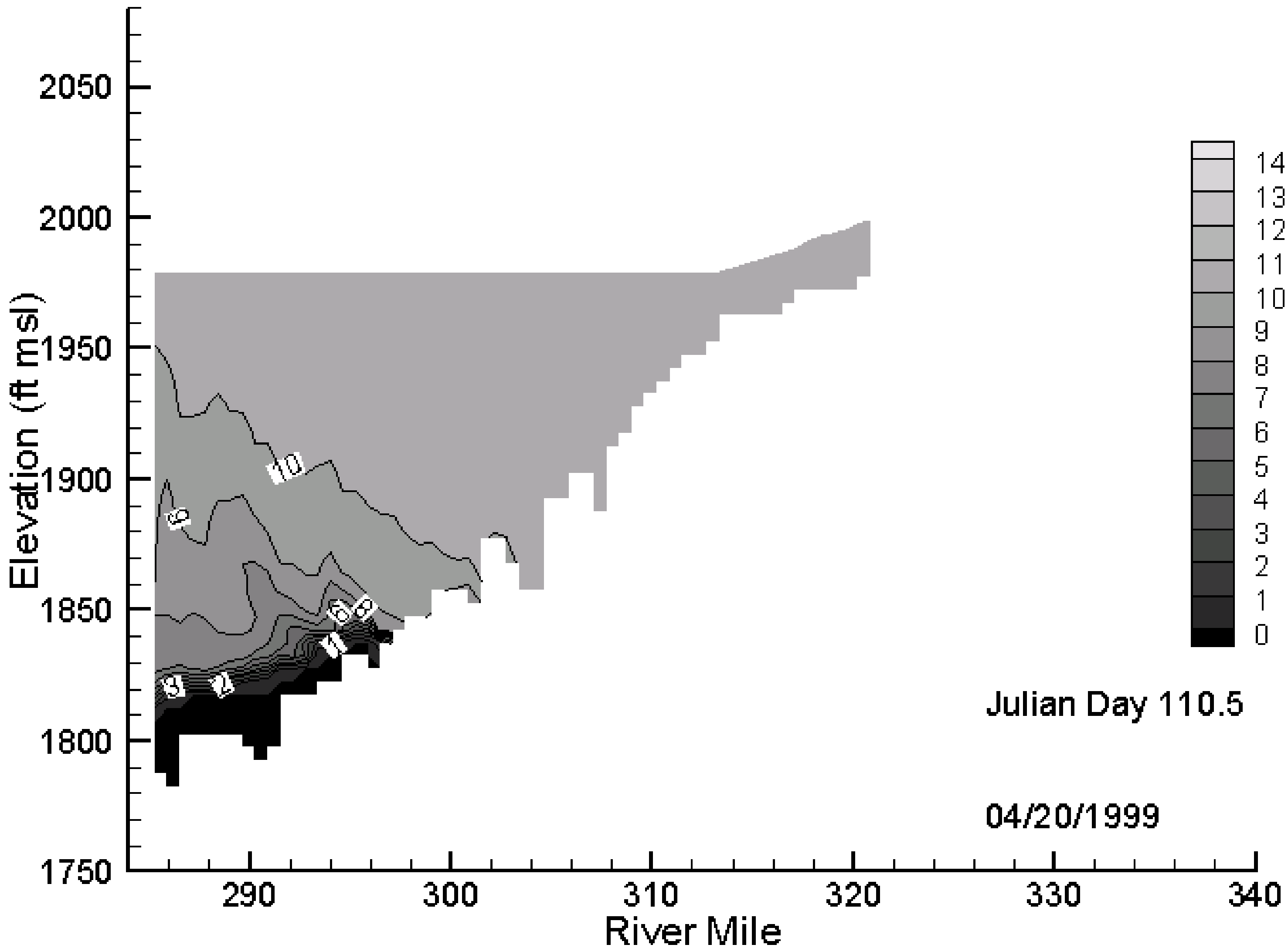

Figure 210. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

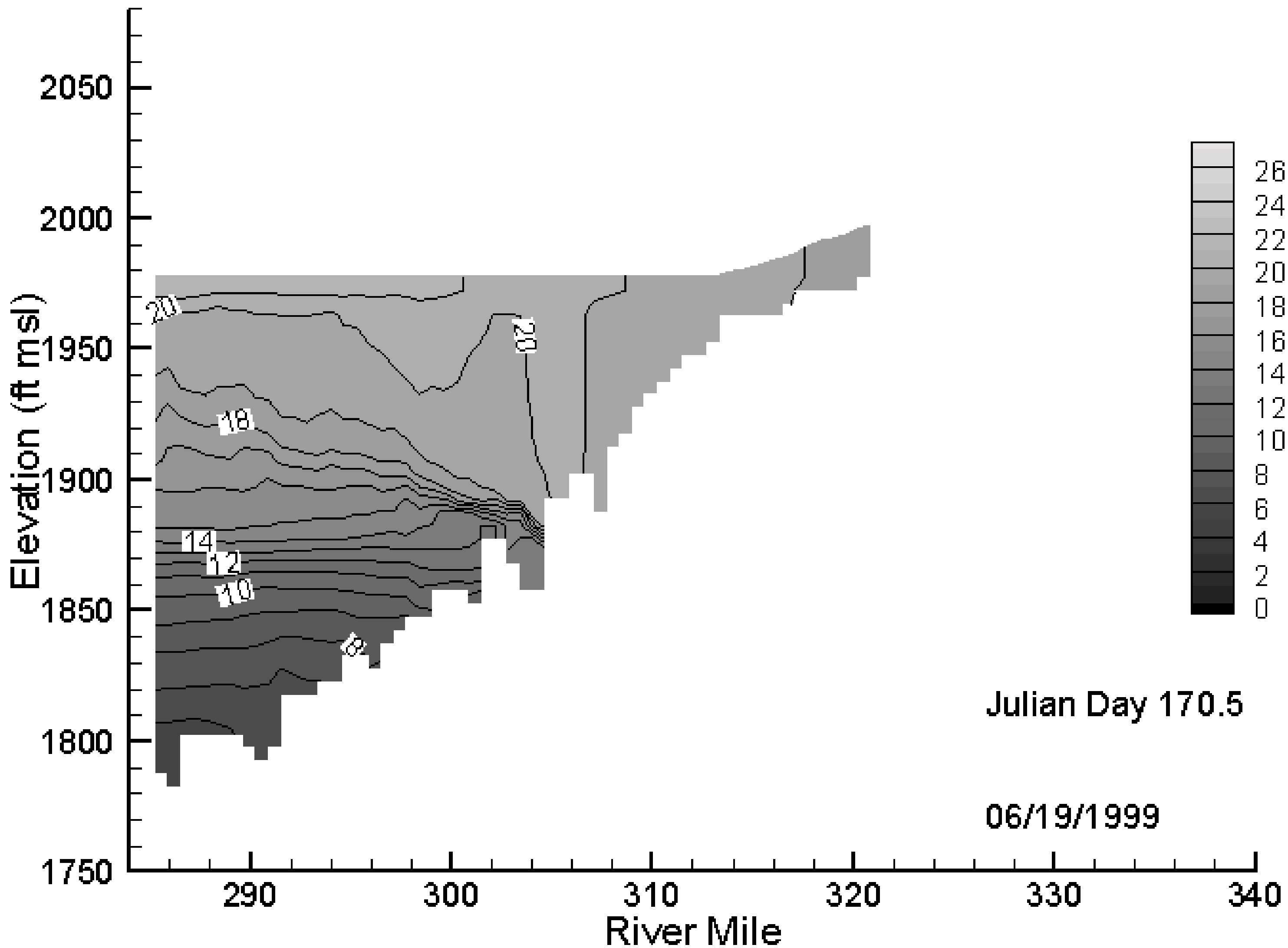

Figure 211. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

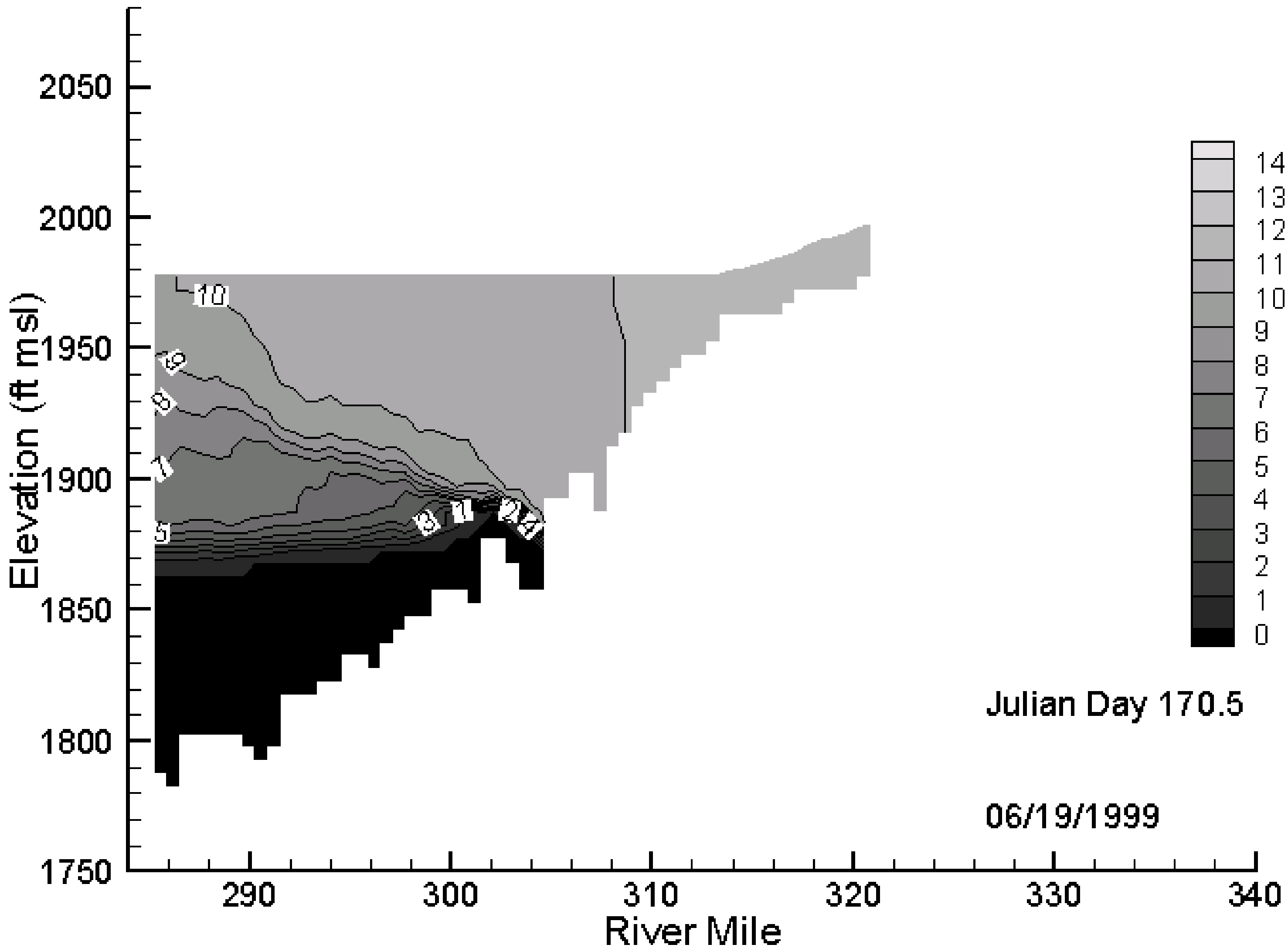

Figure 212. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

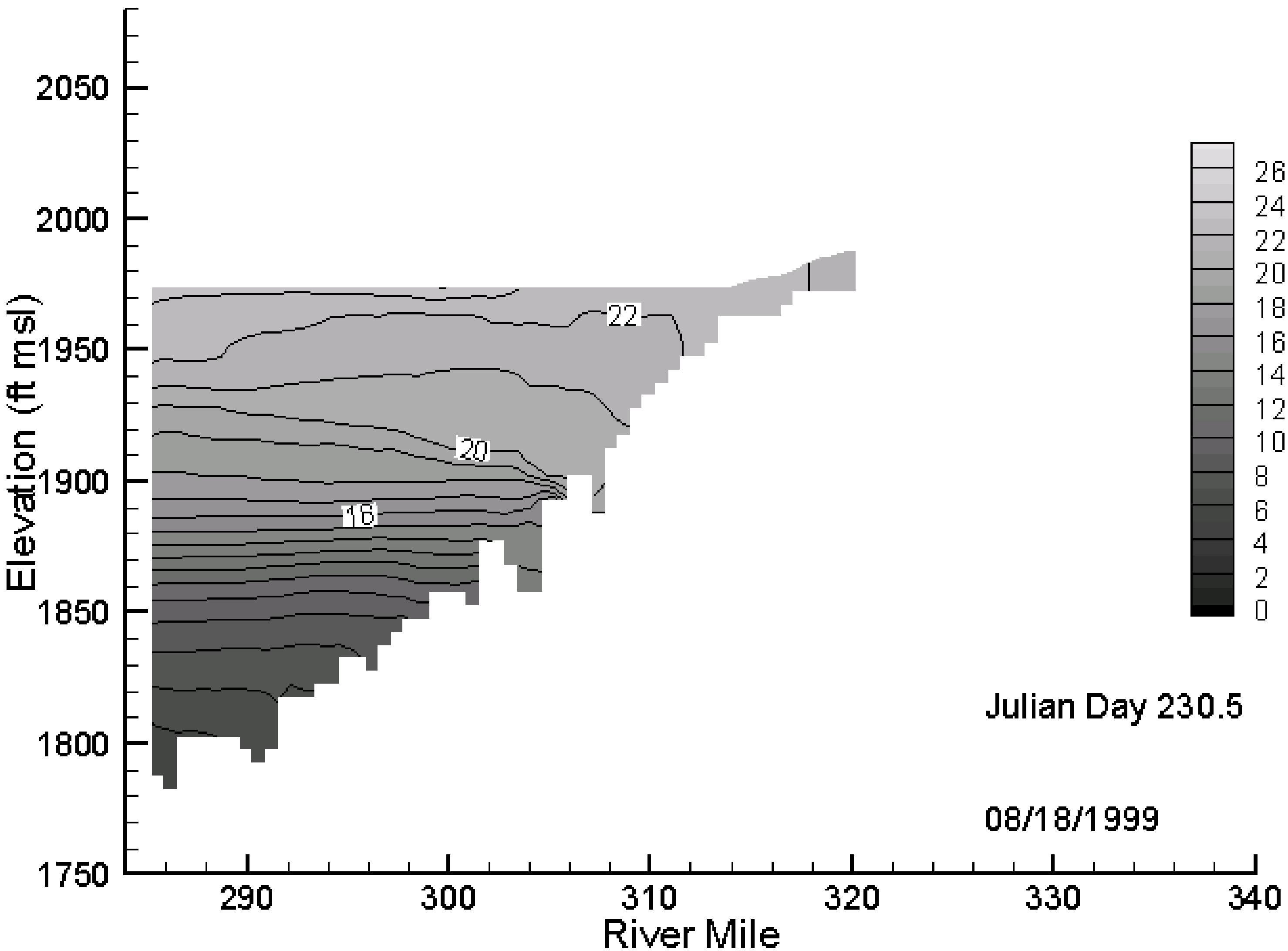

Figure 213. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

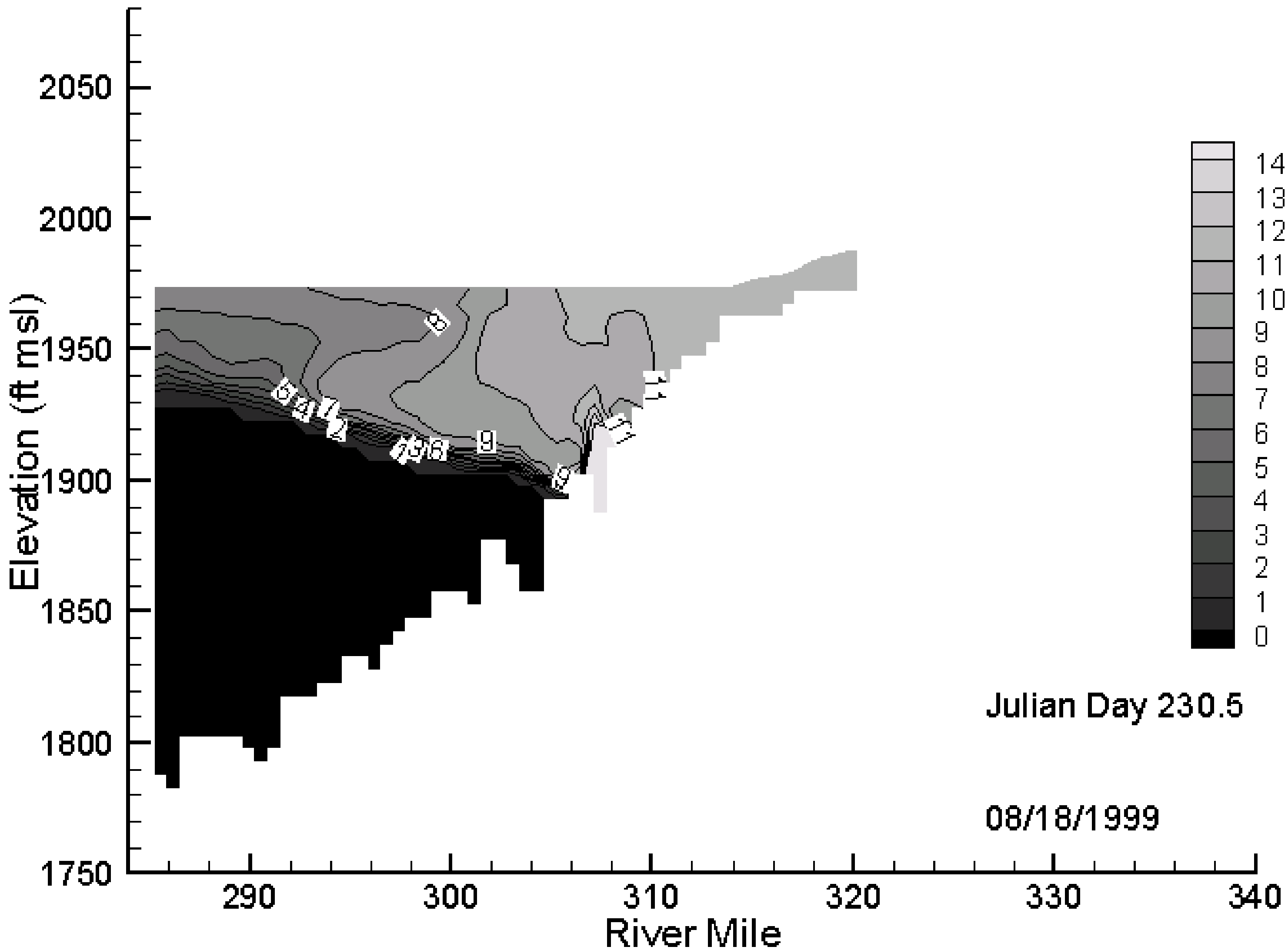

Figure 214. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

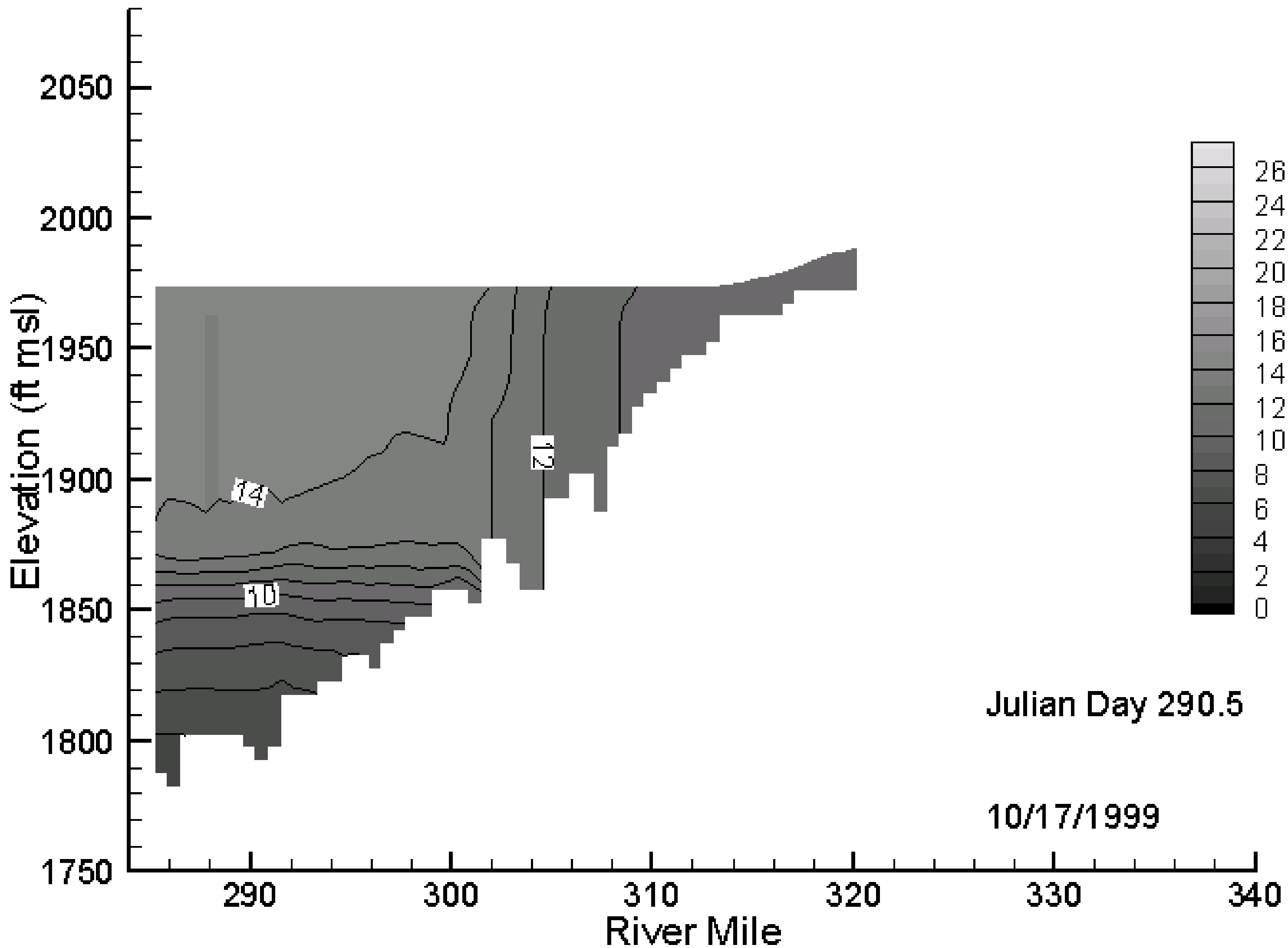

Figure 215. 1999 simulated temperature (°C) for Brownlee Reservoir under OP-5 operations.

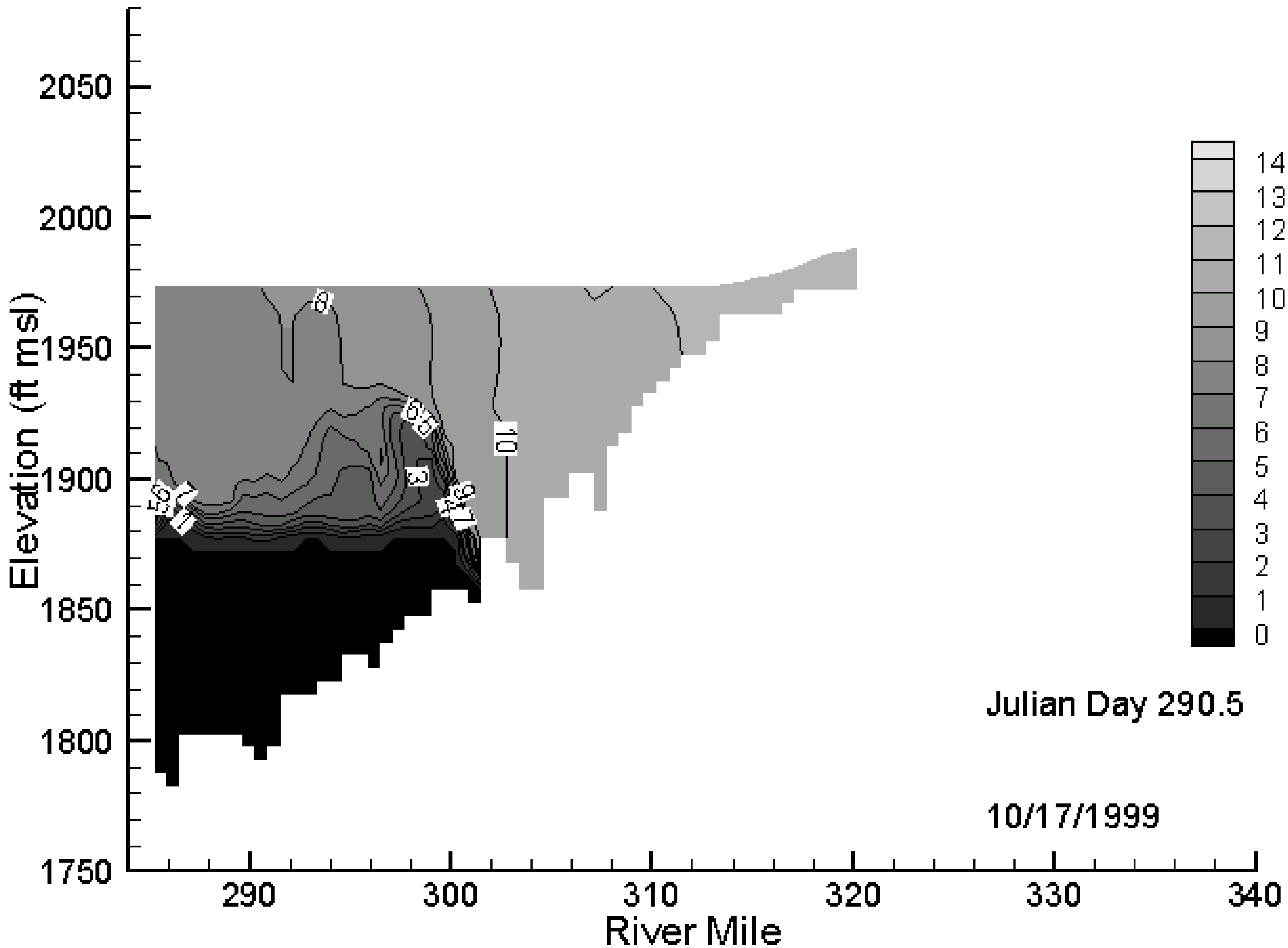

Figure 216. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

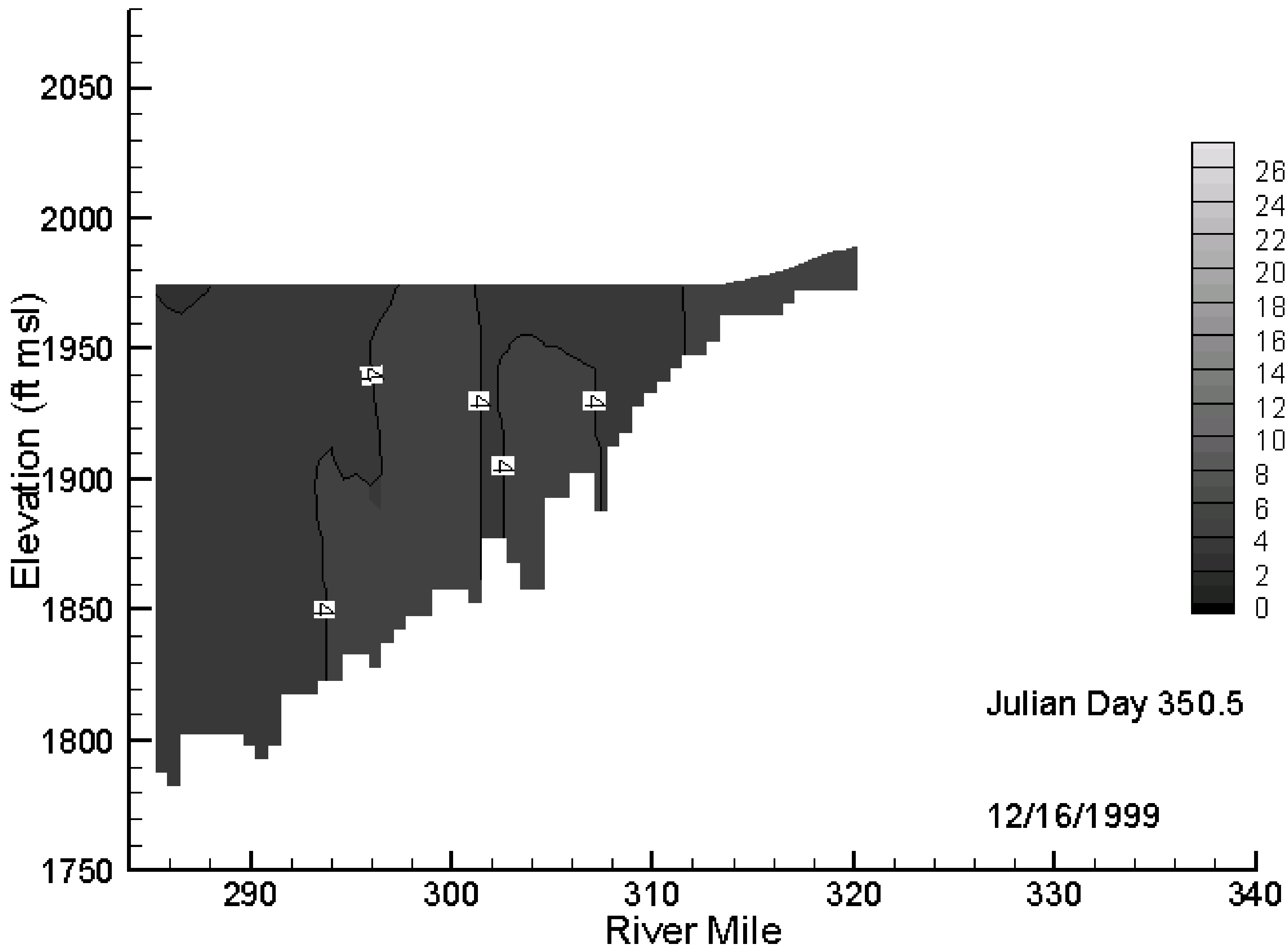

Figure 217. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

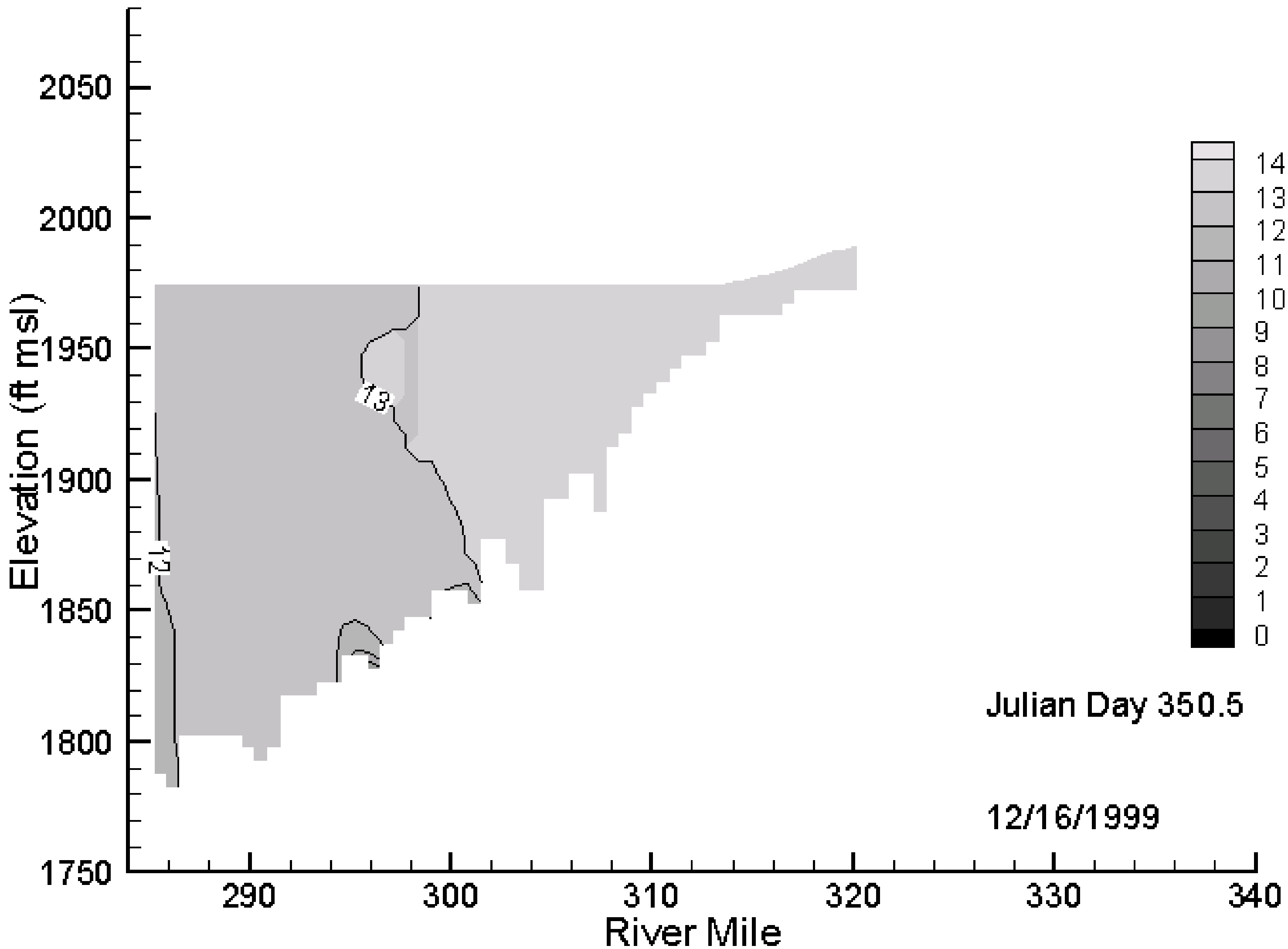

Figure 218. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

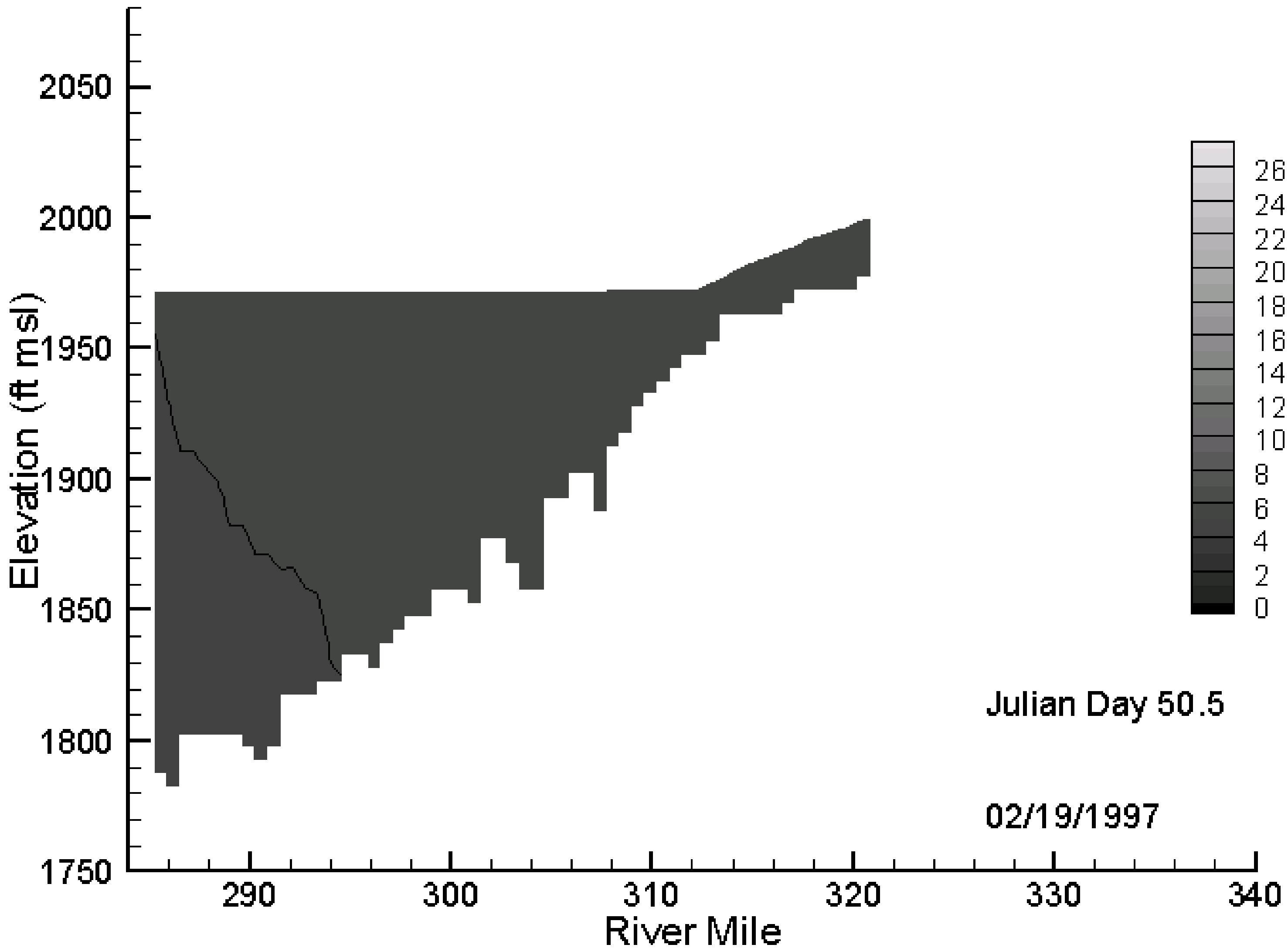

Figure 219. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

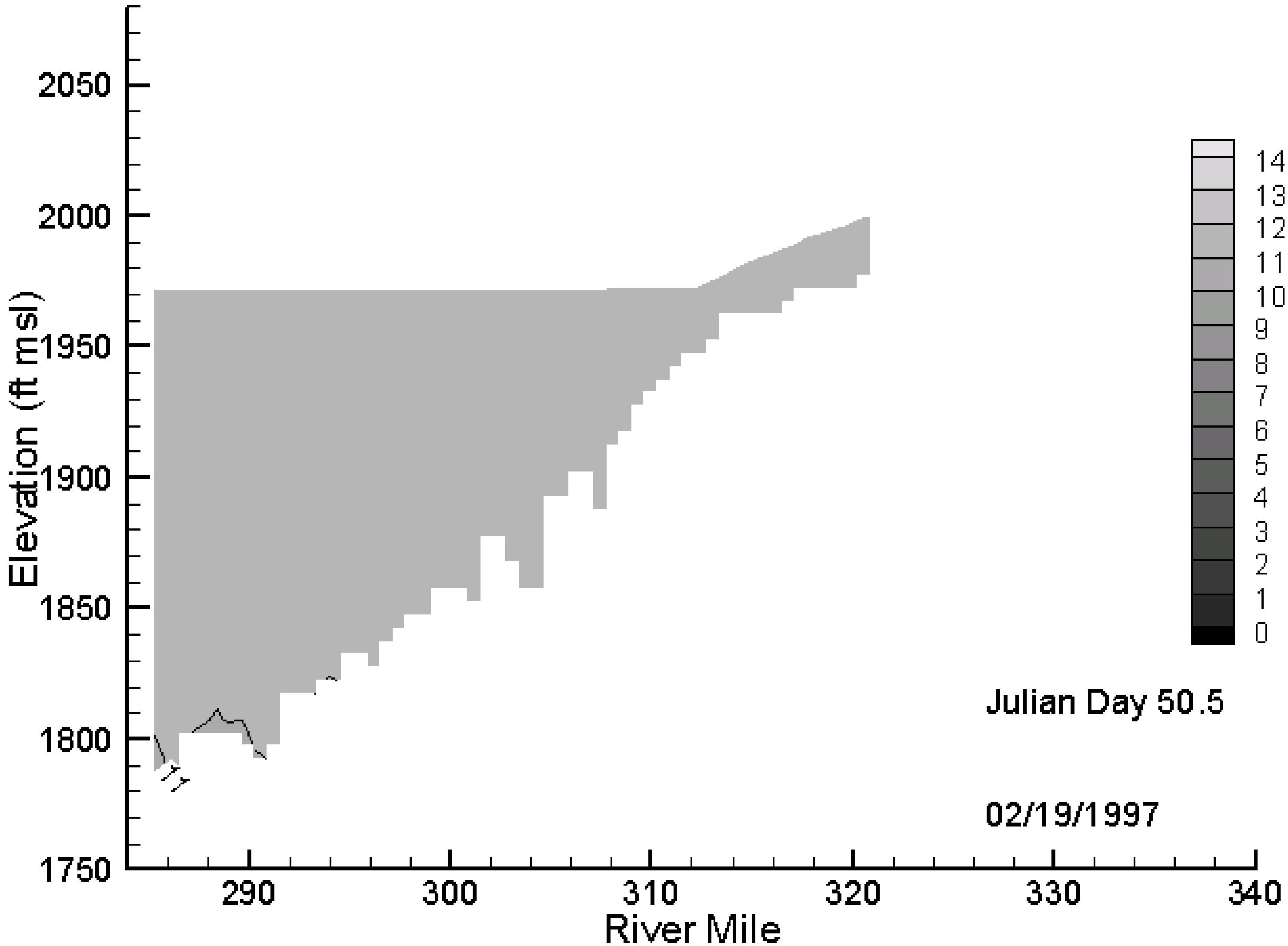

Figure 220. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

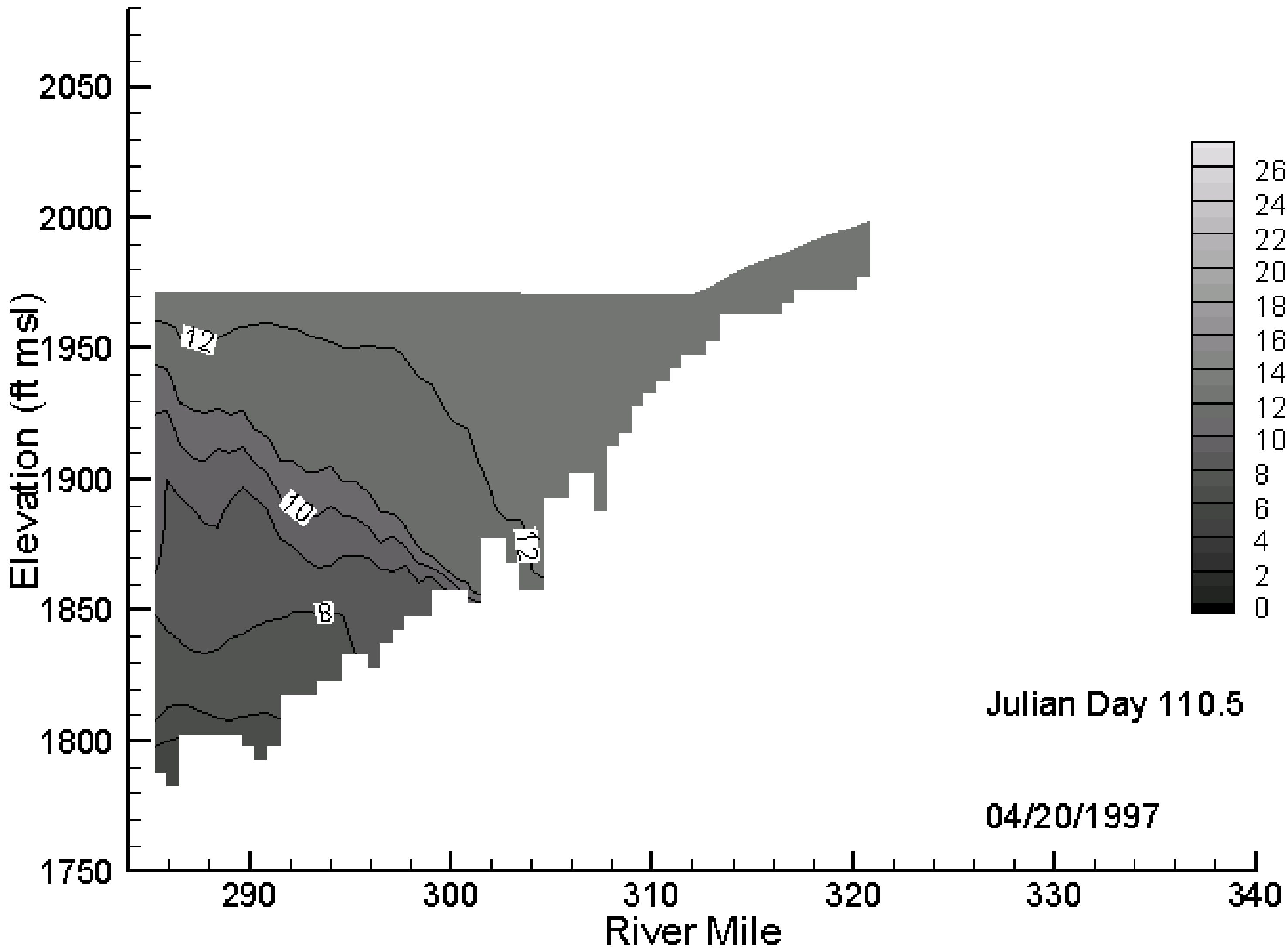

Figure 221. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

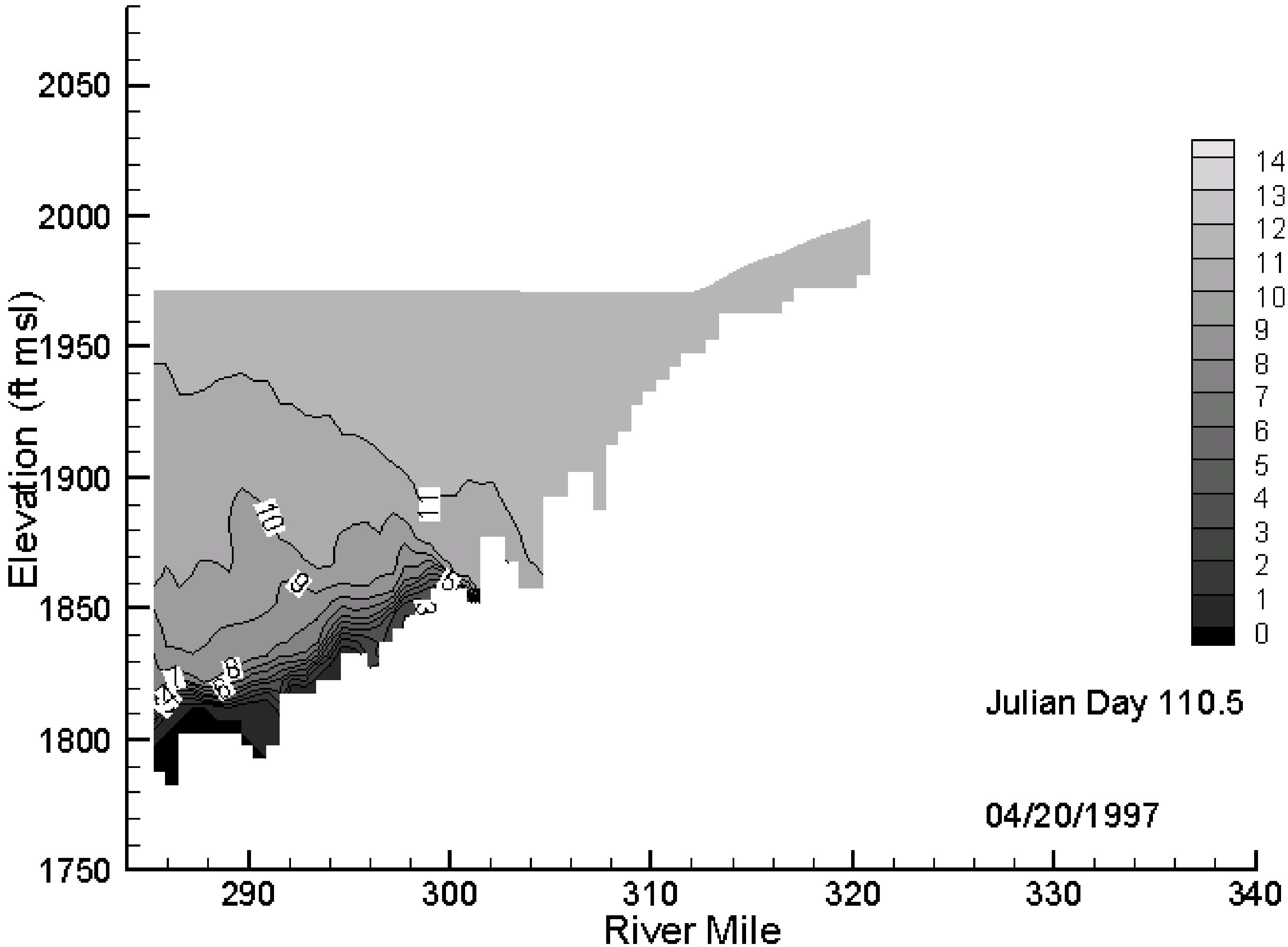

Figure 222. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

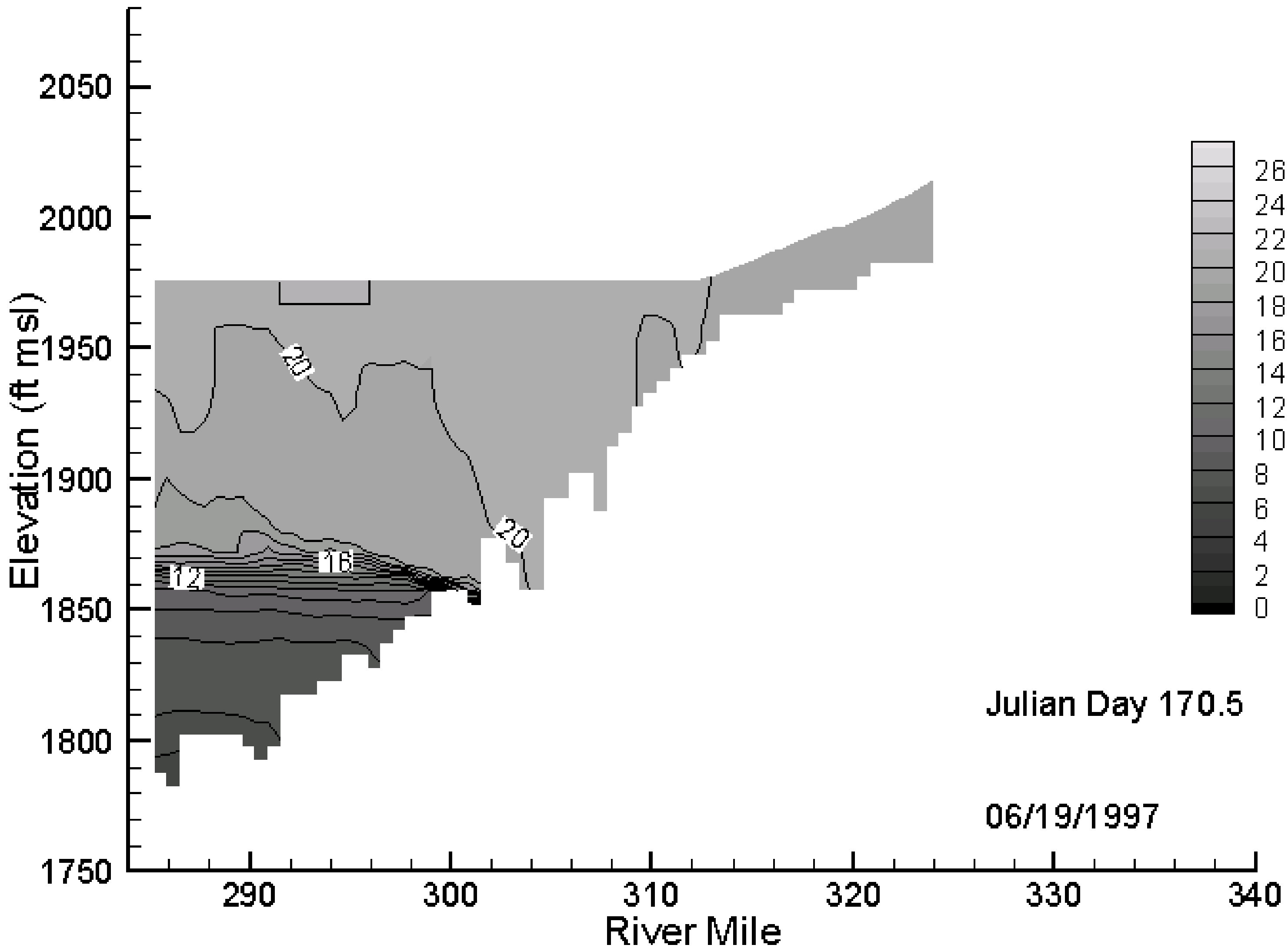

Figure 223. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

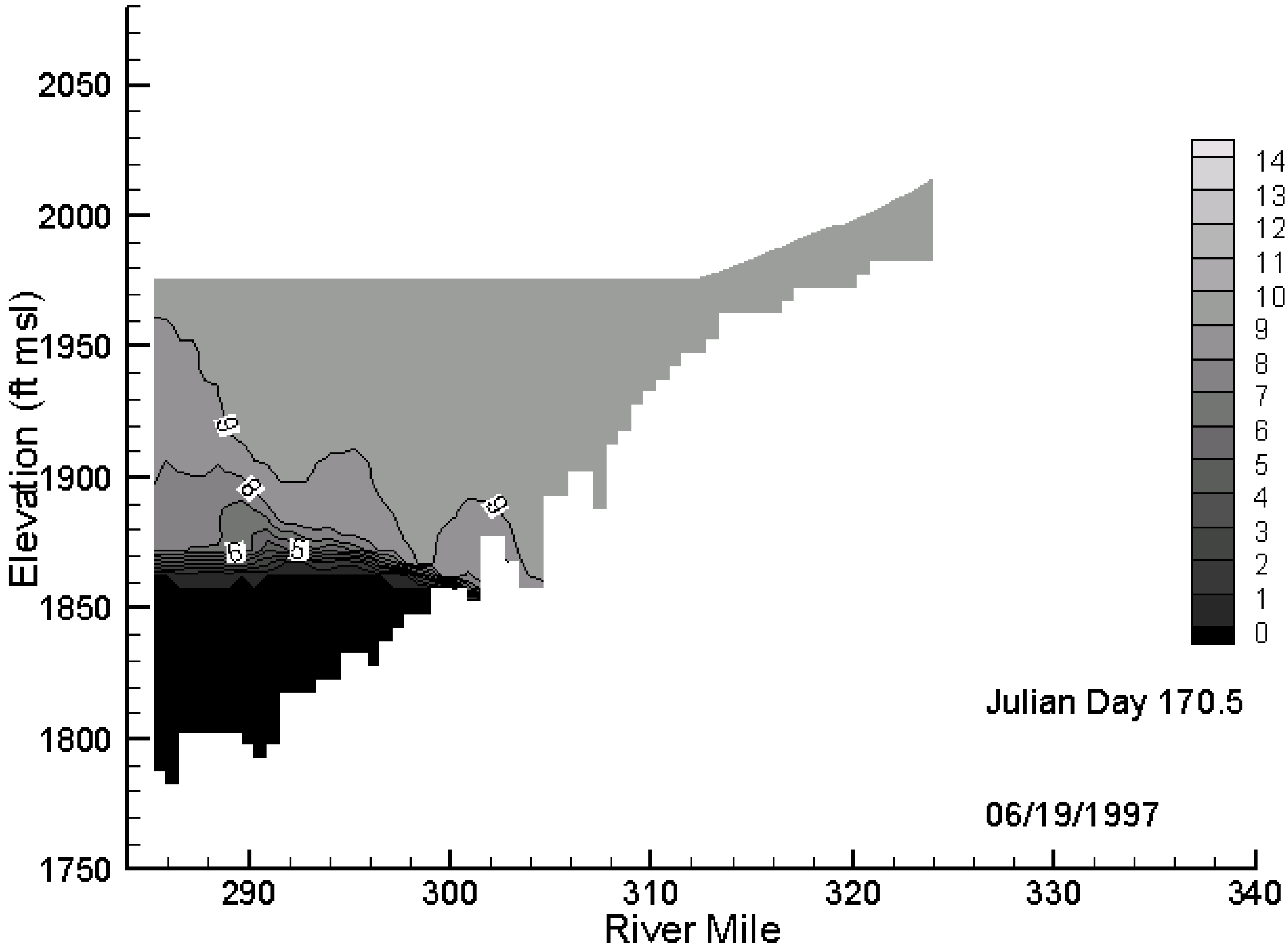

Figure 224. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

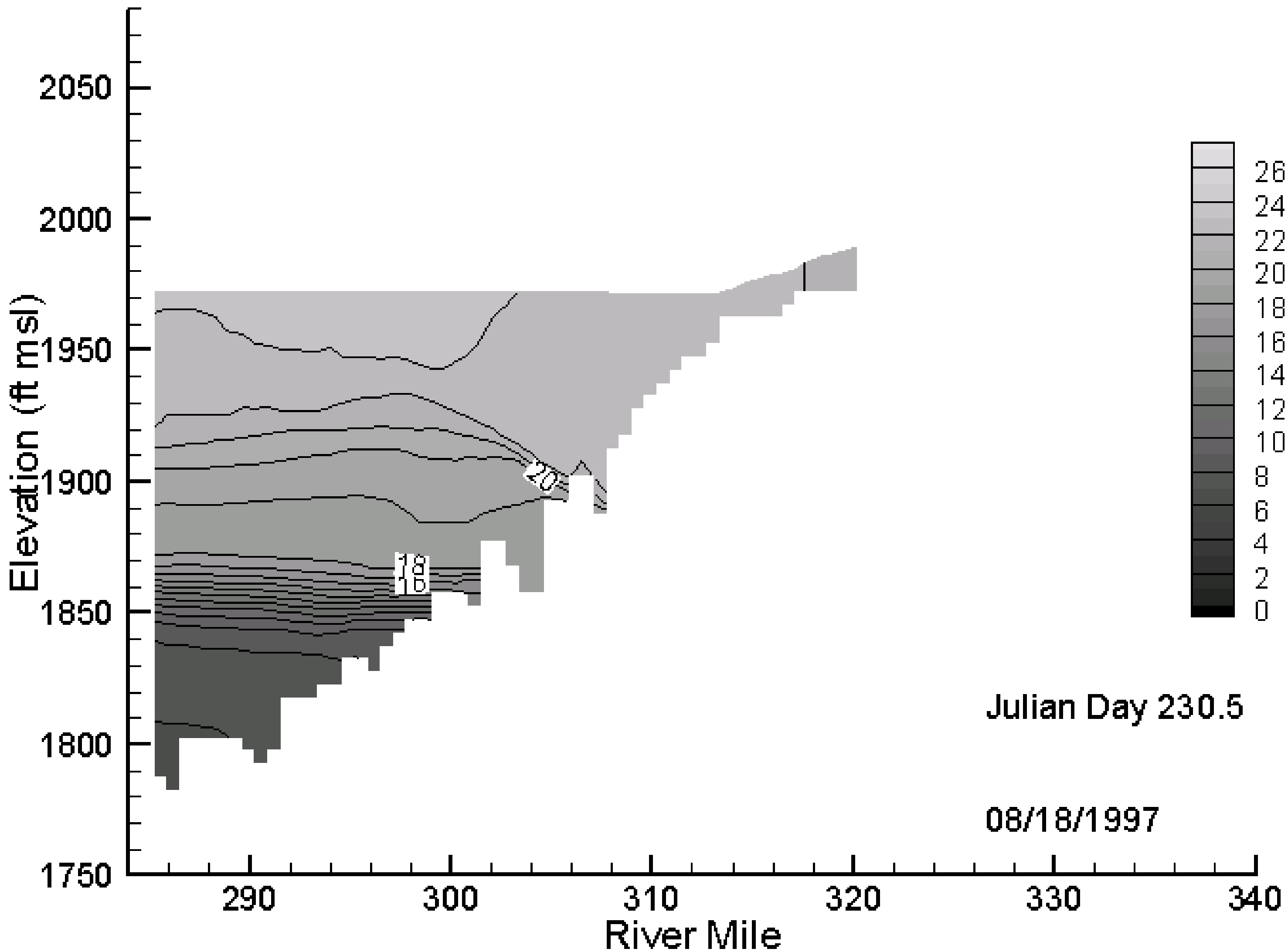

Figure 225. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

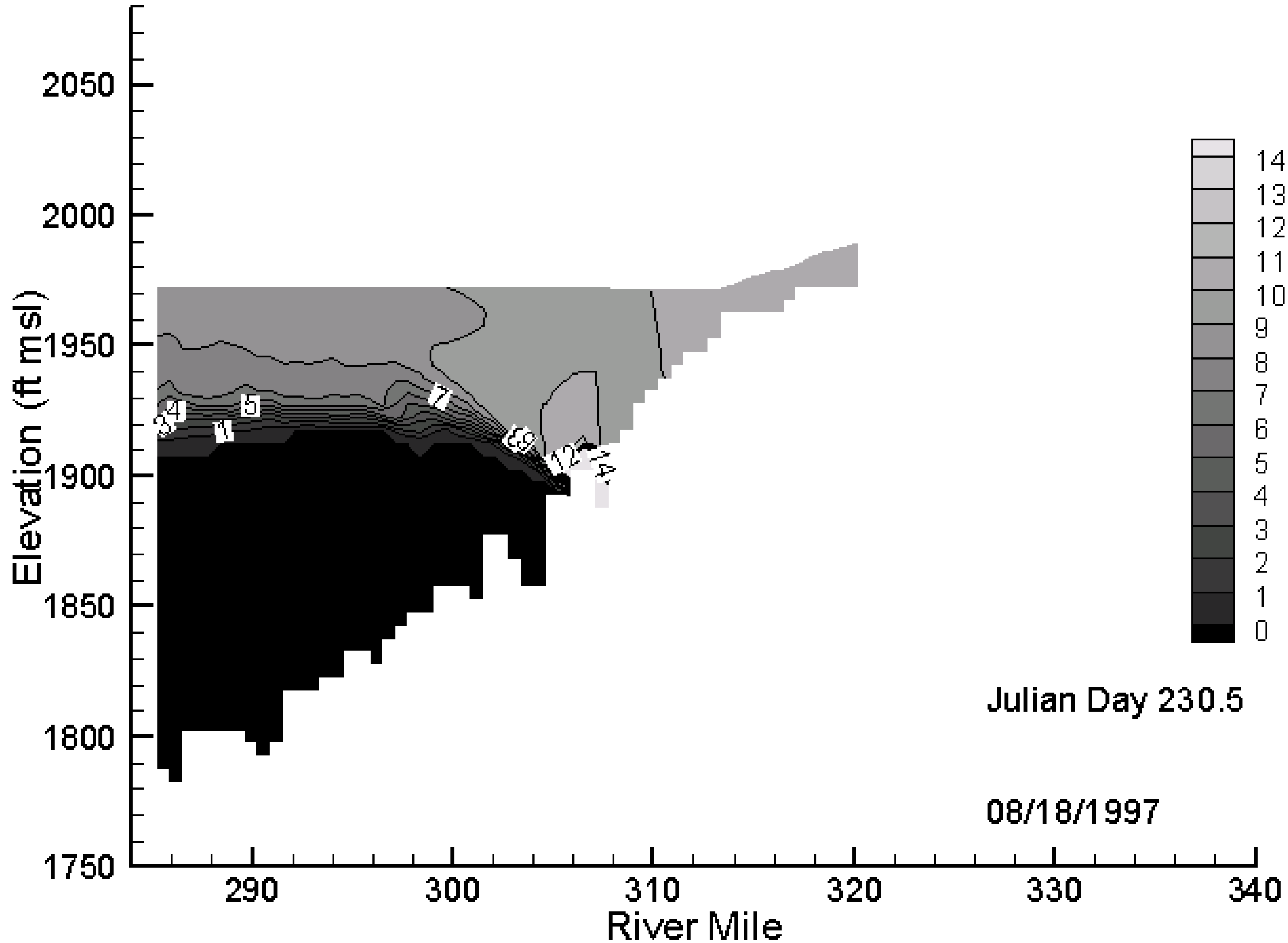

Figure 226. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

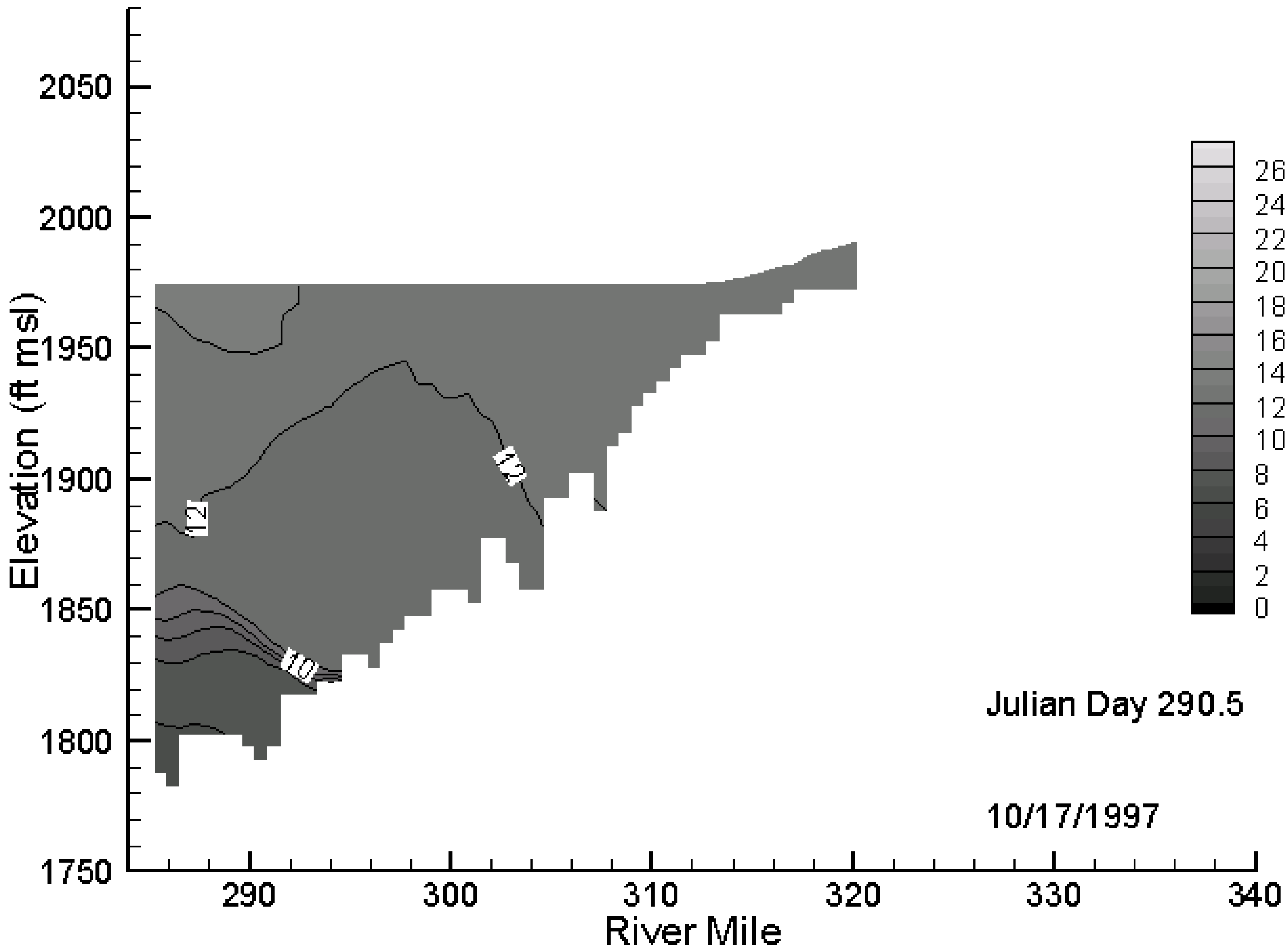

Figure 227. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

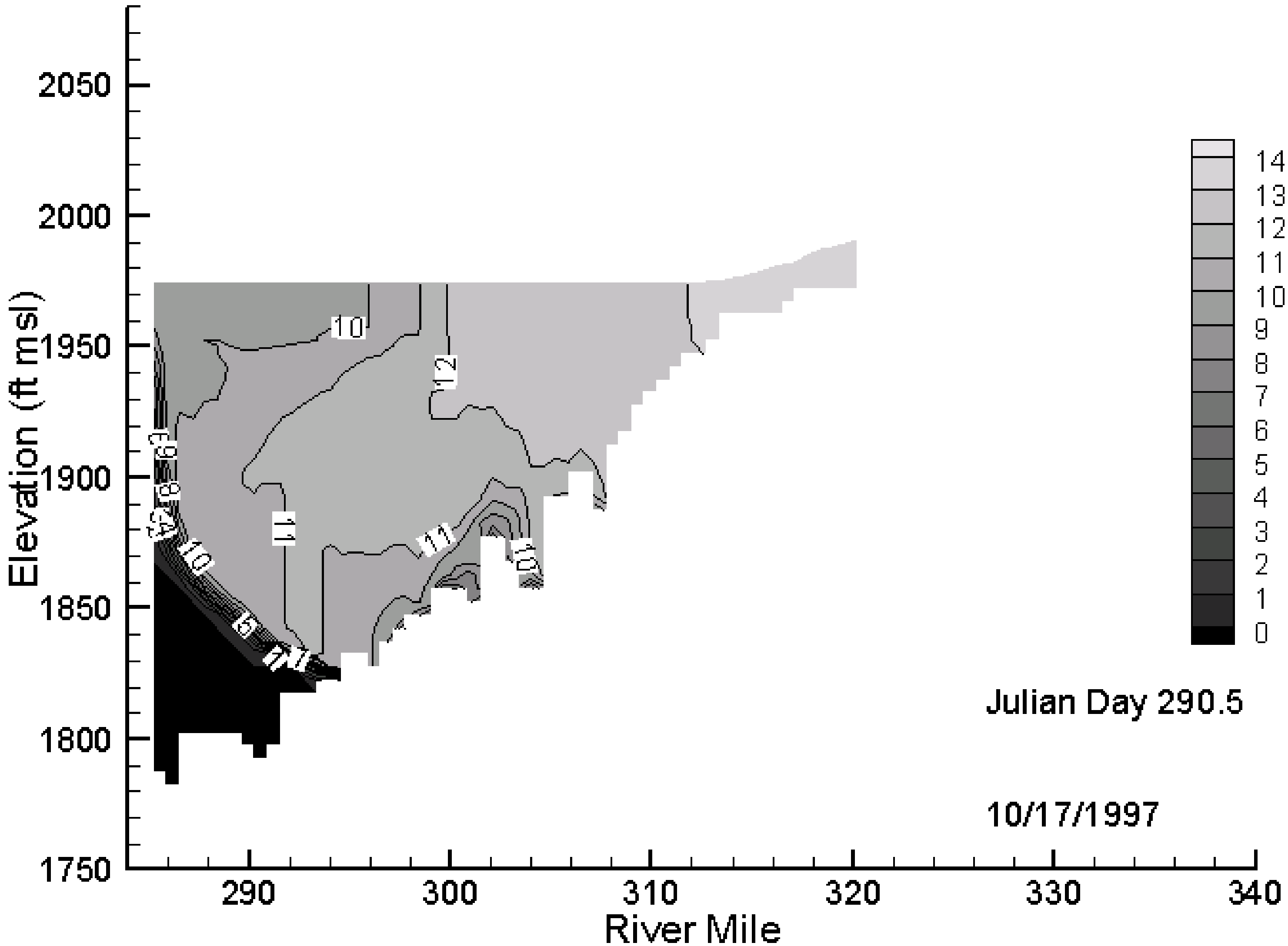

Figure 228. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

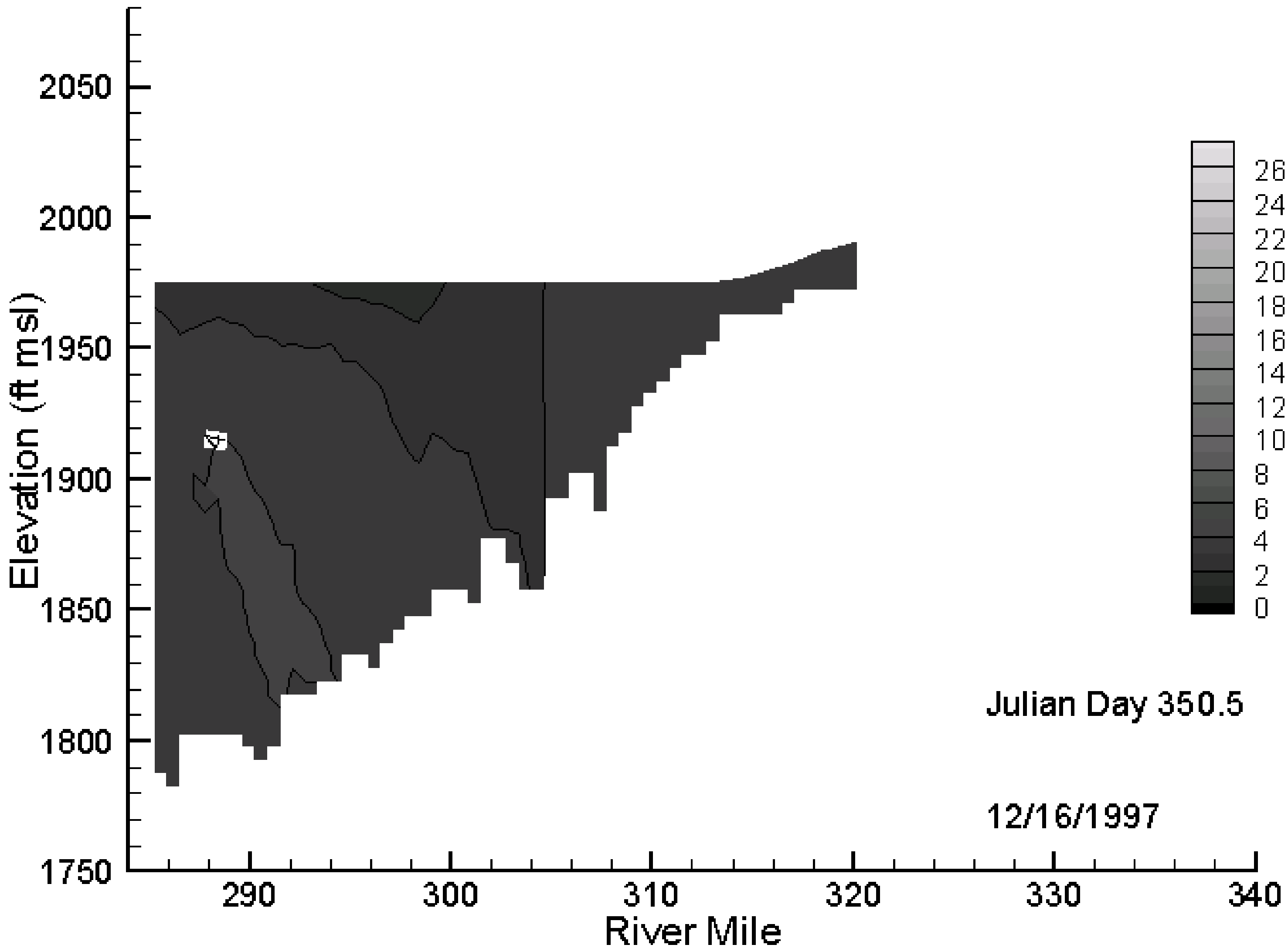

Figure 229. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-5 operations.

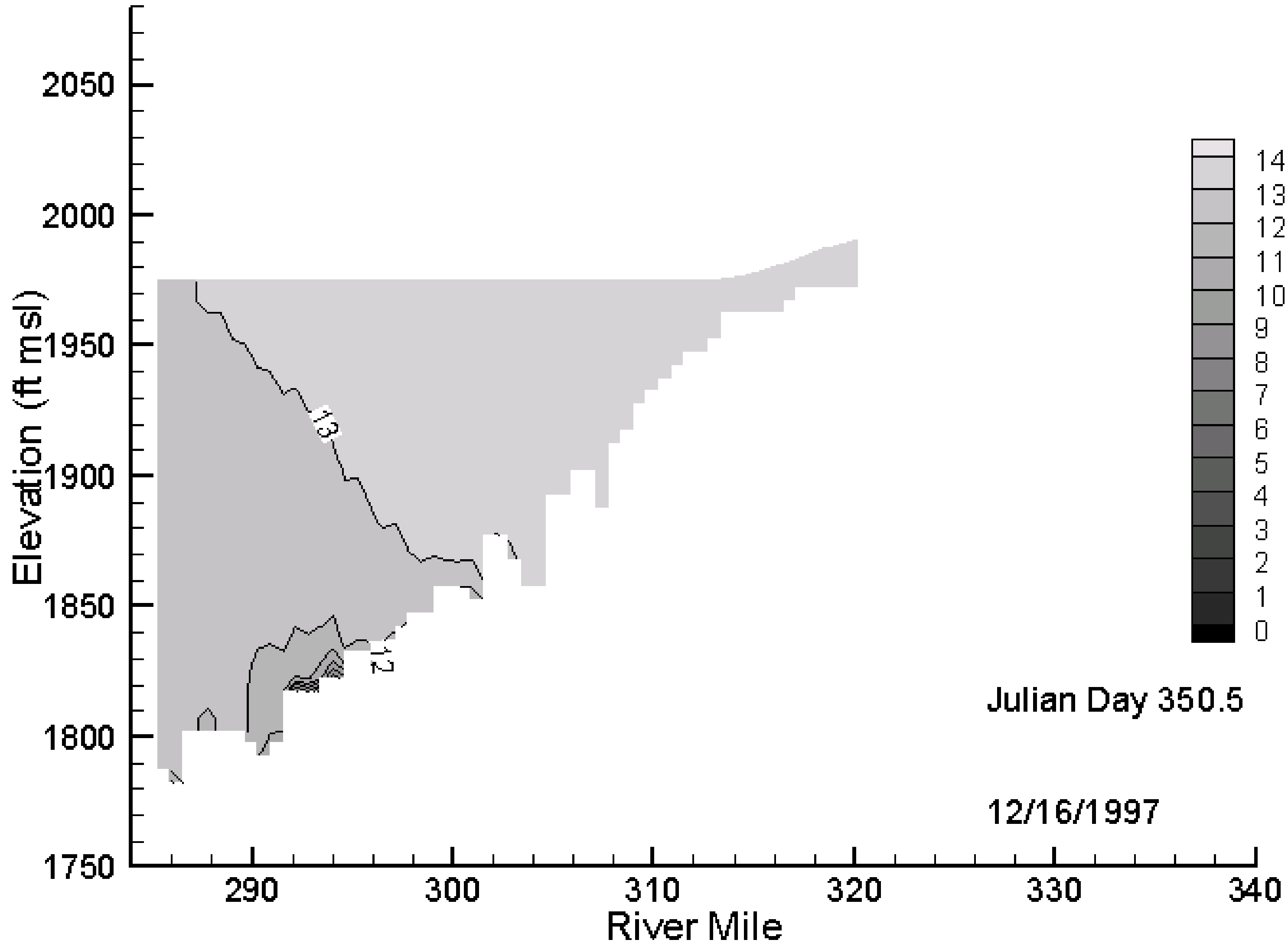

Figure 230. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-5 operations.

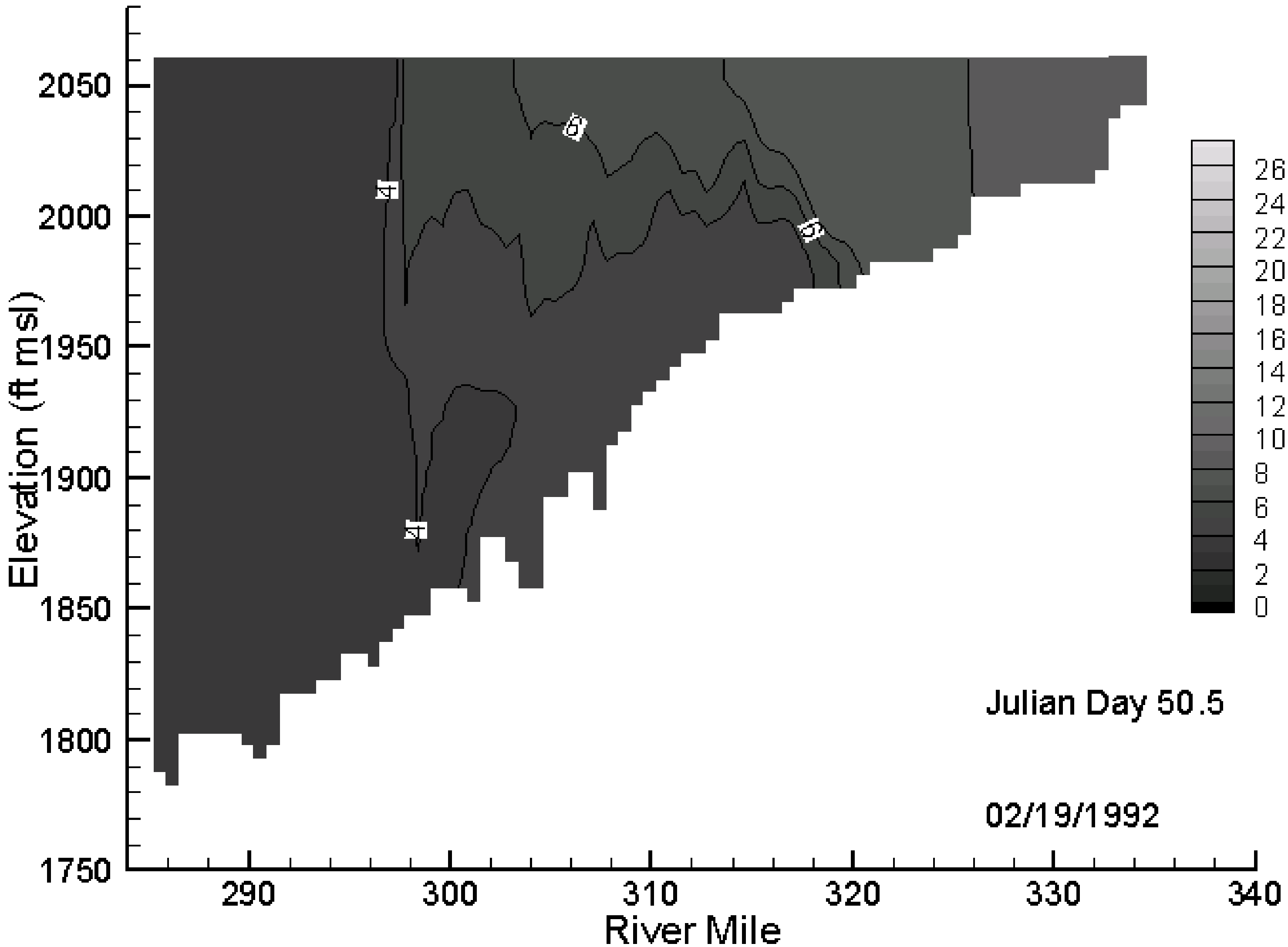

Figure 231. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

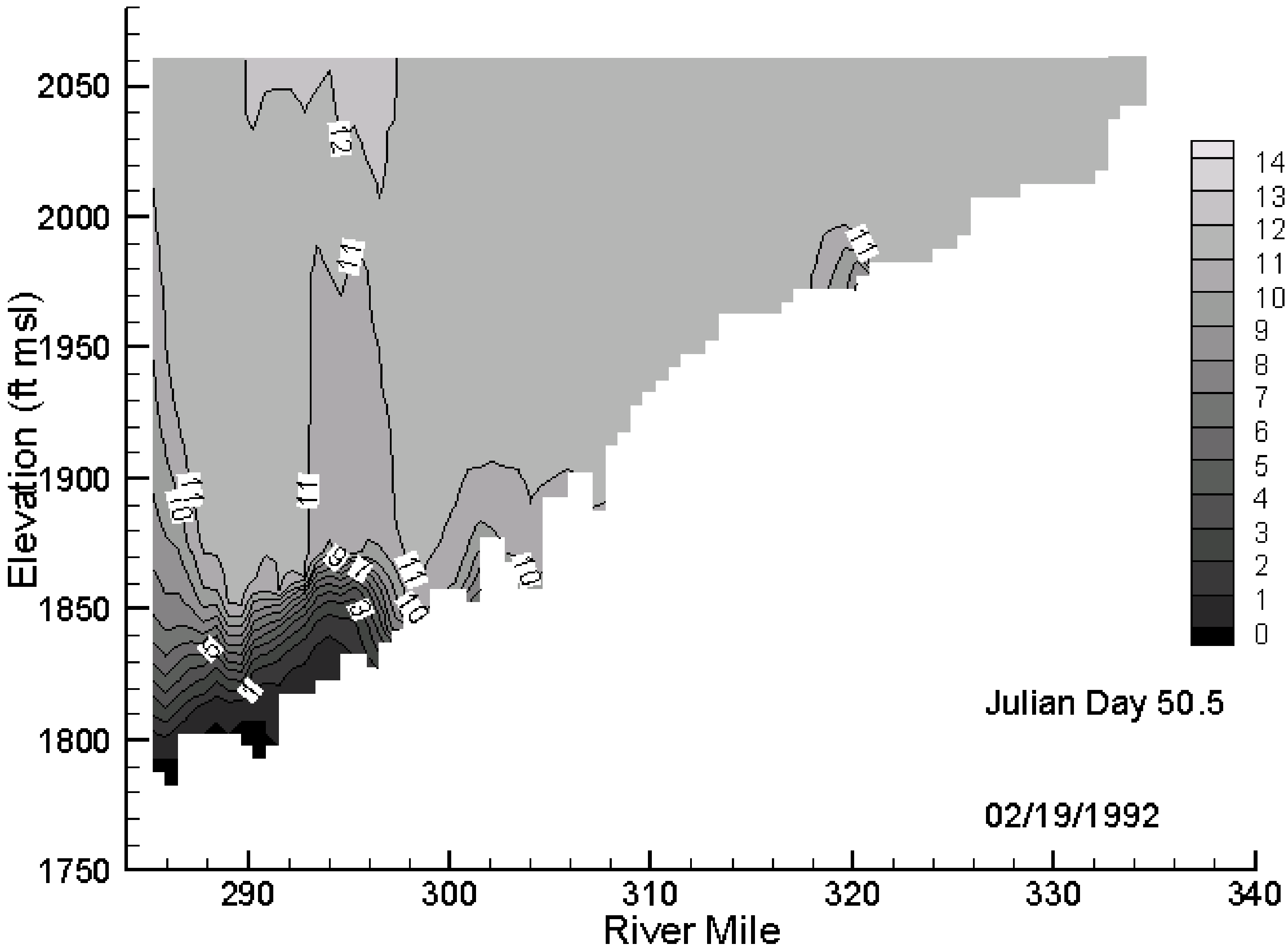

Figure 232. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

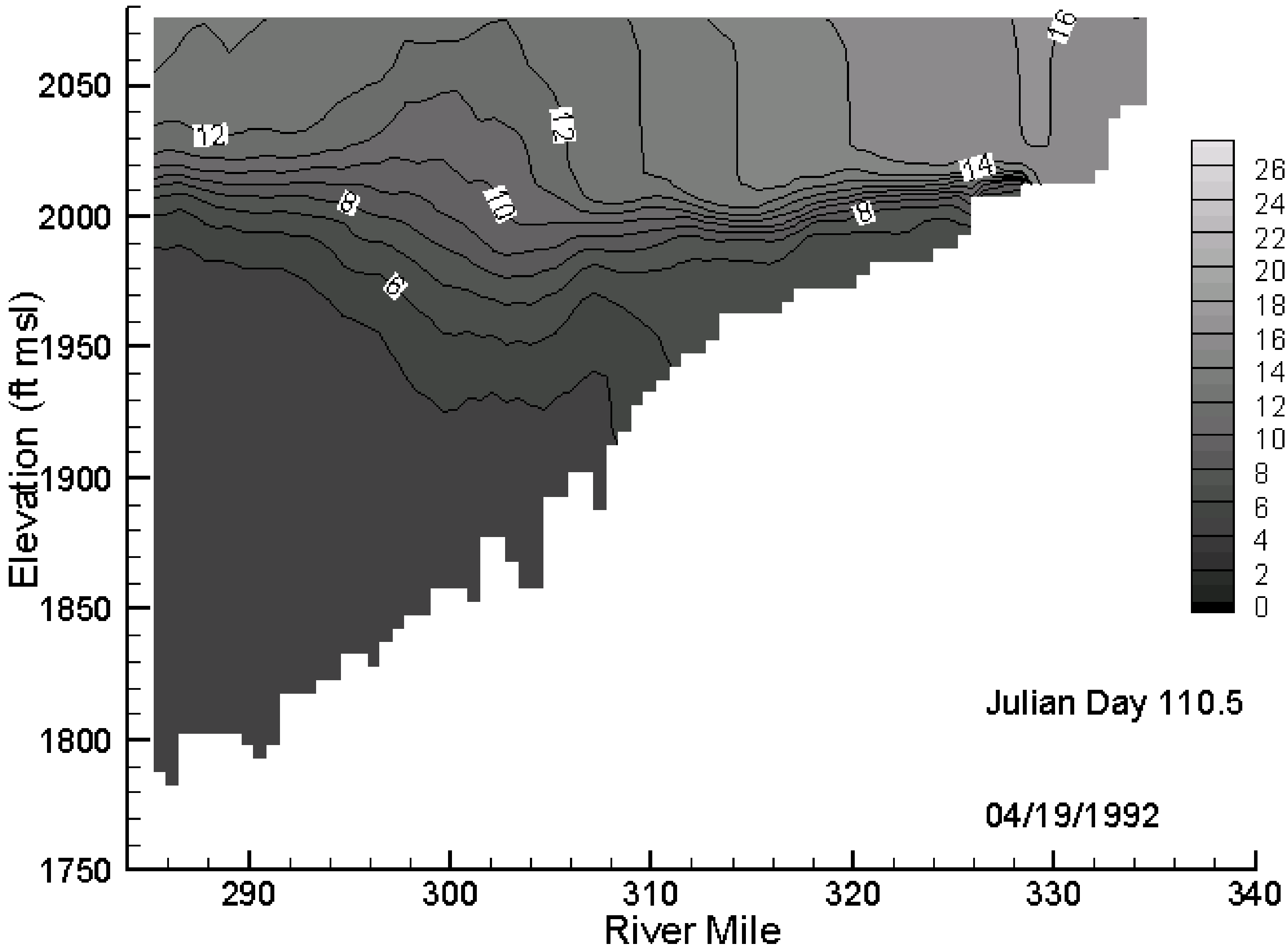

Figure 233. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

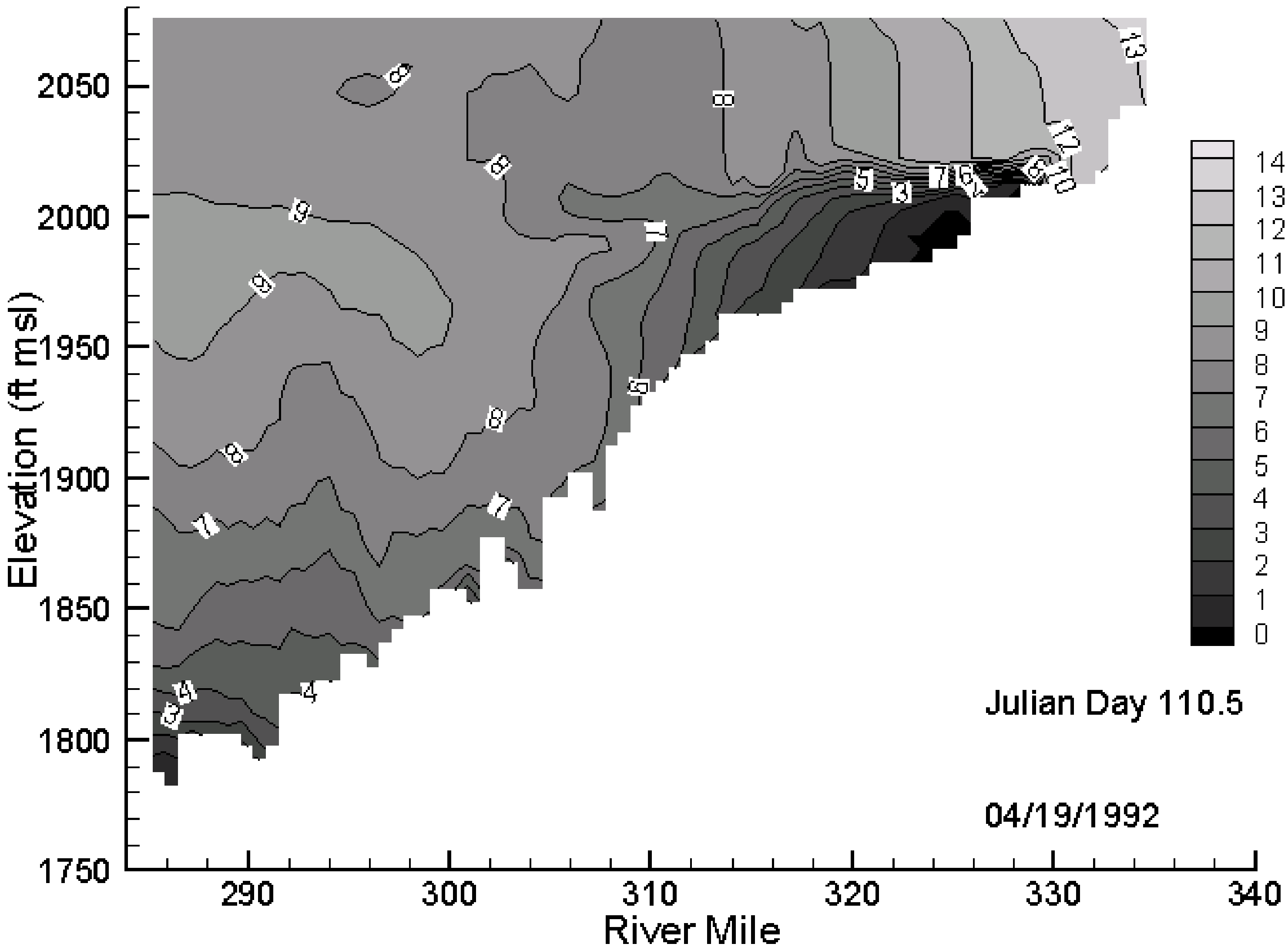

Figure 234. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

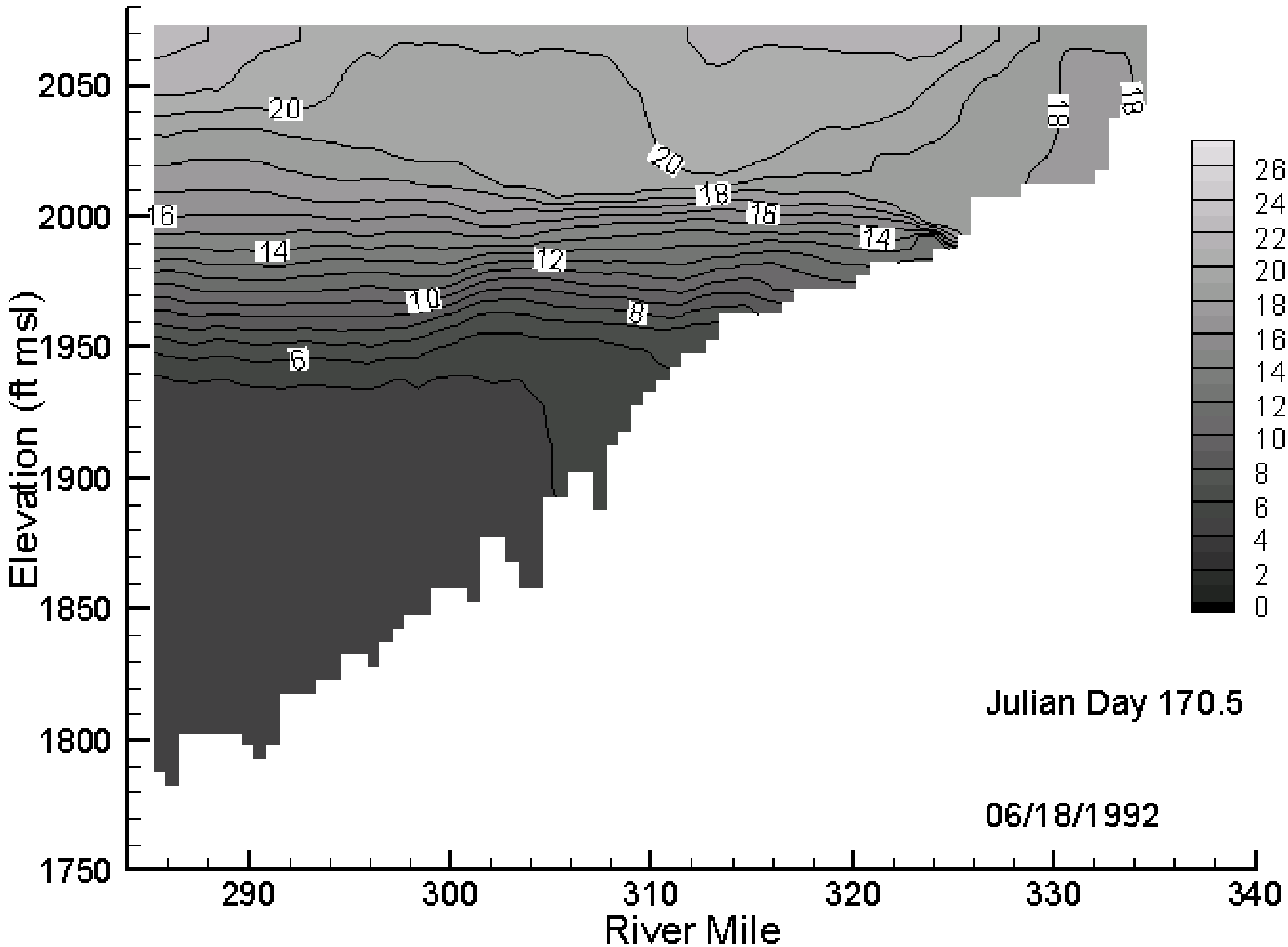

Figure 235. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

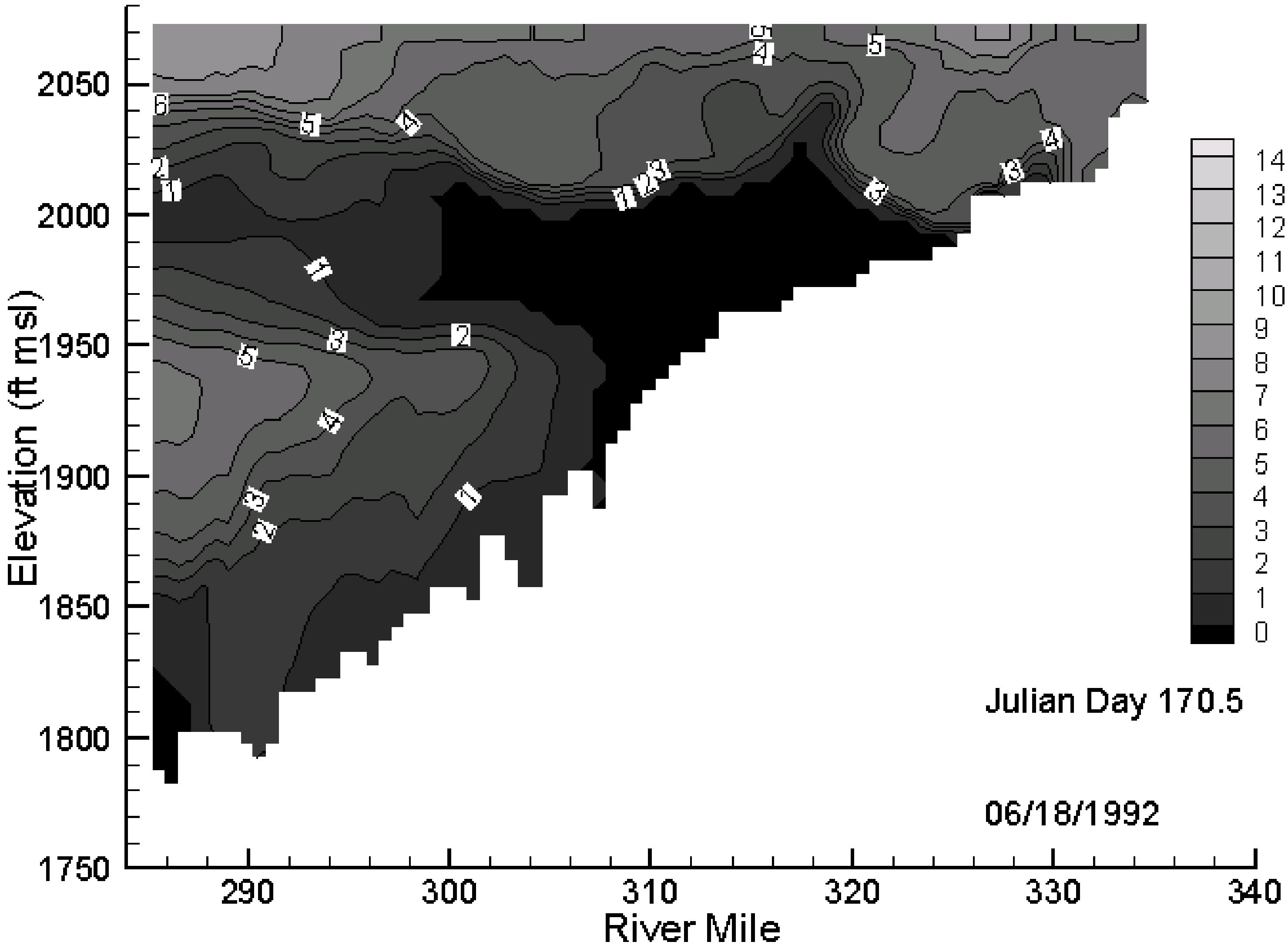

Figure 236. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

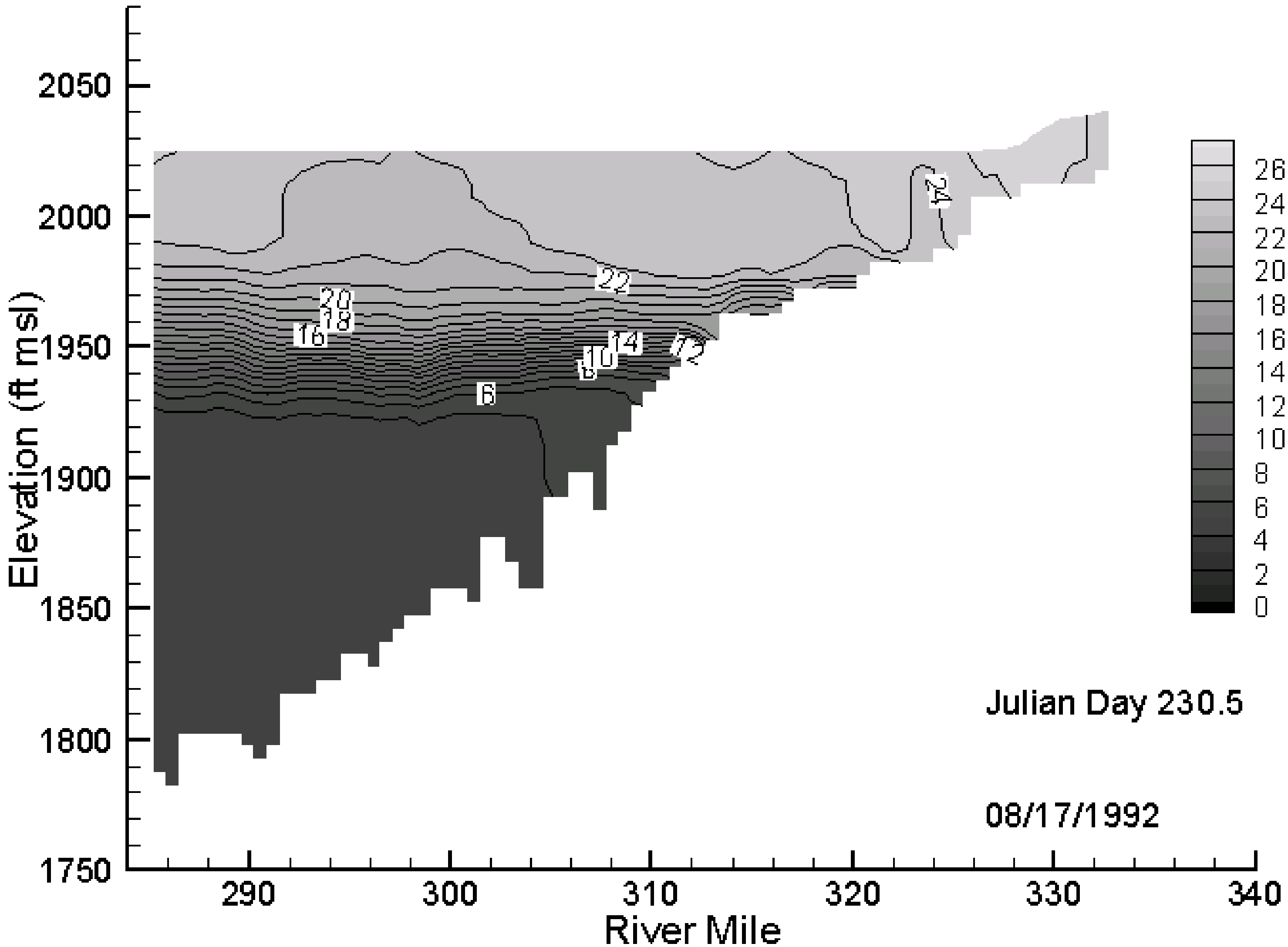

Figure 237. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

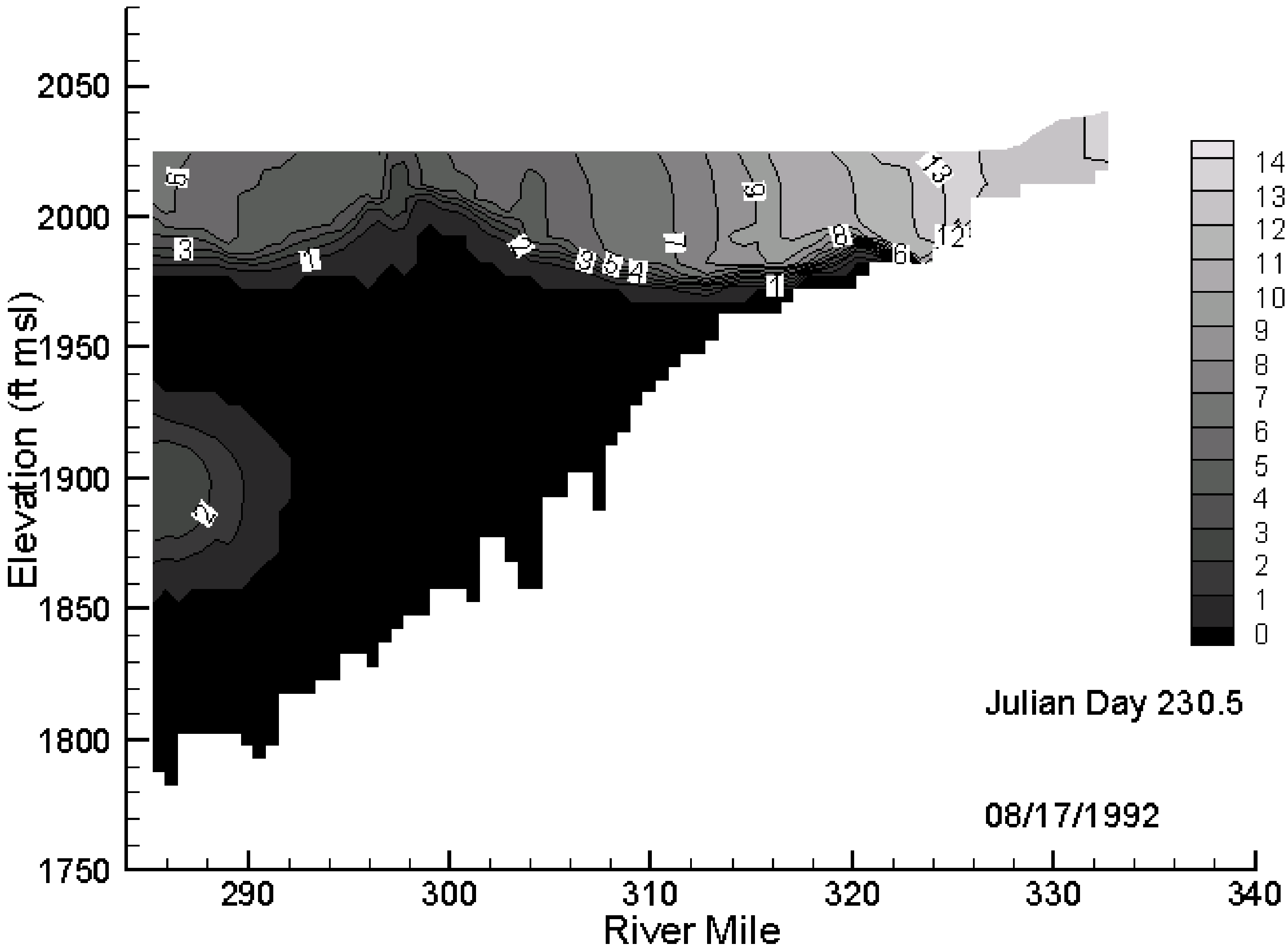

Figure 238. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

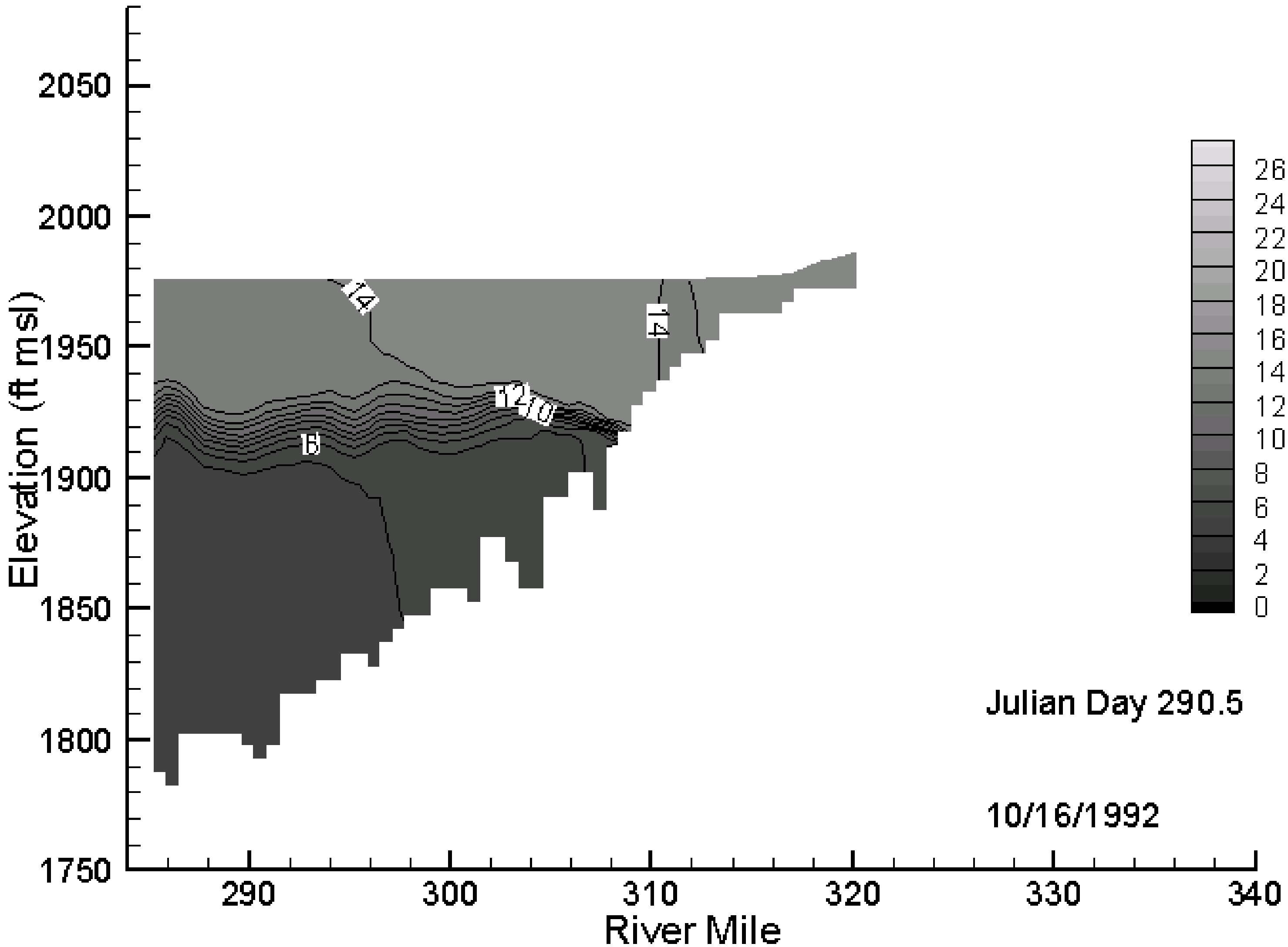

Figure 239. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

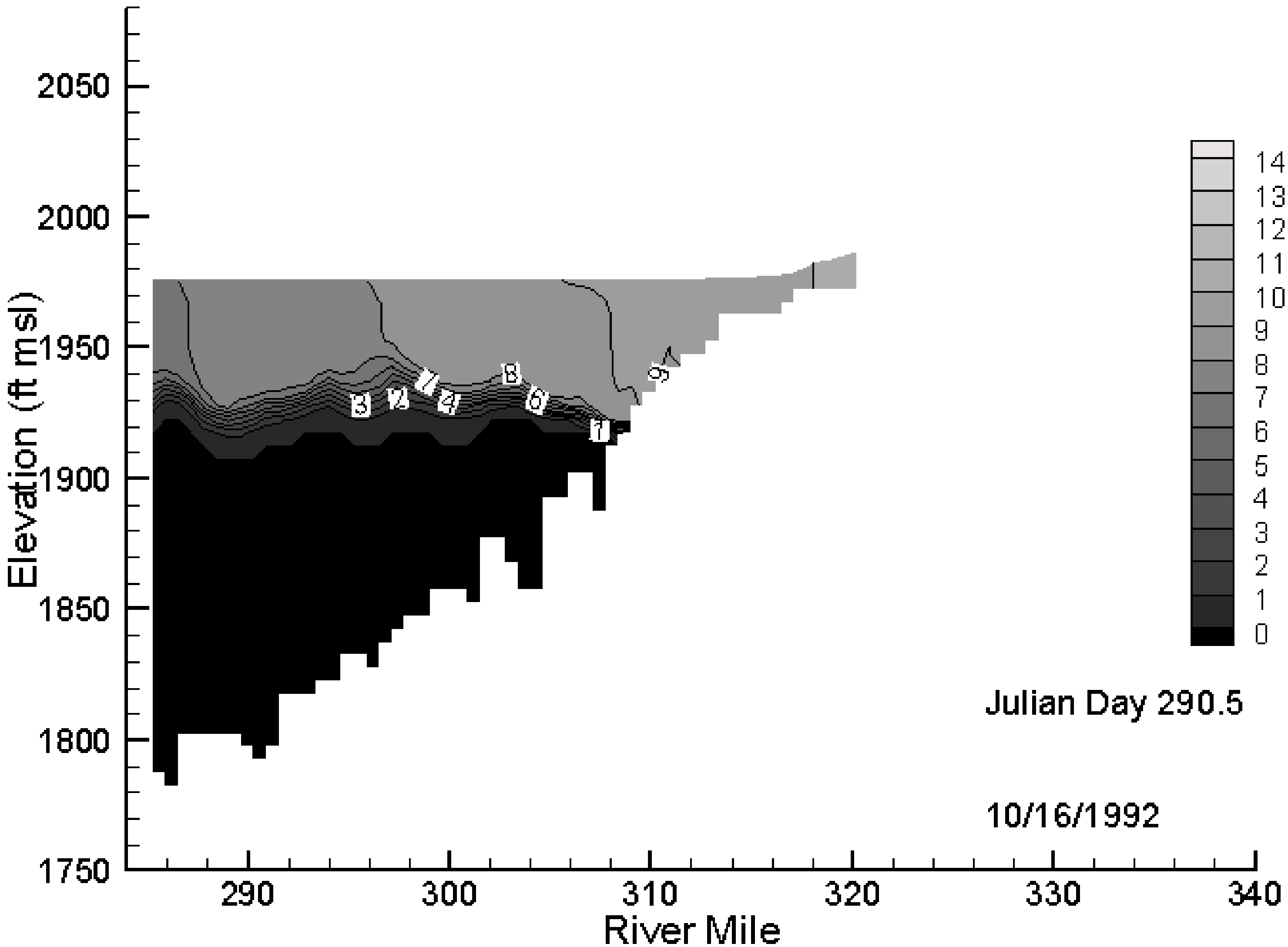

Figure 240. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

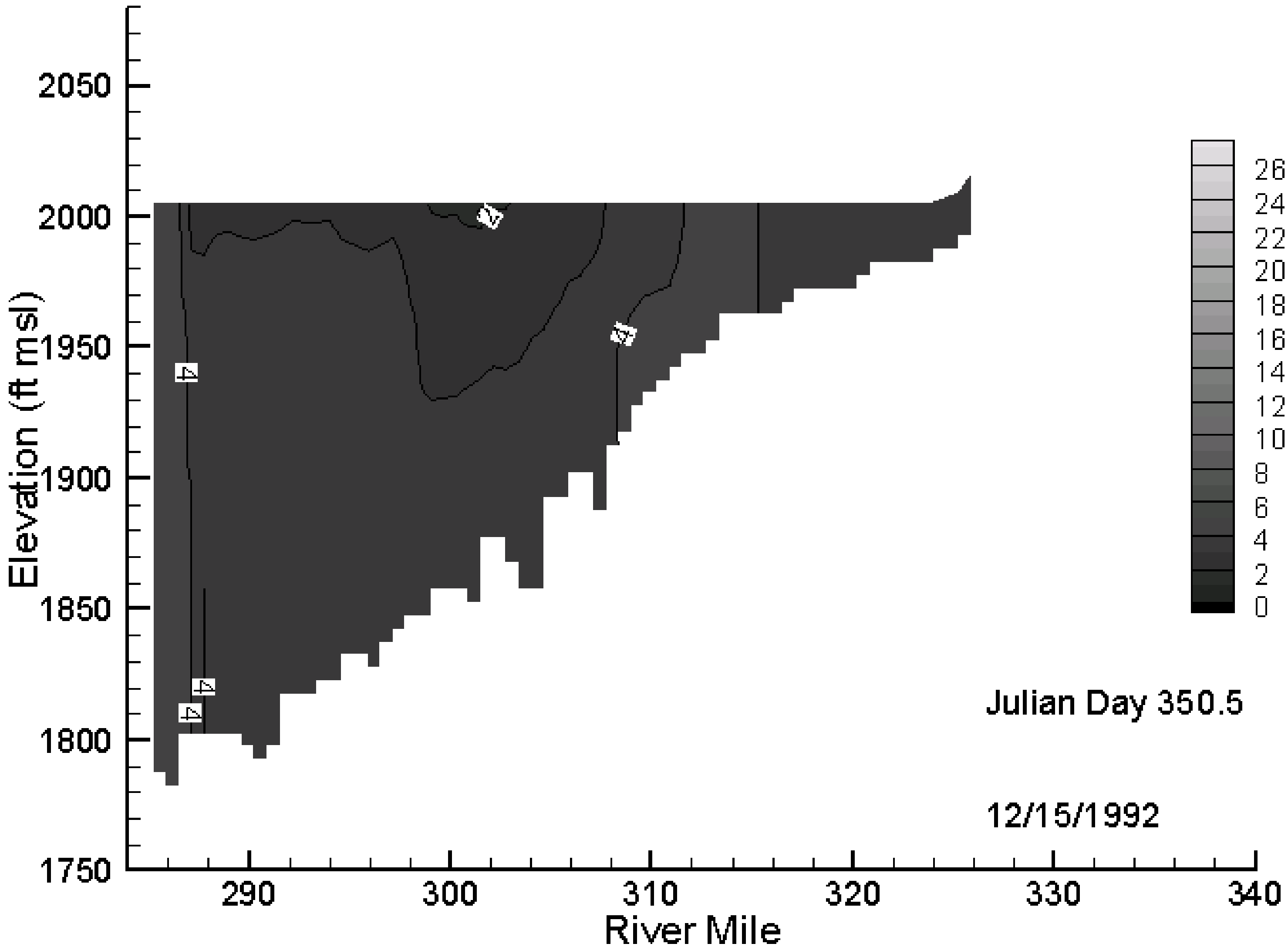

Figure 241. 1992 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

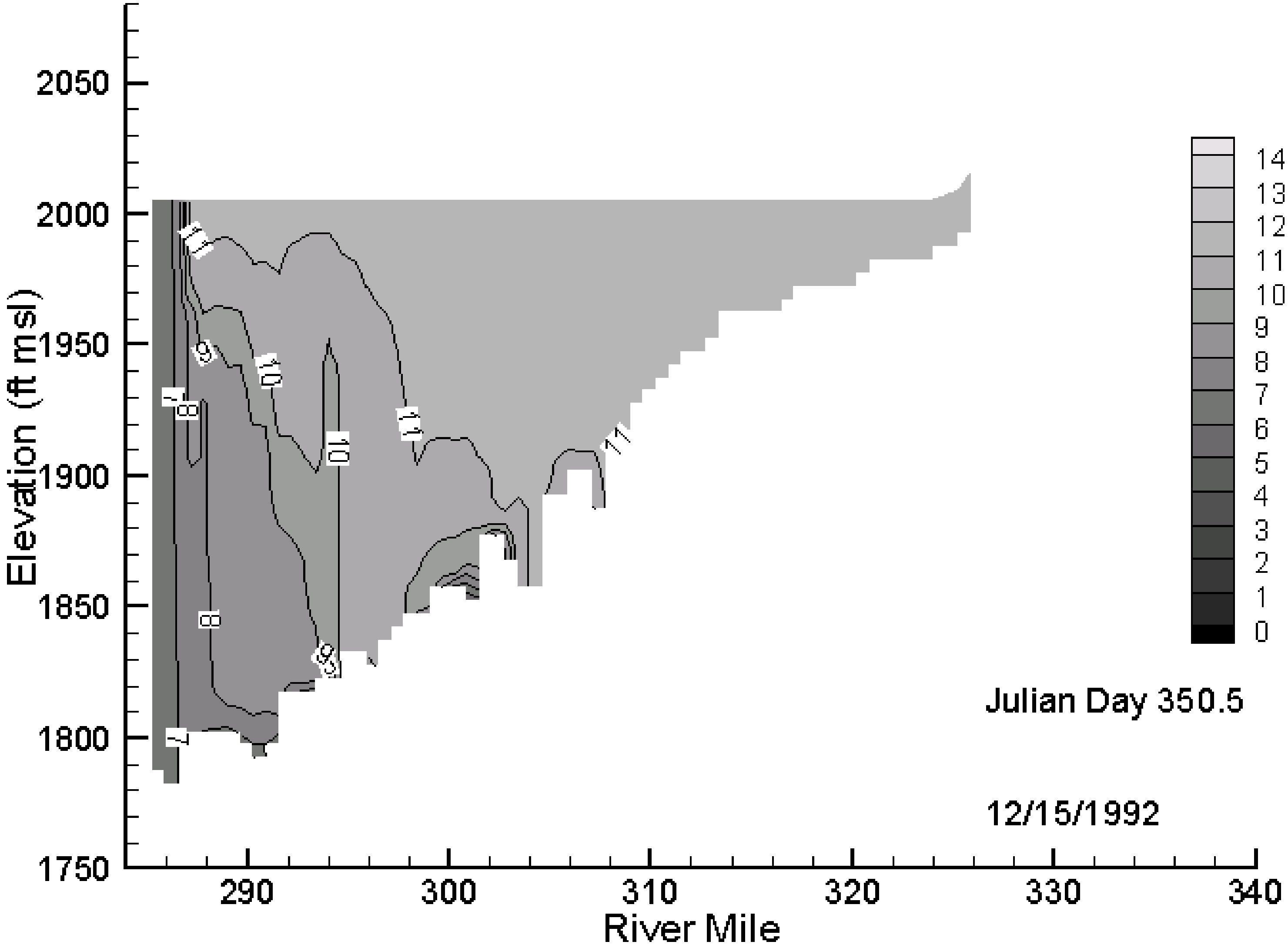

Figure 242. 1992 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

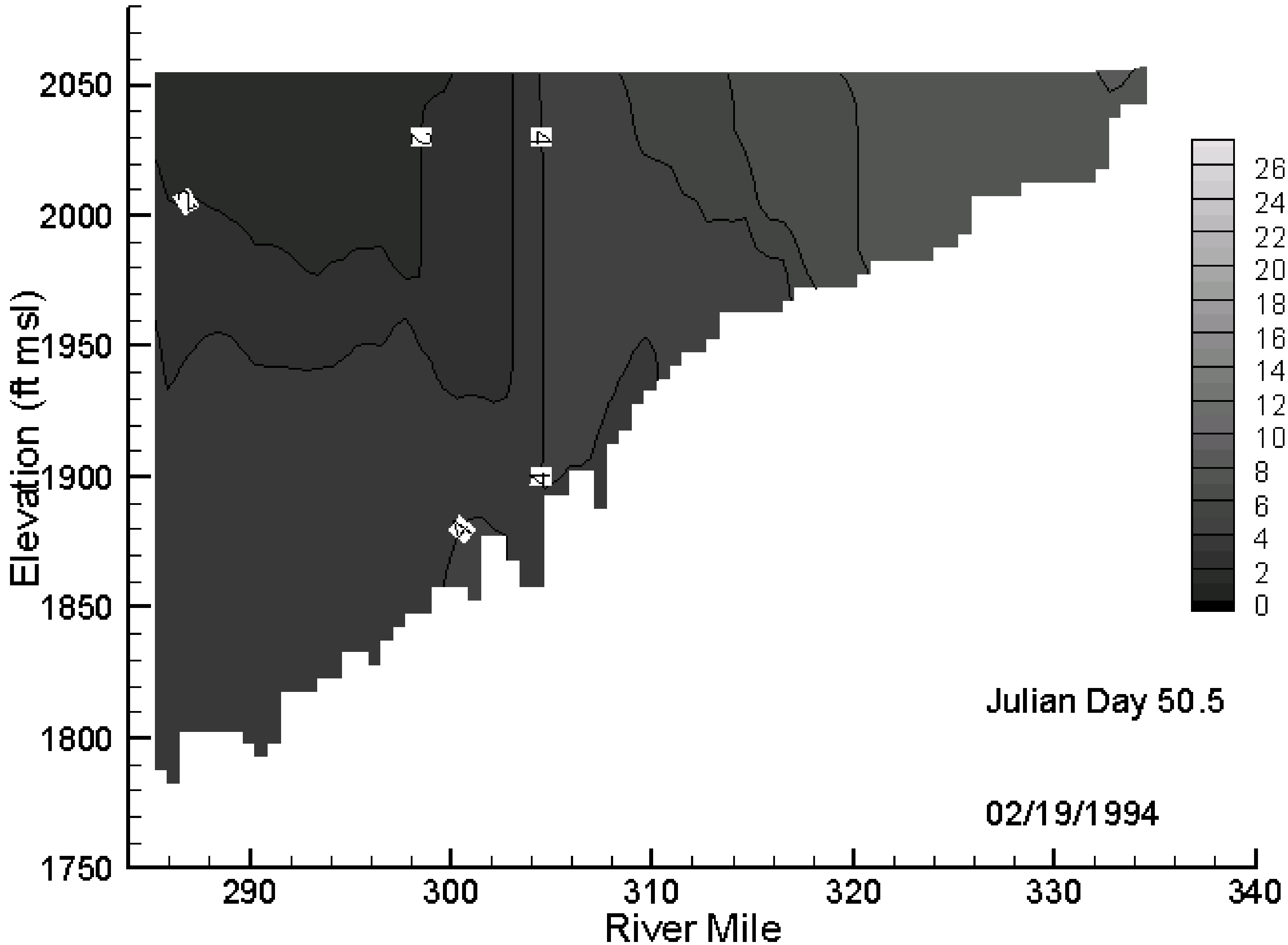

Figure 243. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

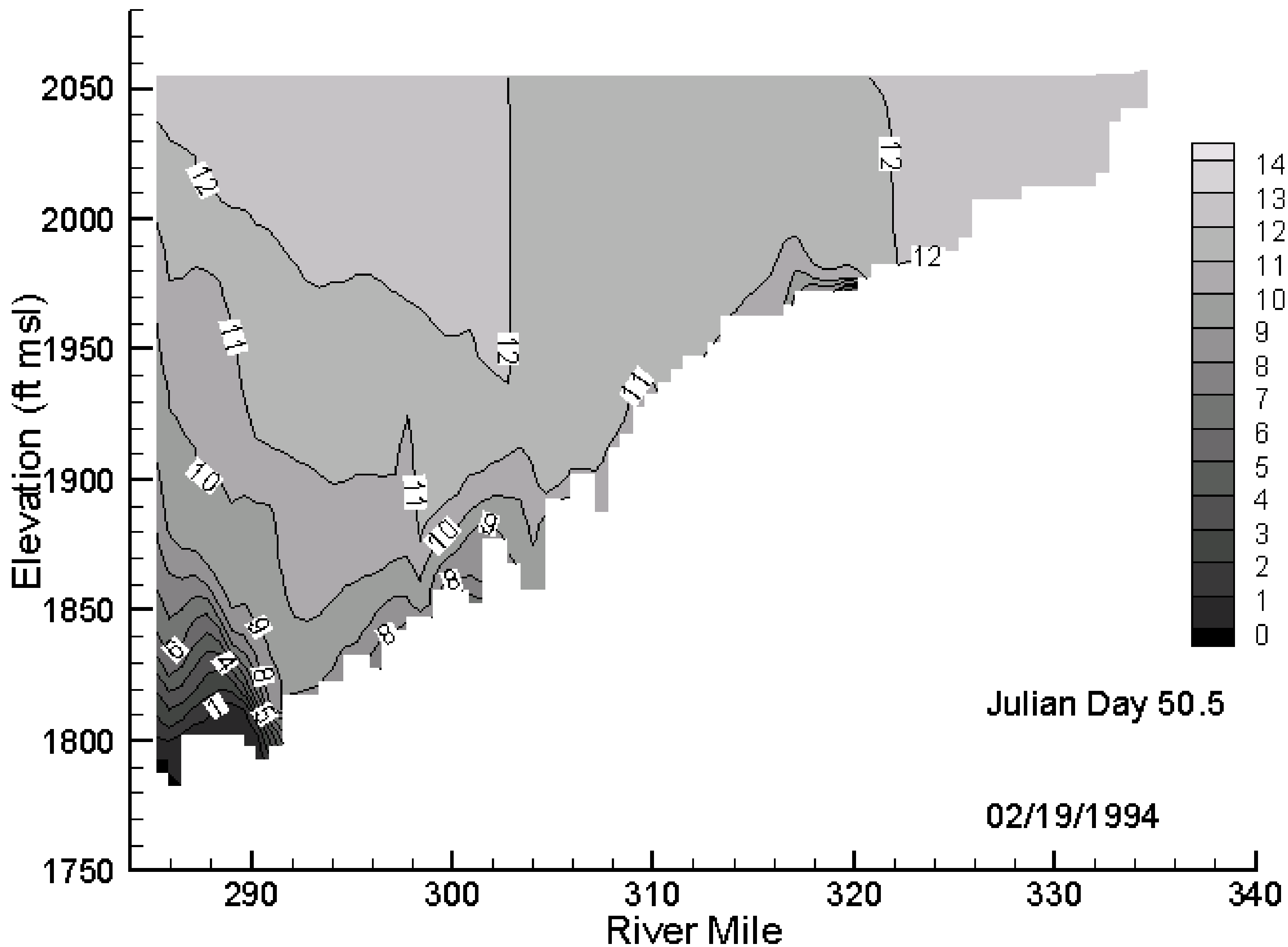

Figure 244. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

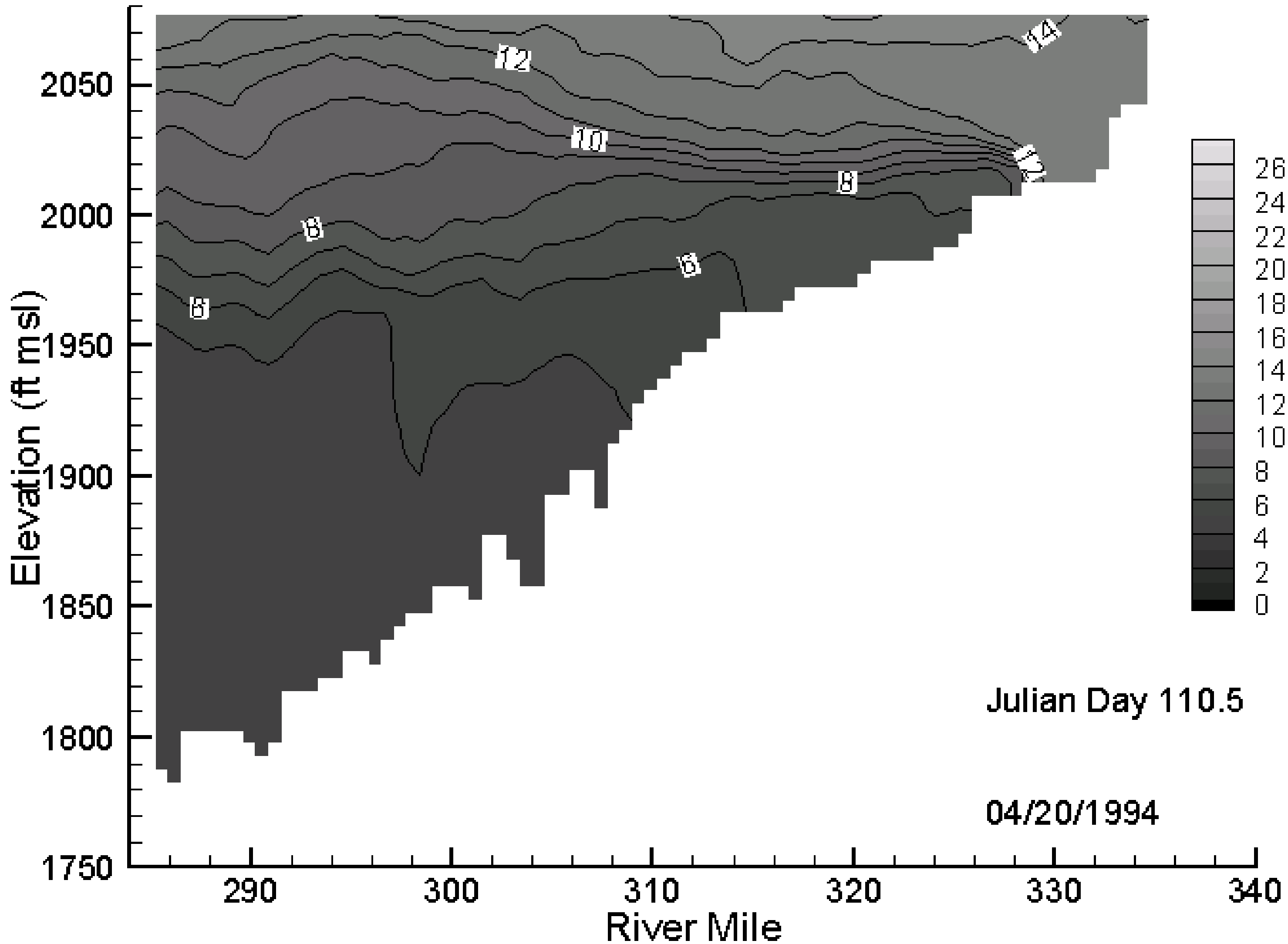

Figure 245. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

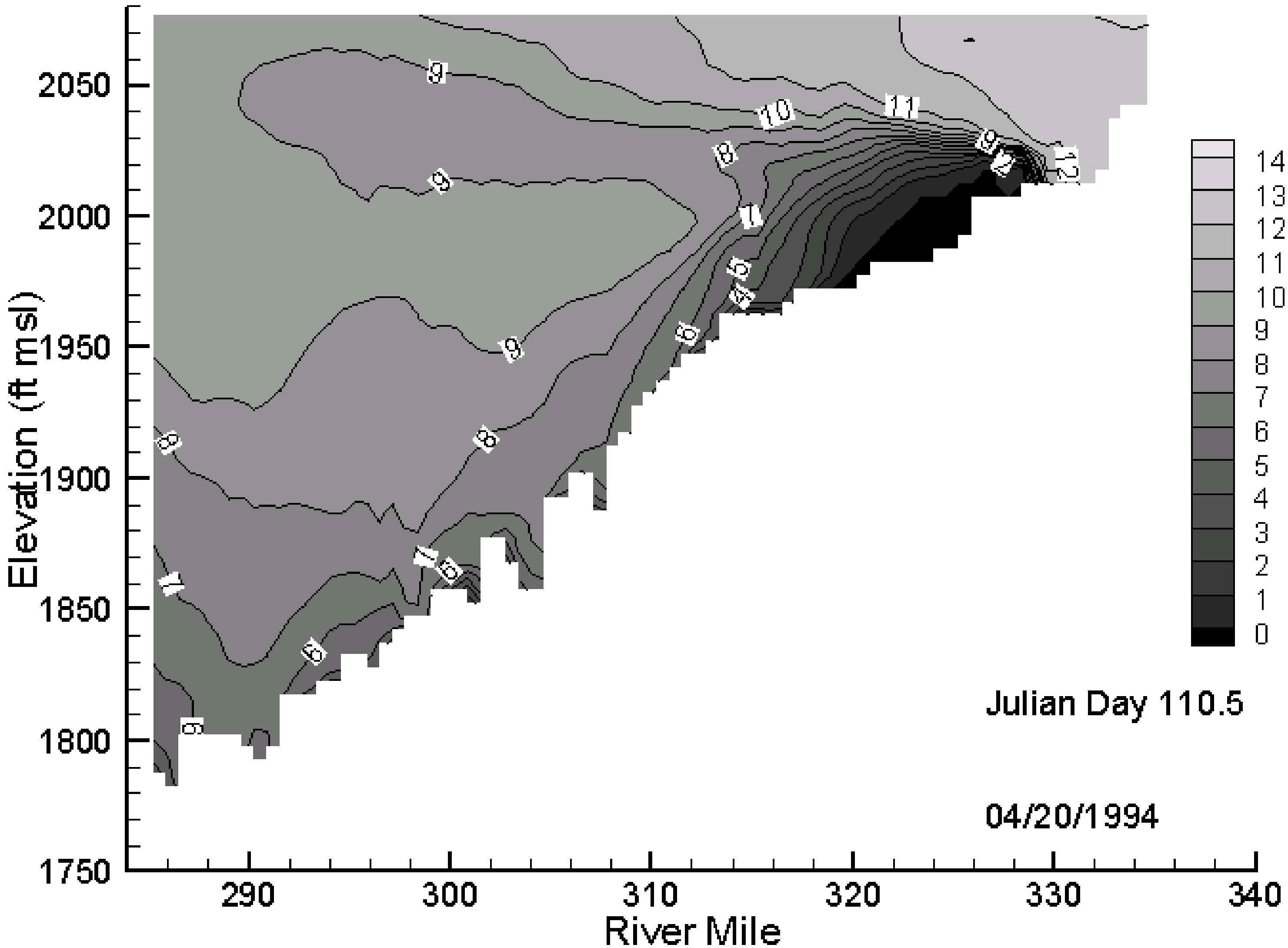

Figure 246. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

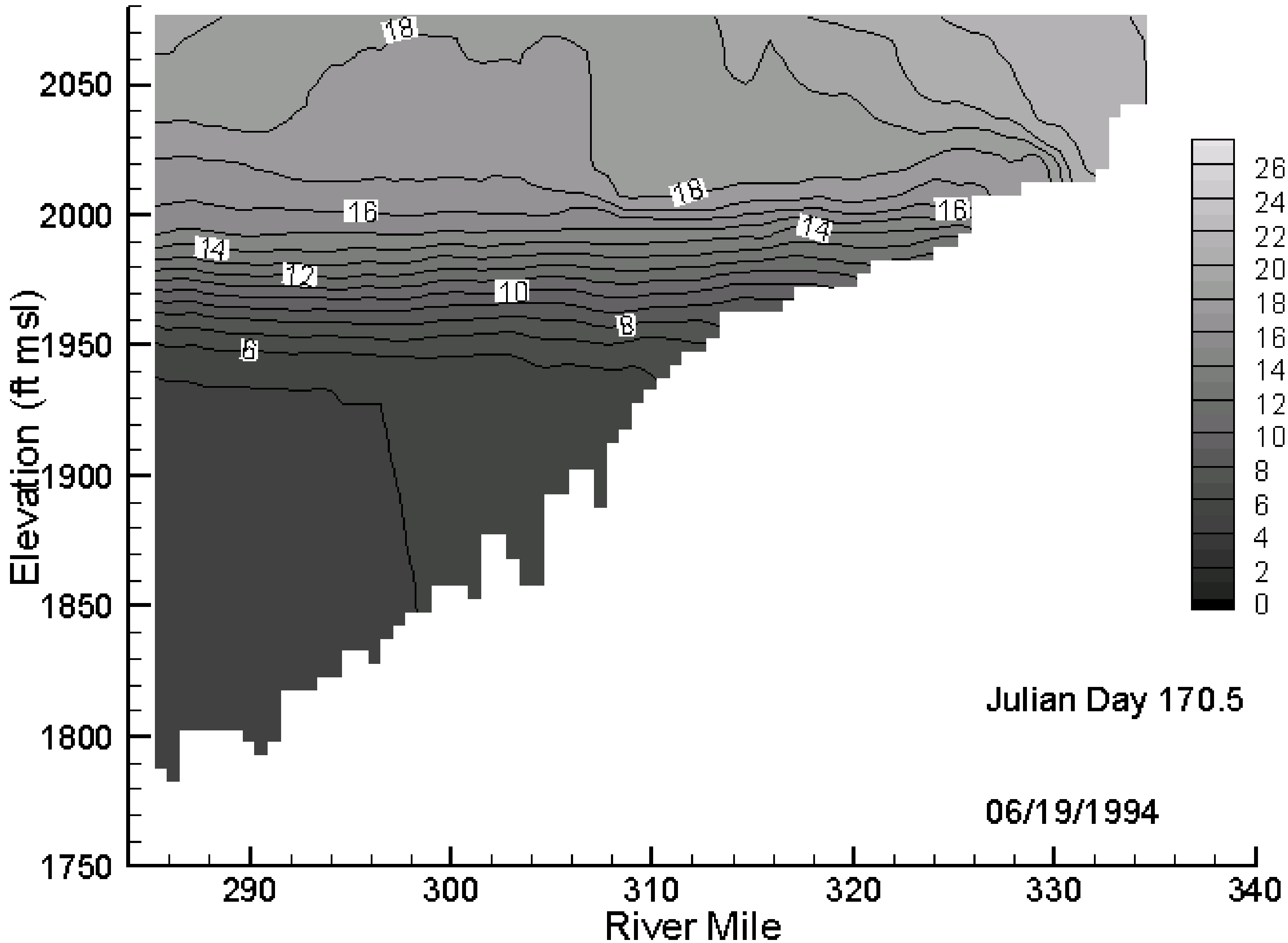

Figure 247. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

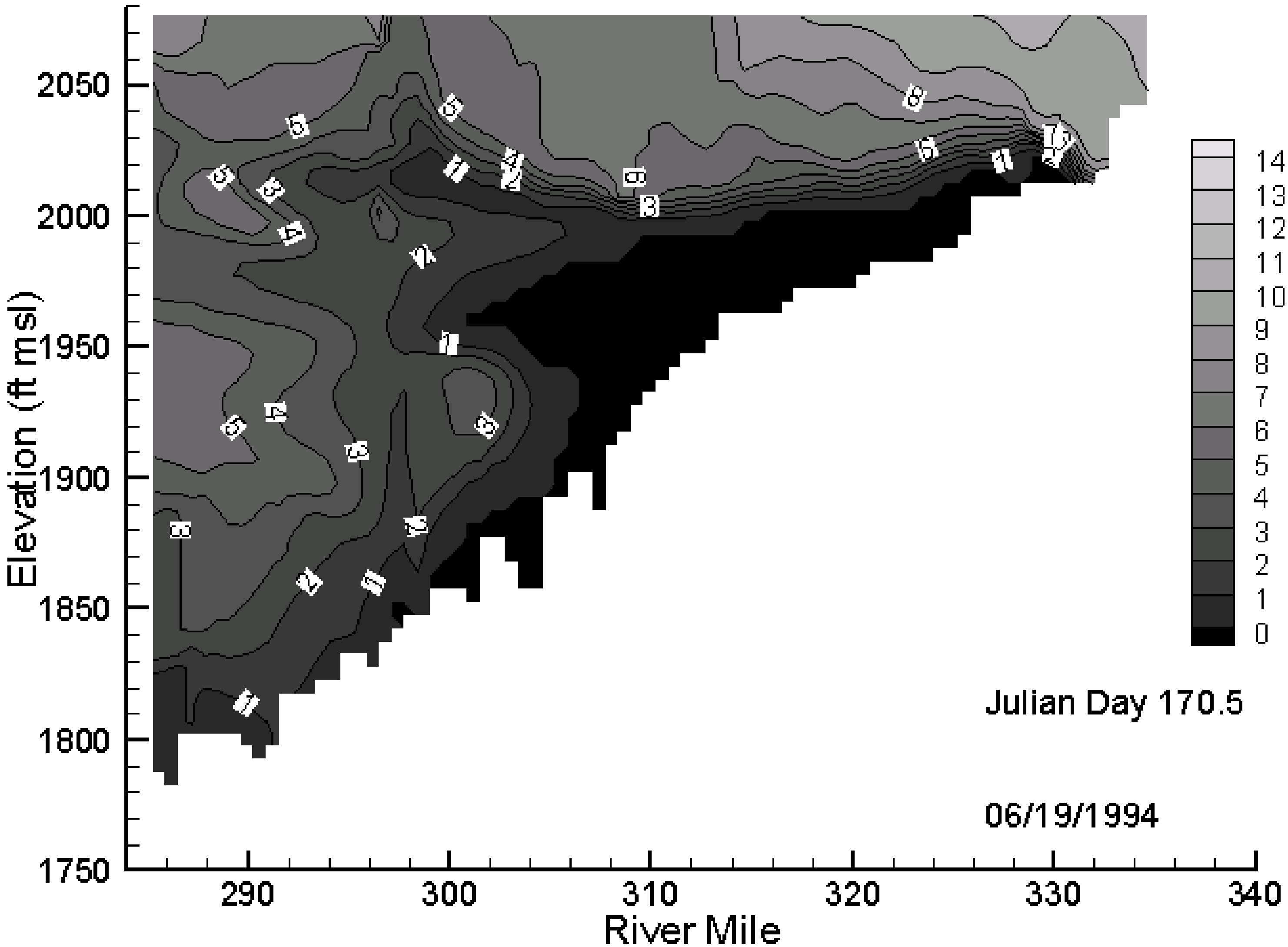

Figure 248. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

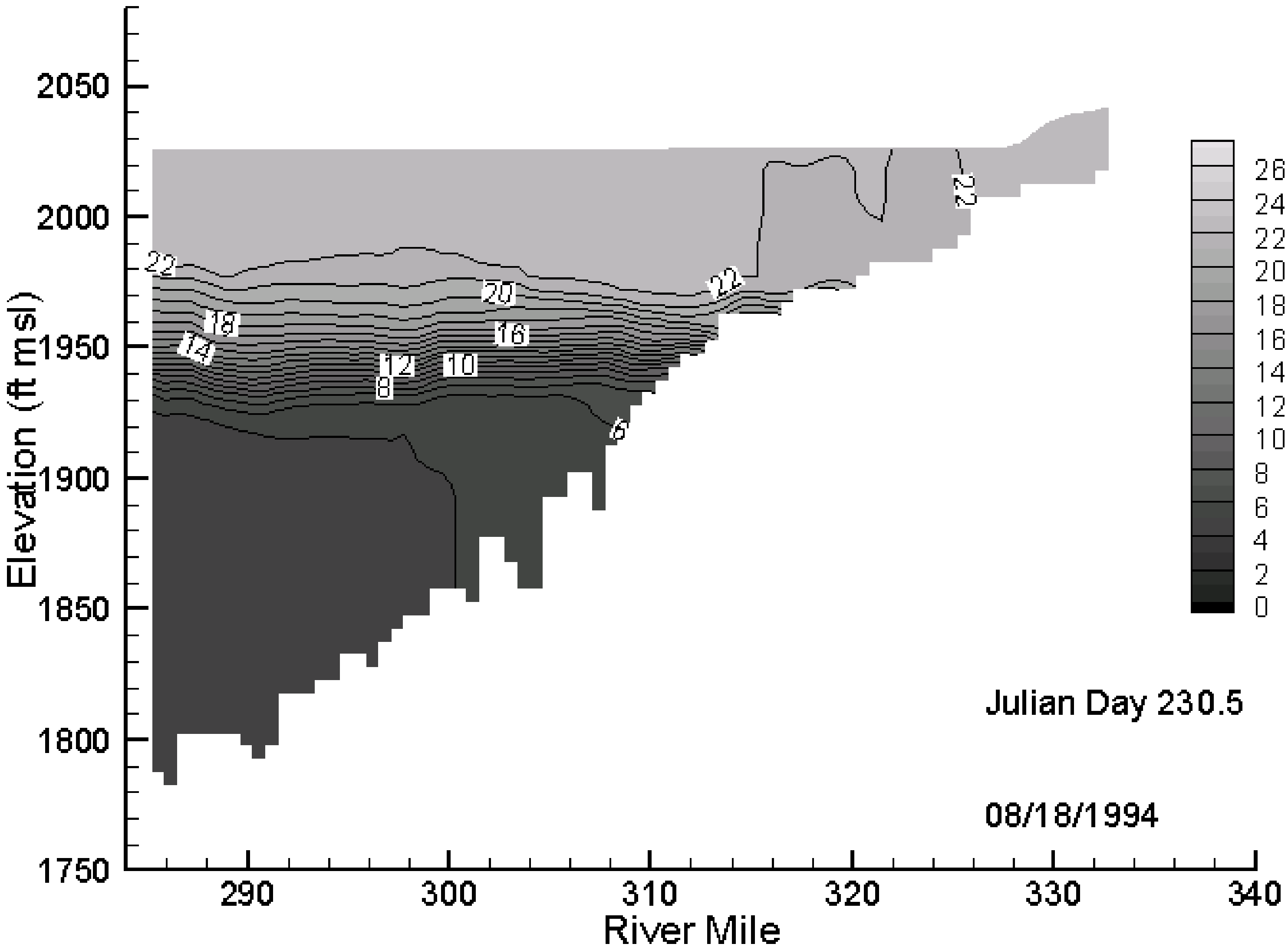

Figure 249. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

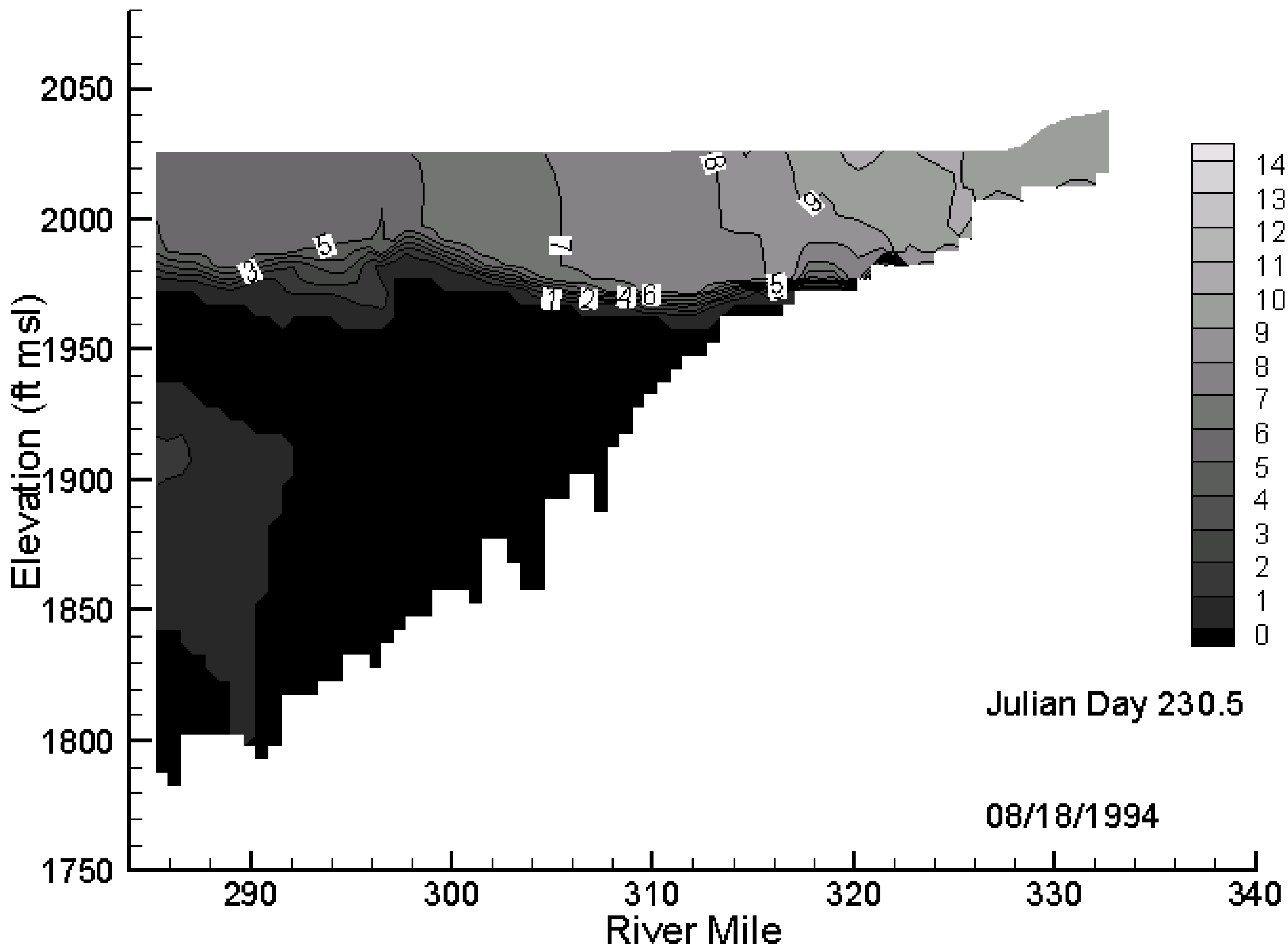

Figure 250. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

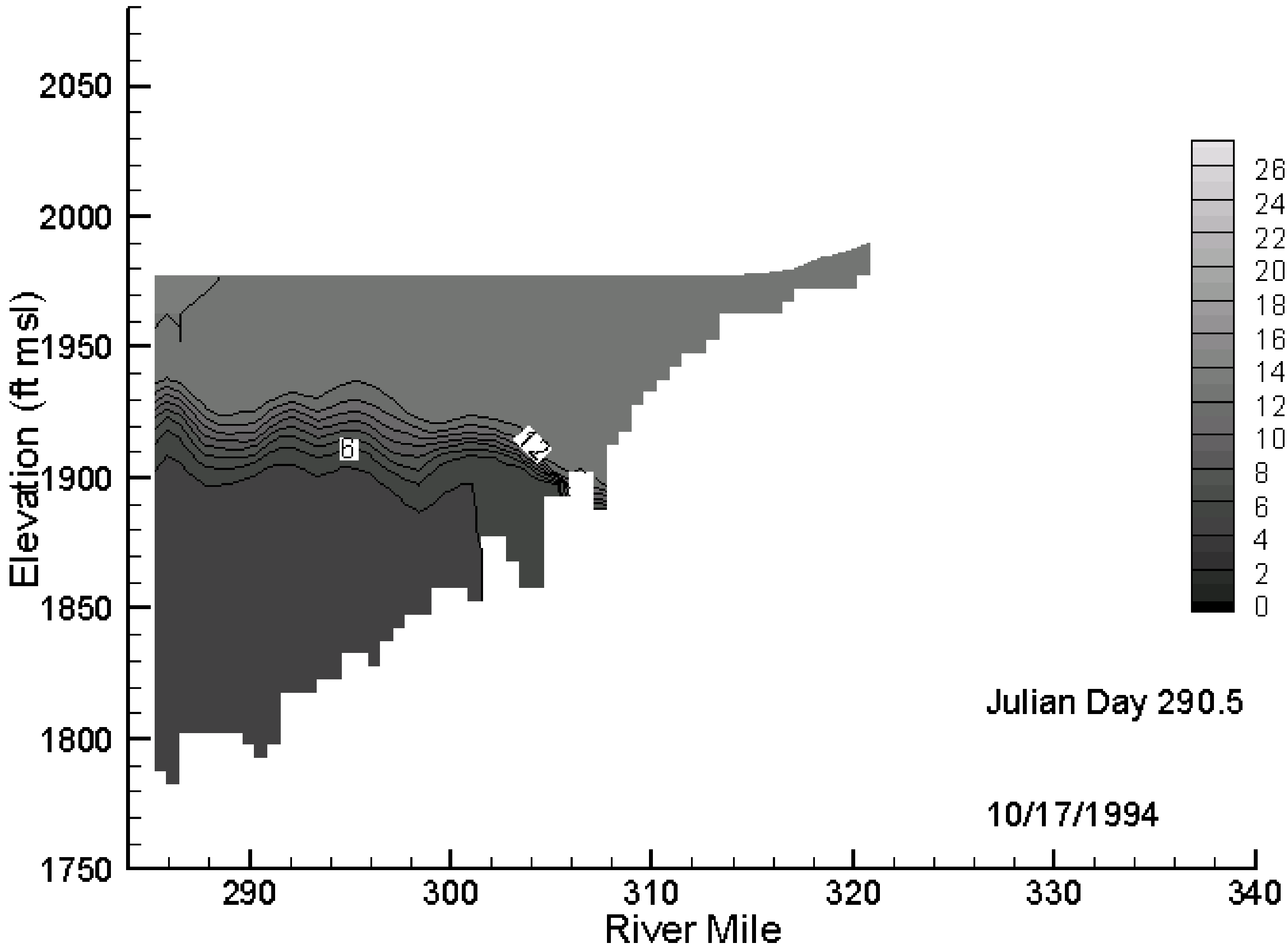

Figure 251. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

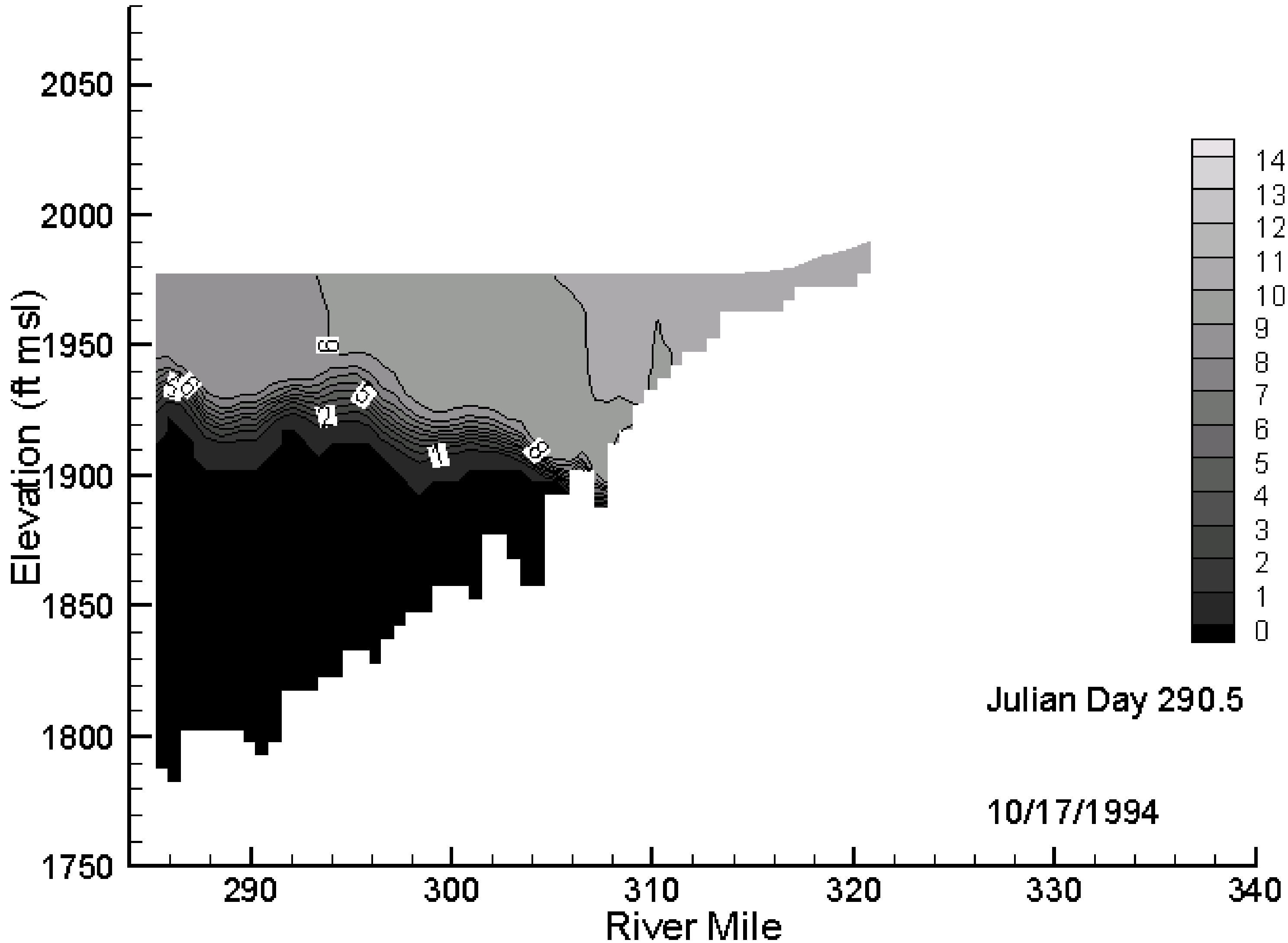

Figure 252. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

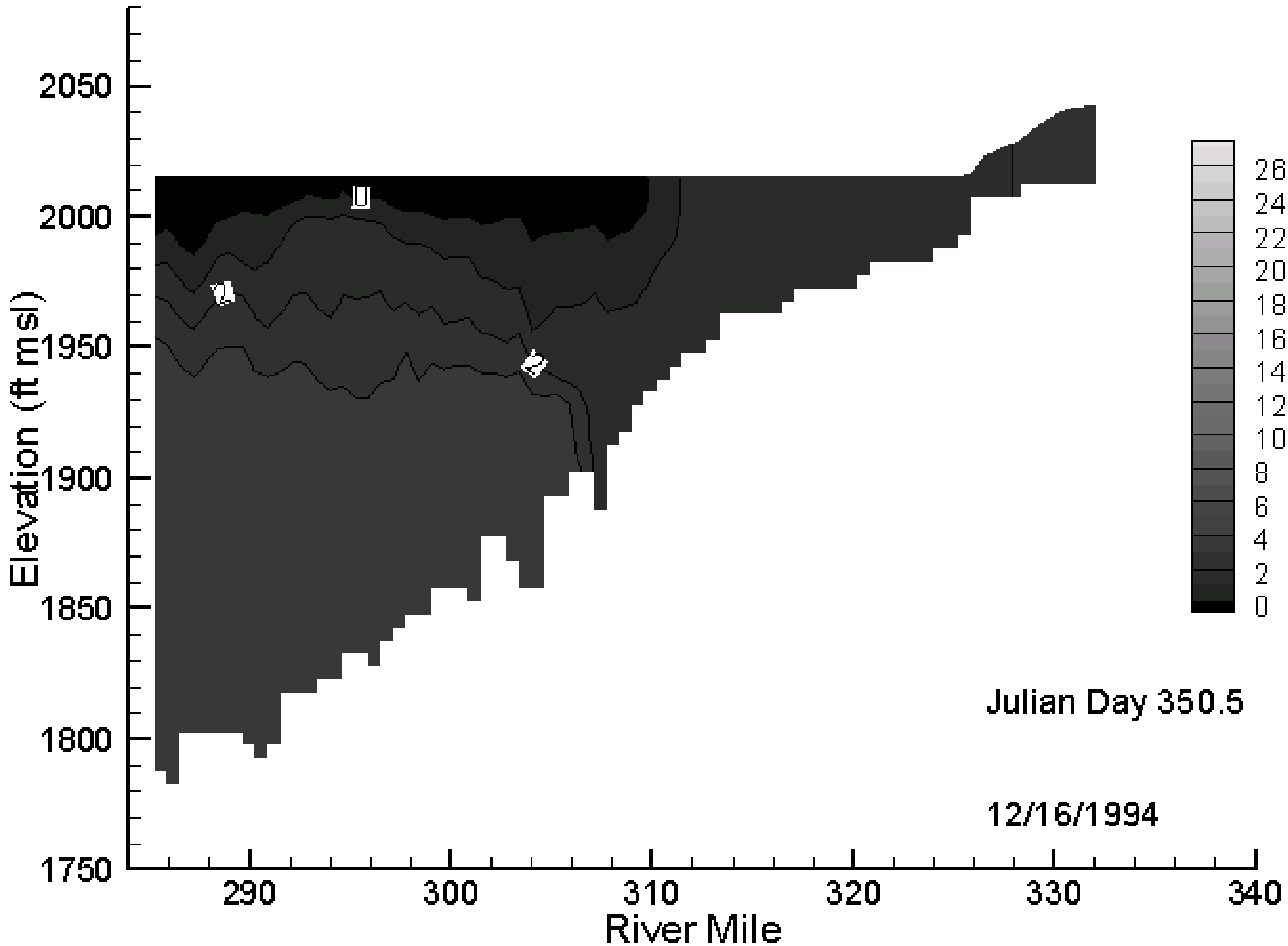

Figure 253. 1994 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

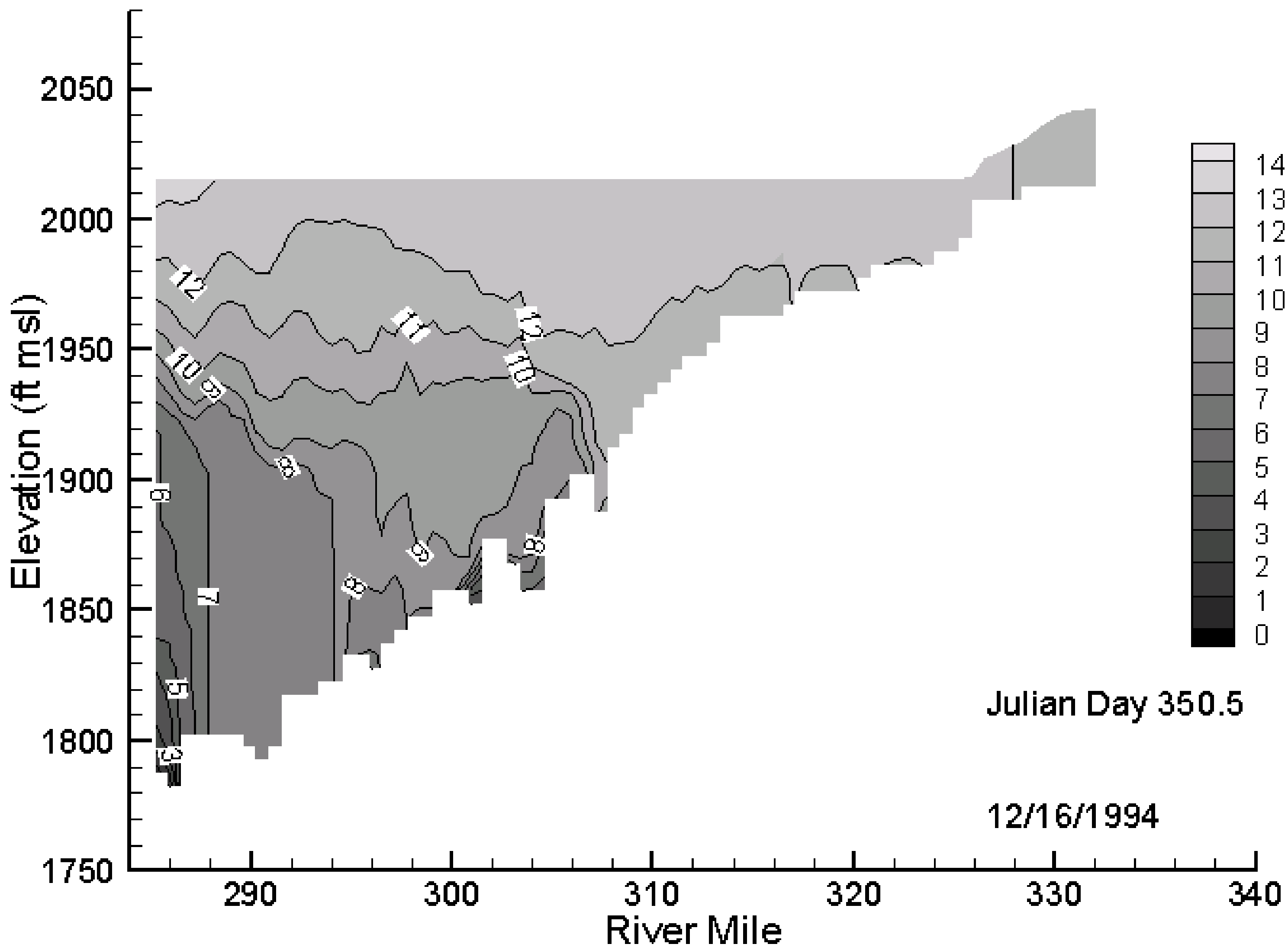

Figure 254. 1994 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

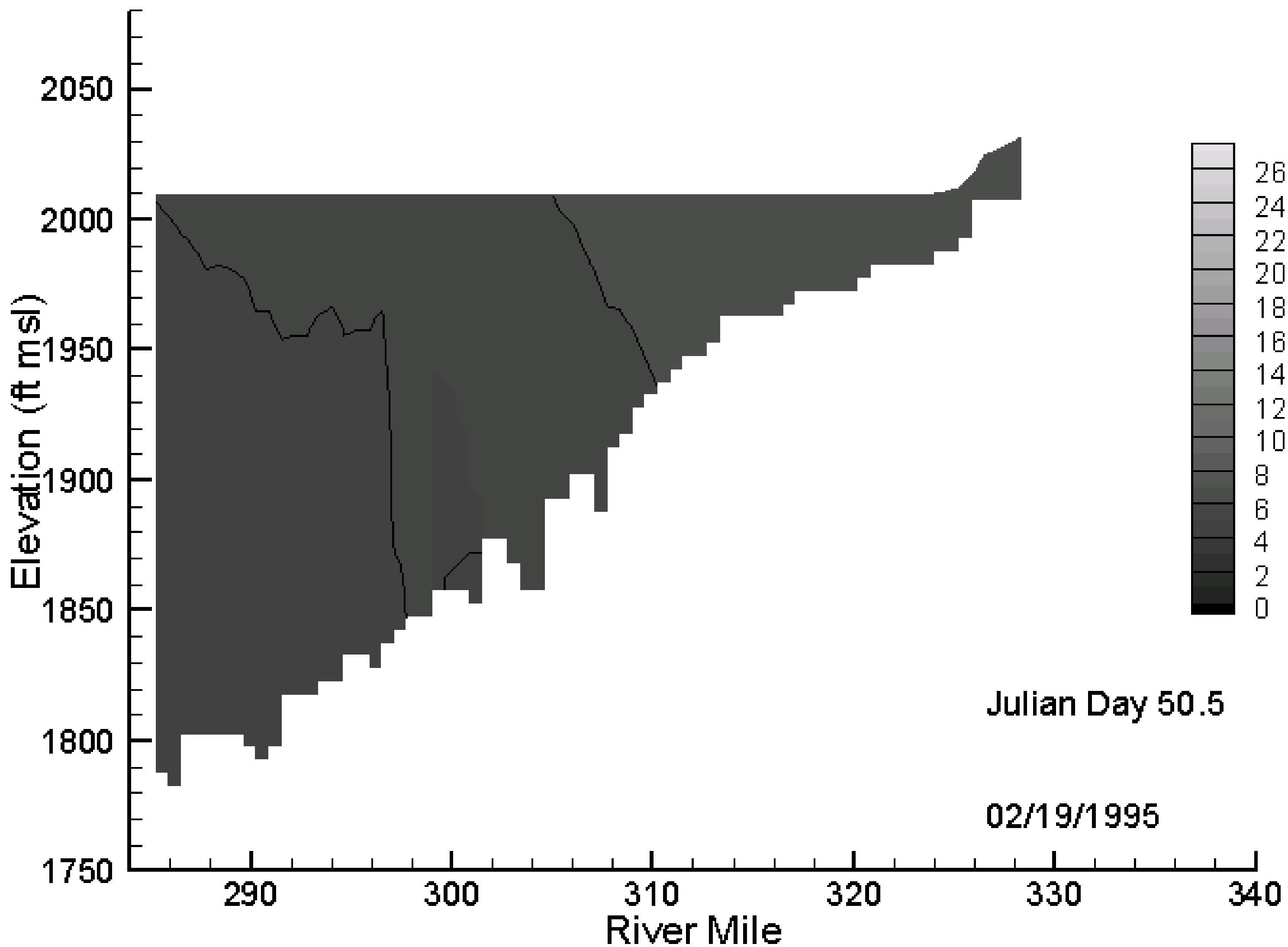

Figure 255. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

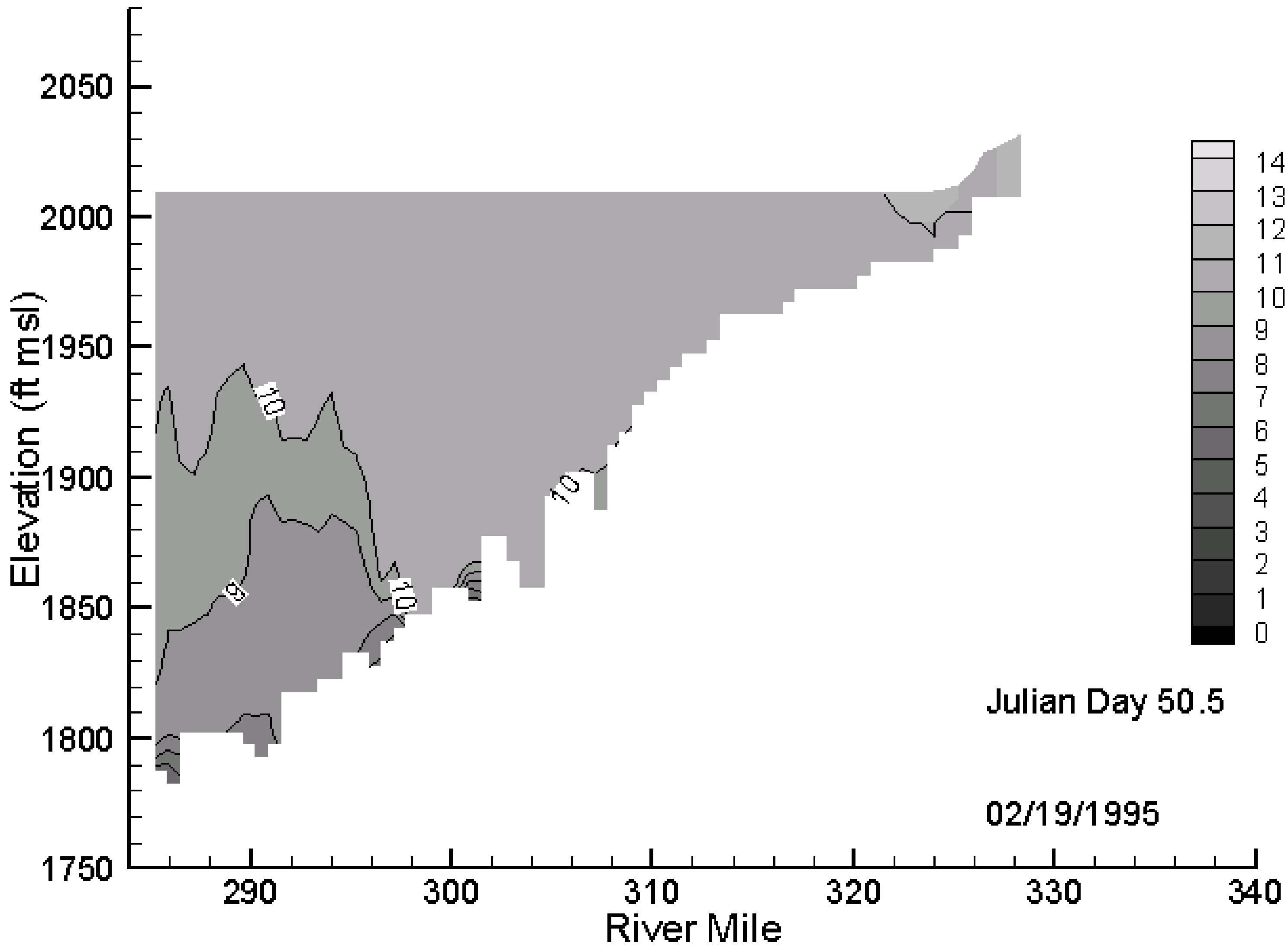

Figure 256. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

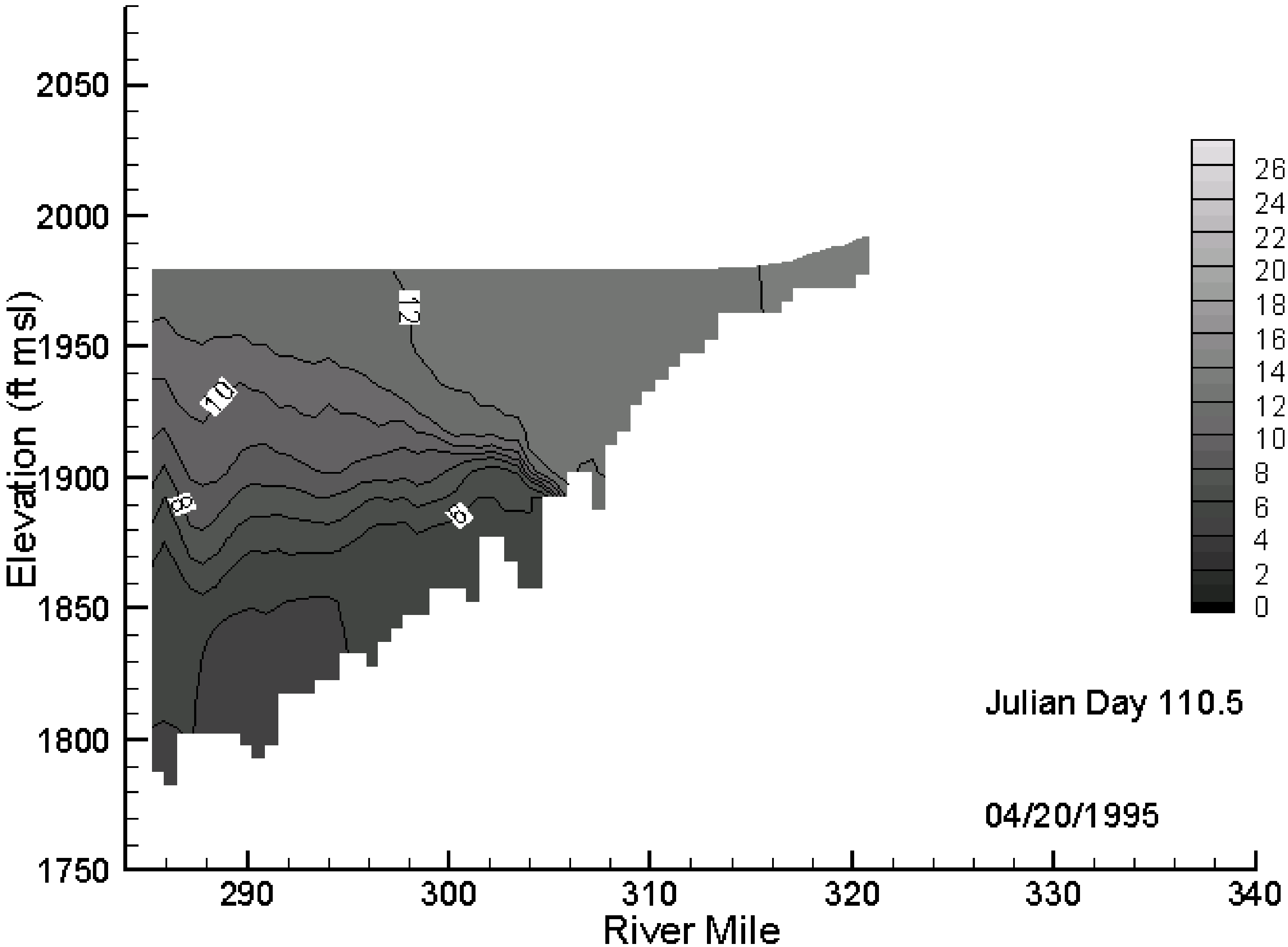

Figure 257. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

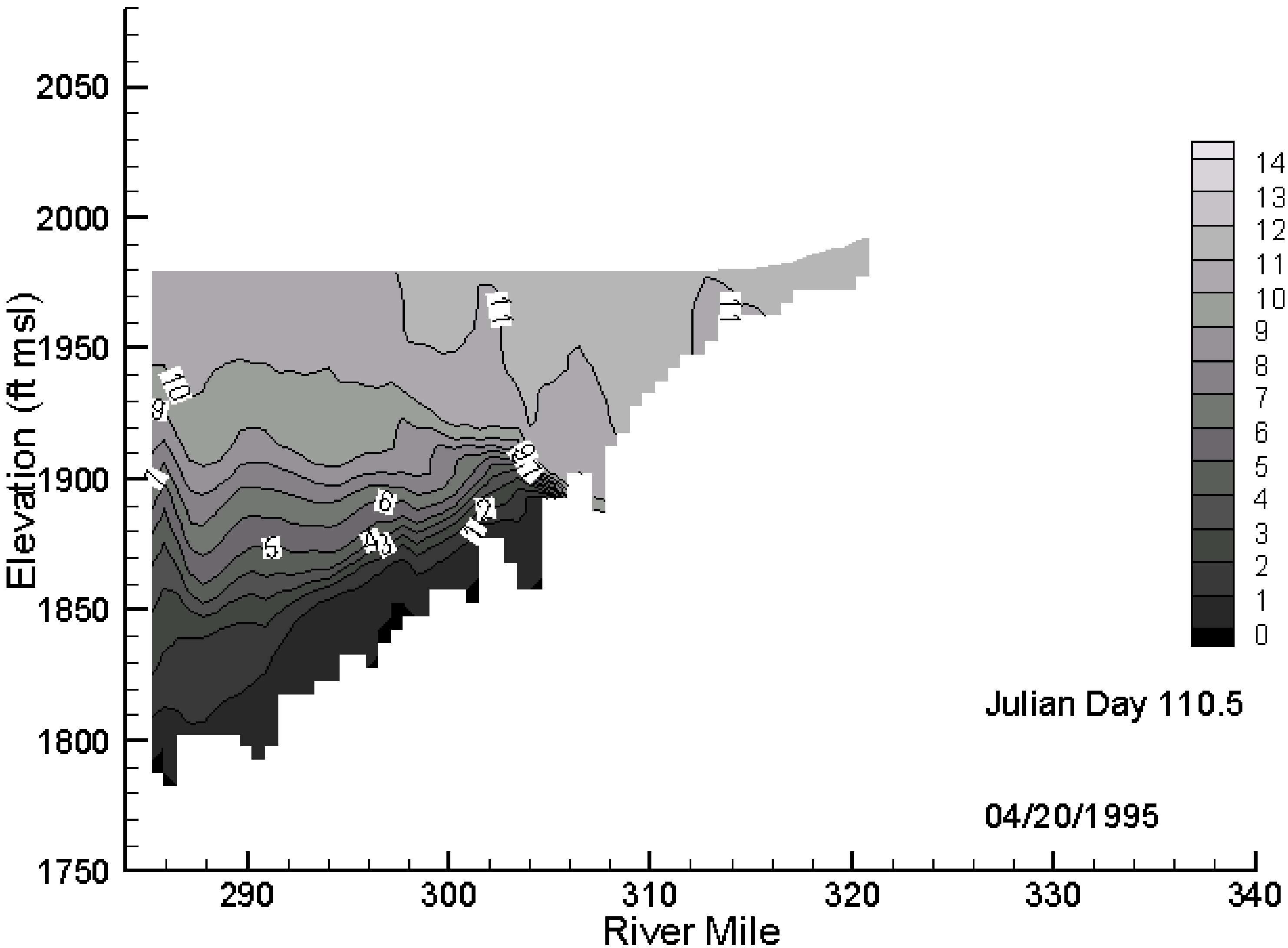

Figure 258. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

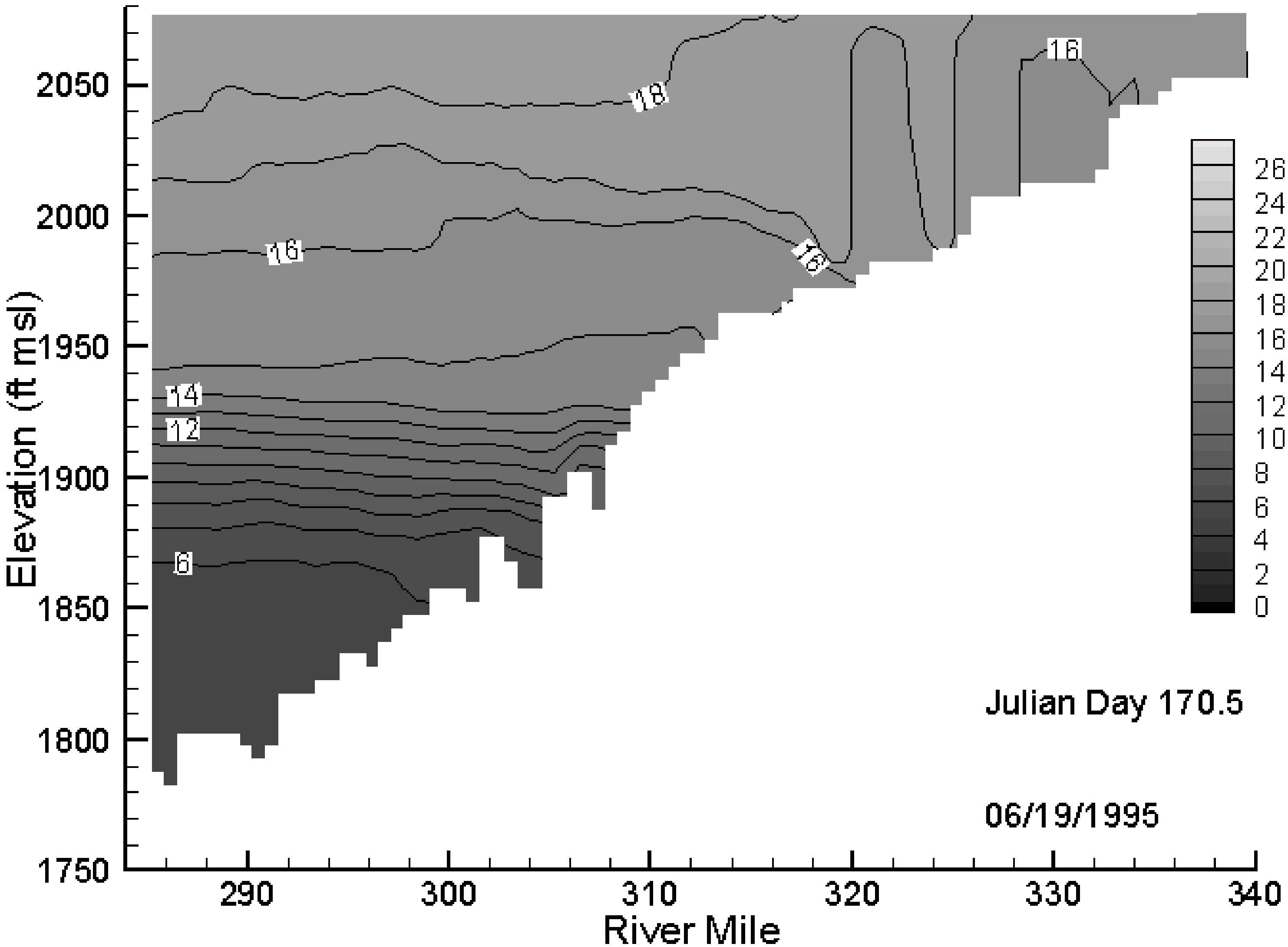

Figure 259. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

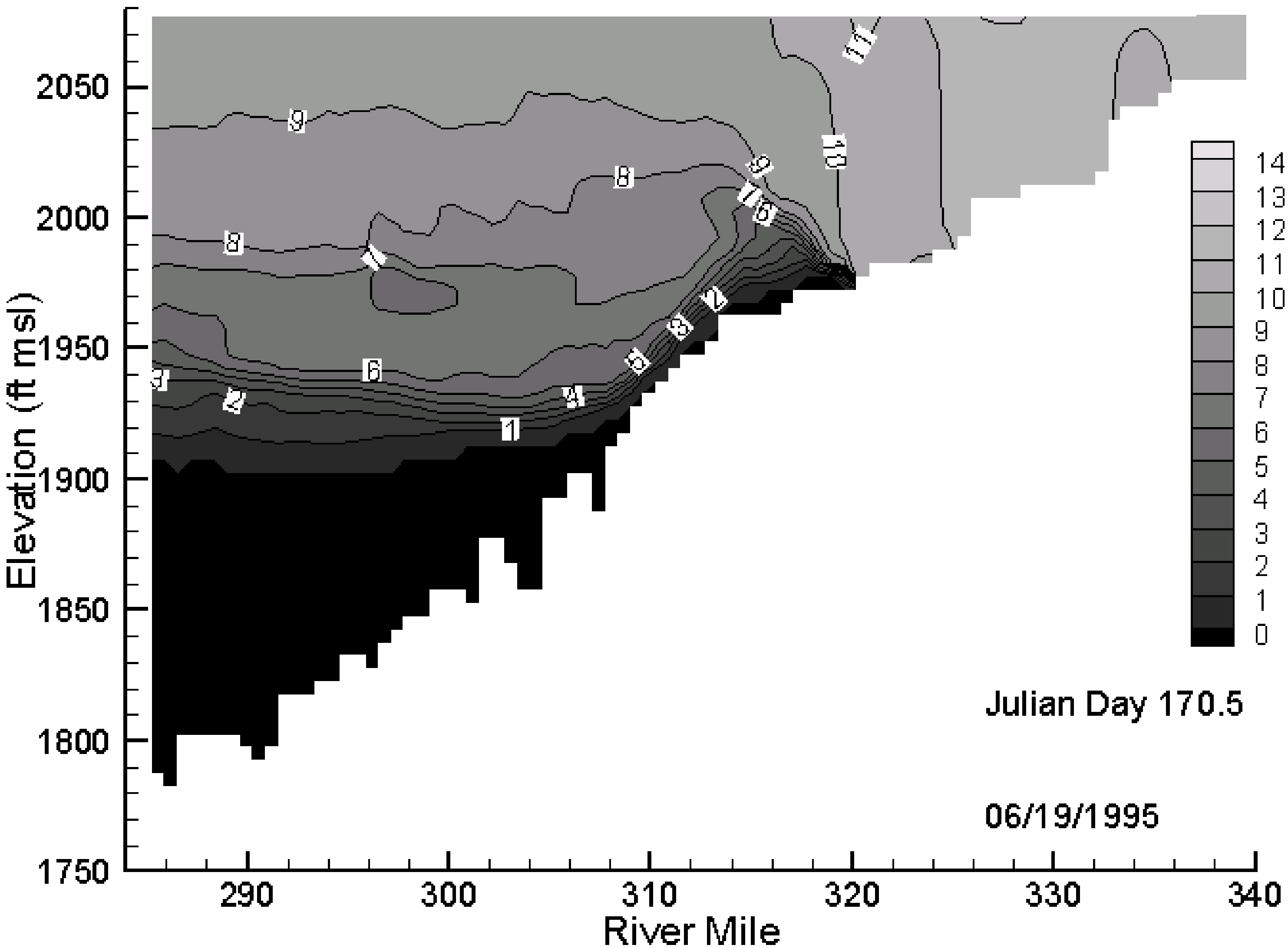

Figure 260. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

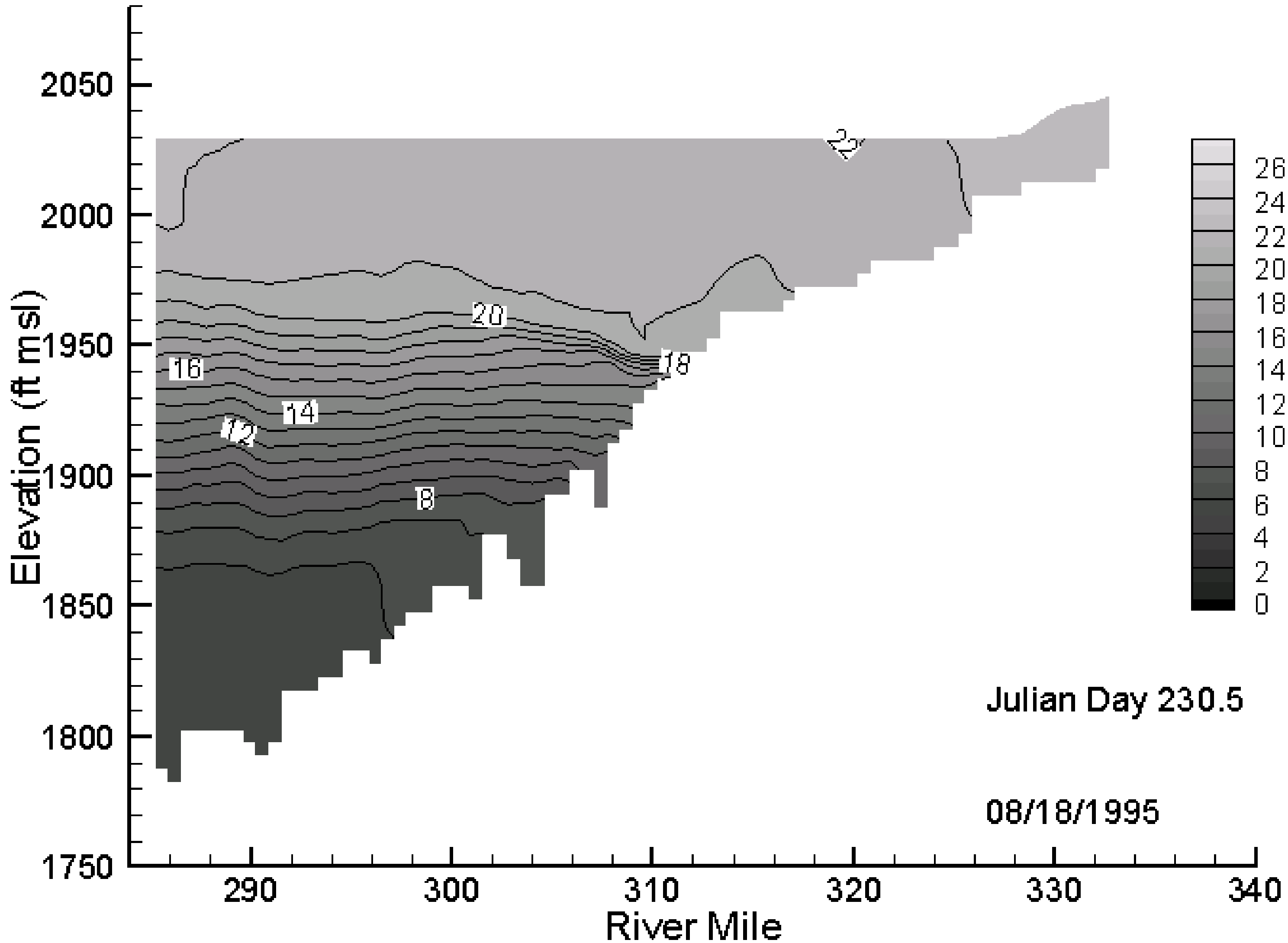

Figure 261. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

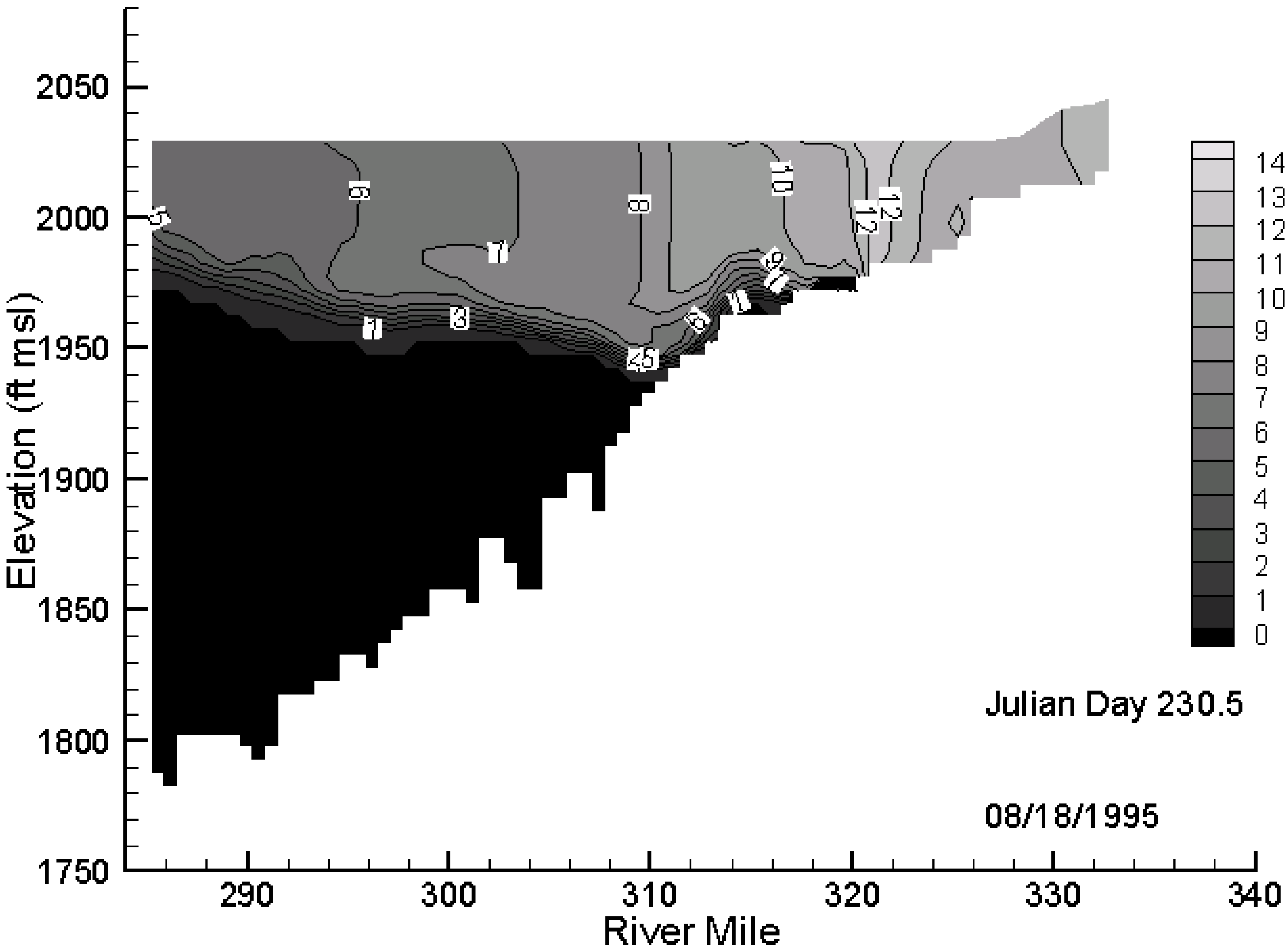

Figure 262. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

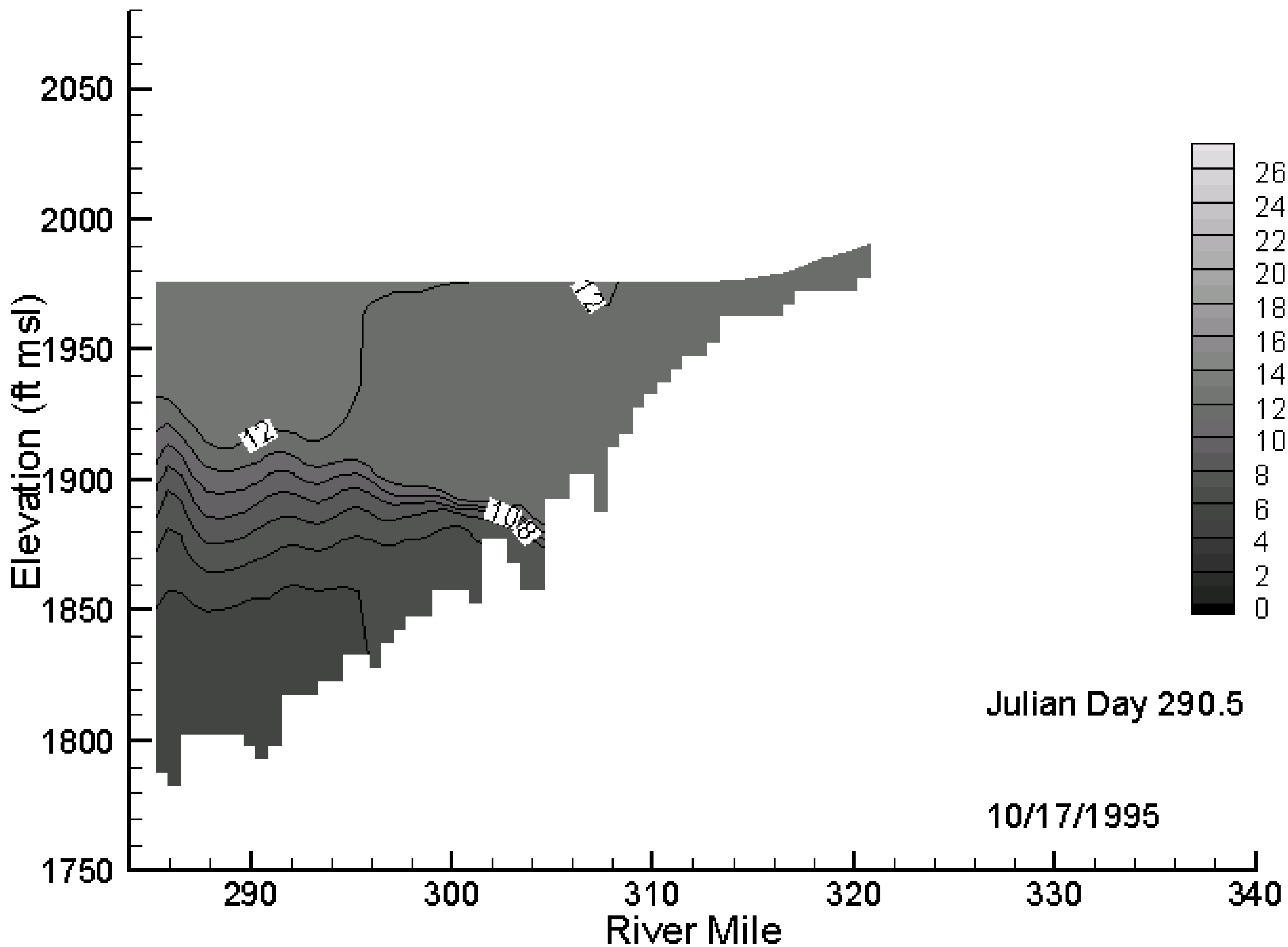

Figure 263. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

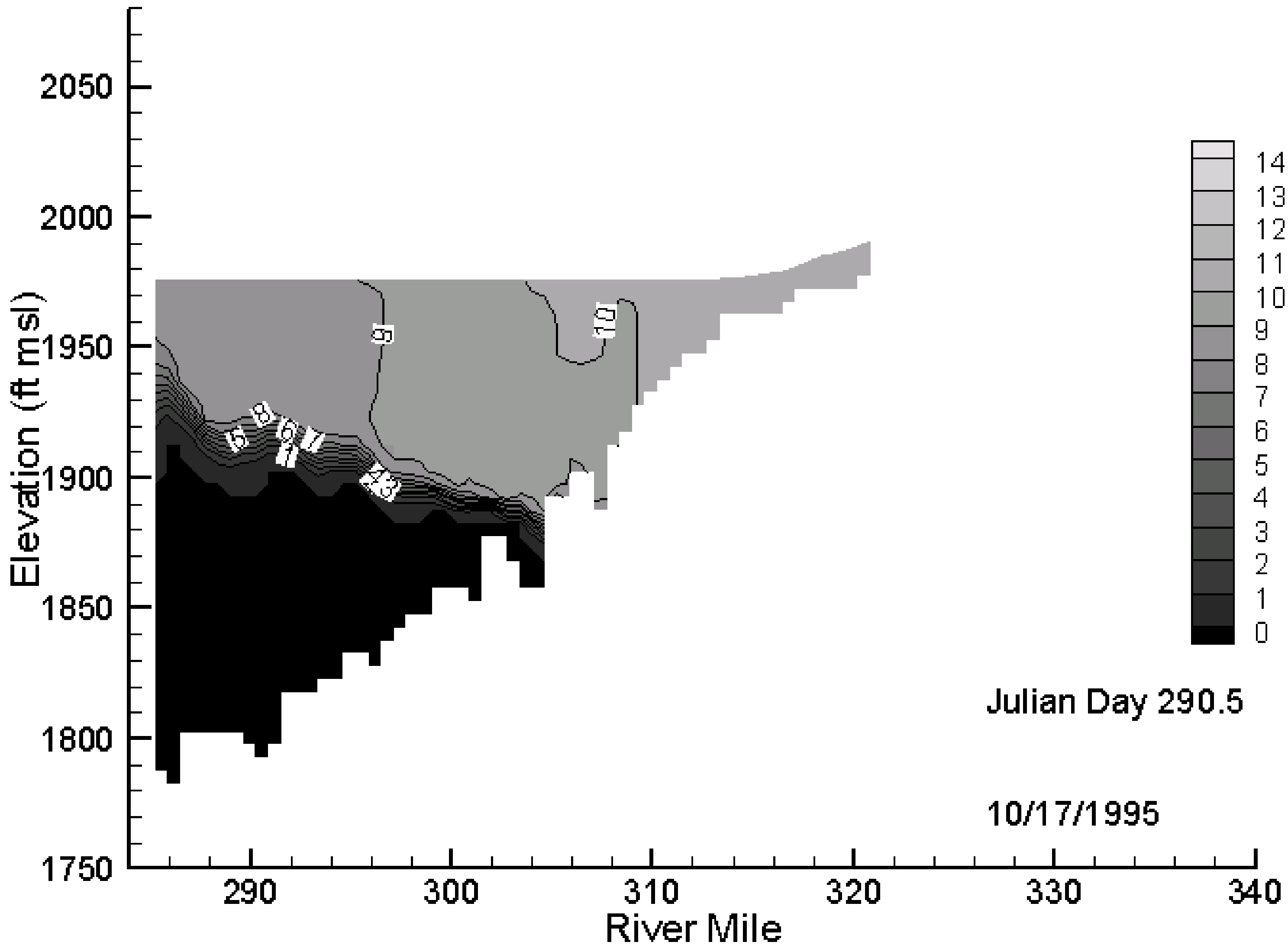

Figure 264. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

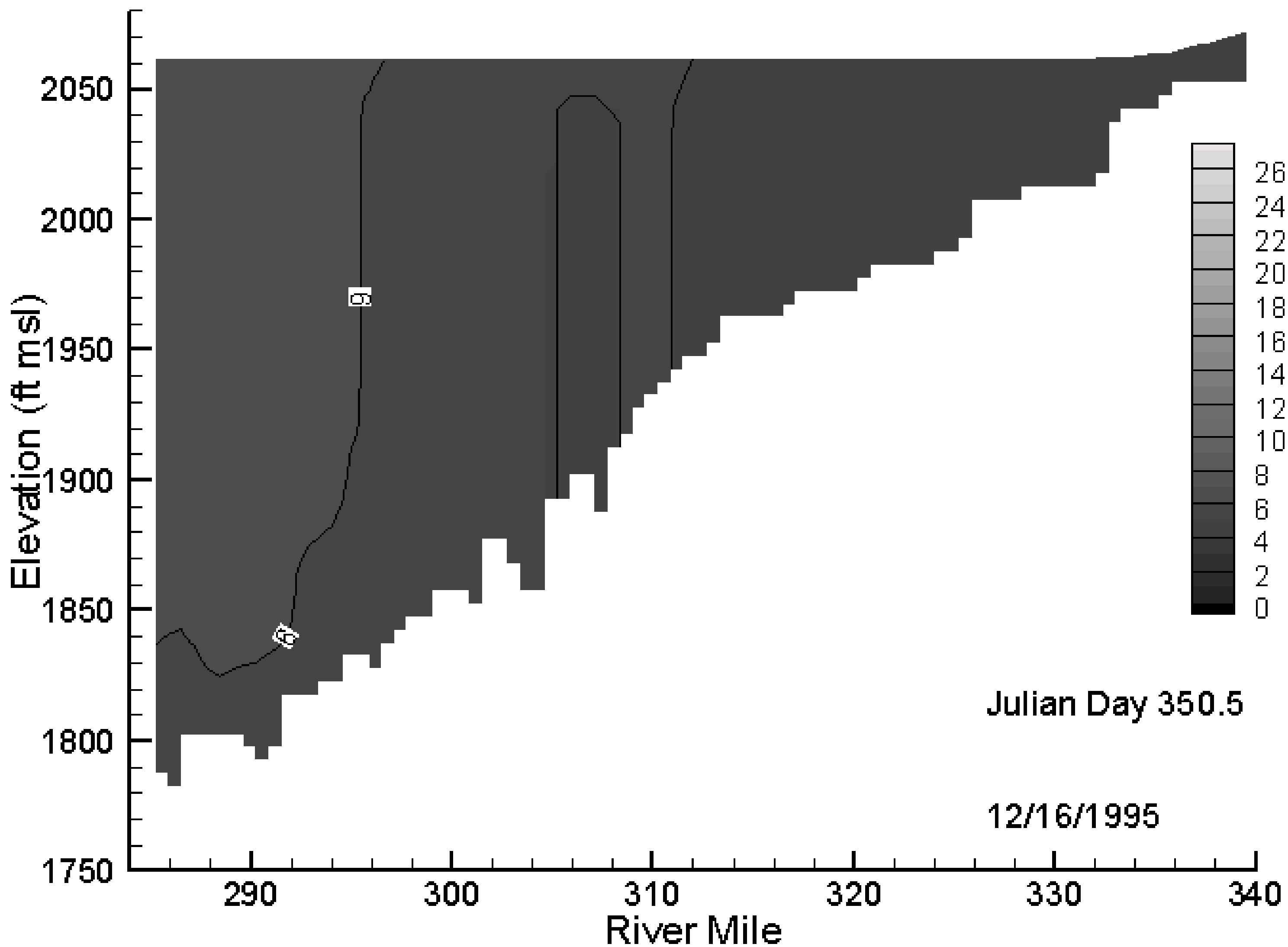

Figure 265. 1995 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

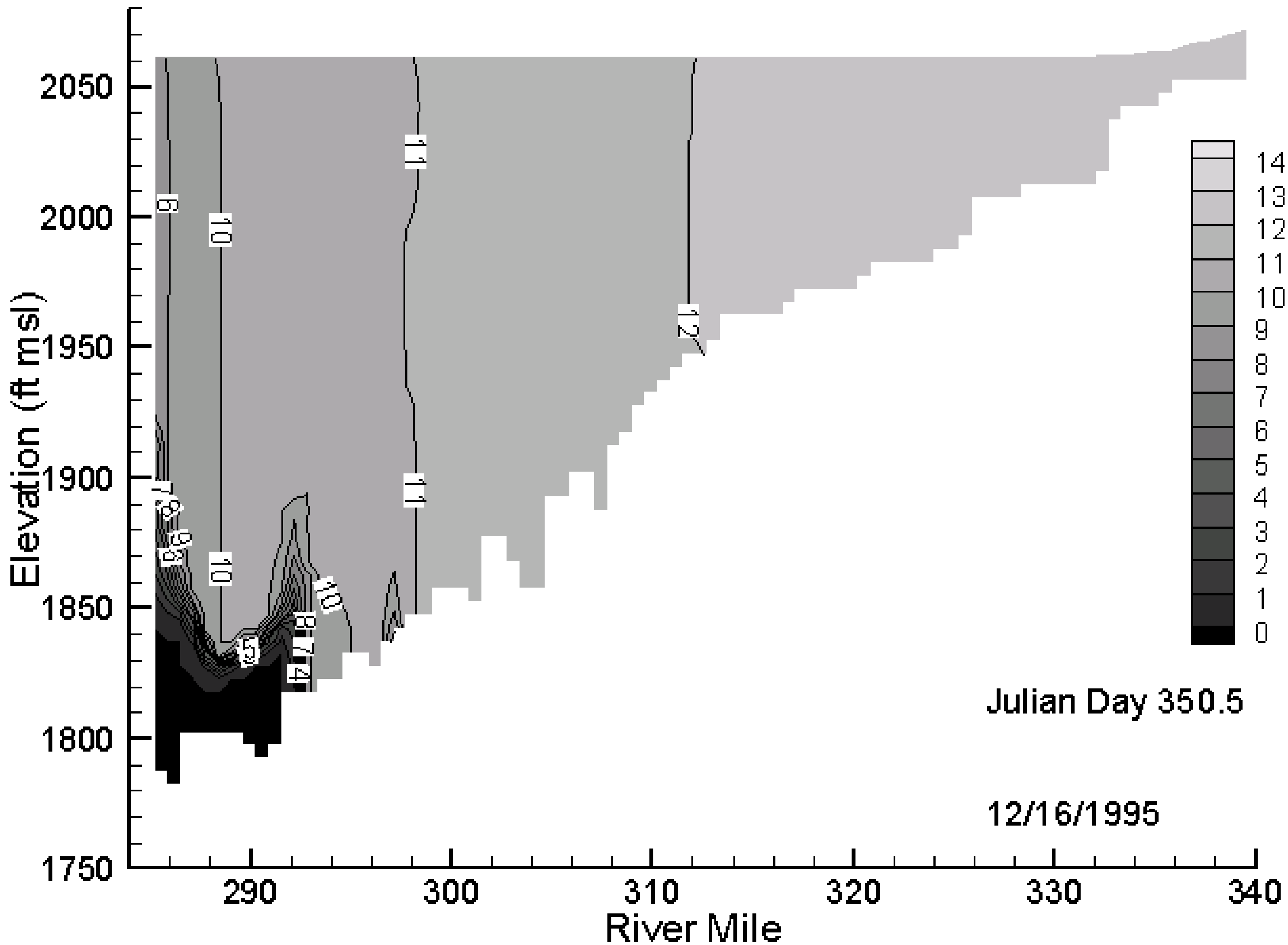

Figure 266. 1995 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

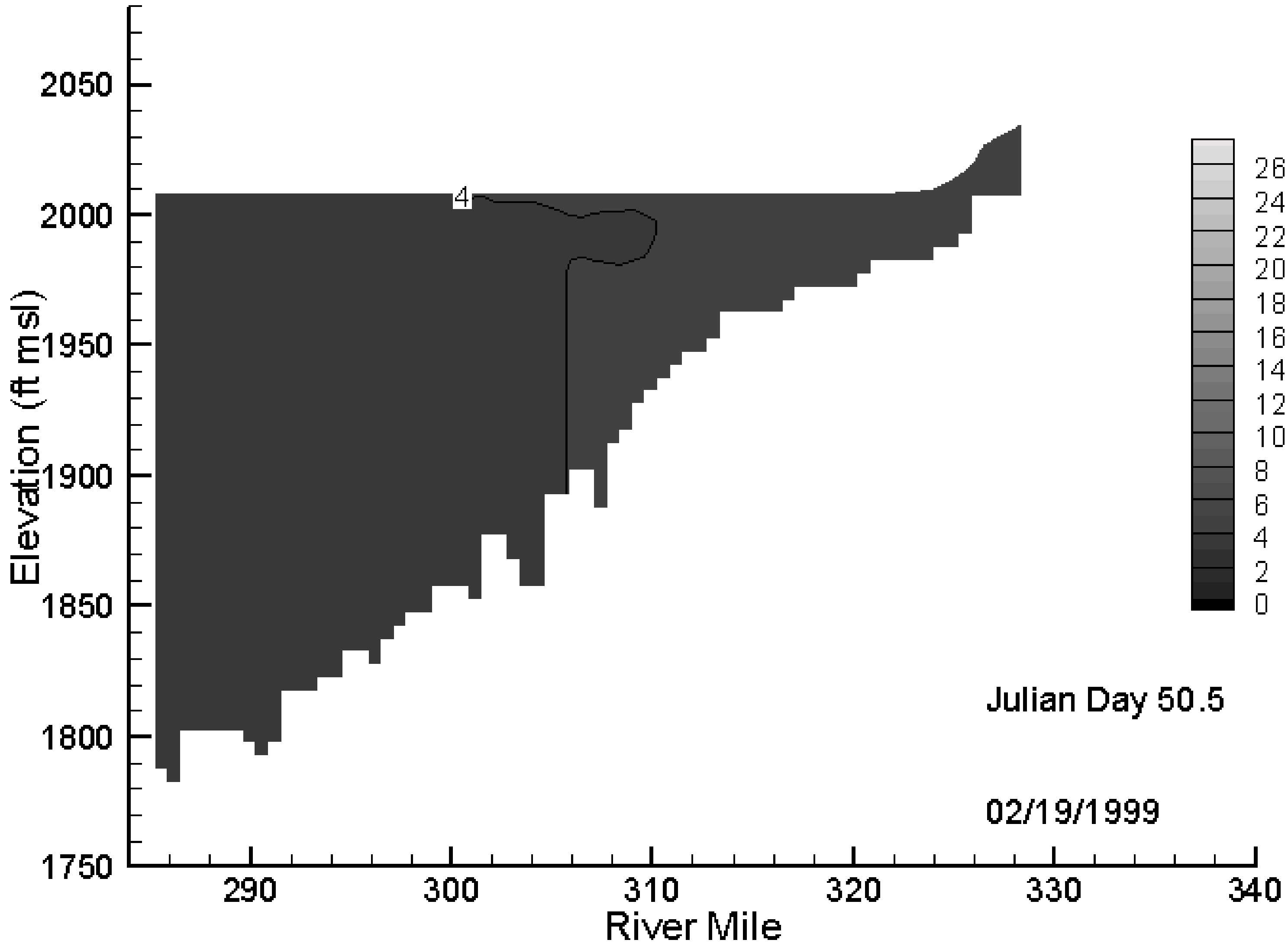

Figure 267. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

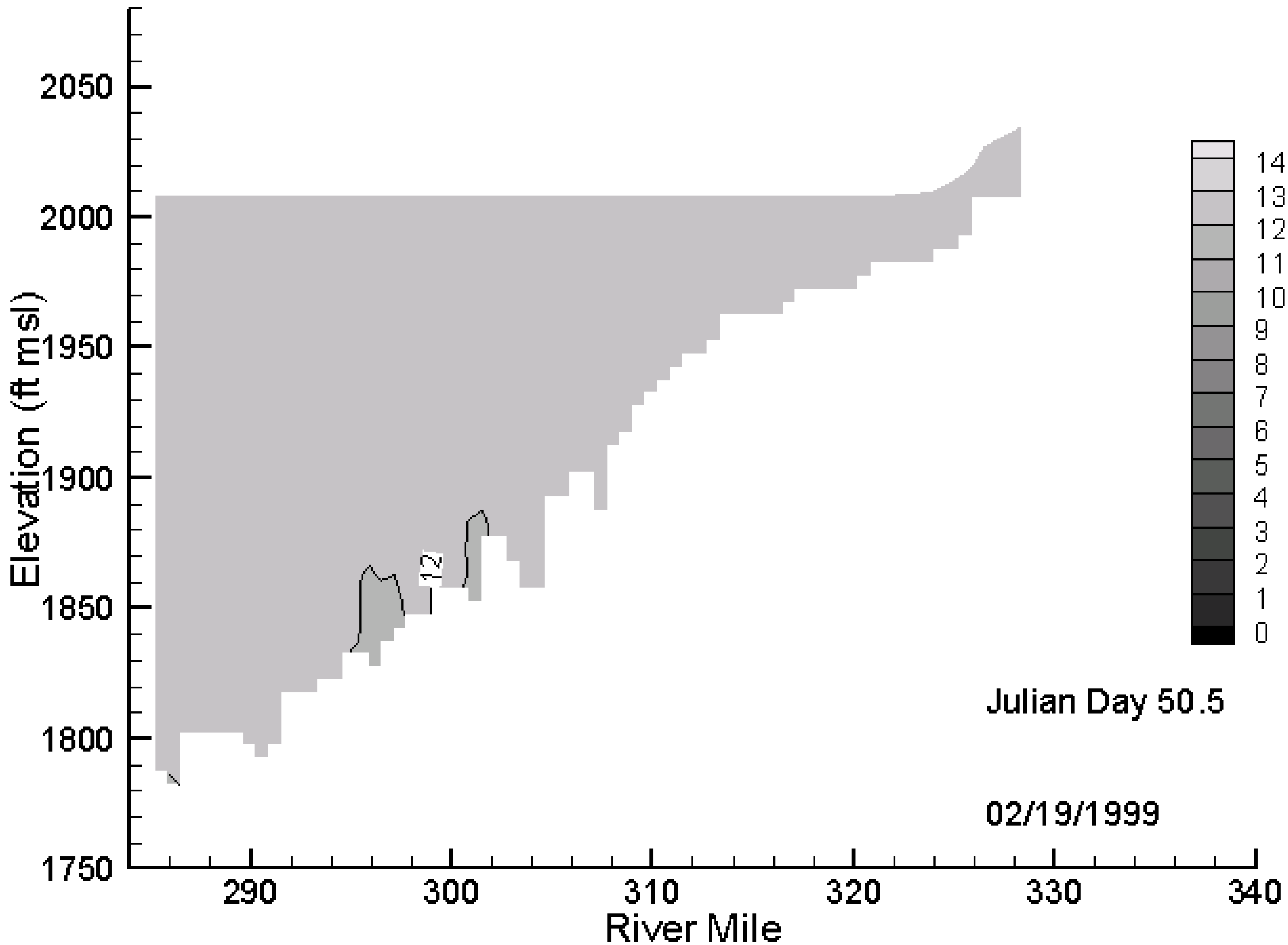

Figure 268. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

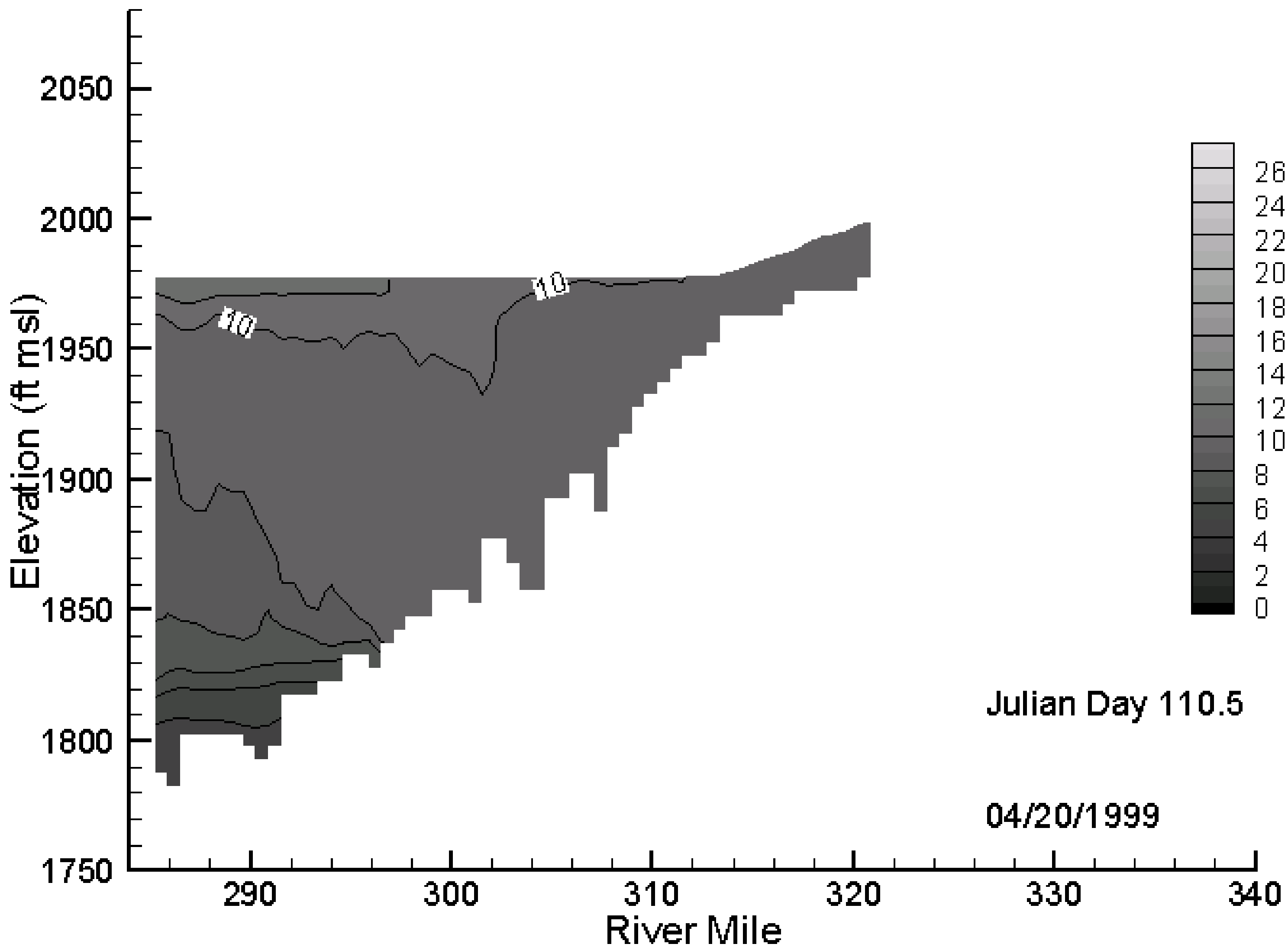

Figure 269. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

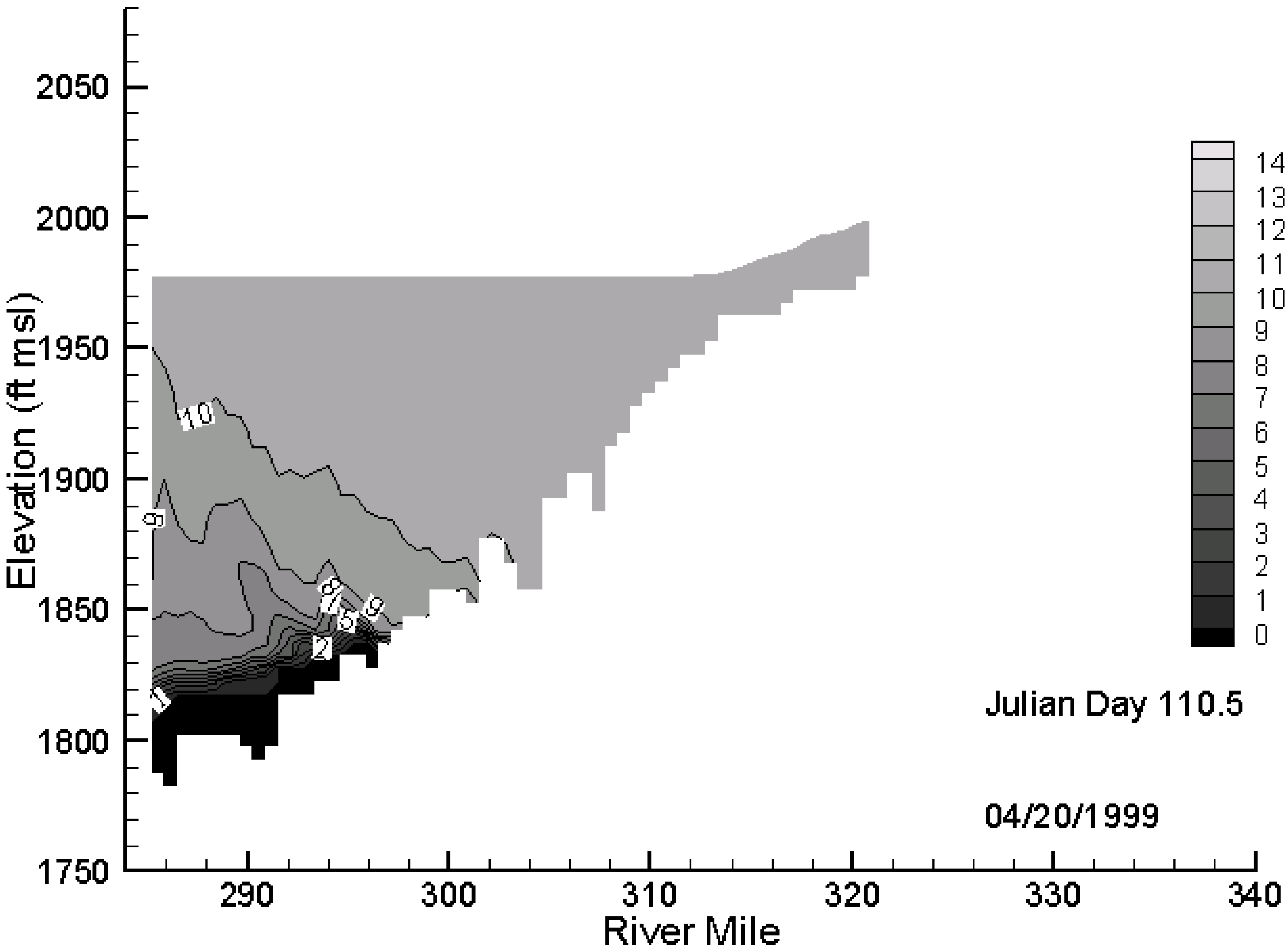

Figure 270. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

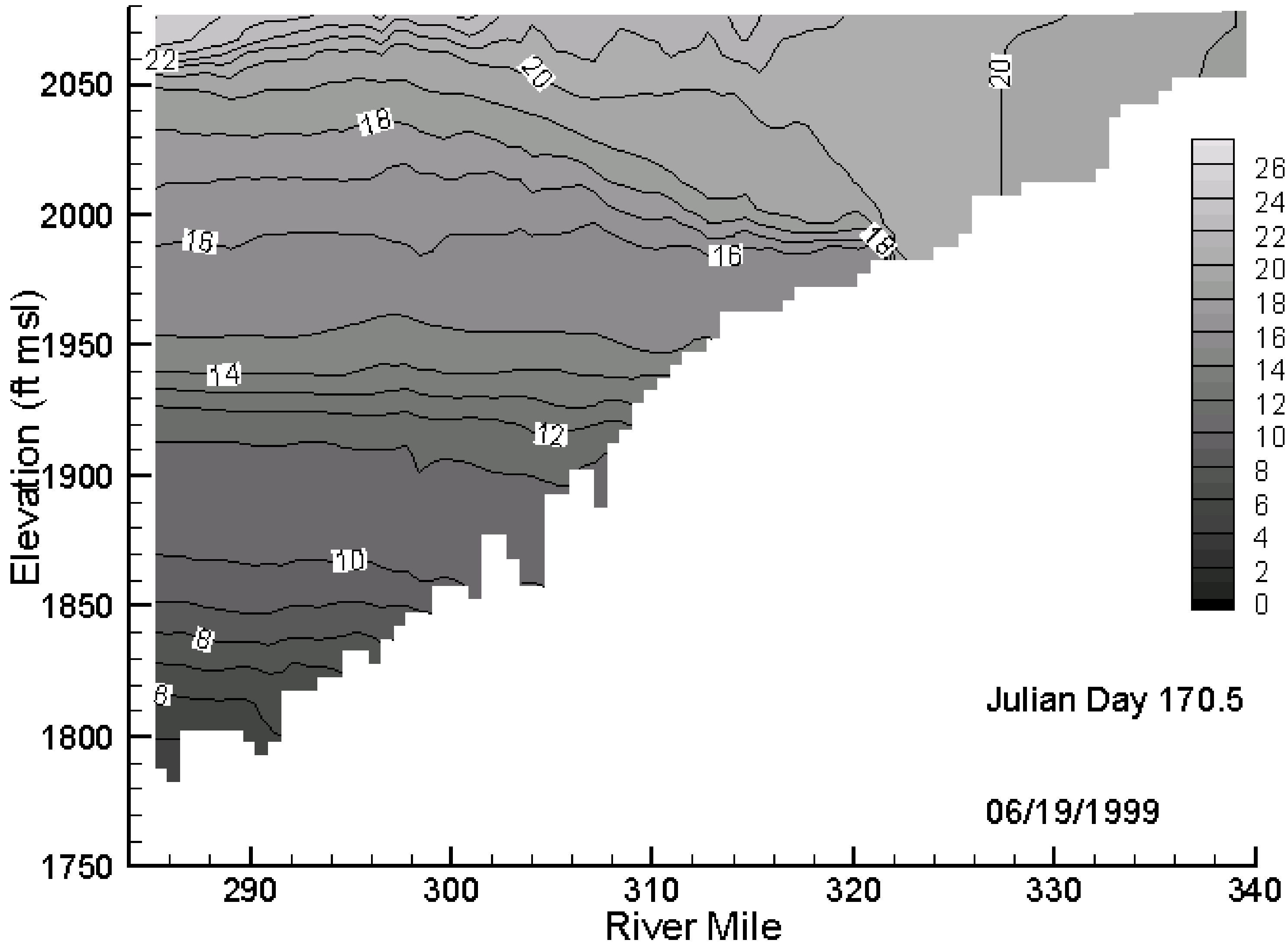

Figure 271. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

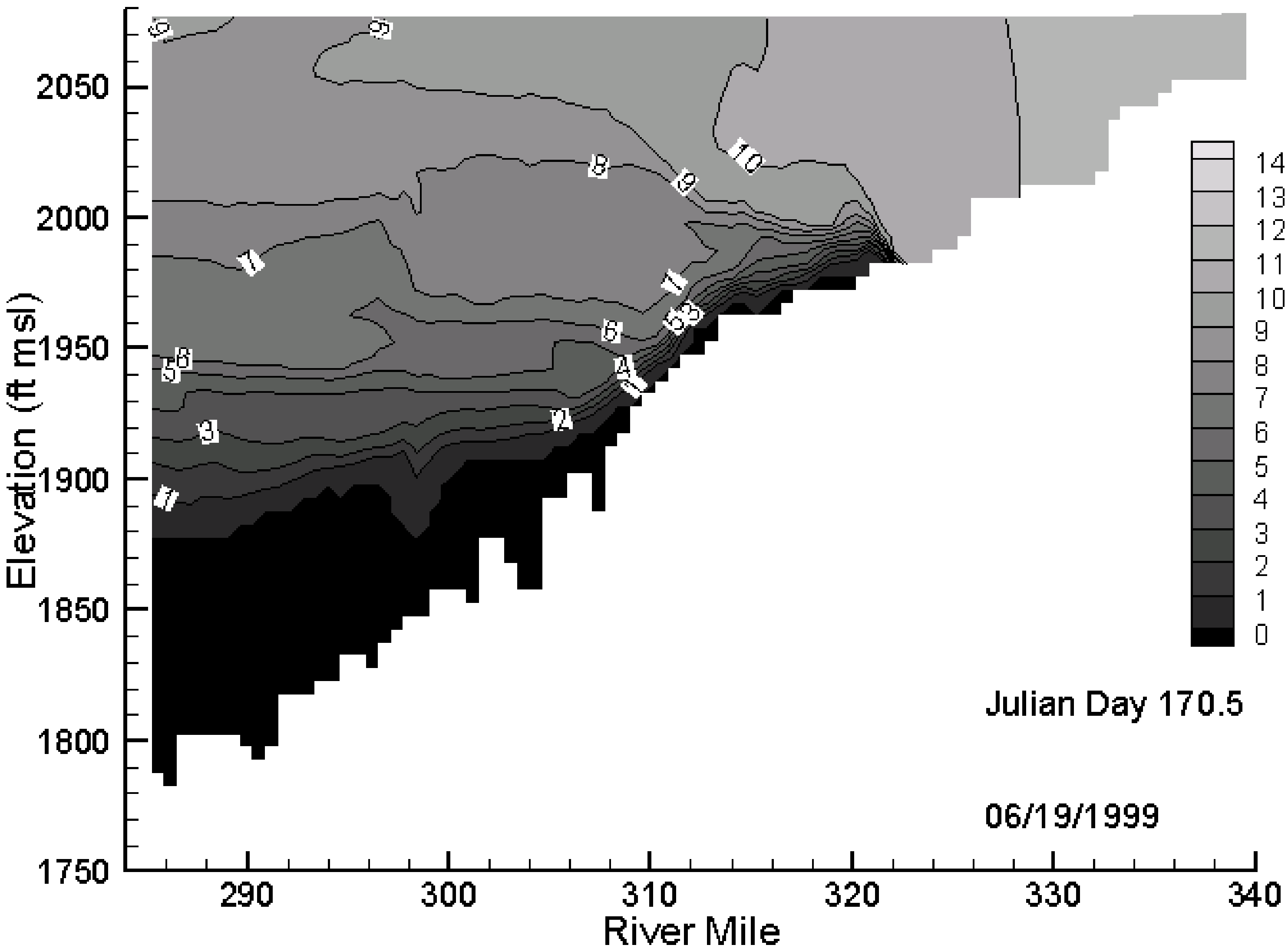

Figure 272. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

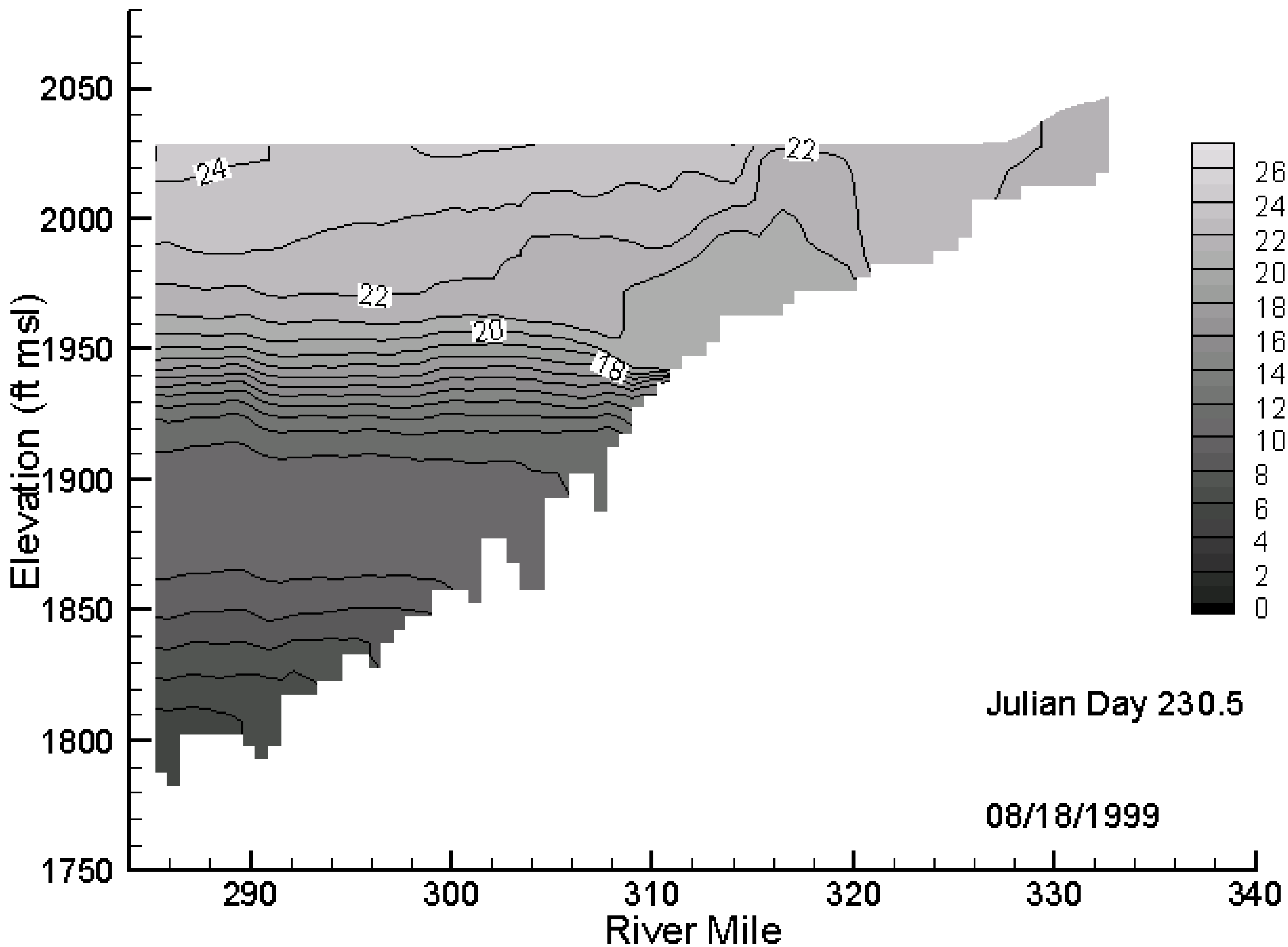

Figure 273. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

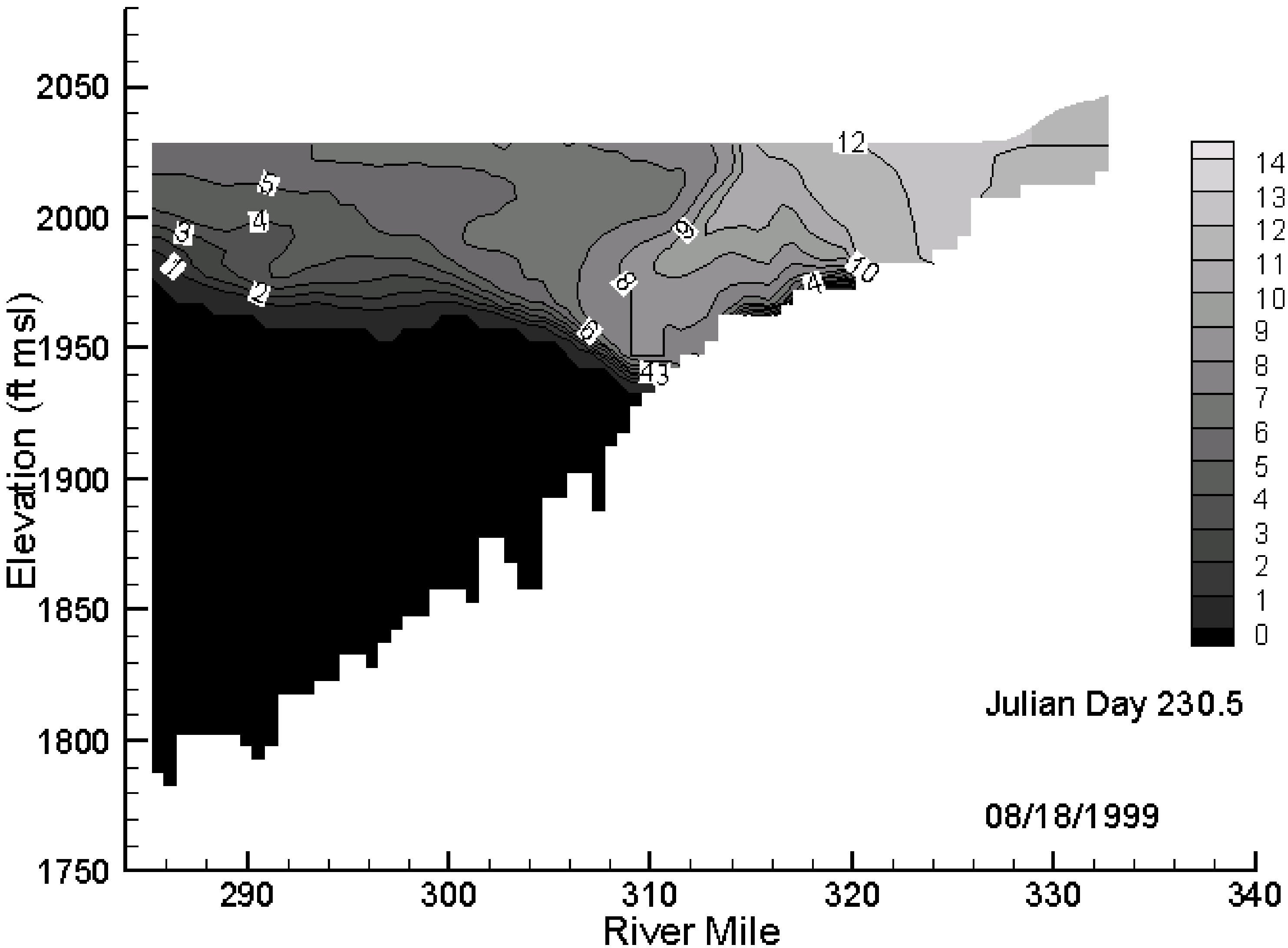

Figure 274. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

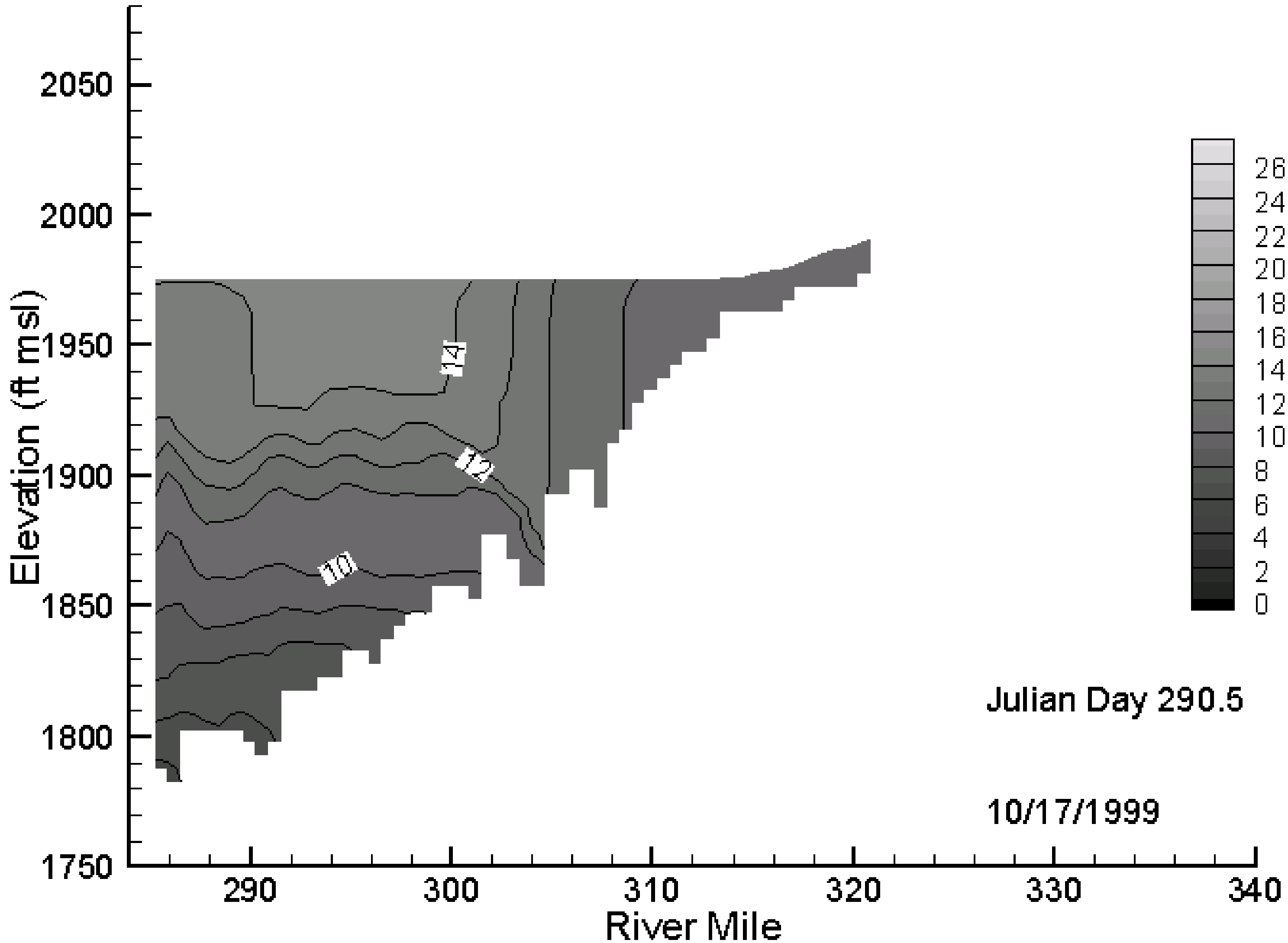

Figure 275. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

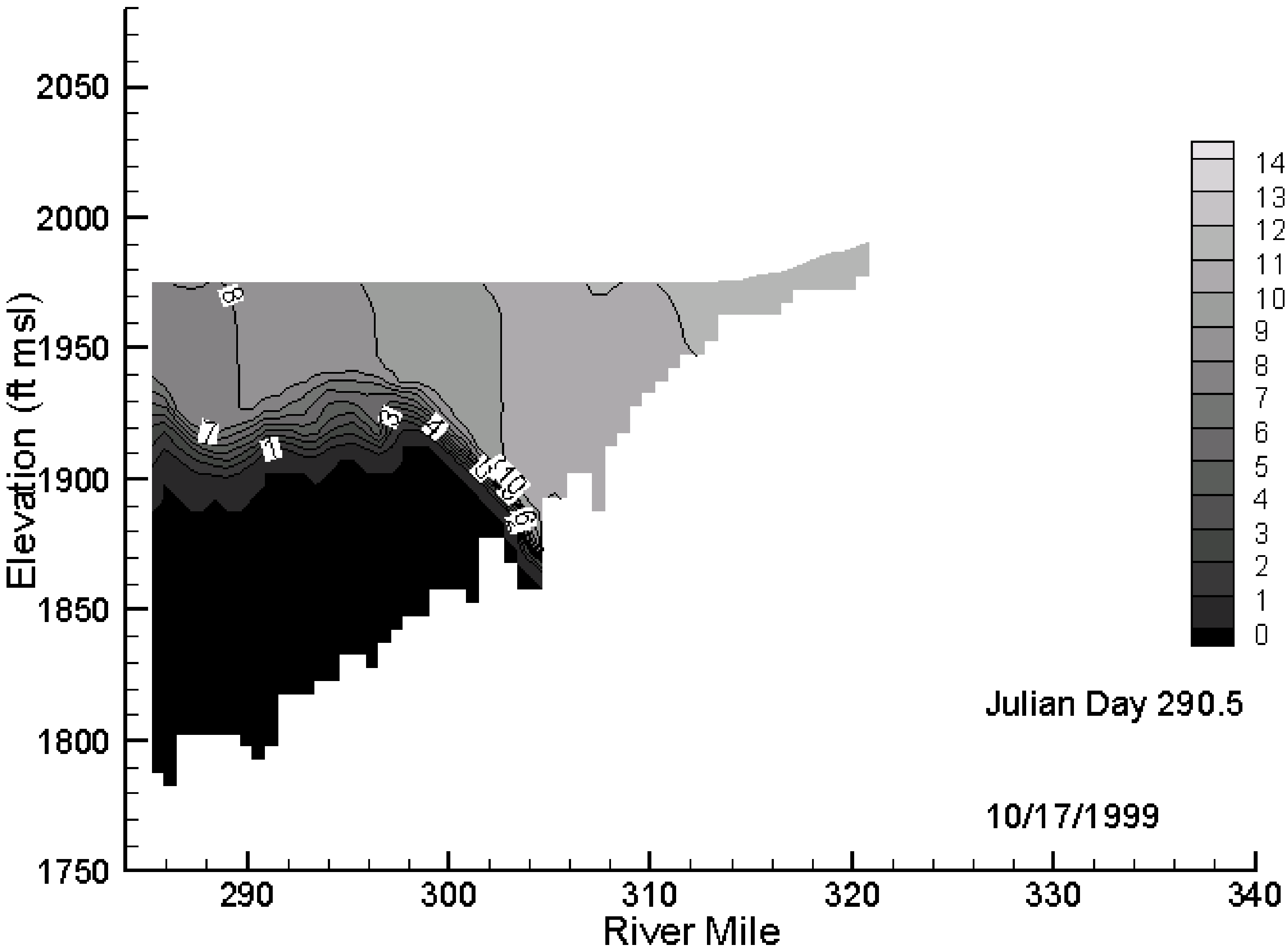

Figure 276. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

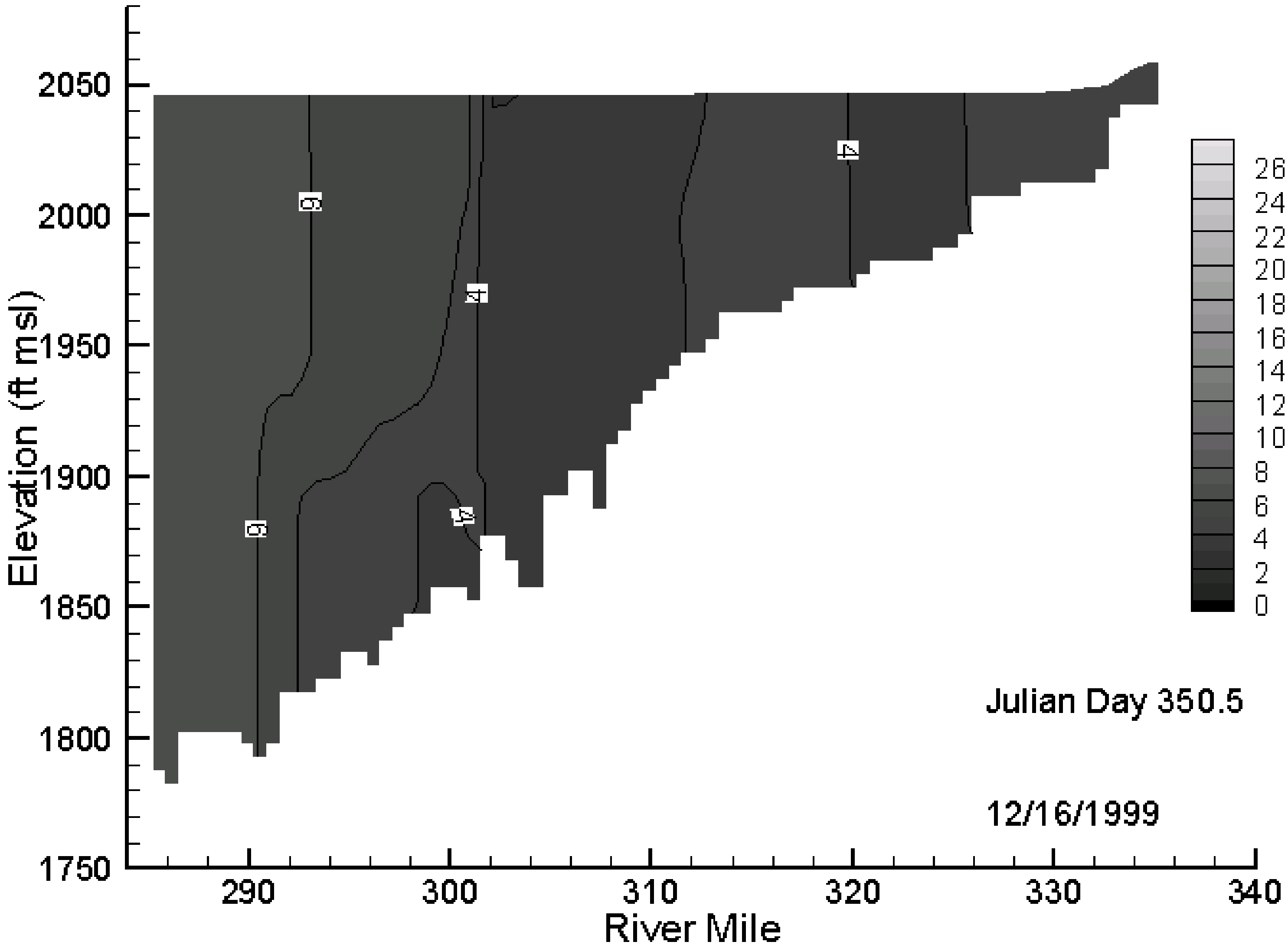

Figure 277. 1999 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

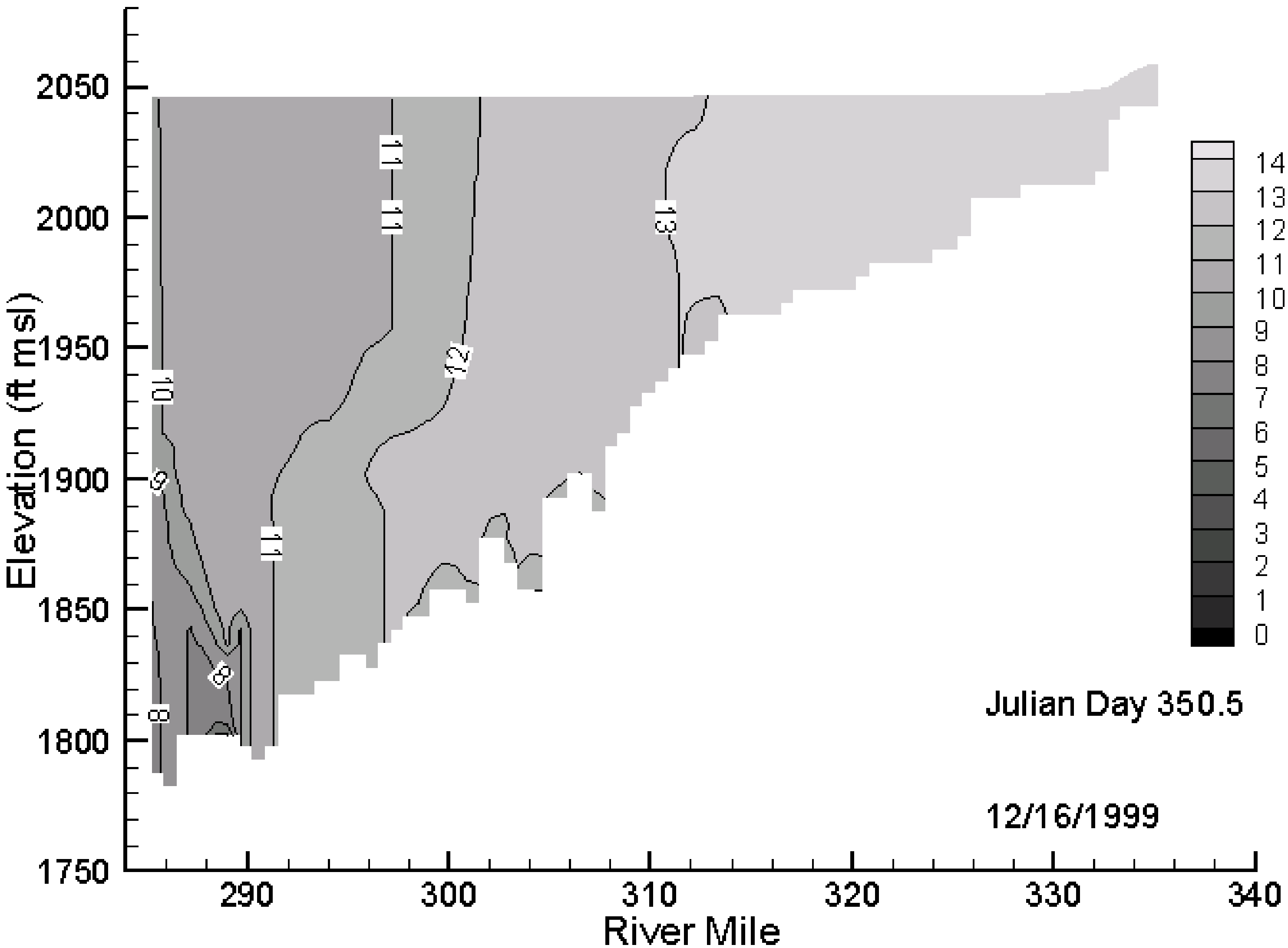

Figure 278. 1999 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

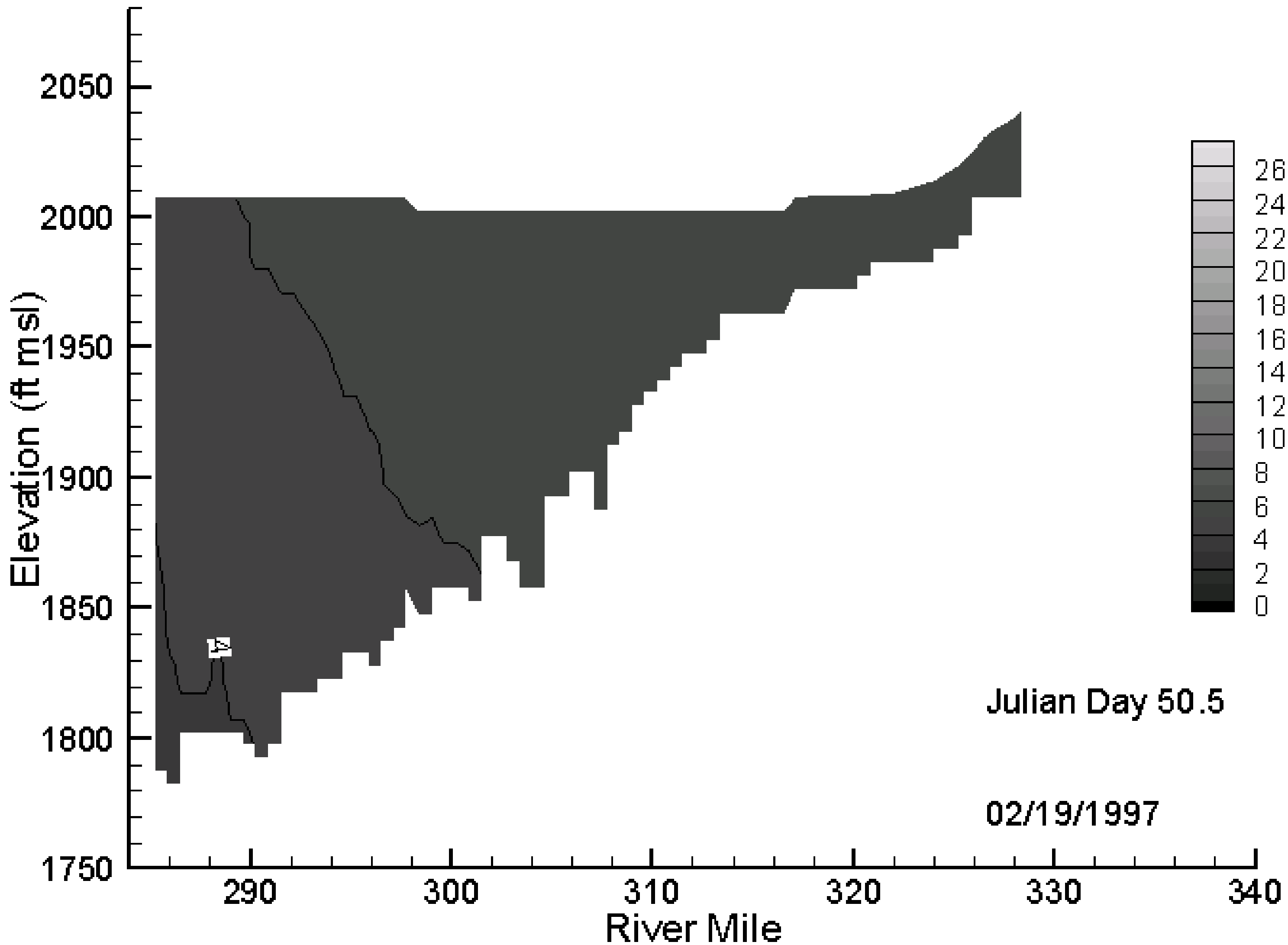

Figure 279. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

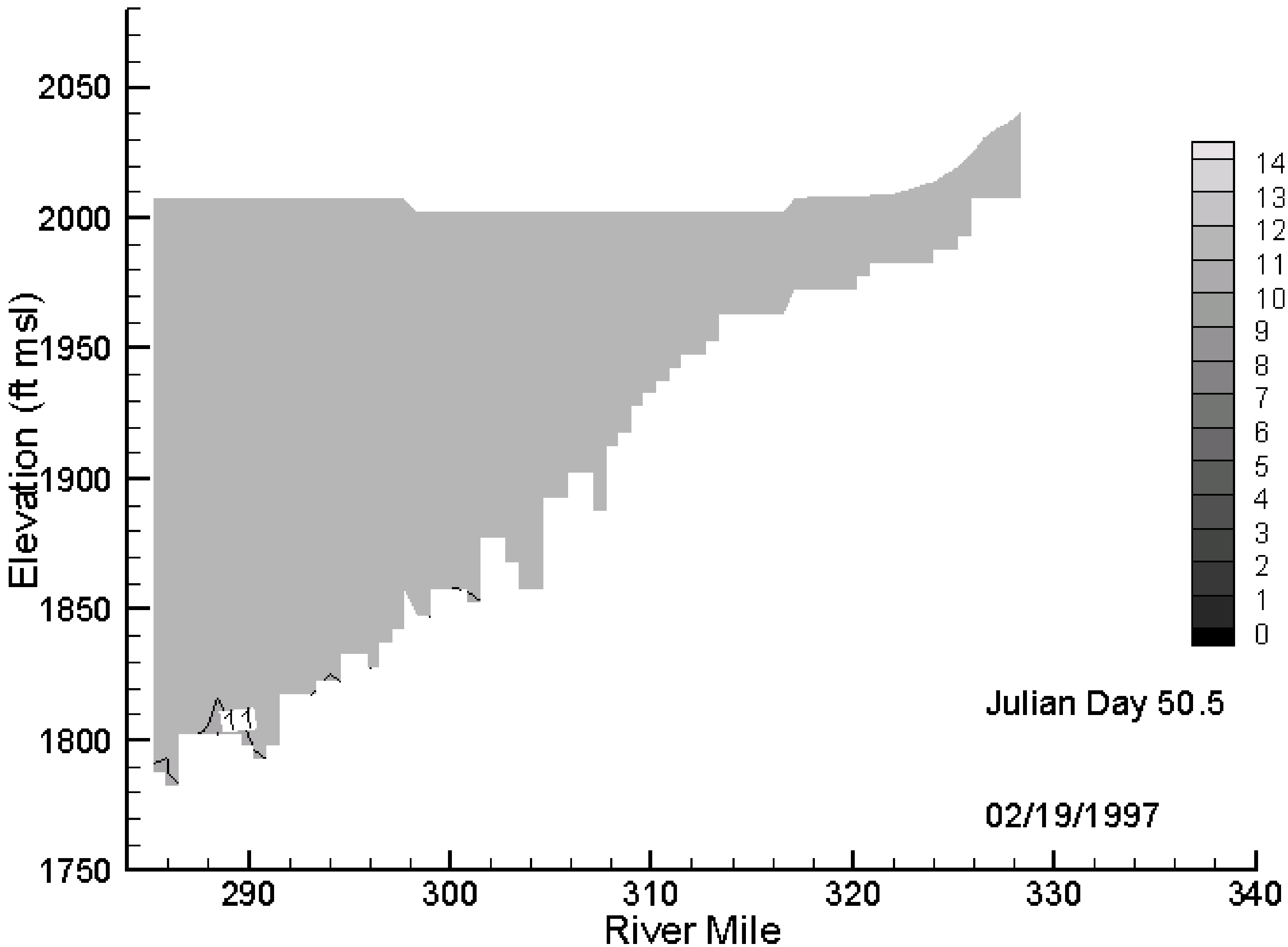

Figure 280. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

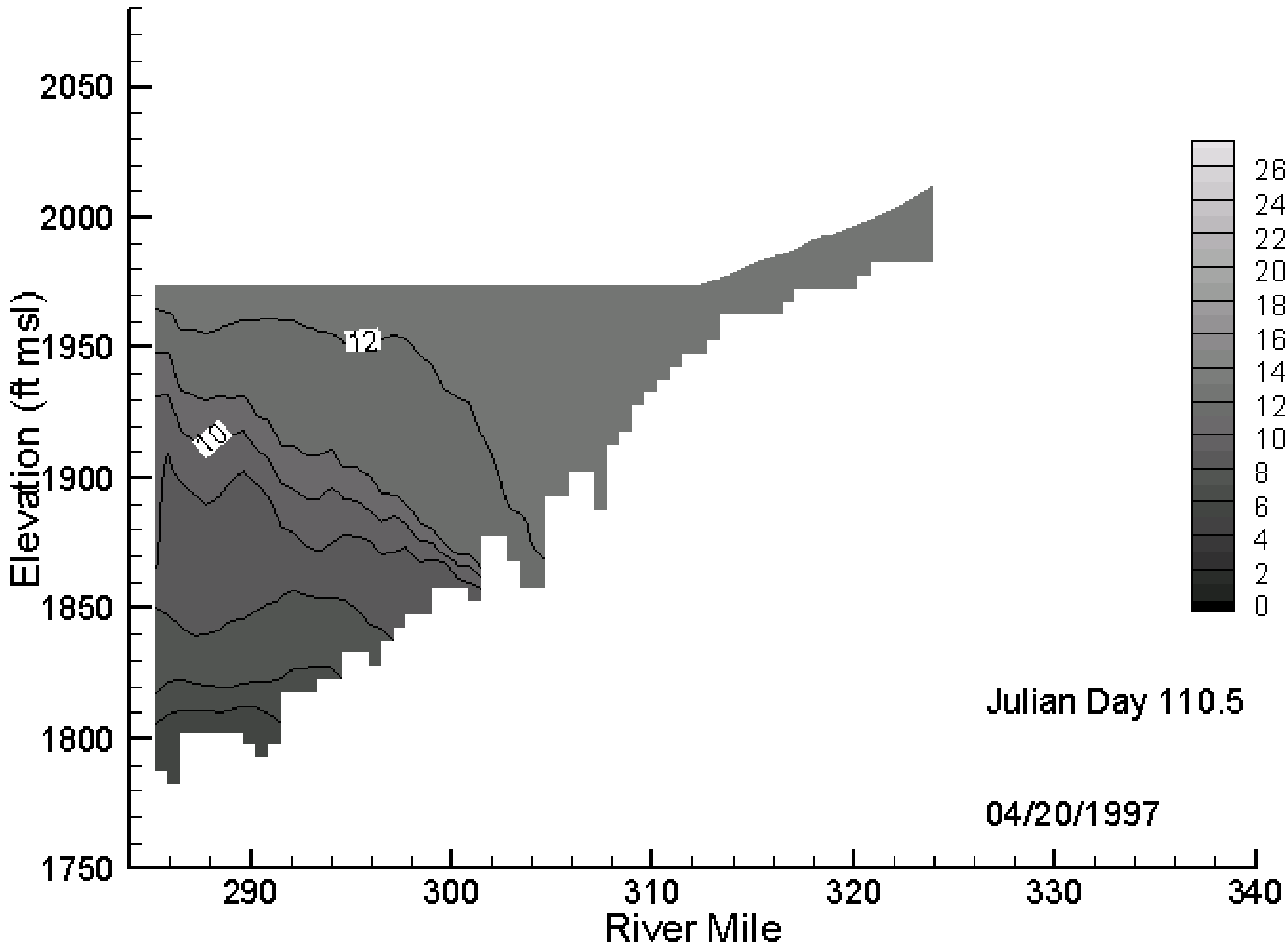

Figure 281. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

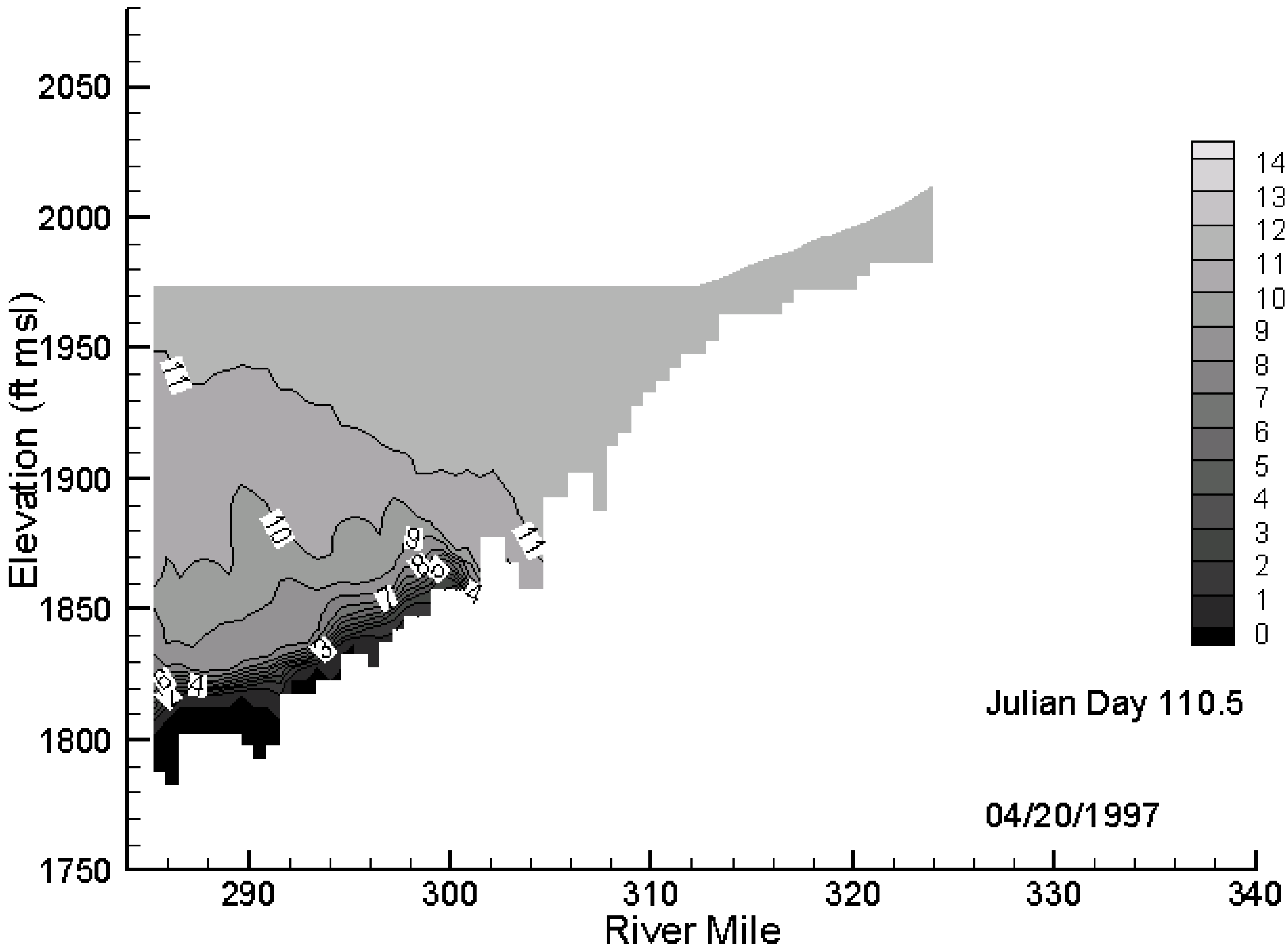

Figure 282. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

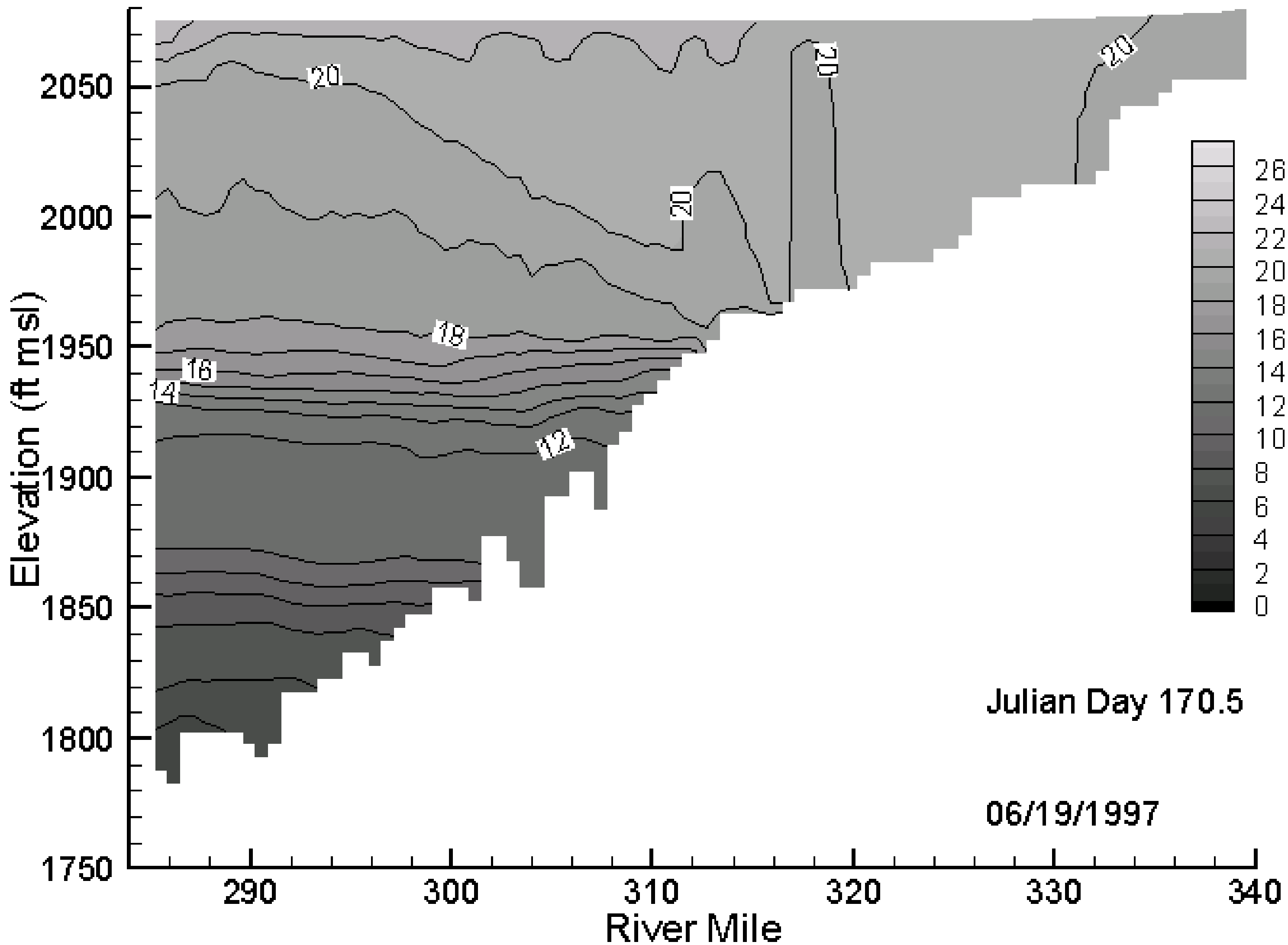

Figure 283. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

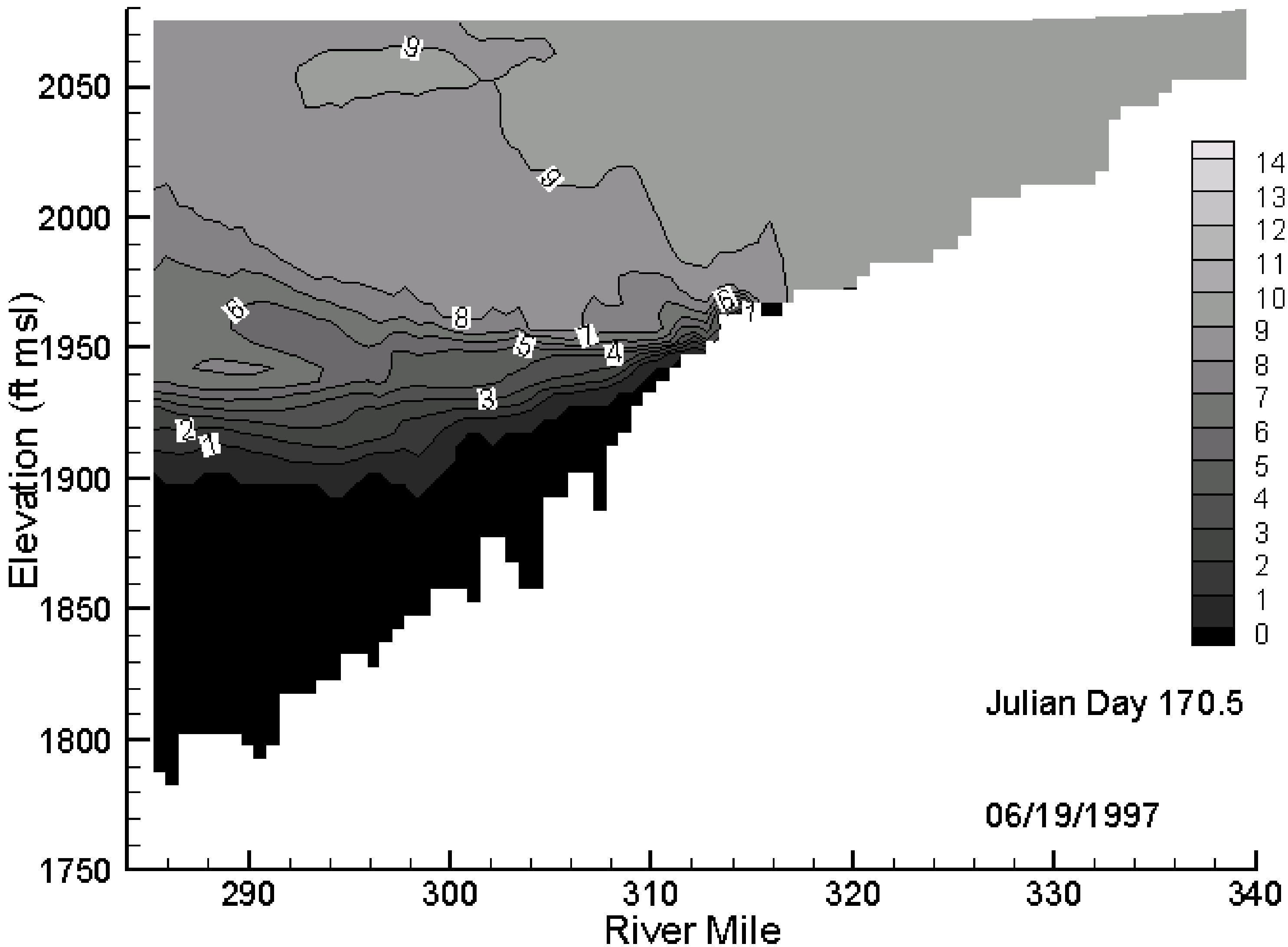

Figure 284. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

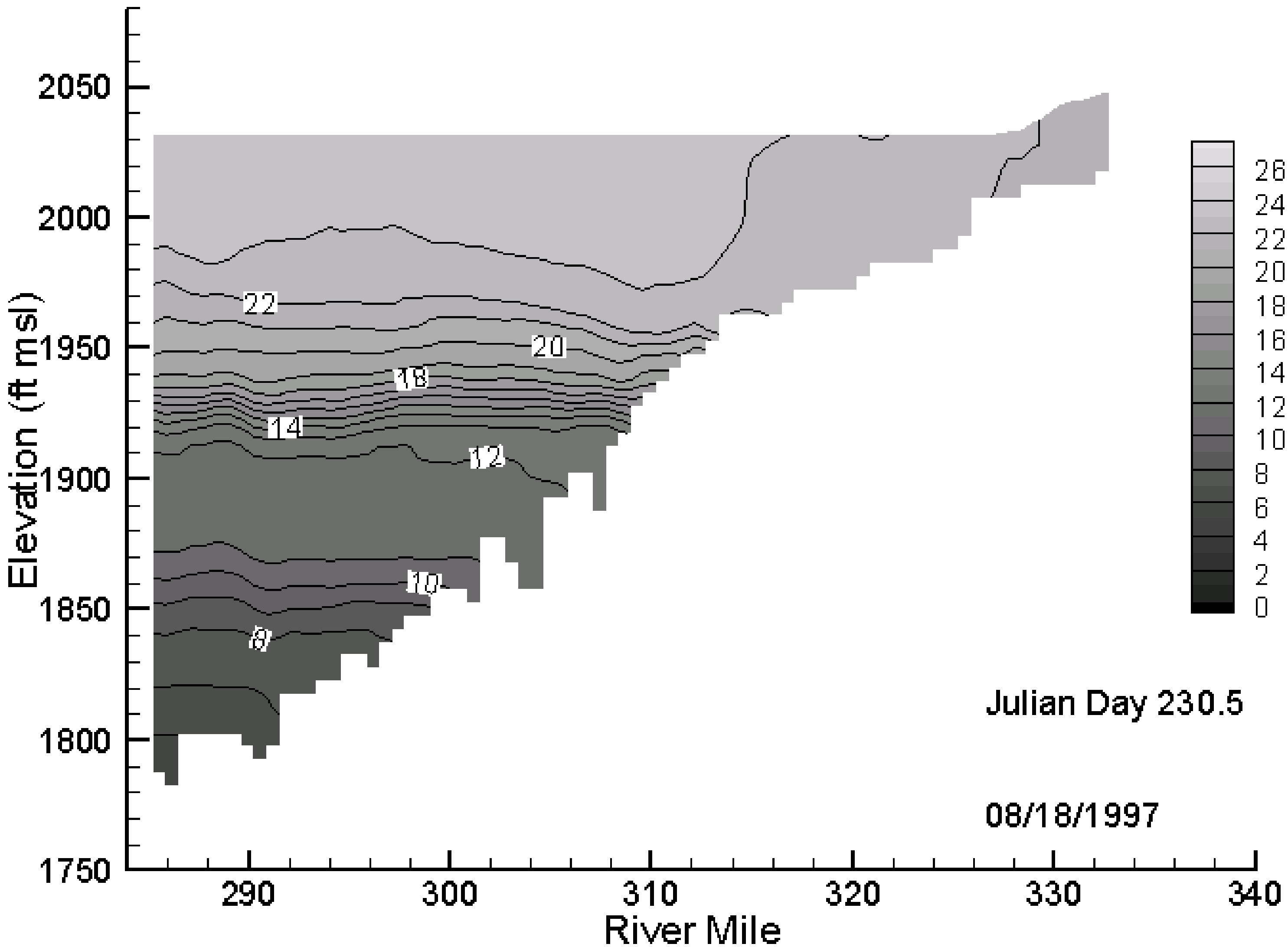

Figure 285. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

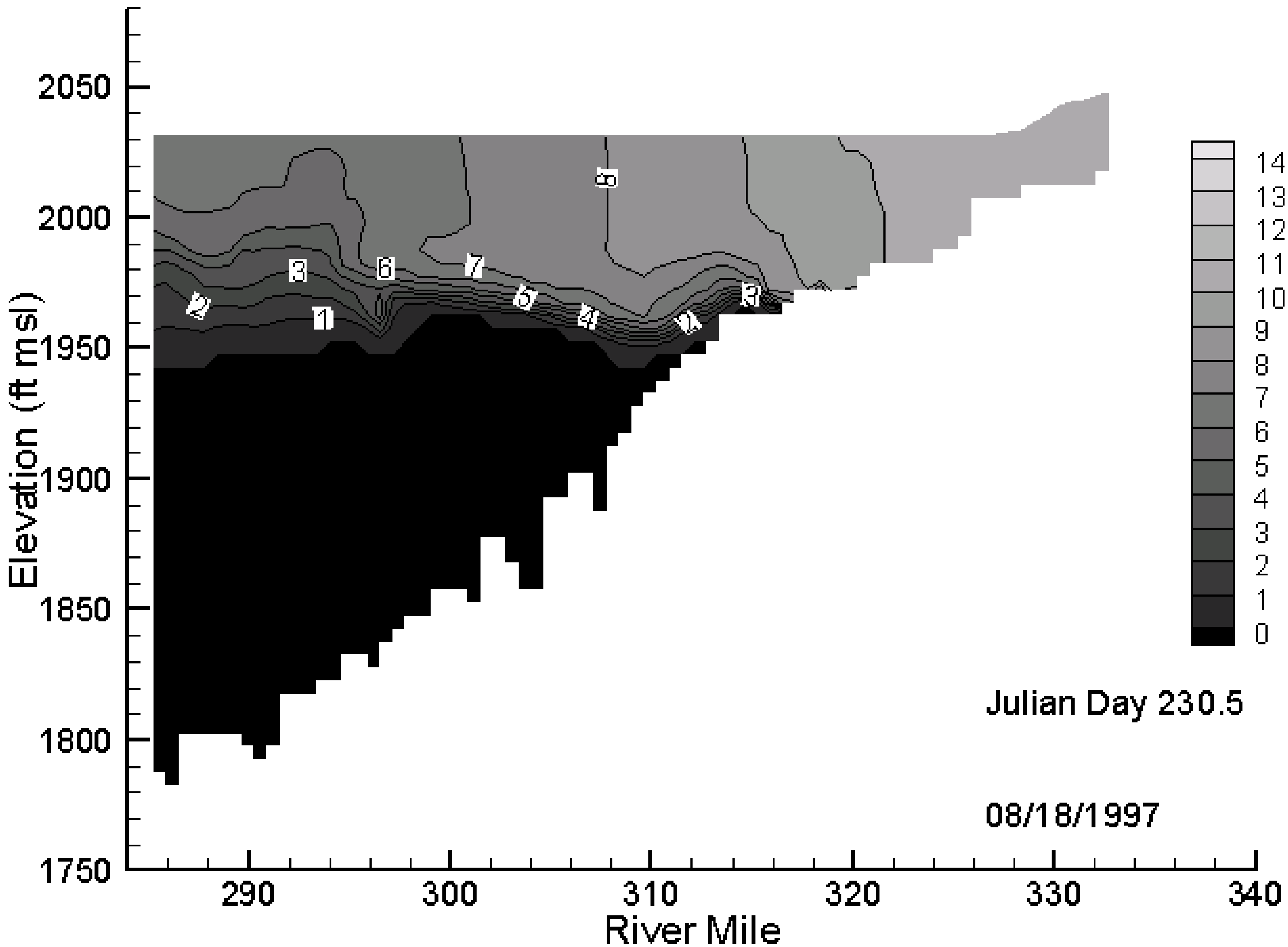

Figure 286. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

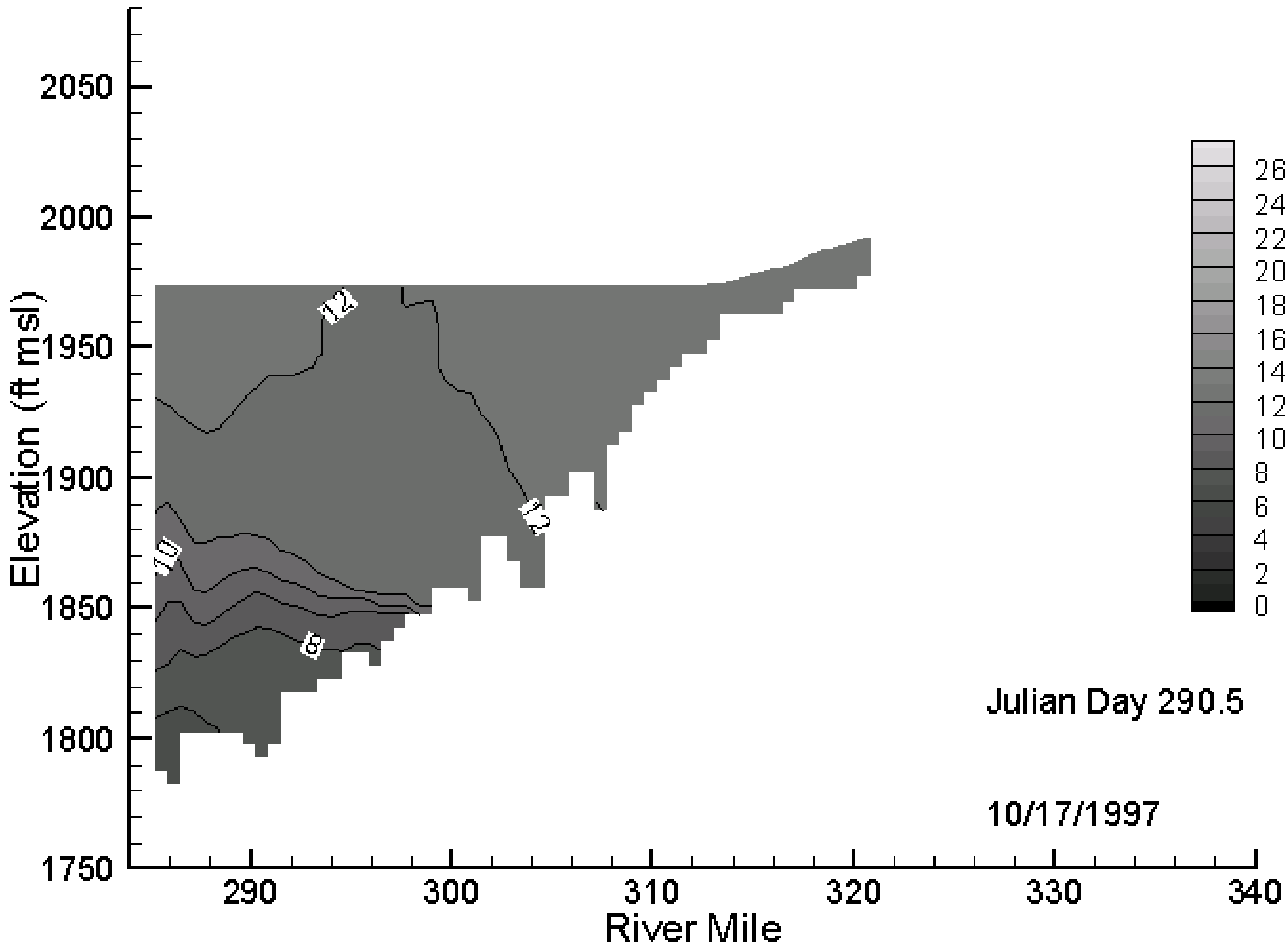

Figure 287. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

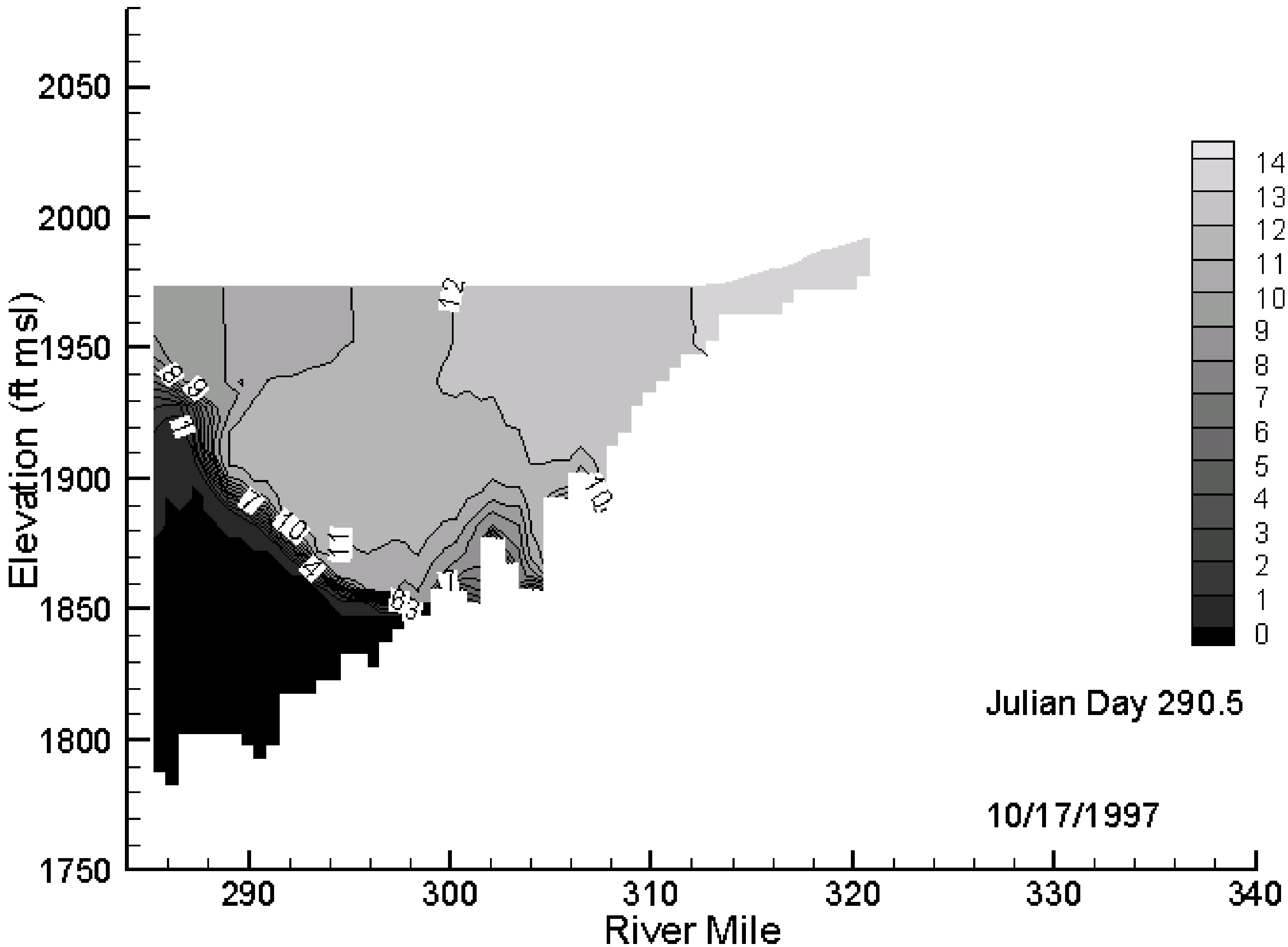

Figure 288. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations.

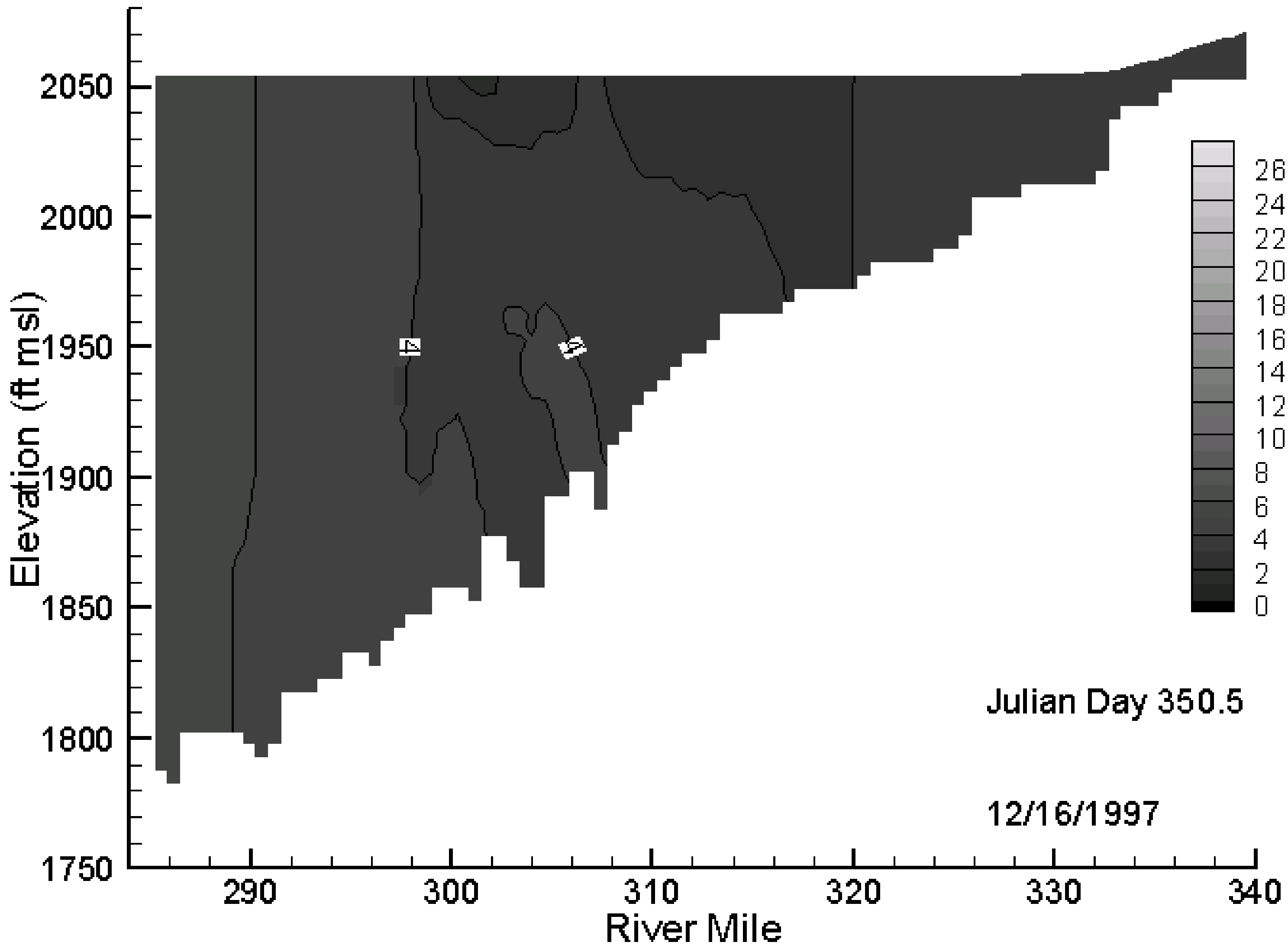

Figure 289. 1997 simulated temperature (°C) isopleth for Brownlee Reservoir under OP-6 operations.

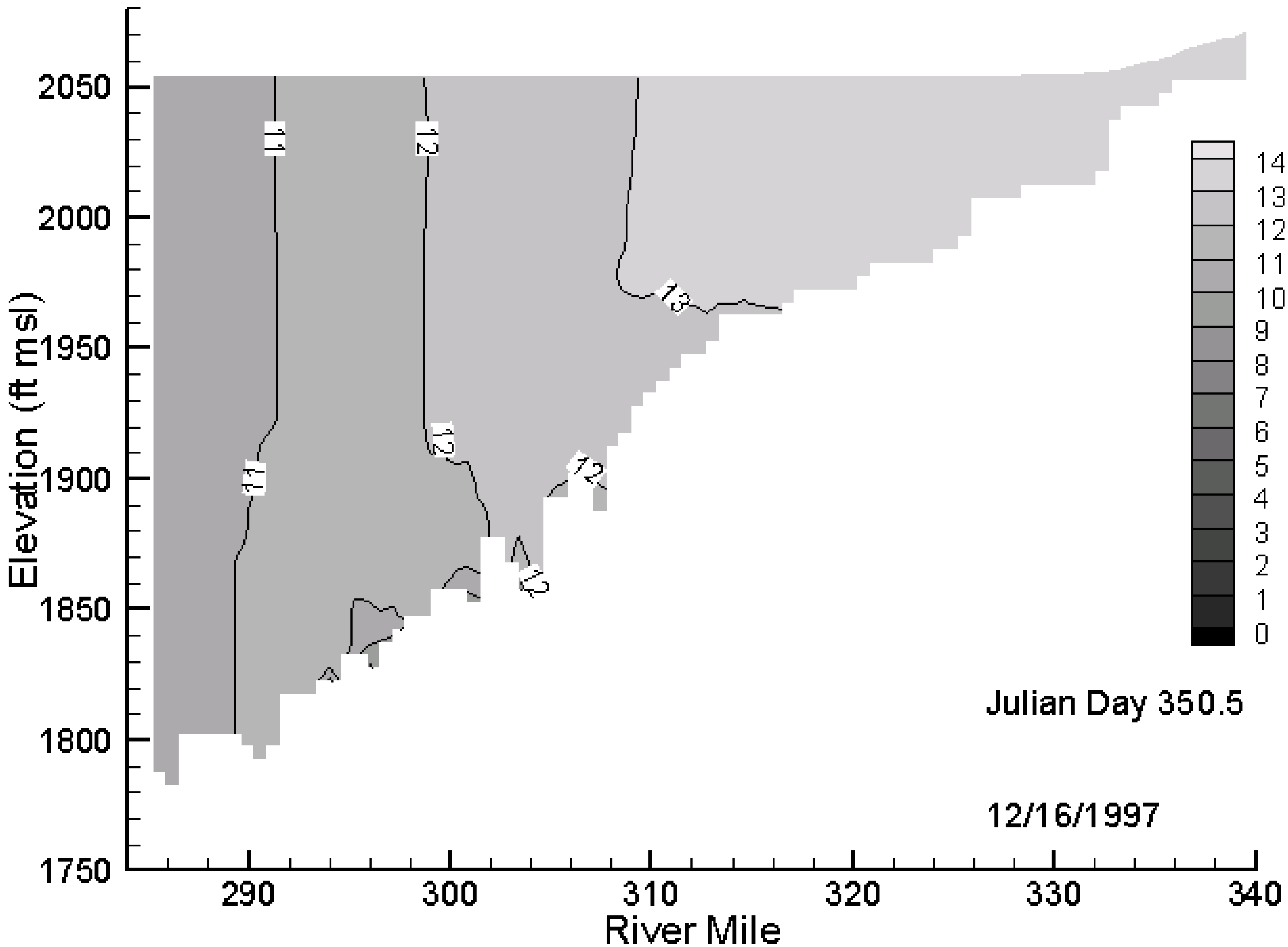

Figure 290. 1997 simulated DO (mg/L) isopleth for Brownlee Reservoir under OP-6 operations

Appendix A. Consultation Record

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
VALE DISTRICT
100 Oregon Street
Vale, Oregon 97918
http://www.or.blm.gov/Vale/

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1780

January 10, 2005

Ralph Myers and Craig Jones
Idaho Power Company
PO Box 70
Boise ID 83707

Dear Mr. Myers and Mr. Jones:

Thank you for the opportunity to comment on the additional information request (AIR) OP-1 (e) Operational Scenarios-Water Quality. Please find the BLM comments attached in attachment 1. We have several specific comments regarding the analysis and data. We look forward to your clarification of these issues.

Please contact me for questions or clarifications. We look forward to continued cooperation towards the completion of the relicensing of Hells Canyon Complex project P-1971. You can reach me at 541-523-1308. My address is BLM, 3165 10th St. Baker City OR, 97814.

Sincerely,

Dorothy Mason

Dorothy Mason
BLM OR/WA and ID
Relicensing Team Lead

Enclosure- Attachment 1
Cc: Alan Mitchnick FERC
Service List

Attachment 1-BLM Comments Additional Information Request OP-1(e) Project P-1971 Hells Canyon Complex 1/10/05

AIR OP-1(e) Background: FERC requested that IPC model the impact of aeration of Brownlee reservoir and the venting of Brownlee units 1 through 5.

Comments:

- IPC did not model the effects of the anticipated improved upstream water quality conditions from implemented TMDL's. This issue should be addressed in future requests from FERC.
- The conceptual system location that IPC used for model segments and layers should be referenced in respect to the actual situation in Brownlee reservoir. In addition, the range of conditions that bracket the conceptual system should be addressed and discussed.
- Proposed Turbine Aeration. It is unclear from the IPC discussion what has been determined from the ongoing studies at Brownlee powerplant and how these results were used in the evaluation. This information should be presented in the document.
- The assumptions that IPC has used to guide the evaluation of potential dissolved oxygen changes should be discussed in relation to the potential results presented. Modification of the assumption of a 1 mg/l increase should be tested to see if it is correct and what effect modification of this assumption by 10, 30, 50 and 100% may have on the modeled results.
- Responses:
    - Proposed and simulated temperatures and DO results from assessing OP-2, OP-5 and OP-6 should be plotted on the same graph to show where differences occur.
- Reservoir Processes. A discussion should evaluate the variability in the reservoir processes that may occur under different operational constraints (see OP-2 comments). This includes variability related to flow augmentation, drought conditions, power plant modifications, and reservoir drawdown for operational regions.
    - Ammonia processes – should address variability issues described above.
    - Mercury processes – same as above
    - Organochlorine compounds – same as above
    - Processes affecting pH – same as above
- Potential Effects of Operation Scenario. The potential impacts from increased sediment scour may lead to turbidity and increased movement of metals and nutrients in the Snake River. This should be addressed as related to impacts to the aquatic food base and uptake by young fish.
- Modifications to the timing of fall and spring turnover are discussed by IPC and should also include the potential variability that may result due to drought conditions, tributary inflows, and modifications of IPC operations at downstream dams. The variability will likely modify the chemical relationships and timing of limnological events in Brownlee and as a result to downstream Oxbow, Hells Canyon and the Snake River.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
2146 NE 4th Street, Suite 104
Bend, OR 97701
(541) 388-6146
Eastern Region
Bend Office

January 10, 2005

Ralph Myers
Water Quality Program Supervisor
Idaho Power Company
P.O. Box 70
Boise, ID 83707

Pete Newton
Idaho Power Company
P.O. Box 70
Boise, ID 83707

Re: Hells Canyon Complex Hydroelectric Project; FERC Project No. 1971; ODEQ Comments on Draft Response to Additional Information Requests for WQ-1 (Dissolved Oxygen Augmentation), WQ-2(a) (Temperature Control, Conceptual Design Report), and OP-1(e) (Operational Scenarios – Water Quality).

Dear Mr. Myers and Mr. Newton:

The Oregon Department of Environmental Quality (ODEQ) has received a number of compact disks (CDs) containing Idaho Power Company's (IPC) draft response to additional information requests (AIRs) issued by the Federal Energy Regulatory Commission (FERC). As requested, ODEQ has reviewed and prepared the enclosed comments on IPC's draft response to the three draft AIRs responses identified above. ODEQ understands that per FERC's request, our comments will be considered and included in IPC's final response to AIRs.

Considering the tight timeline for requested comments, these comments are being provided by electronic facsimile as well as by overland mail to meet the January 10, 2005 deadline.

Please contact me if you have any questions or need clarification regarding these comments.

Sincerely,

Paul A. DeVito
Hydroelectric Specialist

PAD/rm
Enclosures:
Attachment 1: Comments on AIR WQ-1 (Dissolved Oxygen Augmentation)
Attachment 2: Comments on AIR WQ-2(a) (Temperature Control, Conceptual Design)
Attachment 3: Comments on AIR OP-1(e) (Operational Scenarios – Water Quality)

Attachment 3

ODEQ Comments on AIR OP-1(e)
(Operational Scenarios – Water Quality)

Section	Comment
1.	It is stated in the draft response to AIR OP-1(e) that FERC did not specifically require that the simulations of downstream water quality also be evaluated in the context of improved water quality resulting from implementation of the TMDL in the upper basin. ODEQ believes that this was an oversight on FERC's part and that such information is desired by FERC. For instance, for AIR WQ-1, requires simulations for both pre- and post-TMDL implementation. ODEQ believes that provision of post-TMDL implementation simulations would significantly aid IPC in parsing out its impacts on non-attainment of temperature and dissolved oxygen standard criteria in the river below the HCC under the various reservoir drawdown scenarios. ODEQ requests that post-TMDL implementation scenarios also be evaluated and presented in the final response.
2.1.	In order to take greatest advantage of space on the required full-page figures, and in order to improve readability, these and other landscape figures of this AIR response (as well as for other AIRs response) should be oriented with the longest dimension of the figure along the longest dimension of the page. Doing this would result in enlarged figures that would especially aid hard copy viewers. Though electronic viewers could simply elect to use a magnification tool to enlarge these otherwise mis-oriented and reduced-sized figures, properly orienting the figures to better suit the hard copy viewers should not pose a hardship. While some figures may resultantly orient sideways when viewed on a computer, use of Adobe Acrobat's rotation tool can provide correction.
2.2.	Though the comparison of hourly simulations of the DO concentration provided for by the referenced Figures 36 through 50 are quite useful, provision of this information in terms of percent DO saturation is also needed for water quality standard compliance determination. Further, post-TMDL implementation comparative scenarios in terms of concentration and percent saturation would be helpful in parsing out IPC impact on DO compliance.
2.3.	Same as previously stated comment regarding the need for inclusion of post-TMDL implementation scenarios.
2.4.1.4.	The section numbered 2.2.1.4., relating to pH, appears as though it should be numbered 2.4.1.4.
3.	The consultation record should clearly indicate that while a 30-day commenting period was provided, a collaborative forum for stakeholder discussion and input regarding the draft AIR response was not provided. ODEQ understands that IPC proposes to provide presentation and discussion of the final AIR response reports to stakeholders during settlement negotiations to clarify IPC's AIR final responses, provide for related discussion, and to aid the determination of any additional information needs or revised presentation. ODEQ believes this should be clearly articulated in the final report.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
525 NE Oregon Street
PORTLAND, OREGON 97232-2737

F/NWR5

January 20, 2005

Craig Jones, Project Manager
Idaho Power Company
PO Box 70
Boise, ID 83707

Dear Mr. Jones:

The National Marine Fisheries Service (NOAA Fisheries) is pleased to provide you our enclosed comments regarding the Hells Canyon Complex Additional Information Request OP-1(e) (Operational Scenarios – Water Quality) and OP-1(f) (Operational Scenarios – Aquatic Resources). We look forward to working with Idaho Power Company in the coming months on these issues.

Sincerely,

Ritchie J. Graves

for Keith Kirkendall, Chief
FERC and Water Diversions Branch
Hydropower Division

Enclosures

cc: Ralph Myers, IPC
Steve Brink, IPC

NOAA Fisheries' Comments on Idaho Power Company's Response to FERC Additional Information Request OP-1(e): Operational Scenarios – Water Quality.

January 20, 2005

NOAA Fisheries appreciates Idaho Power Company's (IPC) effort to comply with FERC Additional Information Request OP-1(e) by providing modeling results for the purpose of enhancing our understanding of the likely effects of the Hells Canyon Complex on temperature and dissolved oxygen in the Snake River. To assist IPC in this effort, NOAA Fisheries offers the following comments.

General Comment

1. It is NOAA Fisheries' understanding that alternative operational scenario OP-6 was aimed at assessing the ability of Brownlee Reservoir (through fall and winter drafts) to "speed the cooling of outflows from the project and to reduce the incidence and severity of gas supersaturation associated with flood events."[1] We presume that IPC's selection of the mid-July through end of September time frame for these drafts was selected to 1) ensure that this draft occurred prior to the onset of fall chinook salmon spawning downstream of Hells Canyon Dam, and 2) to maximize the energy that could be generated coincident with the peak summer load period. If this is correct, we suggest that these assumptions be made explicit.

2. We appreciate that IPC is trying to clearly illustrate the differences between OP-2, OP-5, and OP-6 in comparison to proposed operations. However, the result is a large number of figures that make direct comparisons between these scenarios more difficult to assess. We suggest that the document would be improved by combining the modeling outputs from each of these scenarios for temperature (figures 21 through 35) and dissolved oxygen (figures 36 through 50) by flow category. By doing this, much redundant information would be eliminated (i.e., multiple copies of proposed operations), and more direct comparisons could be made between operational scenarios, as only 5 figures would be necessary for each water quality parameter instead of 15.

3. In general, NOAA Fisheries believes that, based on our current understanding of chemical and biological processes within Brownlee Reservoir, the model is providing logical output and is likely performing well.

2.4.1 Reservoir Processes

4. We appreciate IPC's inclusion of a qualitative evaluation of the potential effects of operational scenarios on levels of ammonia, pH, and concentrations of mercury and organochlorine compounds in water discharged from Hells Canyon Dam. We agree that these parameters are inextricably intertwined with nutrient loads,

[1] From FERC's May 4, 2004, Request for Additional Information.

reservoir processes, and flow conditions which, together, result in anoxic conditions (to a greater or lesser extent) in the hypolimnion of Brownlee Reservoir and the sediments therein. This discussion reinforces our concern with respect to anoxic sediments which we previously noted in our January 10, 2005, comments regarding IPC's draft response to FERC AIR WQ-1. We again note that the sediment oxygen demand will likely impede the initial success of oxygen injection and suggest that IPC plan to inject additional oxygen during an initial operational phase to reduce the amount sediment oxygen demand.

2.4.2. Potential Effects of Operation Scenarios

5. We agree with IPC's assessment that there is apparently little or no effect of OP-2 on temperature and dissolved oxygen under the medium to high flow conditions. We also agree that under the low flow condition, downstream temperatures and dissolved oxygen levels appear to be substantially elevated compared to proposed operations. The modeling results are more complicated under medium-low flow conditions as dissolved oxygen levels appear to be increased initially, and then decreased during the summer draft period, and temperatures appear to be slightly elevated compared to proposed operations. Thus we do not understand IPC's assertion (on page 6) that "discharged anoxic waters from the transition zone in low and medium-low flow years apparently do not affect outflow DO." Please either delete this comment or provide additional text to support the assertion.

6. We agree with IPC's assessment with respect to the likely effects of OP-5 on downstream temperatures and dissolved oxygen levels compared to proposed operations. These modeling results support NOAA Fisheries' previous assessments of Brownlee Reservoir's effects on downstream temperatures (including the influence of flow conditions and flood control operations). With respect to dissolved oxygen, OP-5, compared to proposed operations, appears to be reduced during the spring under the low and medium-low flow conditions, but increased during this time under the medium to high flow conditions. In addition, dissolved oxygen levels during the fall are elevated under all flow conditions.

7. We agree with IPC's assessment of the OP-6 modeling results.

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Dorothy Mason
Bureau of Land Management
3165 10th Street
Baker City, OR 97814

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Ms. Mason:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

David Henderson
Bureau of Land Management
100 Oregon Street
Vale, OR 97918

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Henderson:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Albert Teeman
Burns-Paiute Tribe
100 Pasigo Street
HC 71
Burns, OR 97720

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Teeman:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Don Sampson
Columbia River Inter-Tribal Fish Commission
729 NE Oregon Street, Suite 200
Portland, OR 97232

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Sampson:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Gary Burke
Confederated Tribes of the Umatilla Indian Reservation
PO Box 638
Pendleton, OR 97801

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Burke:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Olney Patt, Jr.
Confederated Tribes of the Warm Springs
PO Box C
Warm Springs, OR 97761-0078

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Patt, Jr.:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Kate Kelly
Idaho Department of Environmental Quality
1445 North Orchard
Boise, ID 83706-2239

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Ms. Kelly:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs

Phone 208-388-2358
Fax 208-388-6902
E-Mail RMyers@idahopower.com

December 7, 2004

Tracey Trent
Idaho Department of Fish and Game
600 South Walnut
PO Box 25
Boise, ID 83702

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Trent:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

The draft response is enclosed on a CD. Because of the tight time constraints imposed by the FERC for this AIR, your comments must be delivered to me by no later than January 10, 2005 for inclusion in the final response to this AIR that will be filed with the FERC. Comments received after this 30-day review period may not be included in the final response.

Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers	Phone	208-388-2358
Water Quality Program Supervisor	Fax	208-388-6902
Environmental Affairs	E-Mail	
RMyers@idahopower.com		

December 7, 2004

Rick Eichstaedt
Nez Perce Tribe
PO Box 305
Lapwai, ID 83540

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Eichstaedt:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers | Phone 208-388-2358
Water Quality Program Supervisor | Fax 208-388-6902
Environmental Affairs | E-Mail
RMyers@idahopower.com

December 7, 2004

Ritchie Graves
NOAA Fisheries
525 NE Oregon Street, Suite 500
Portland, OR 97232

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Graves:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Paul DeVito
Oregon Department of Environmental Quality
2146 NE Fourth Street, Suite 104
Bend, OR 97701

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr DeVito:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Colleen Fagan
Oregon Department of Fish and Wildlife
107 20th Street
La Grande, OR 97850

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Ms. Fagan:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Frederick Auck
Shoshone-Bannock Tribe
PO Box 306
Fort Hall, ID 83203

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Auck:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Donald Clary
Shoshone-Paiute Tribe
633 West Fifth Street Twenty-First Floor
Los Angeles, CA 90071-2040

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Clary:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Jeffery Foss
U.S. Fish and Wildlife Service
1387 South Vinnell Way, Suite 368
Boise, ID 83709

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Mr. Foss:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

Ralph Myers
Water Quality Program Supervisor
Environmental Affairs
RMyers@idahopower.com

Phone 208-388-2358
Fax 208-388-6902
E-Mail

December 7, 2004

Forest Supervisor
Wallowa-Whitman National Forest
1550 Dewey Avenue
PO Box 907
Baker City, OR 97814

Re: Hells Canyon Additional Information Request OP-1(e) – Operational Scenarios – Water Quality

Dear Forest Supervisor:

In a letter dated May 4, 2004, the Federal Energy Regulatory Commission (FERC) issued to Idaho Power Company (IPC) an additional information request (AIR) for the Hells Canyon New License Application.

In AIR OP-1(e), the FERC requested specific information related to operational scenarios and water quality and directed IPC to consult with various entities (see attached list) about its response to the AIR. Therefore, IPC is requesting your review and comments regarding the draft response to AIR OP-1(e).

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Please contact me if you have questions or need clarification.

Sincerely,

Ralph Myers

Ralph Myers
Water Quality Program Supervisor

REM/da
Enclosure
Cc: Jim Tucker, IPC
Nathan Gardiner, IPC
Craig Jones, IPC
Jim Vasile, DWT

Idaho Power Company
Hells Canyon Complex (FERC Project No. 1971)
OP-1(e) Additional Information Request - Consulting Entities List

David Henderson	Bureau of Land Management
Dorothy Mason	Bureau of Land Management
Albert Teeman	Burns-Paiute Tribe
Don Sampson	Columbia River Inter-Tribal Fish Commission
Robert Lothrop	Columbia River Inter-Tribal Fish Commission
Gary Burke	Confederated Tribes of the Umatilla Indian Reservation
Olney Patt, Jr.	Confederated Tribes of the Warm Springs
Kate Kelly	Idaho Department of Environmental Quality
Tracey Trent	Idaho Department of Fish and Game
Rick Eichstaedt	Nez Perce Tribe
Bob Lohn	NOAA Fisheries
Ritchie Graves	NOAA Fisheries
Paul DeVito	Oregon Department of Environmental Quality
Colleen Fagan	Oregon Department of Fish and Wildlife
Frederick Auck	Shoshone-Bannock Tribe
Donald Clary	Shoshone-Paiute Tribe
Jeffery Foss	U.S. Fish and Wildlife Service
Forest Supervisor	Wallowa-Whitman National Forest