FINAL REPORT

for

MODELING OF THE TRANSPORT, DISTRIBUTION, AND FATE OF PCBS AND HEAVY METALS IN THE ACUSHNET RIVER/ NEW BEDFORD HARBOR/BUZZARDS BAY SYSTEM

APPENDIX VOLUME 2
Appendices E - F

Under Contract No. 4236-MOD-0019

to

EBASCO SERVICES, INC.
211 Congress Street
Boston, MA 02110

September 21, 1990

from

BATTELLE MEMORIAL INSTITUTE
Duxbury Operations
397 Washington Street
Duxbury, MA 02332

APPENDIX E

SEDIMENT/CONTAMINANT TRANSPORT MODEL CALIBRATION RESULTS

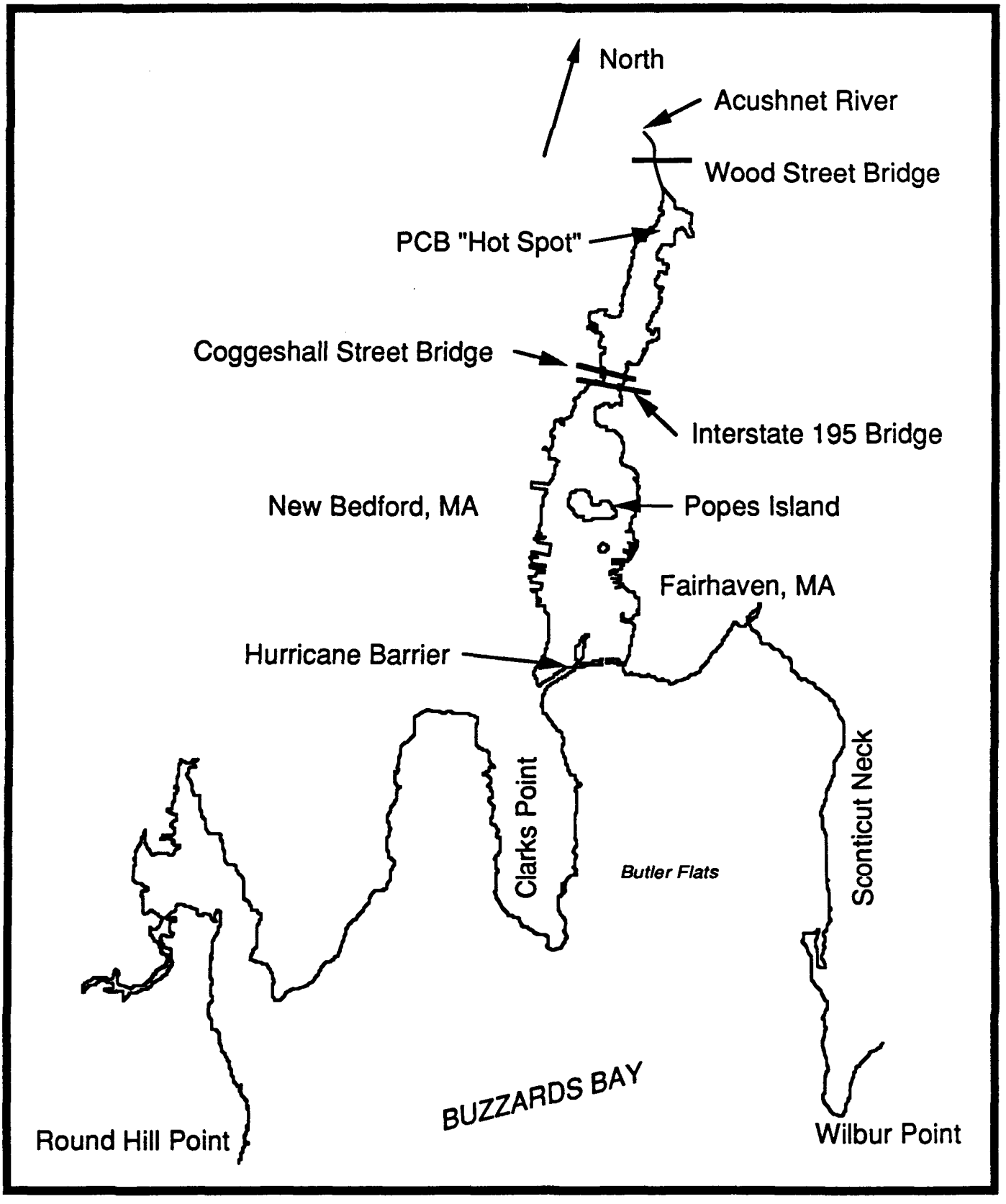

FIGURE E.1. NEW BEDFORD HARBOR STUDY AREA

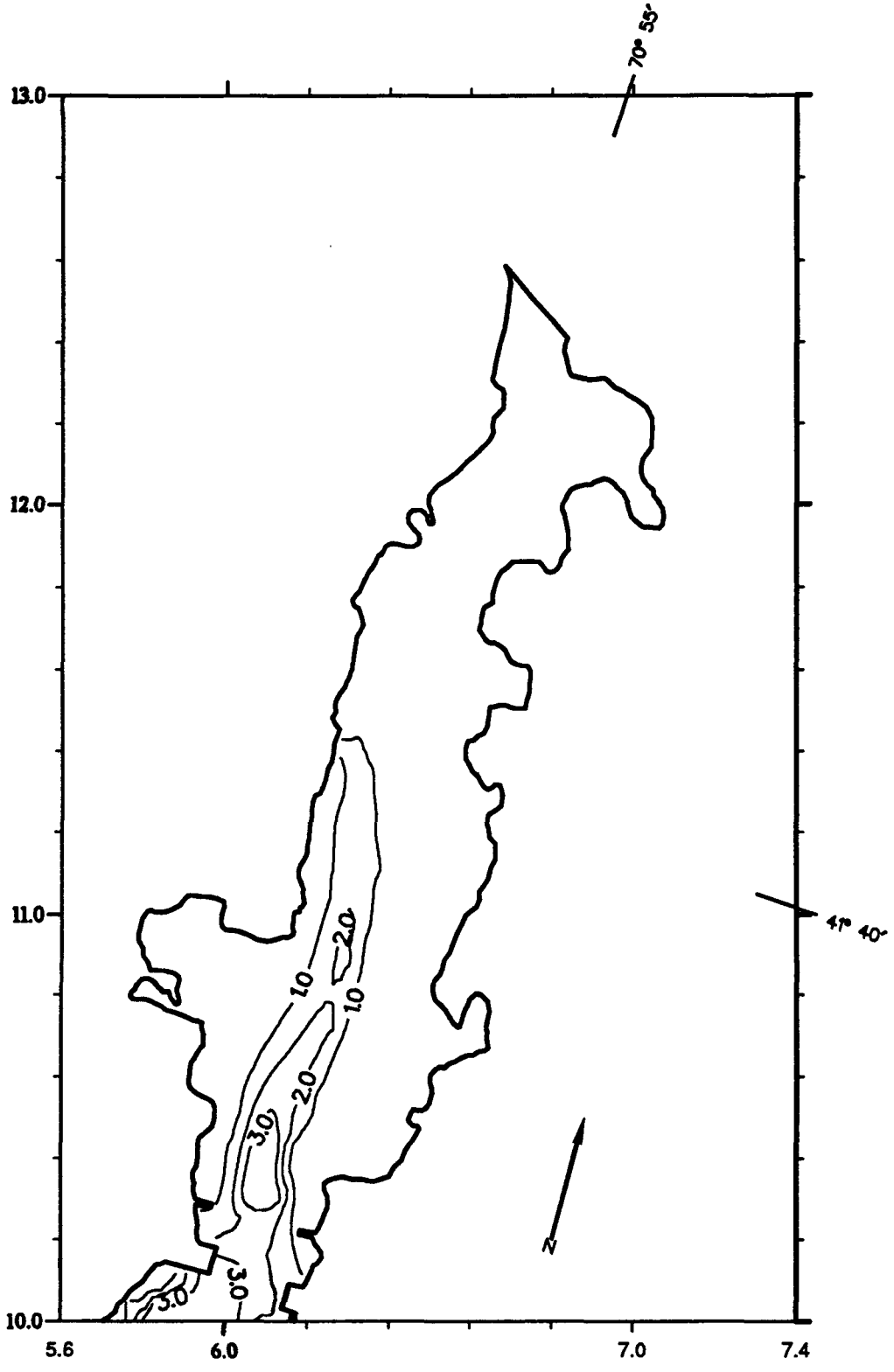

FIGURE E.2. NEW BEDFORD HARBOR BATHYMETRY. DEPTHS IN METERS (MLW). NORTHERN AREA

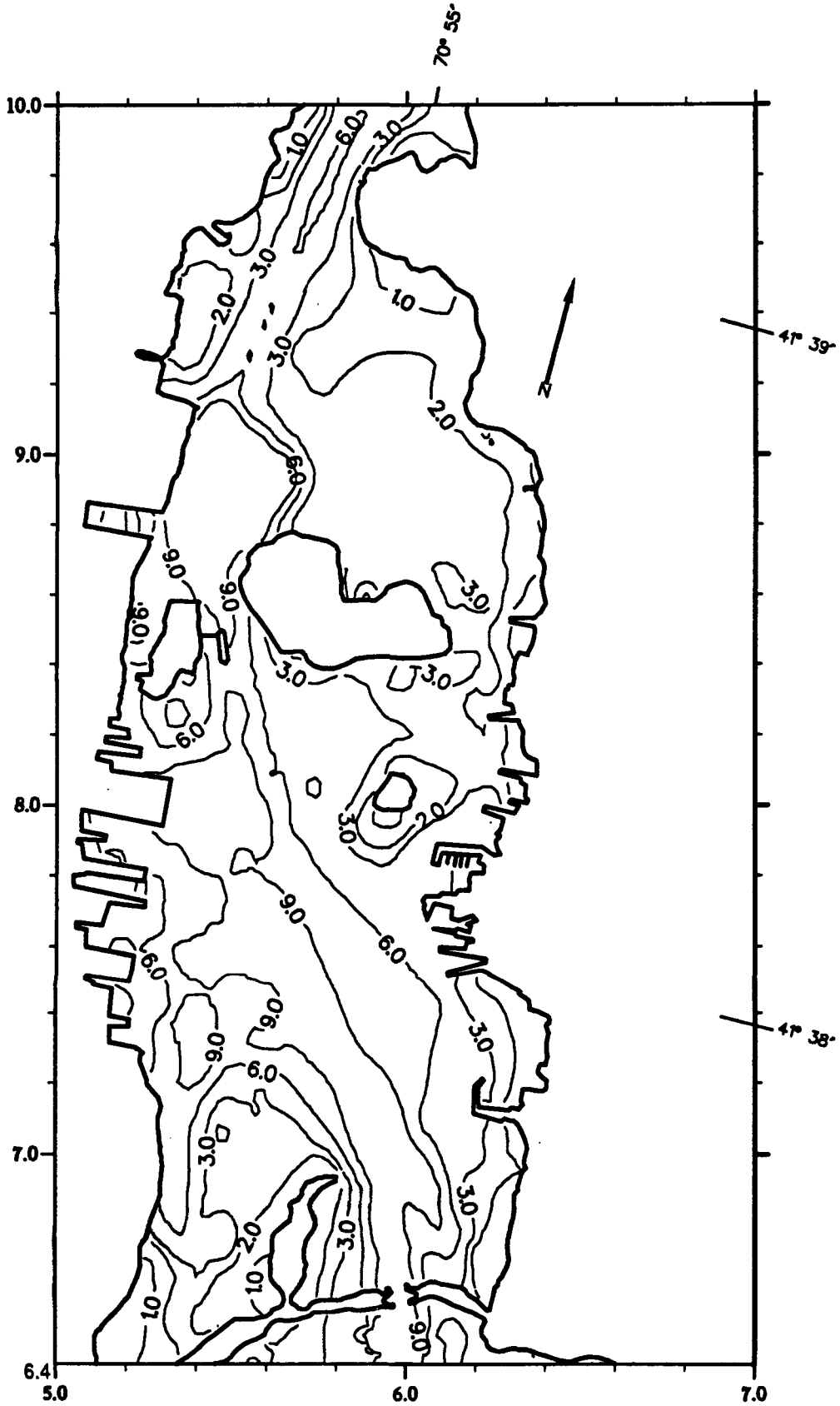

FIGURE E.3. NEW BEDFORD HARBOR BATHYMETRY. DEPTHS IN METERS (MLW). MIDDLE AREA

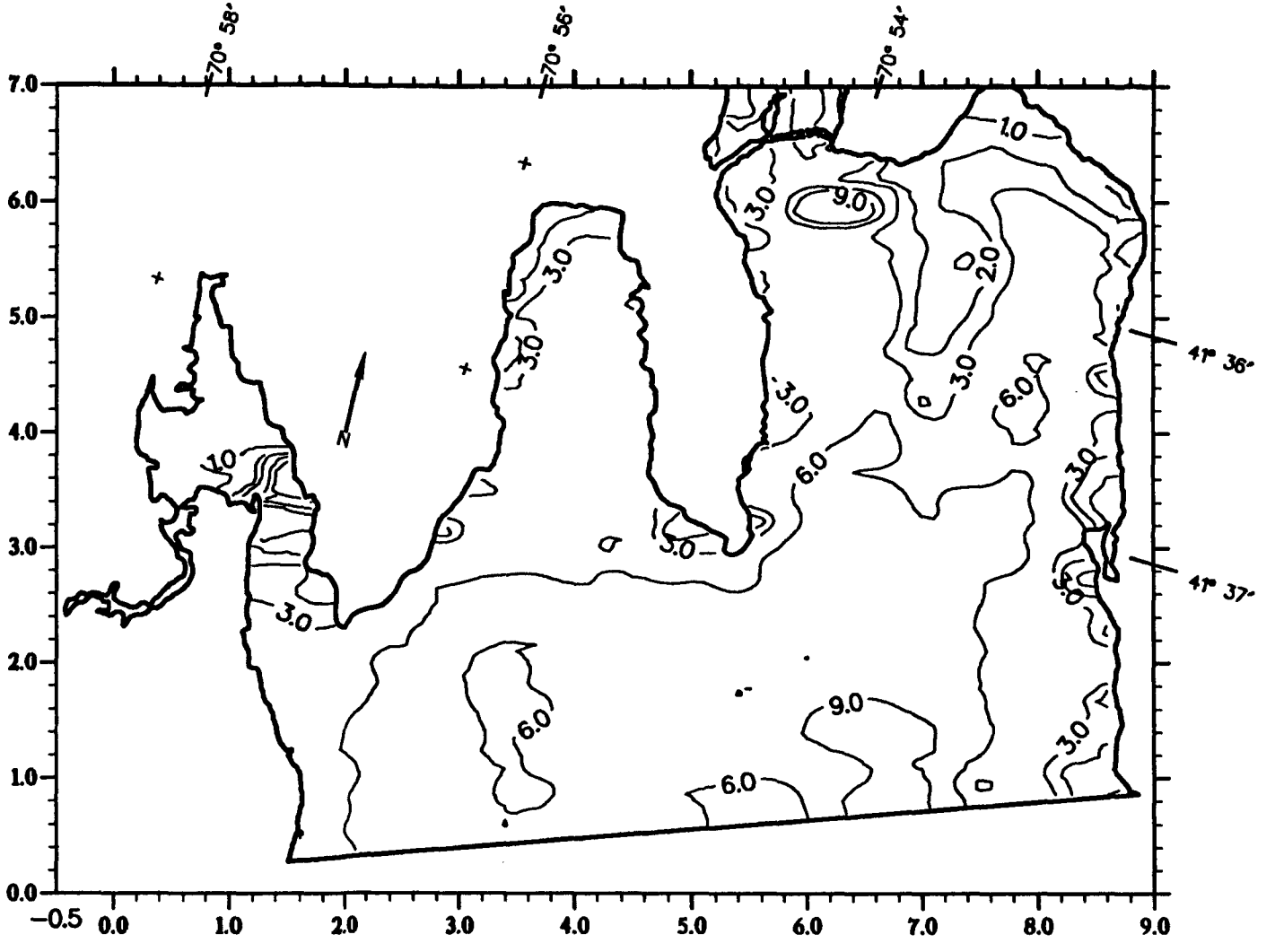

FIGURE E.4. NEW BEDFORD HARBOR BATHYMETRY. DEPTHS IN METERS (MLW). SOUTHERN AREA

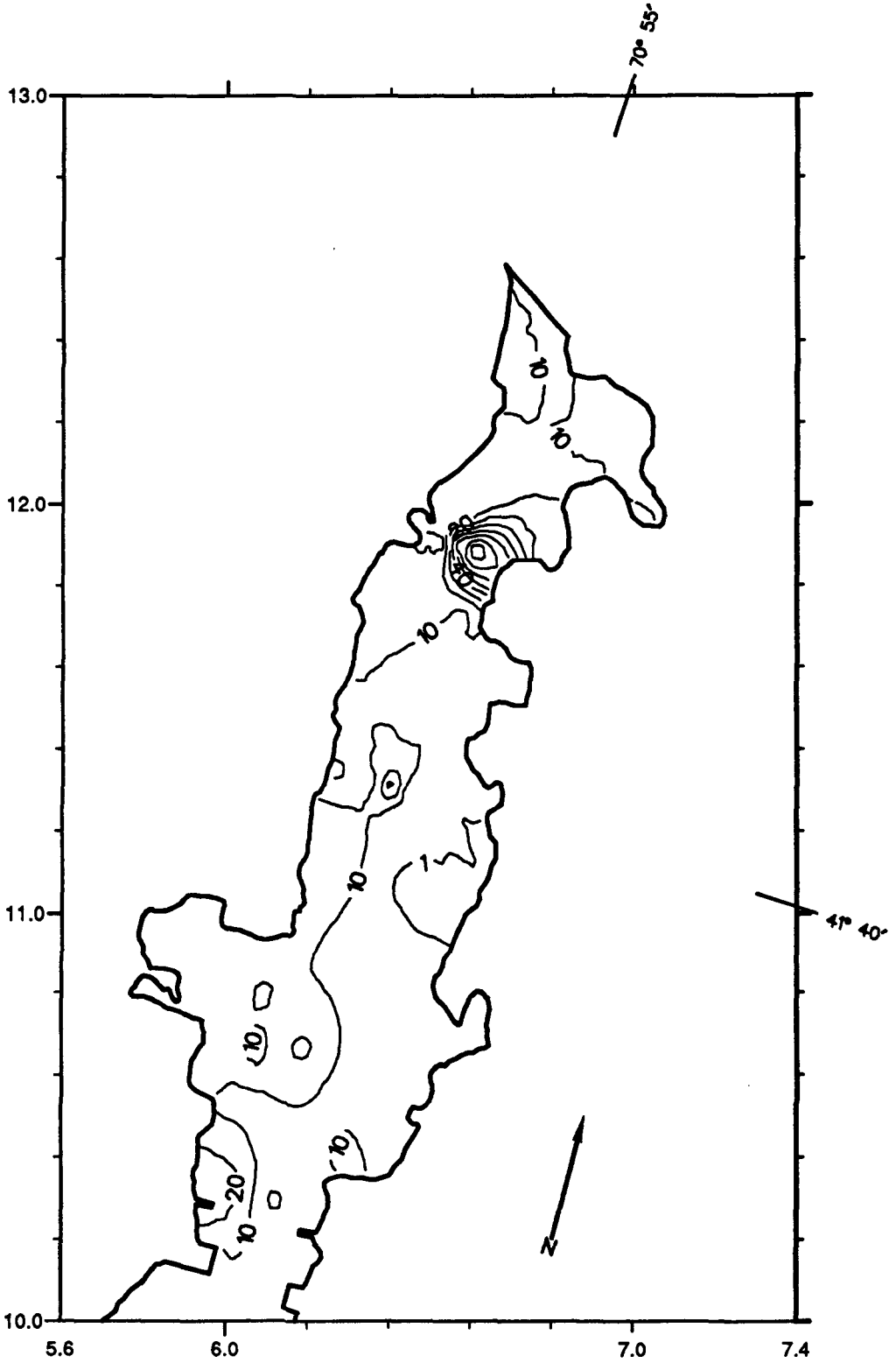

FIGURE E.5. BED SEDIMENT GRAIN SIZE DISTRIBUTION. CLAY FRACTION. NORTHERN AREA.

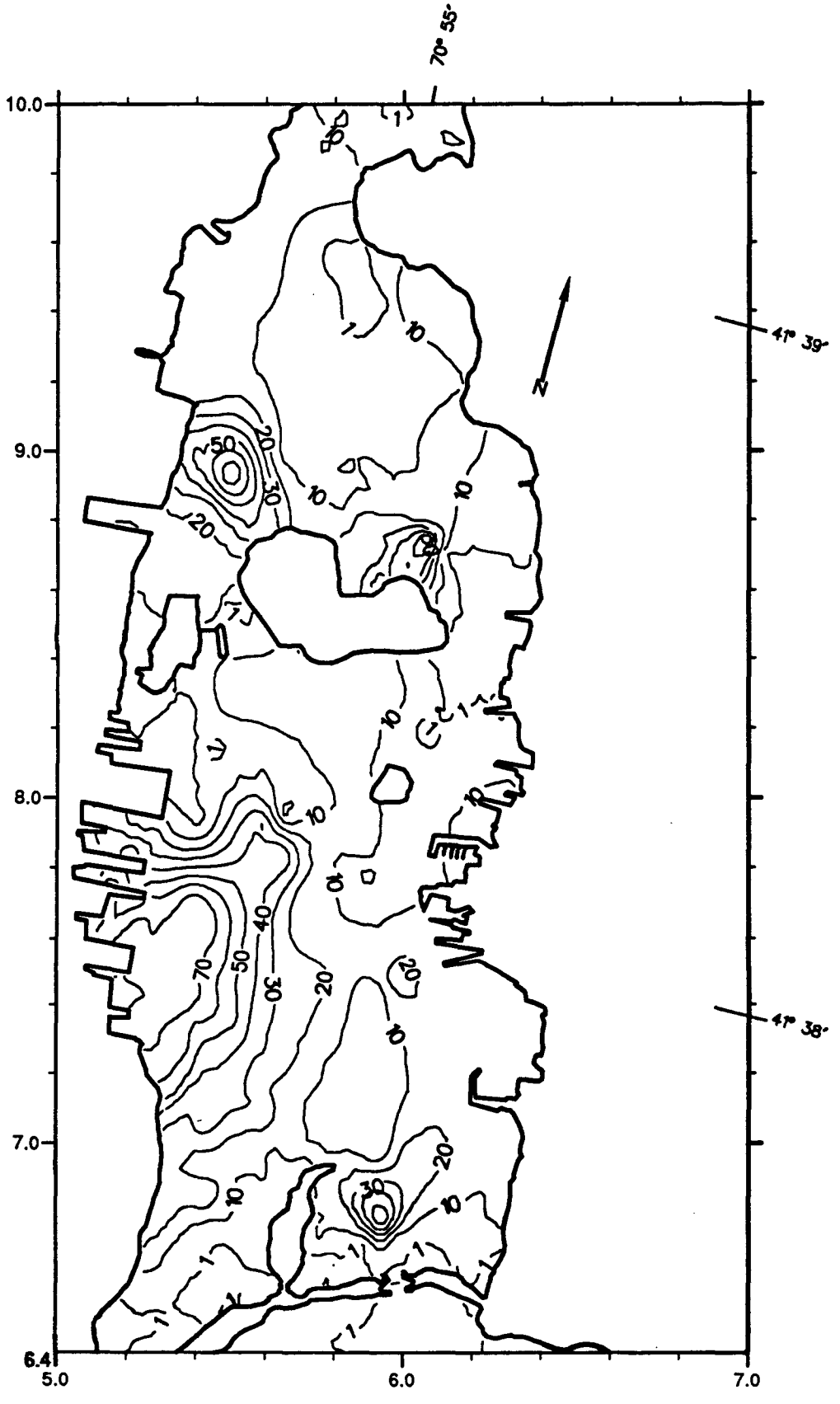

FIGURE E.6. BED SEDIMENT GRAIN SIZE DISTRIBUTION. CLAY FRACTION. MIDDLE AREA.

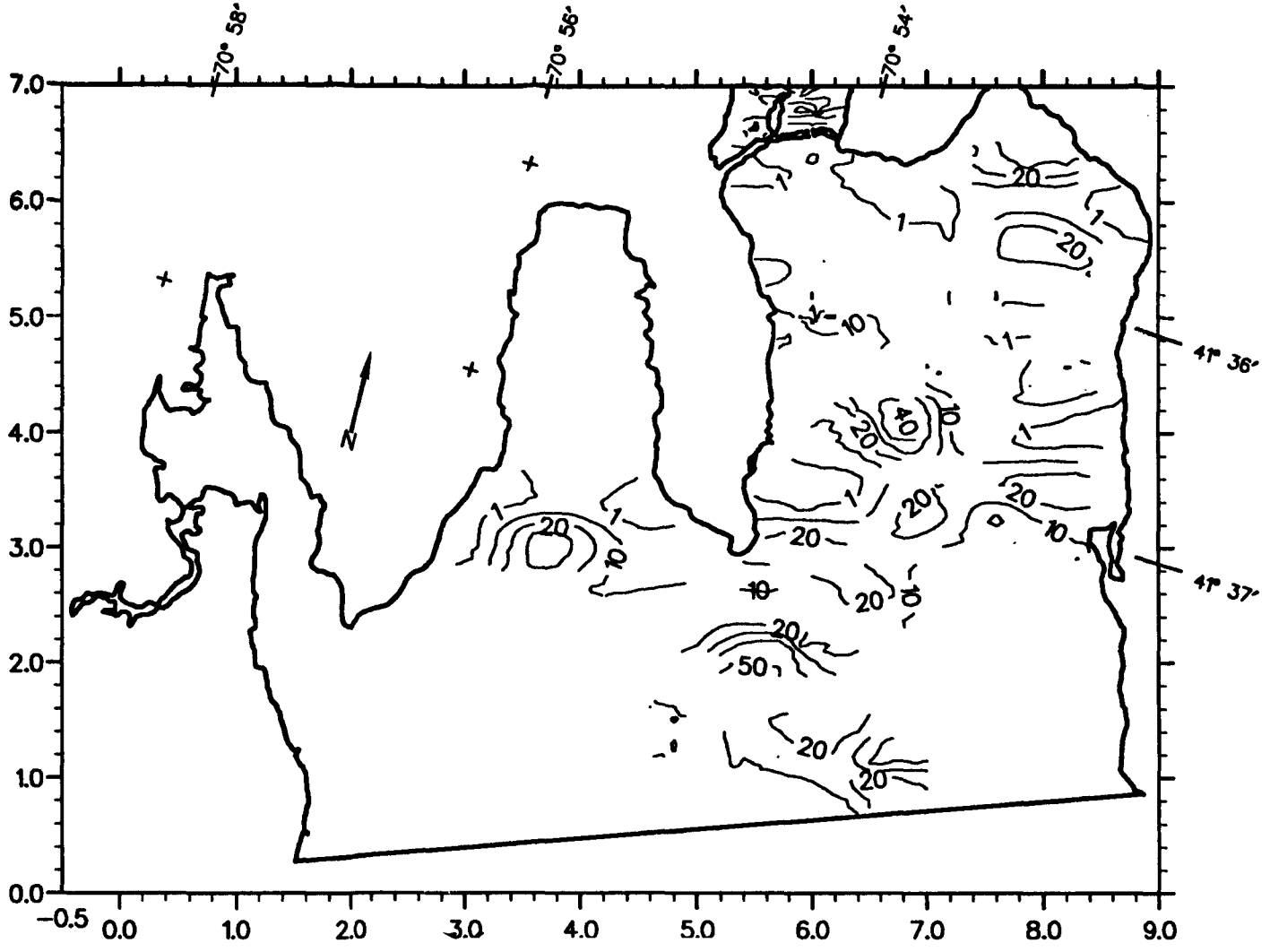

FIGURE E.7. BED SEDIMENT GRAIN SIZE DISTRIBUTION. CLAY FRACTION. SOUTHERN AREA.

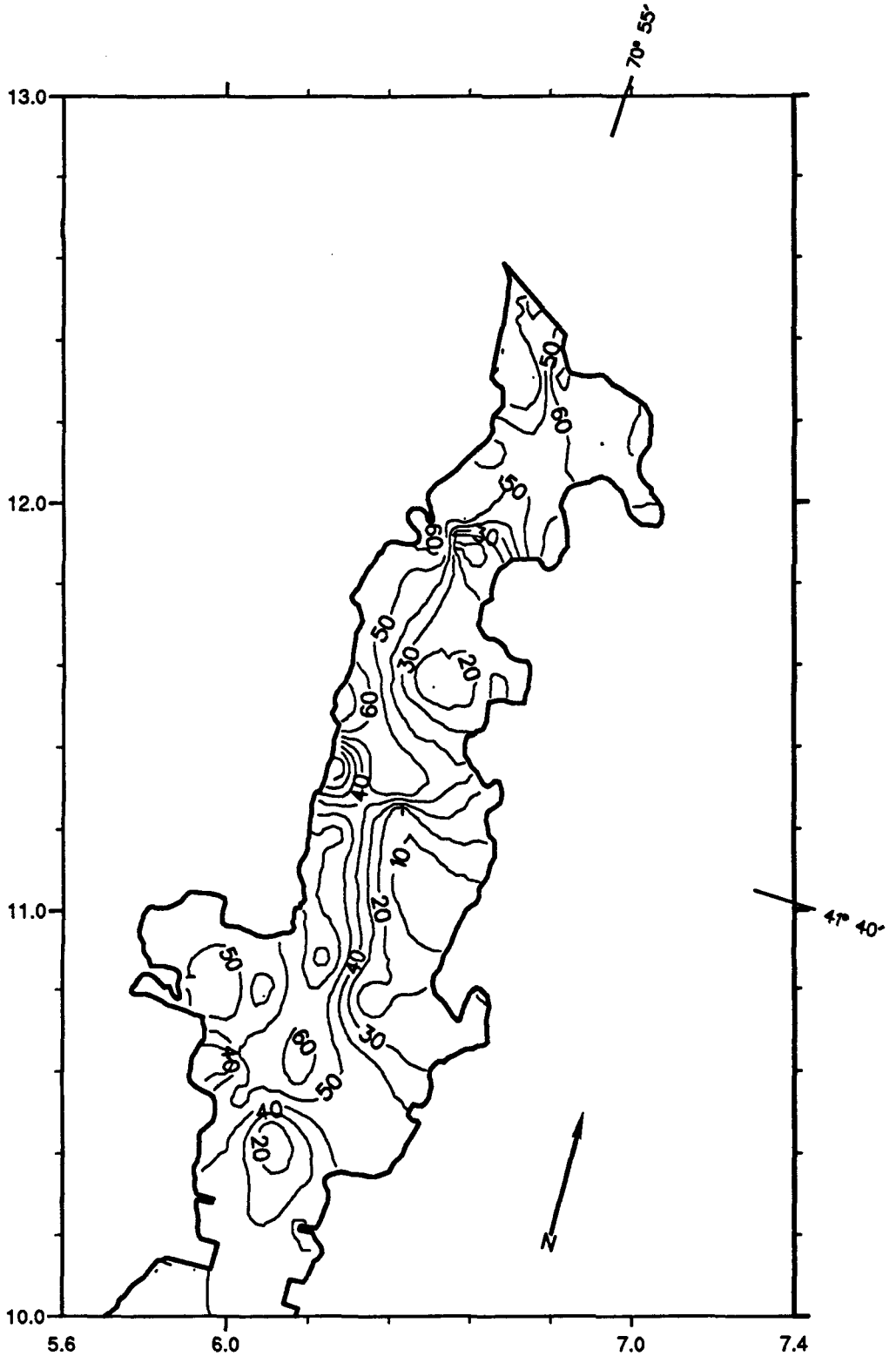

FIGURE E.8. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SILT FRACTION. NORTHERN AREA.

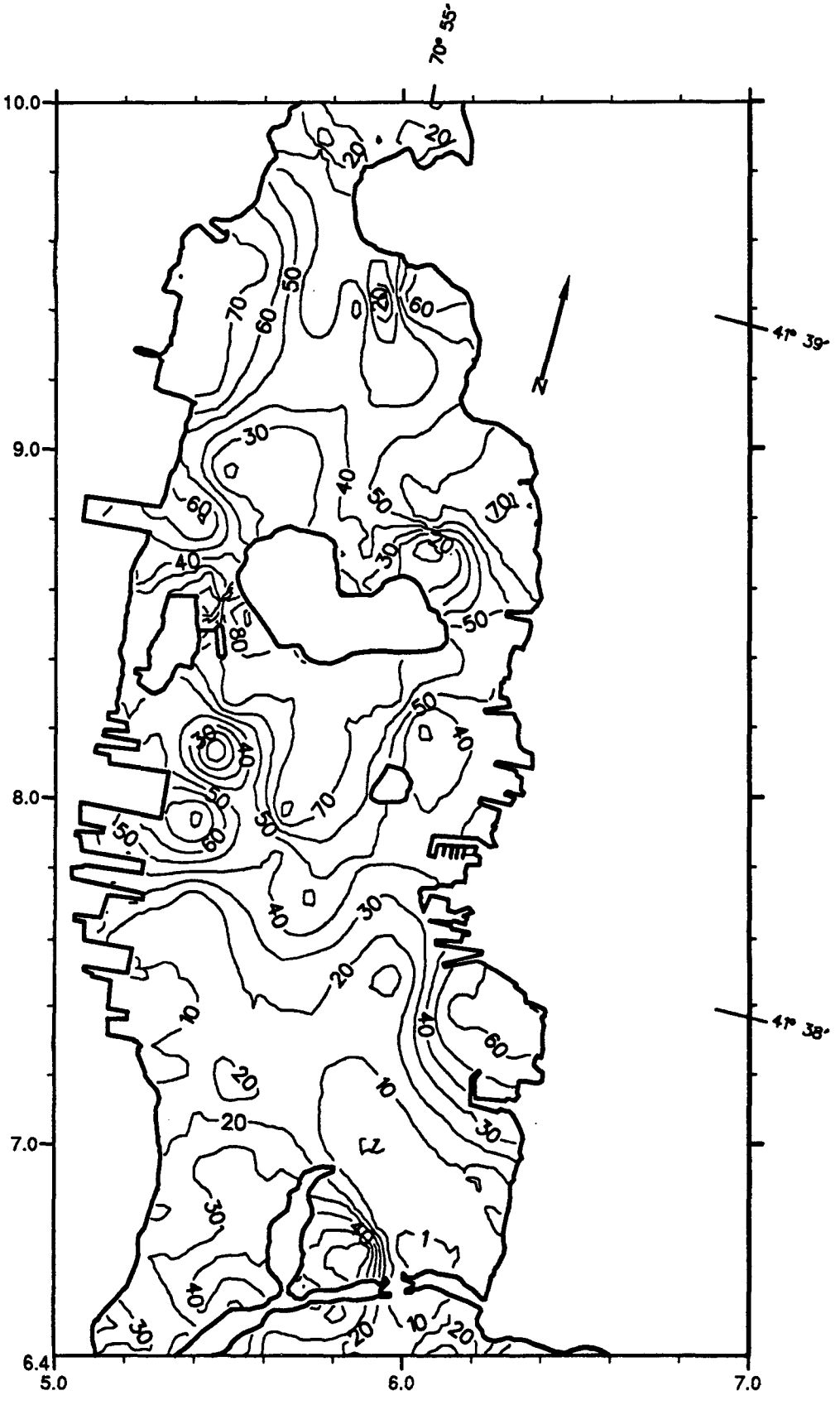

FIGURE E.9. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SILT FRACTION. MIDDLE AREA.

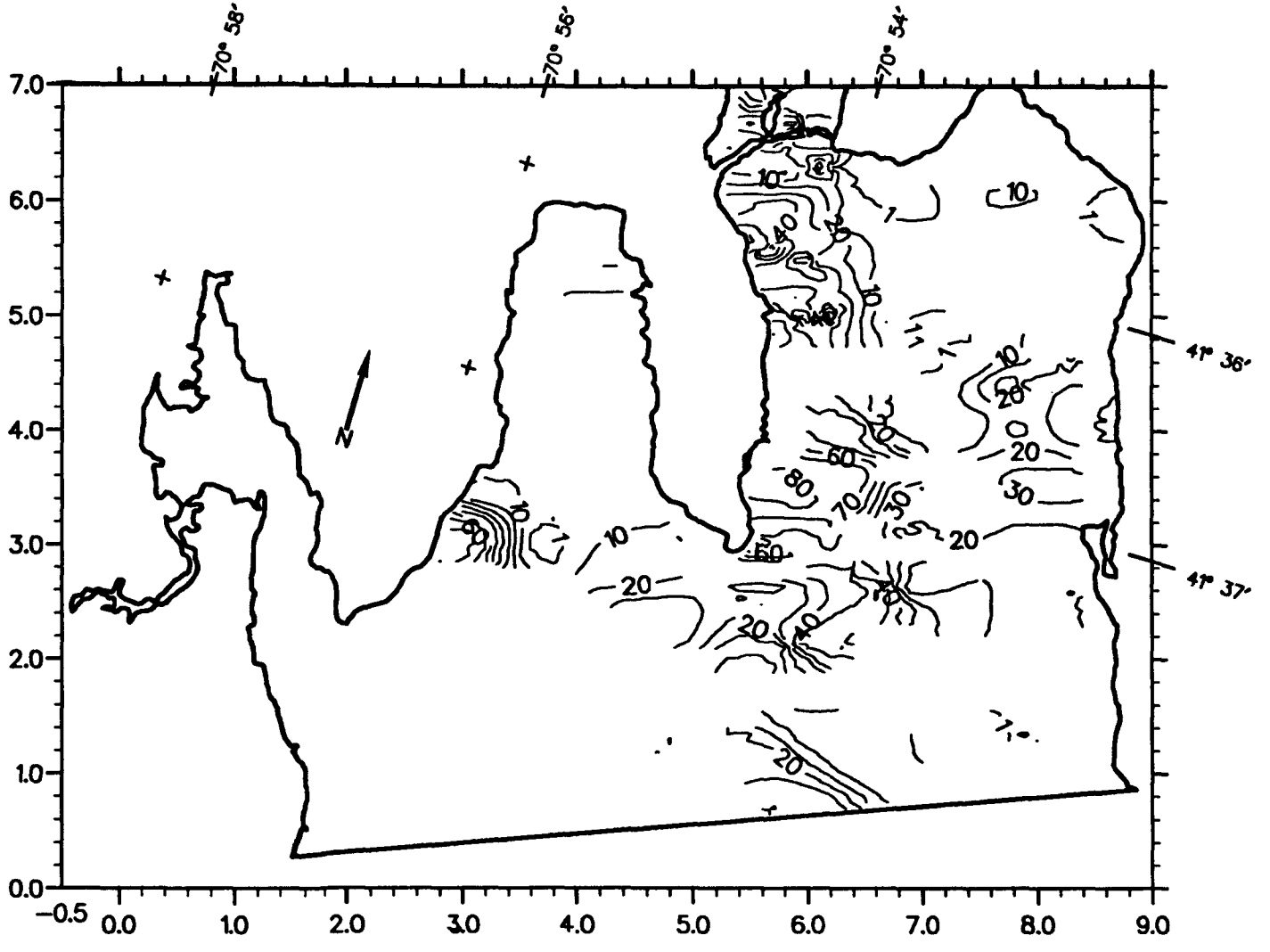

FIGURE E.10. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SILT FRACTION. SOUTHERN AREA.

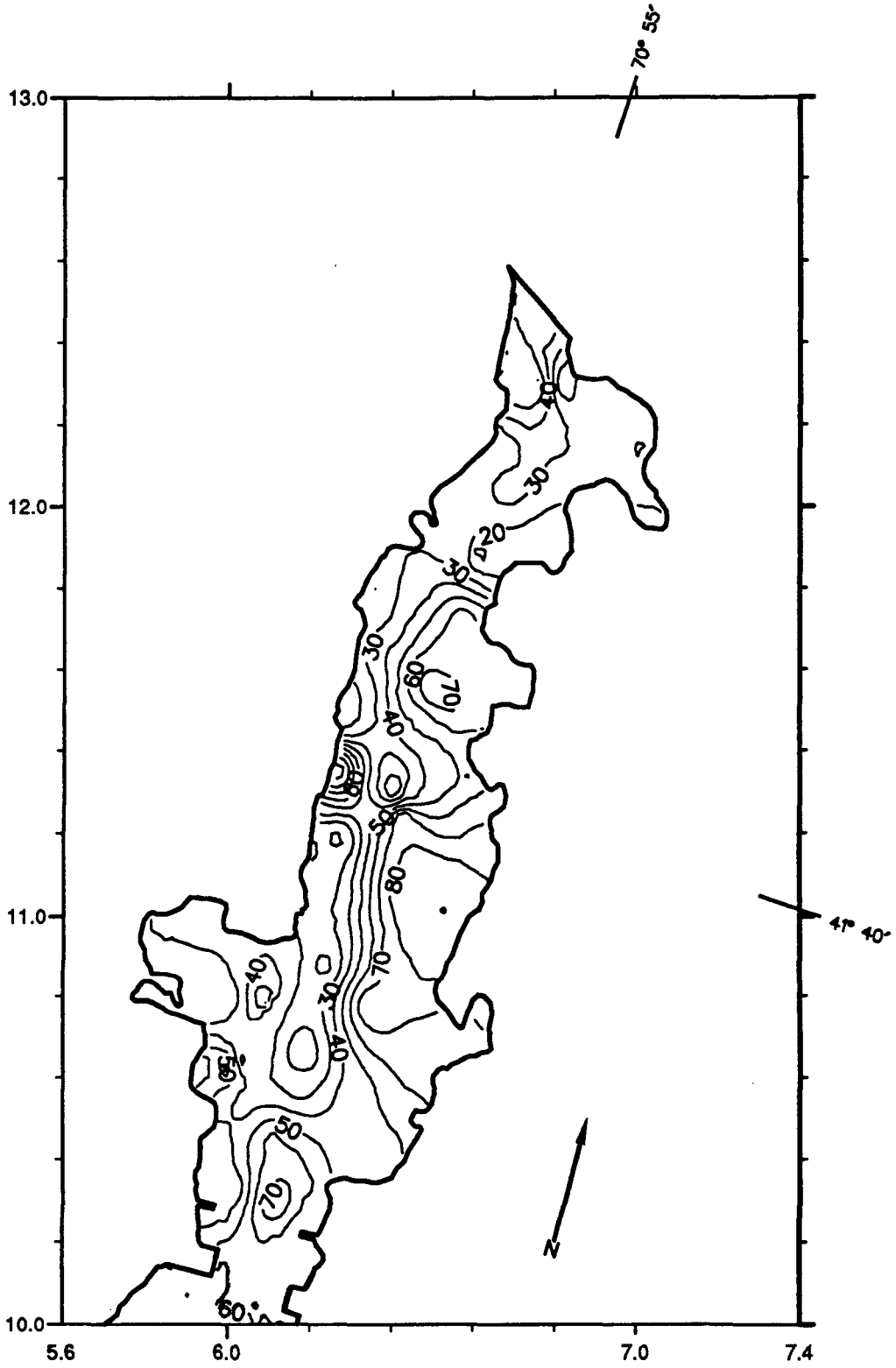

FIGURE E.11. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SAND FRACTION. NORTHERN AREA.

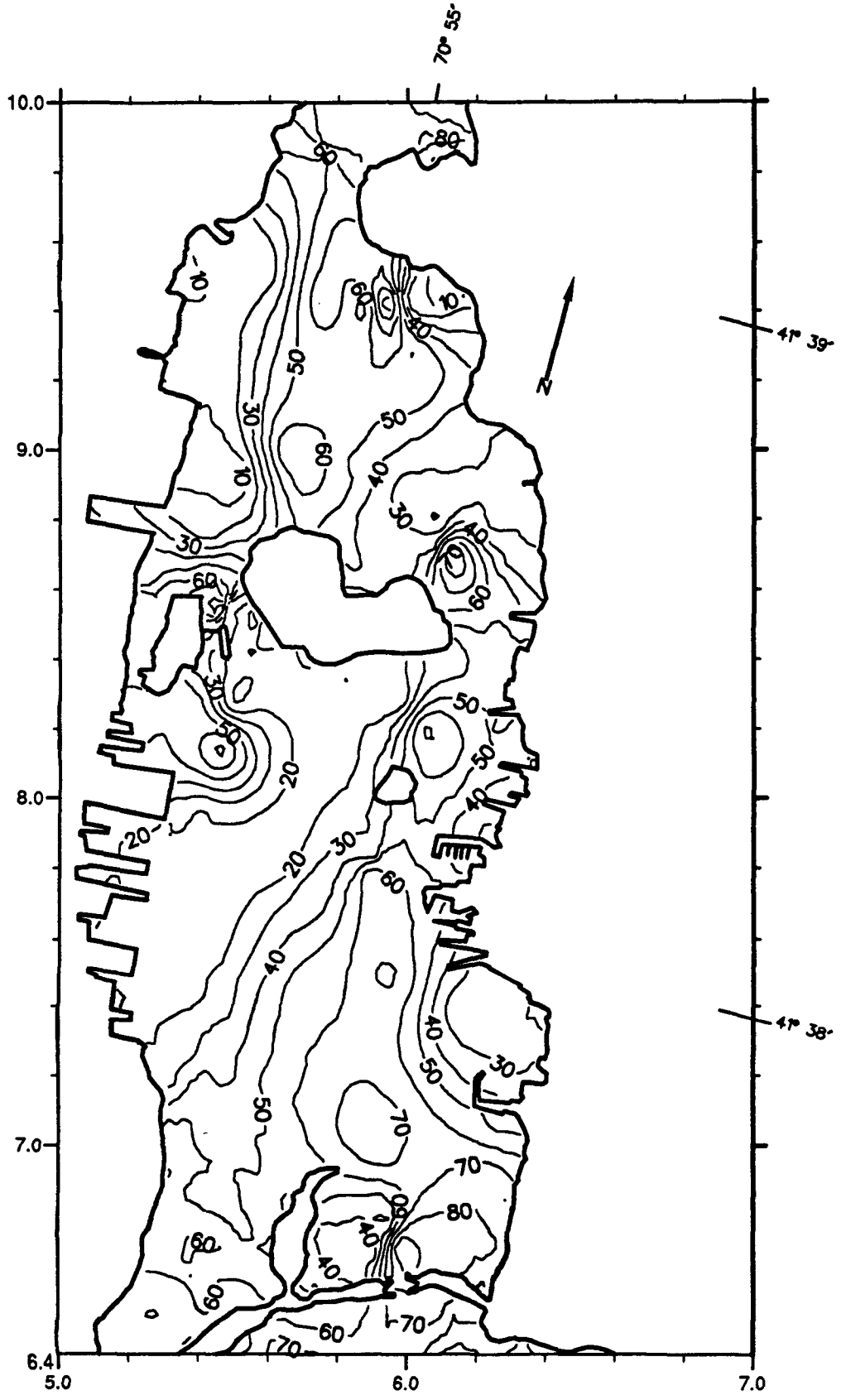

FIGURE E.12. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SAND FRACTION. MIDDLE AREA.

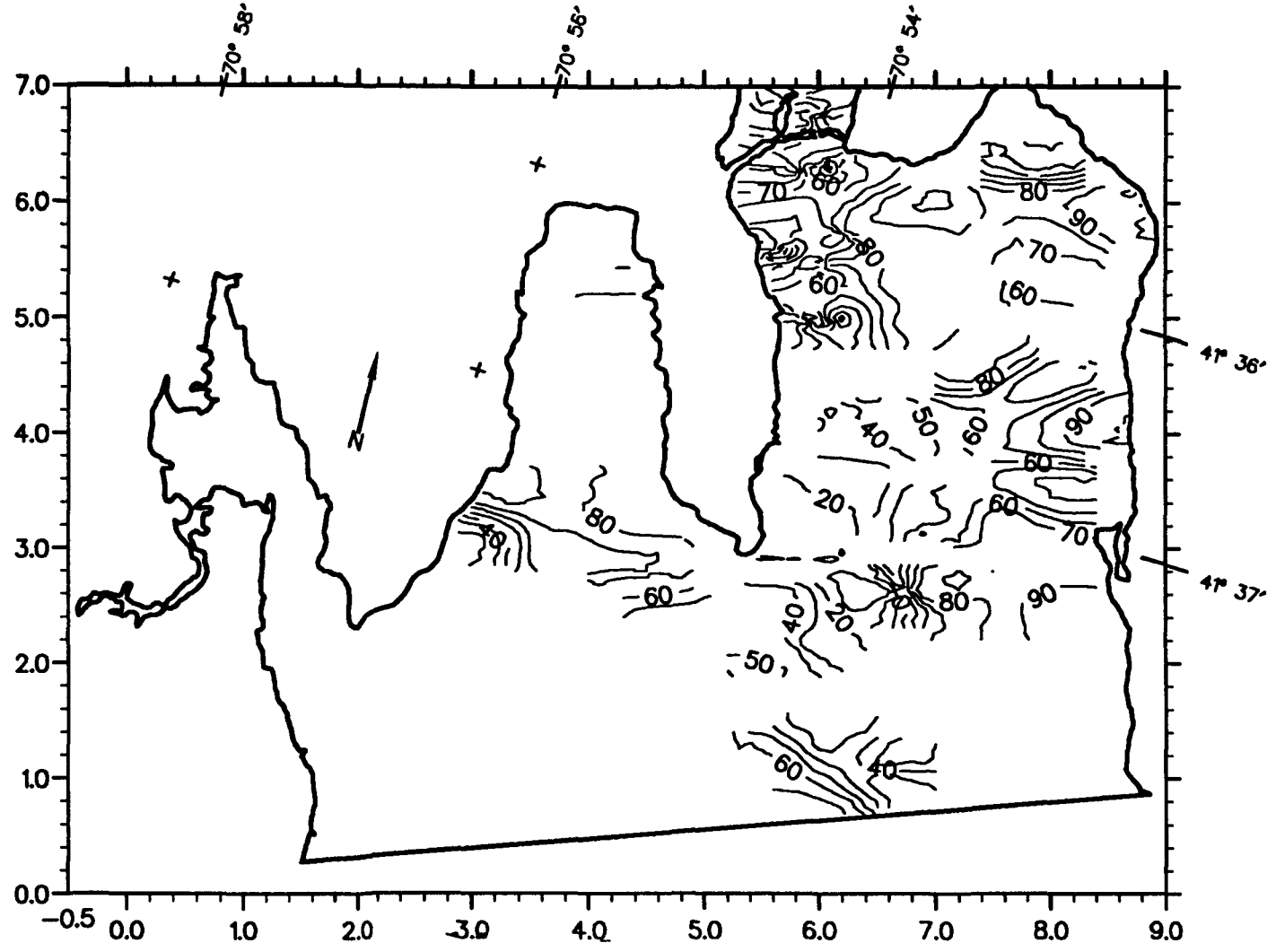

FIGURE E.13. BED SEDIMENT GRAIN SIZE DISTRIBUTION. SAND FRACTION. SOUTHERN AREA.

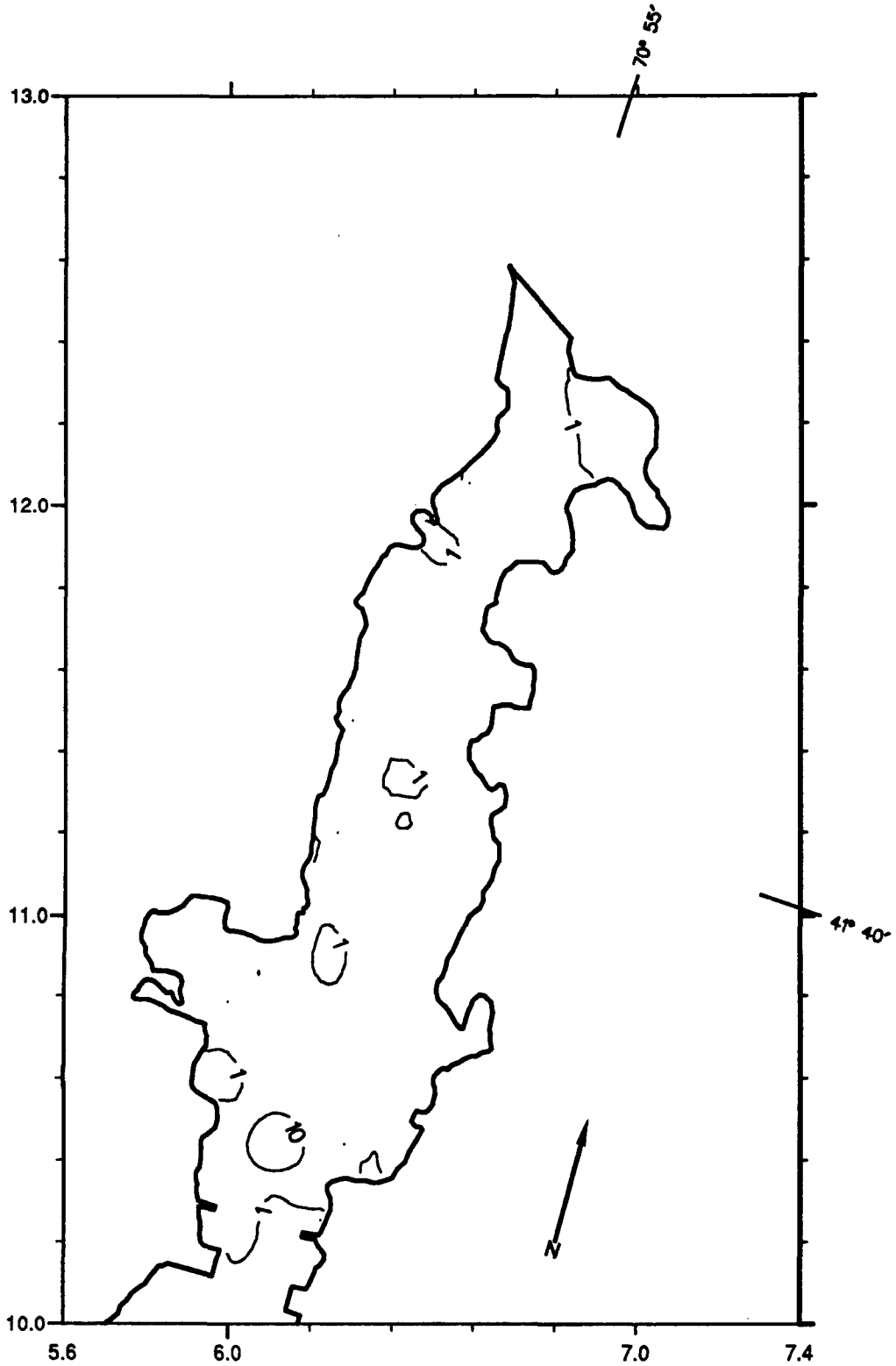

FIGURE E.14. BED SEDIMENT GRAIN SIZE DISTRIBUTION. GRAVEL FRACTION. NORTHERN AREA.

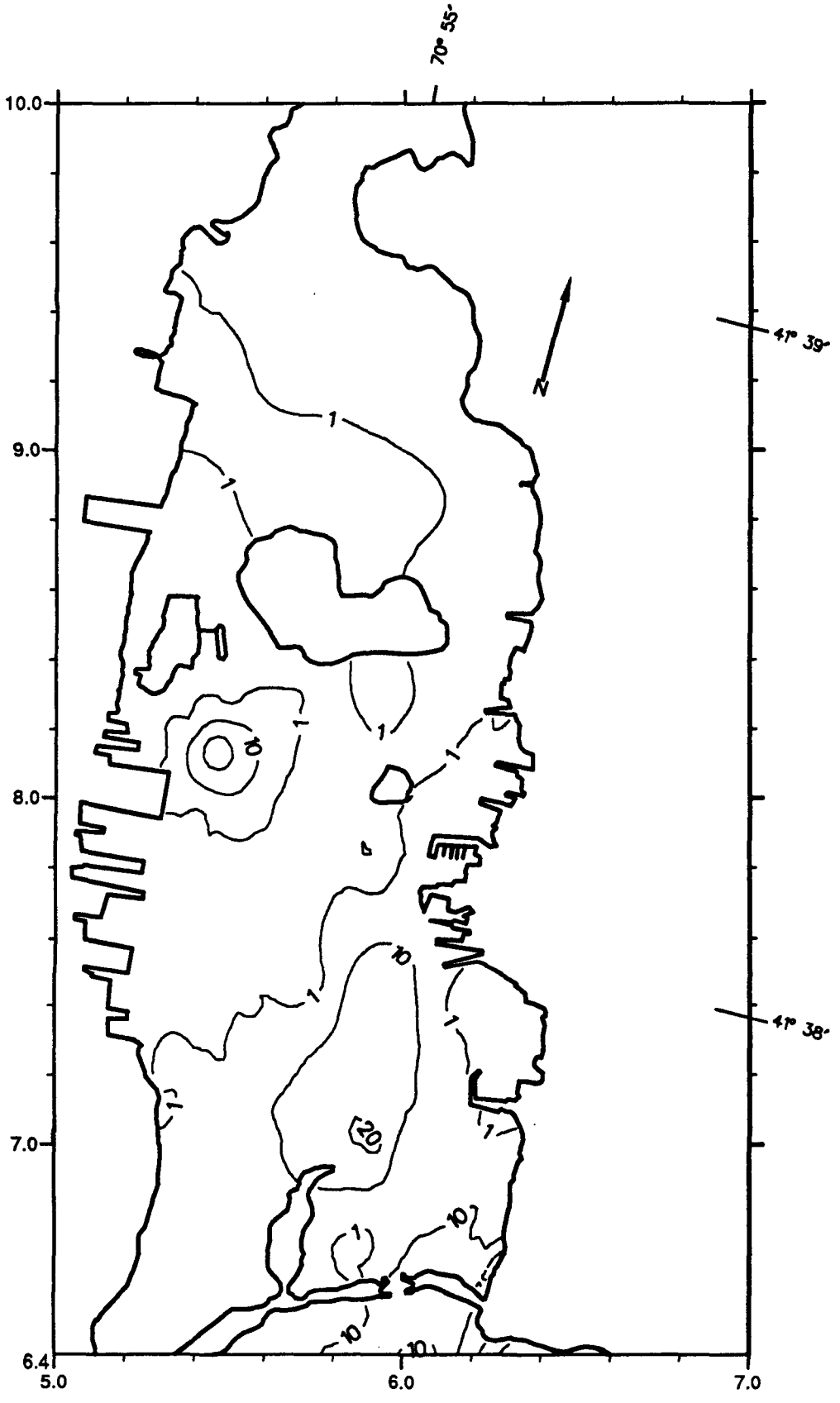

FIGURE E.15. BED SEDIMENT GRAIN SIZE DISTRIBUTION. GRAVEL FRACTION. MIDDLE AREA.

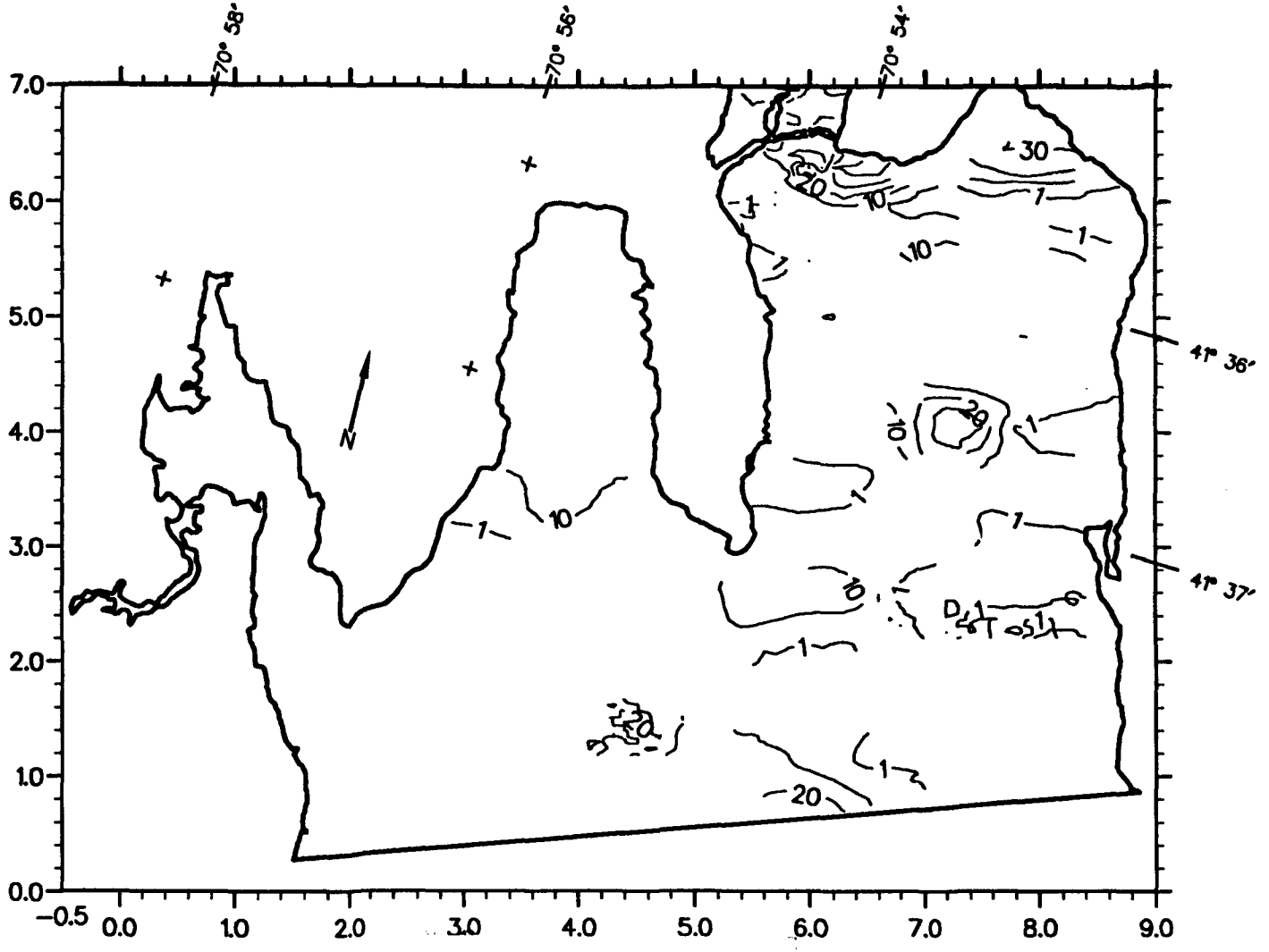

FIGURE E.16. BED SEDIMENT GRAIN SIZE DISTRIBUTION. GRAVEL FRACTION. SOUTHERN AREA.

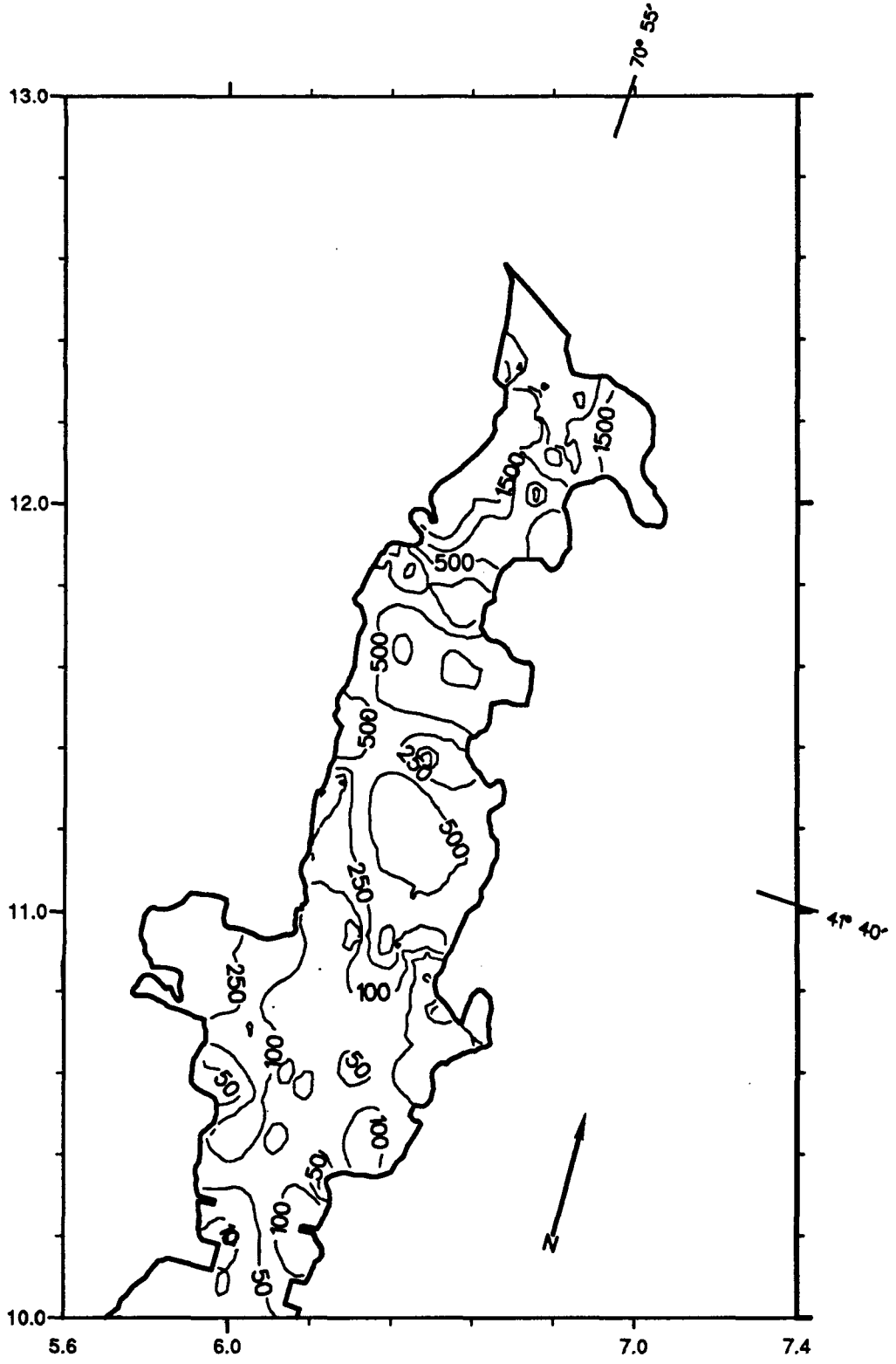

FIGURE E.17. MEASURED PCB CONCENTRATIONS IN SURFICIAL BED SEDIMENTS (mg/kg). NORTHERN AREA.

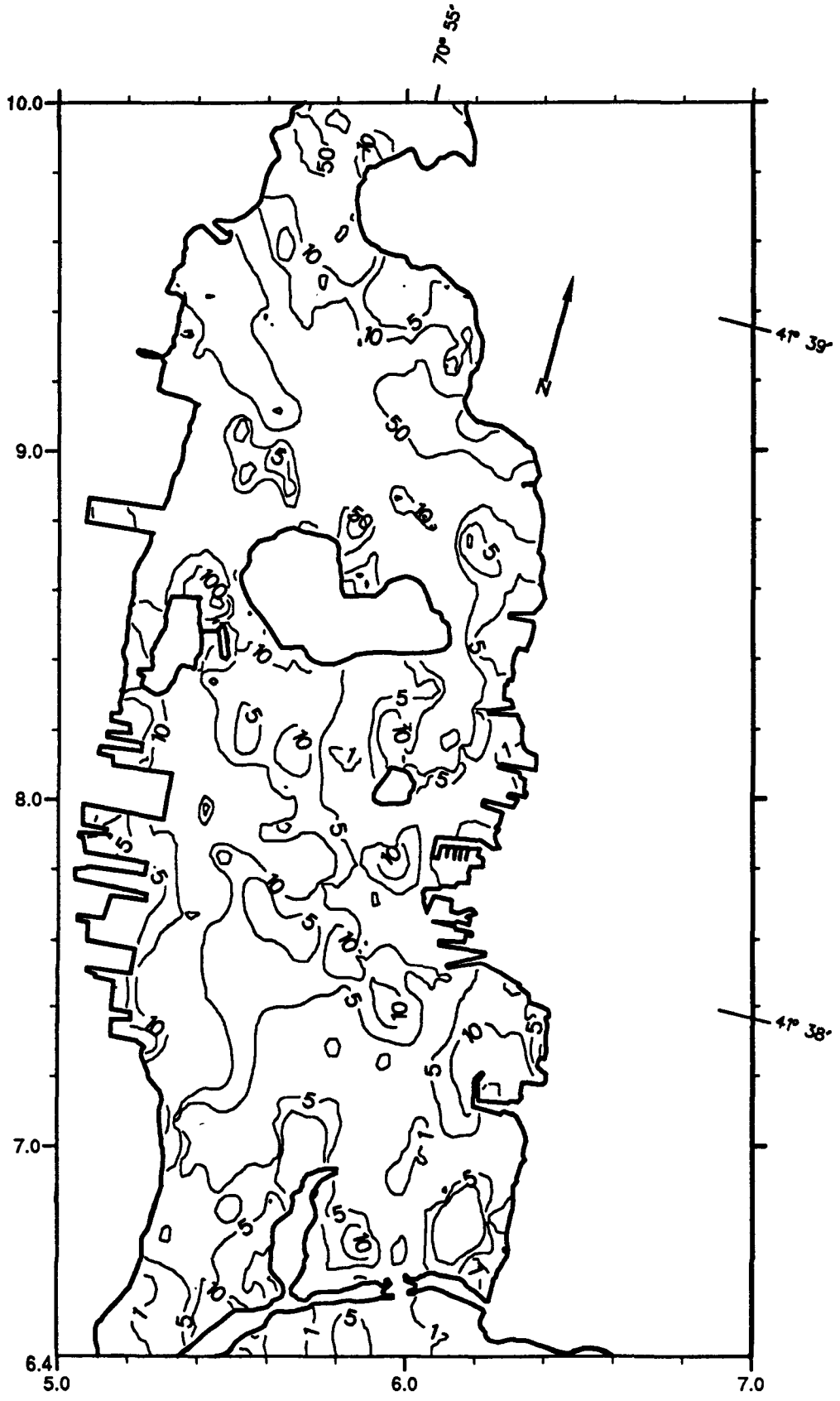

FIGURE E.18. MEASURED PCB CONCENTRATIONS IN SURFICIAL BED SEDIMENTS (mg/kg). MIDDLE AREA.

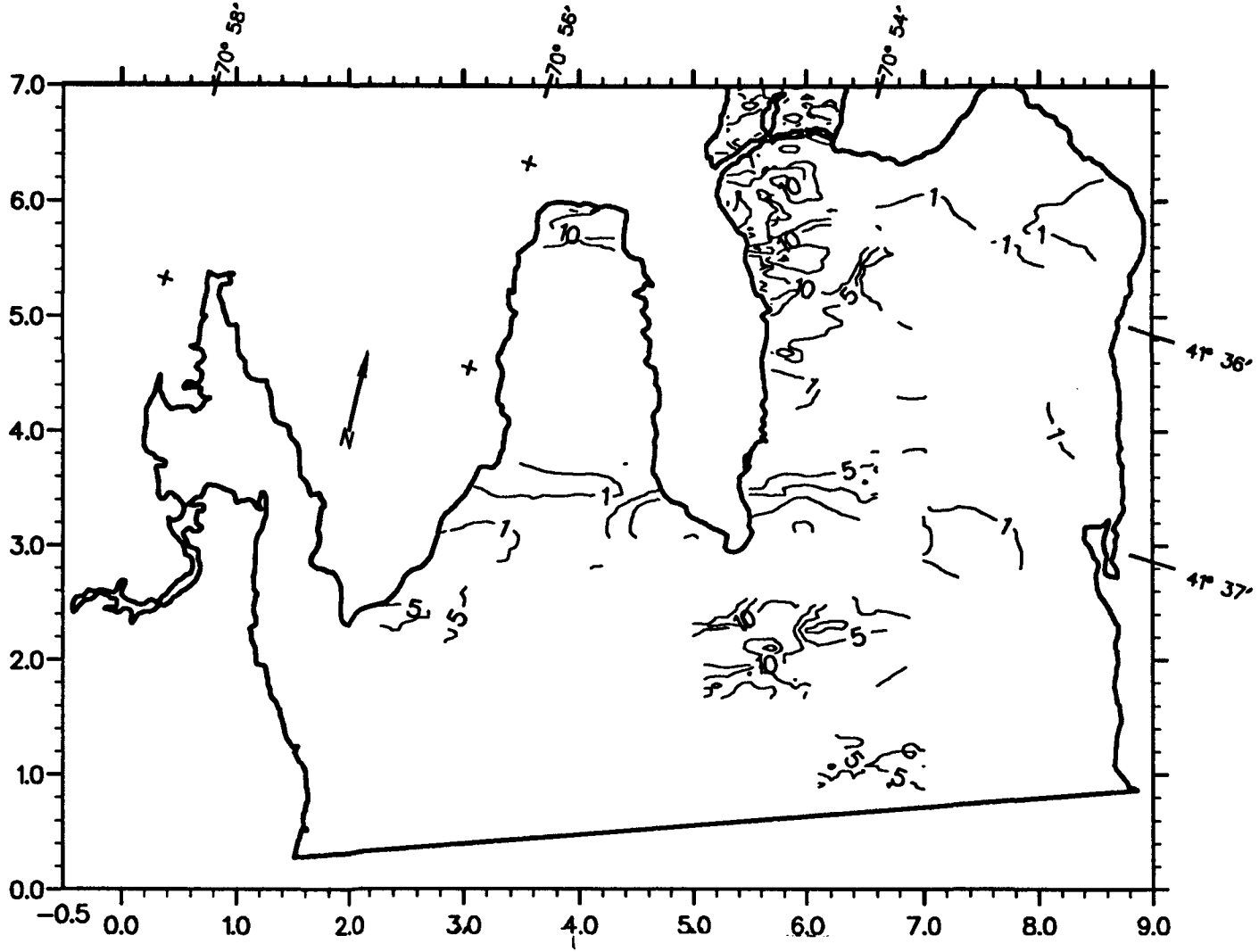

FIGURE E.19. MEASURED PCB CONCENTRATIONS IN SURFICIAL BED SEDIMENTS (mg/kg). SOUTHERN AREA.

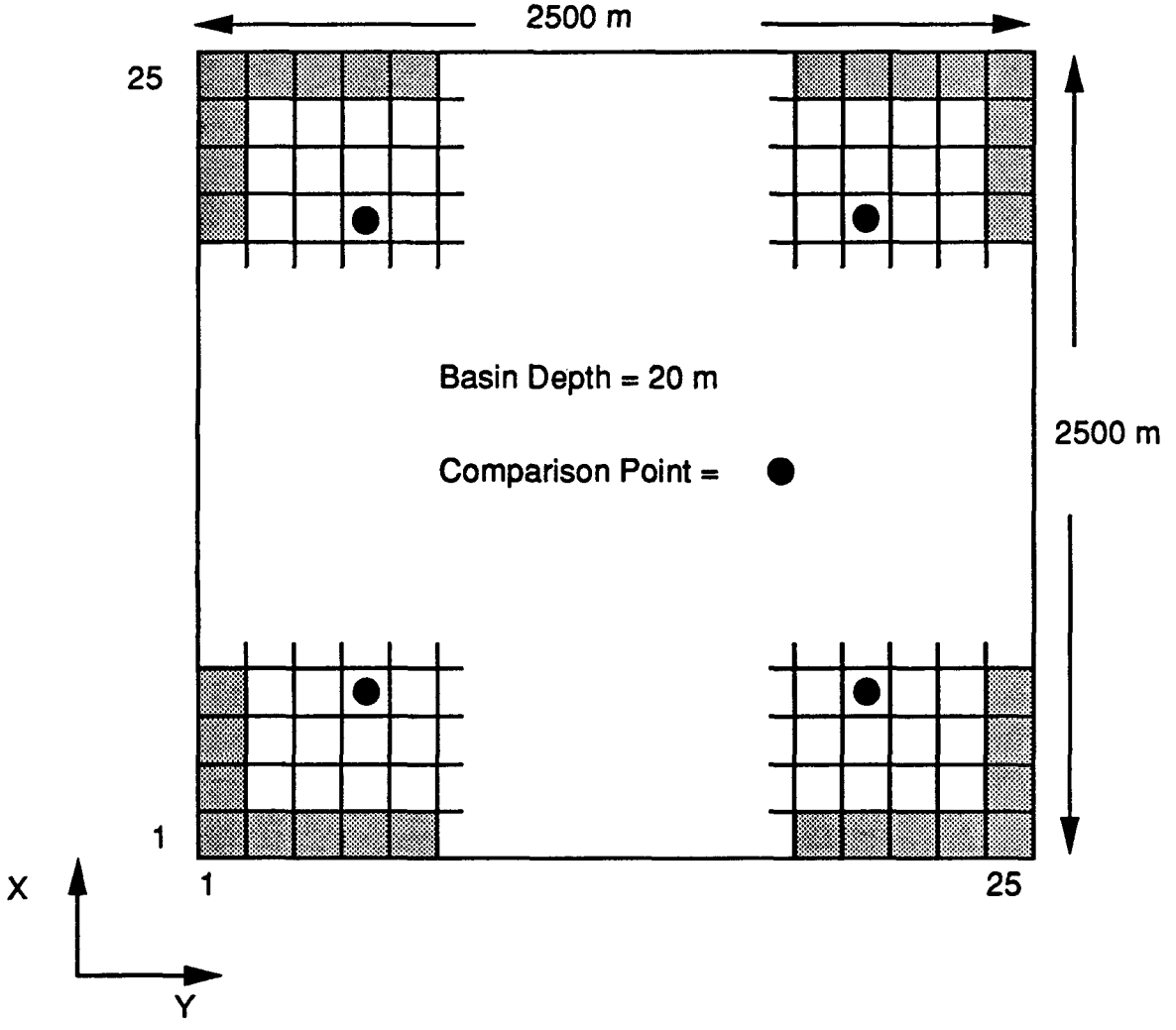

FIGURE E.20. TEST CONFIGURATION FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX. SHADED CELLS ARE USED BY TEMPEST/FLESCOT TO SET BOUNDARY CONDITIONS.

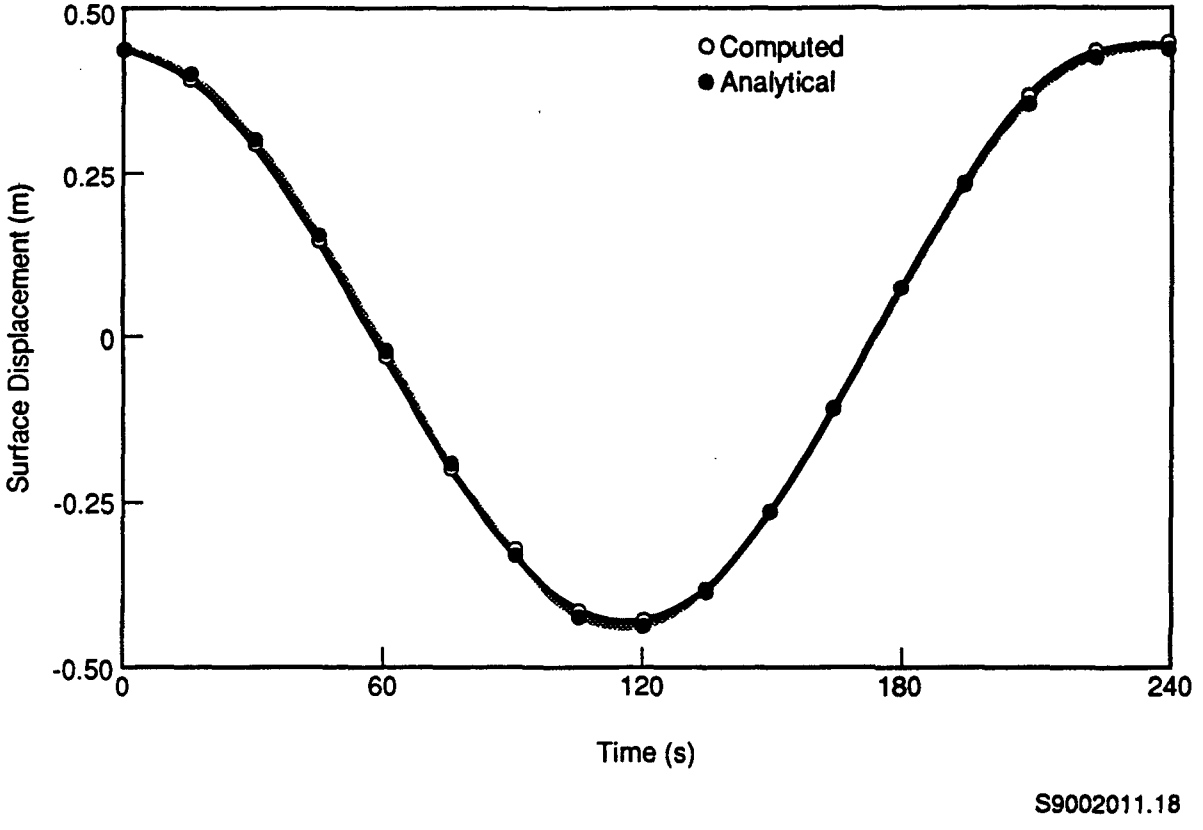

FIGURE E.21. WATER SURFACE DISPLACEMENT AT LOCATION 4,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

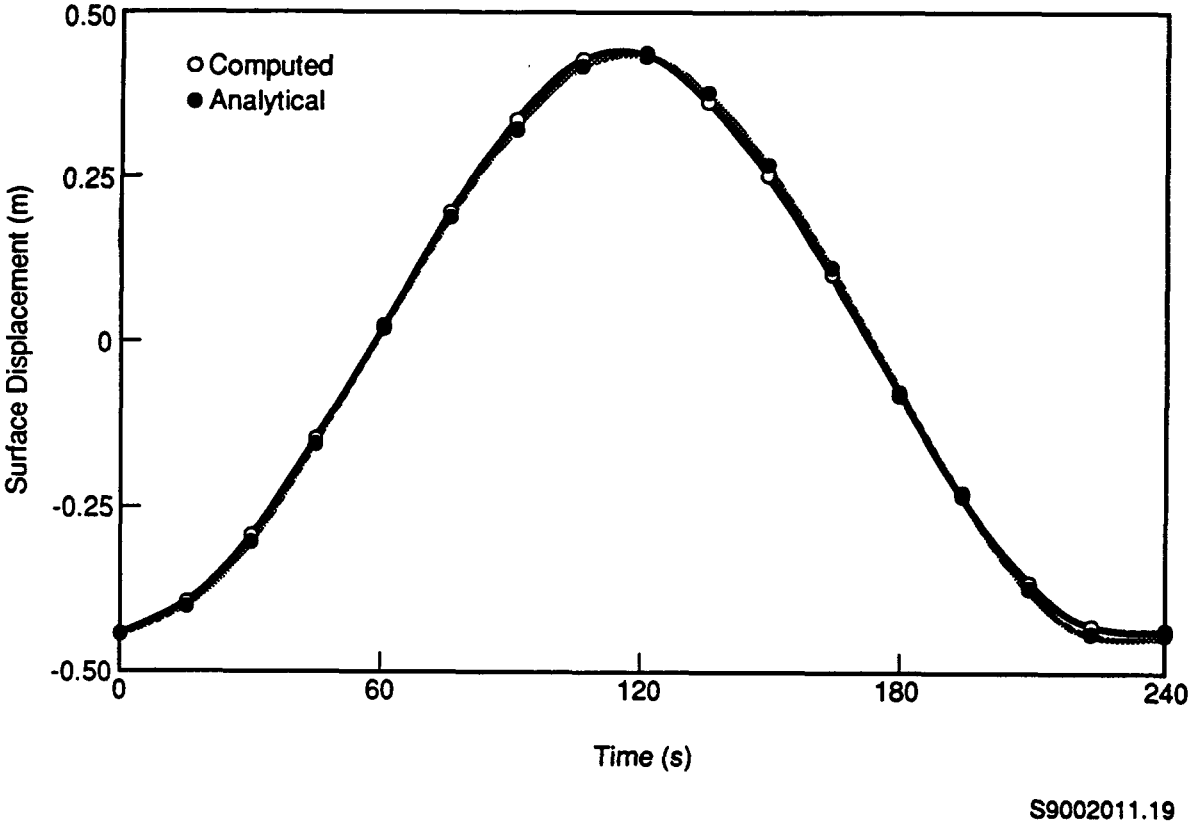

FIGURE E.22. WATER SURFACE DISPLACEMENT AT LOCATION 4,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

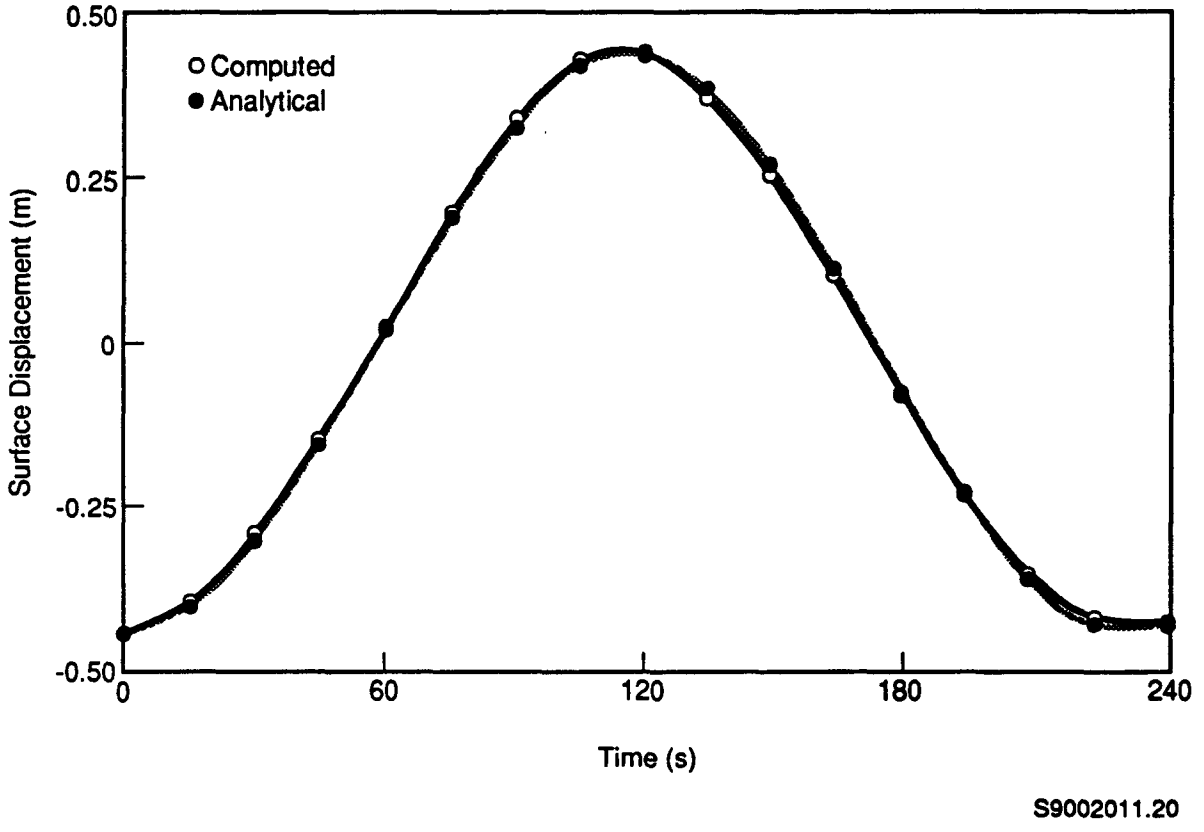

FIGURE E.23. WATER SURFACE DISPLACEMENT AT LOCATION 22,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

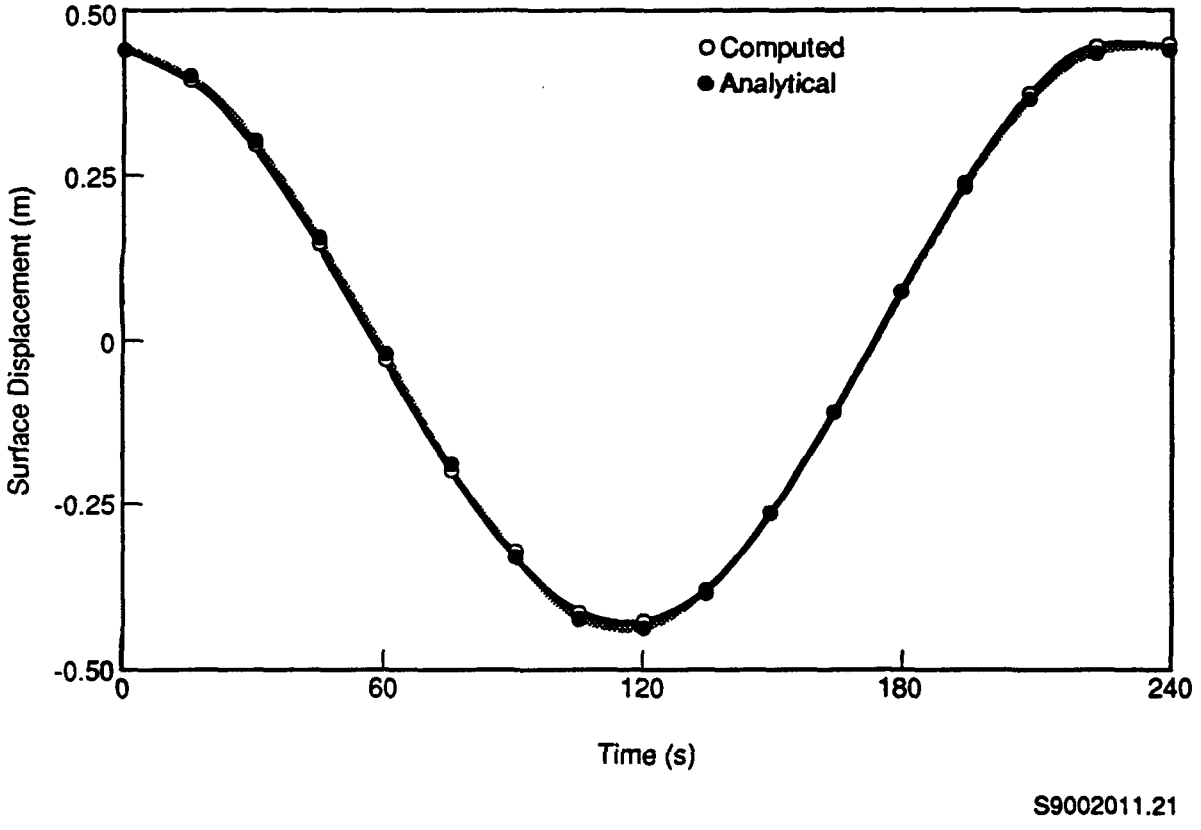

FIGURE E.24. WATER SURFACE DISPLACEMENT AT LOCATION 22,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

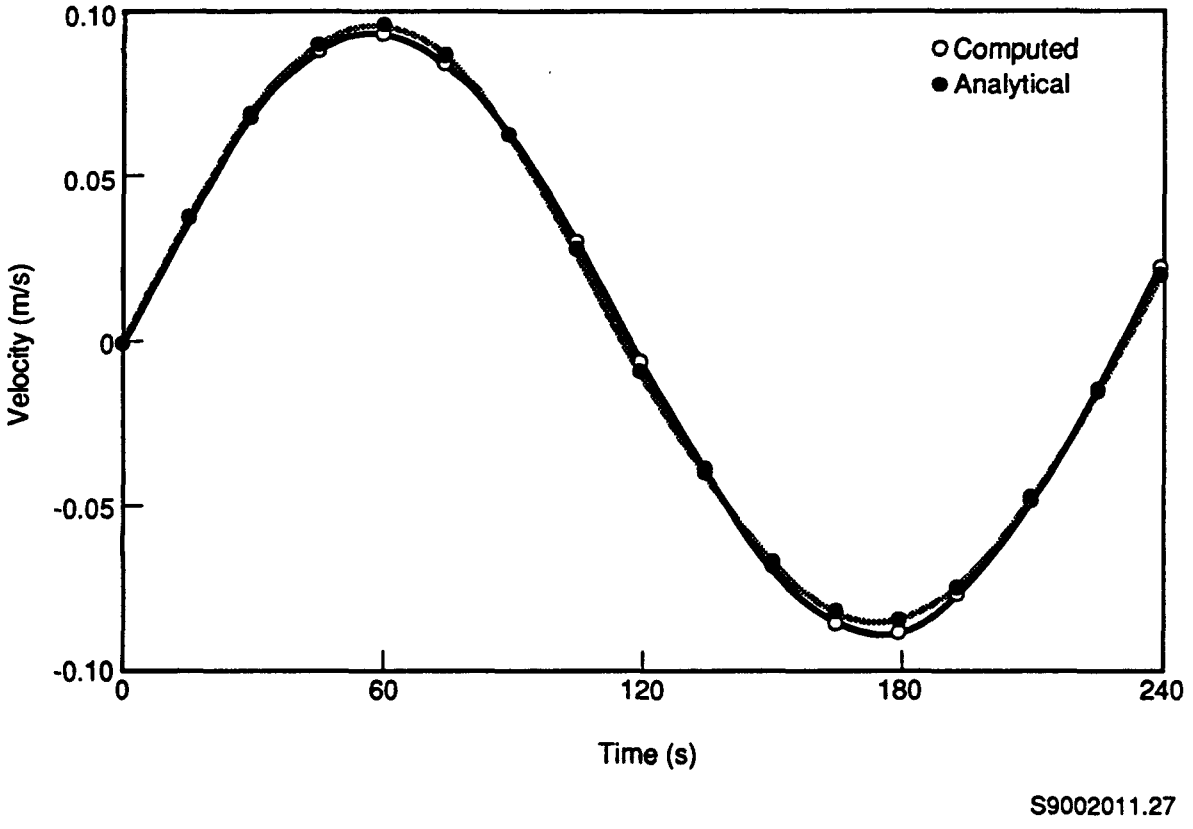

FIGURE E.25. THE Y-DIRECTION VELOCITY AT LOCATION 4,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

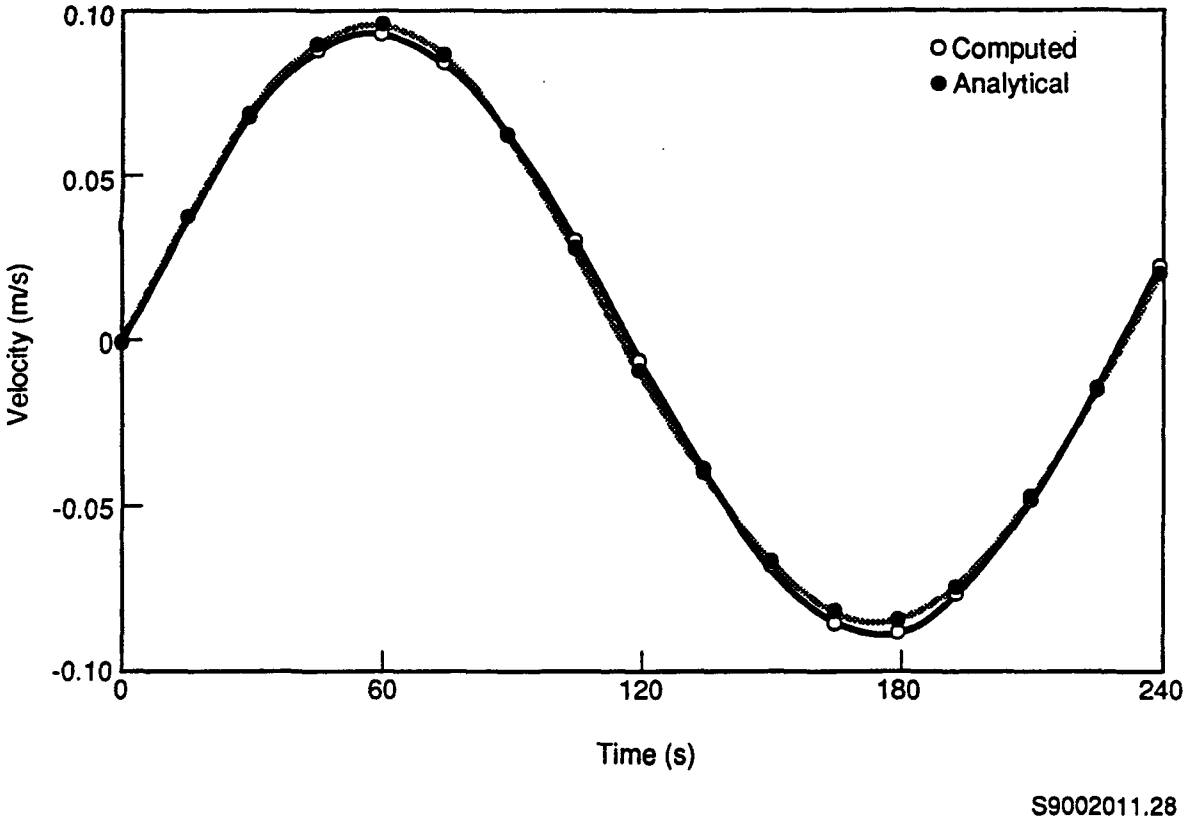

FIGURE E.26. THE X-DIRECTION VELOCITY AT LOCATION 4,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

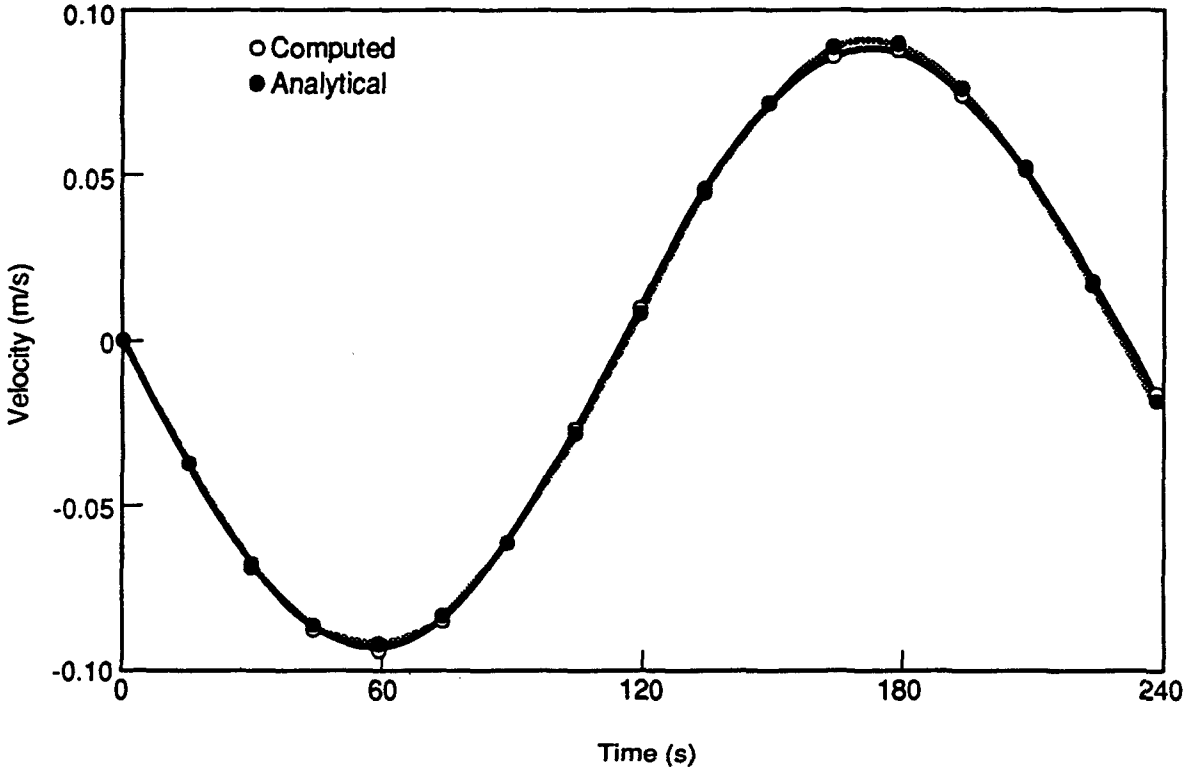

FIGURE E.27. THE Y-DIRECTION VELOCITY AT LOCATION 4,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

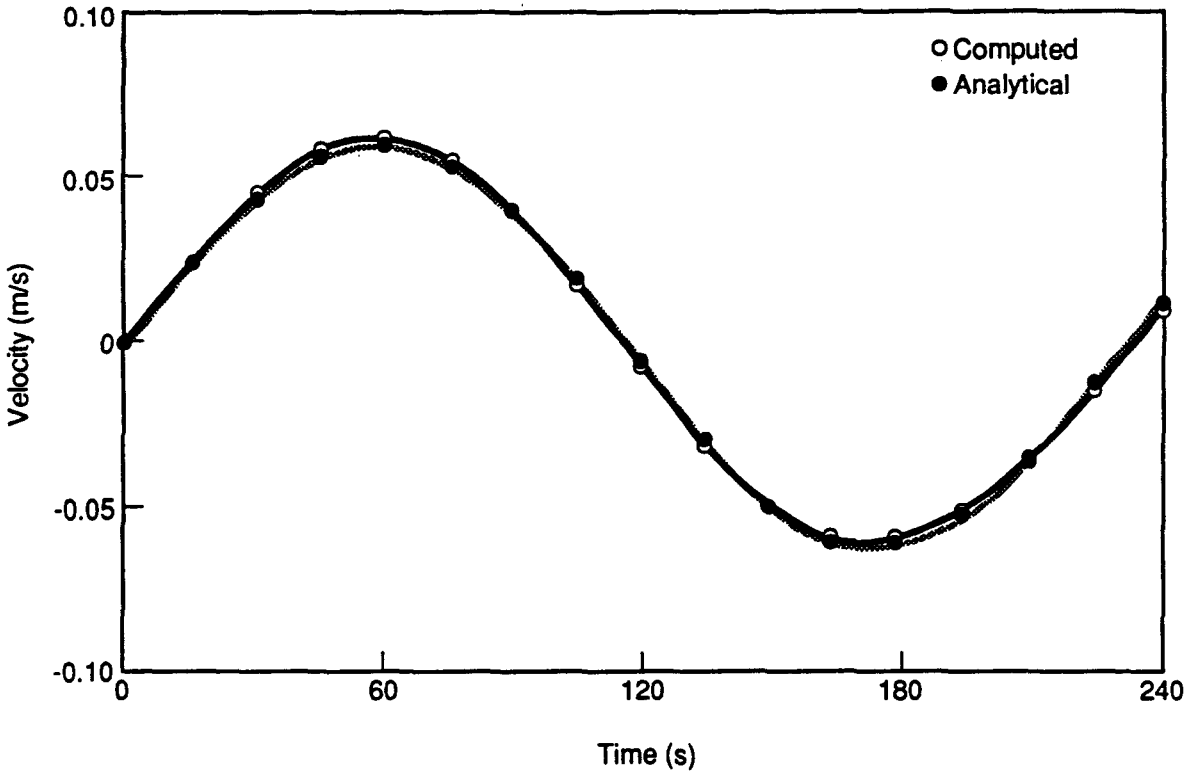

FIGURE E.28. THE X-DIRECTION VELOCITY AT LOCATION 4,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

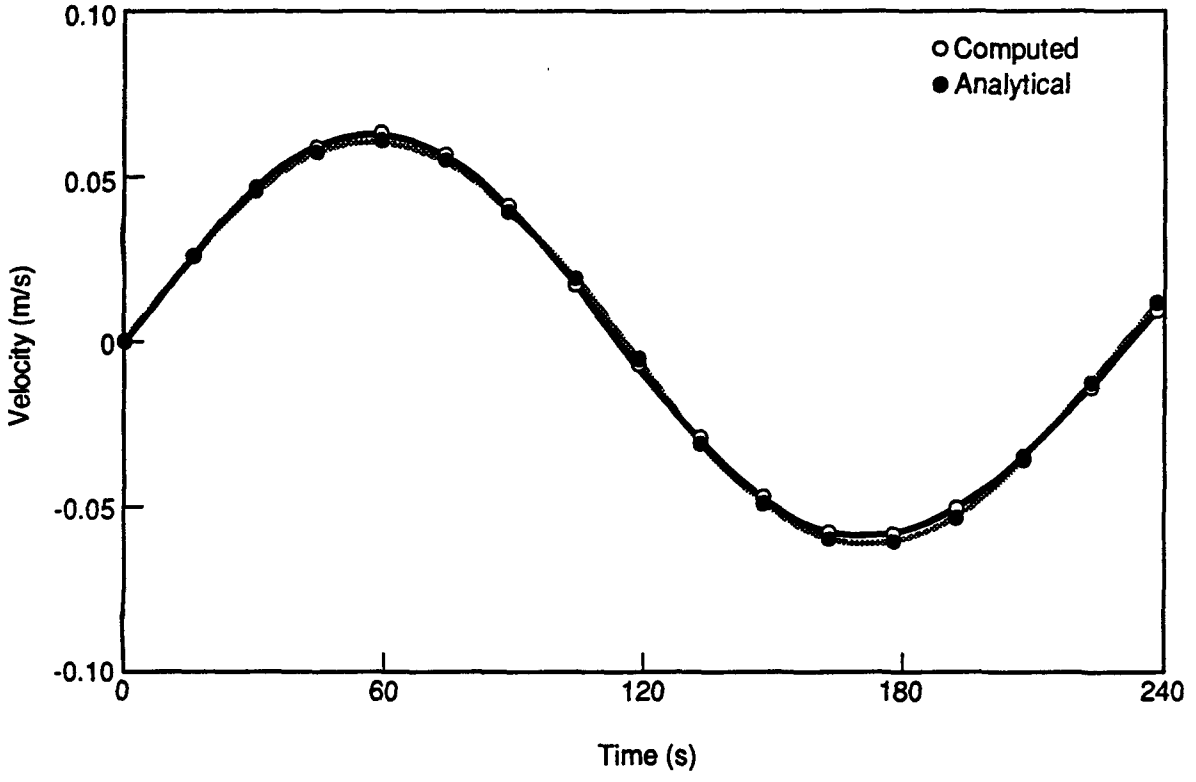

FIGURE E.29. THE Y-DIRECTION VELOCITY AT LOCATION 22,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

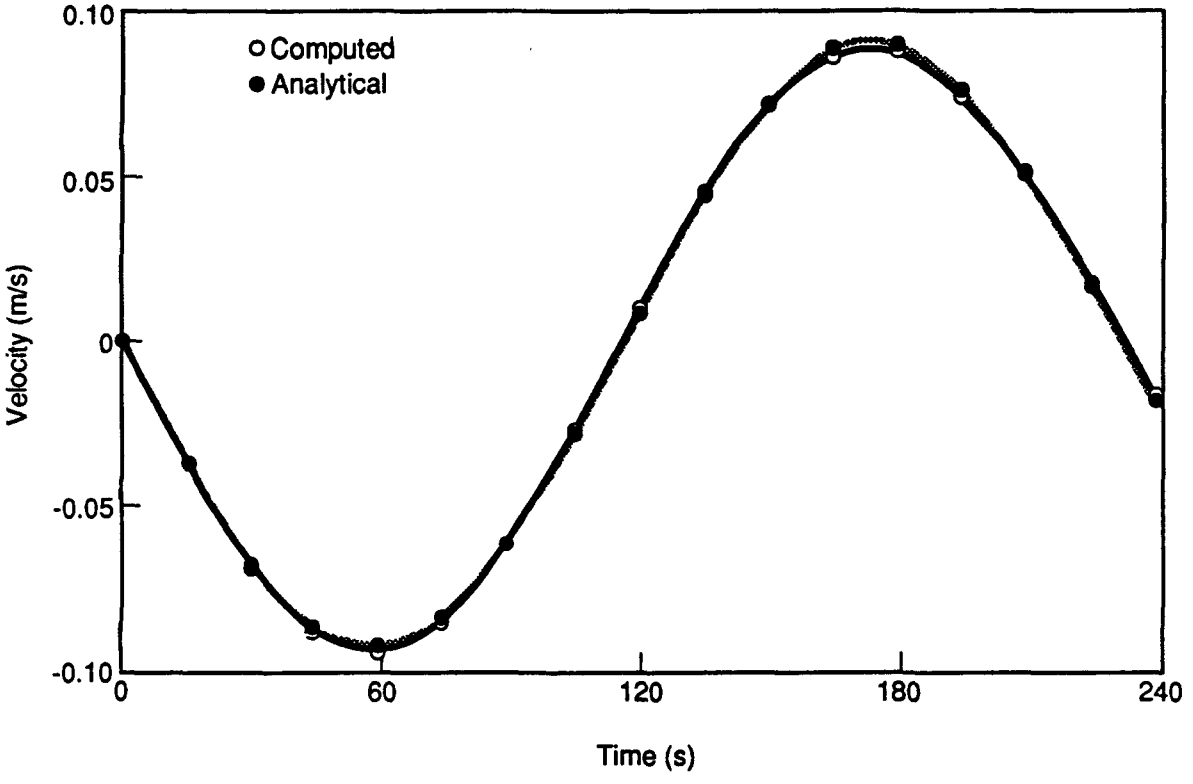

FIGURE E.30. THE X-DIRECTION VELOCITY AT LOCATION 22,4 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

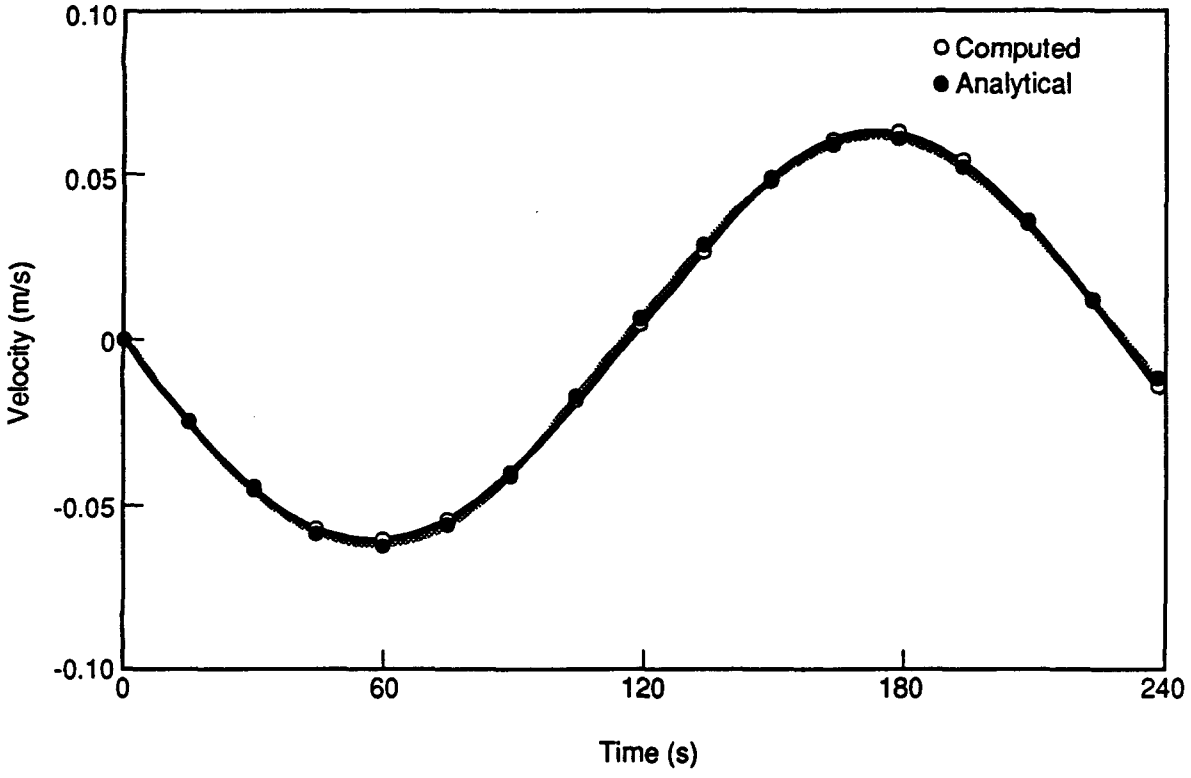

FIGURE E.31. THE Y-DIRECTION VELOCITY AT LOCATION 22,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

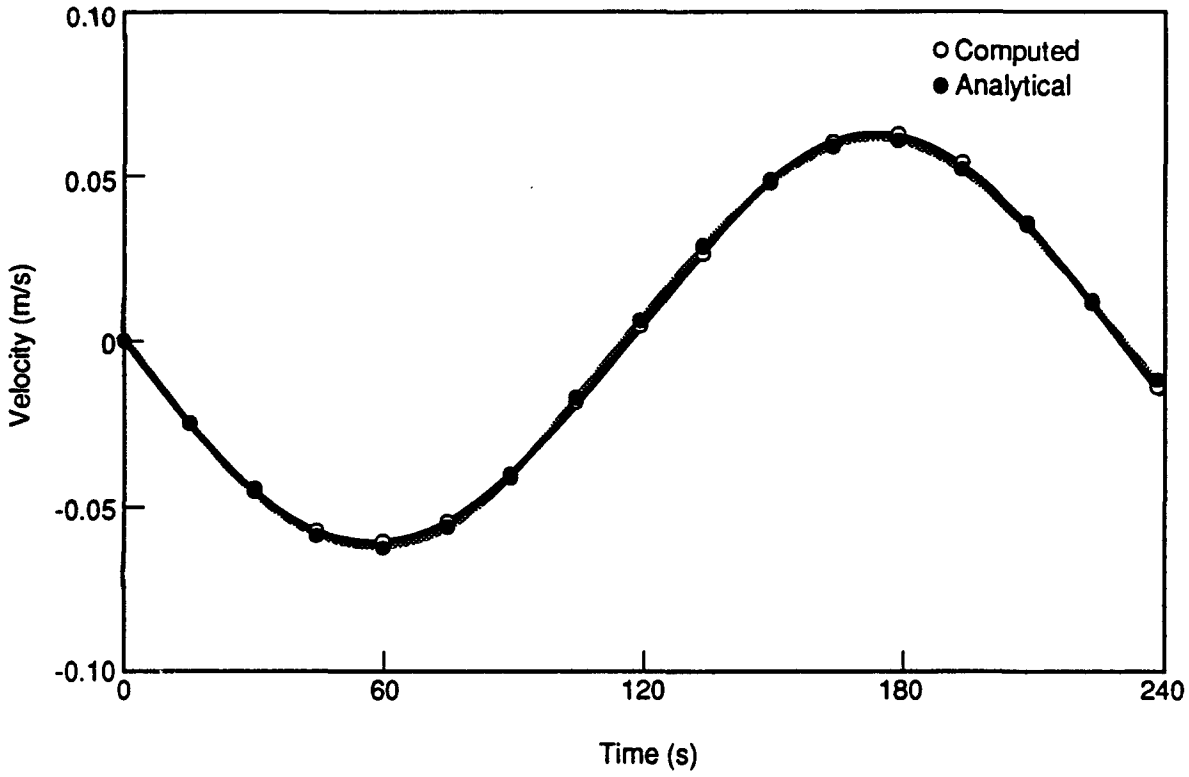

FIGURE E.32. THE X-DIRECTION VELOCITY AT LOCATION 22,22 FOR THREE-DIMENSIONAL OSCILLATIONS IN A RECTANGULAR BOX.

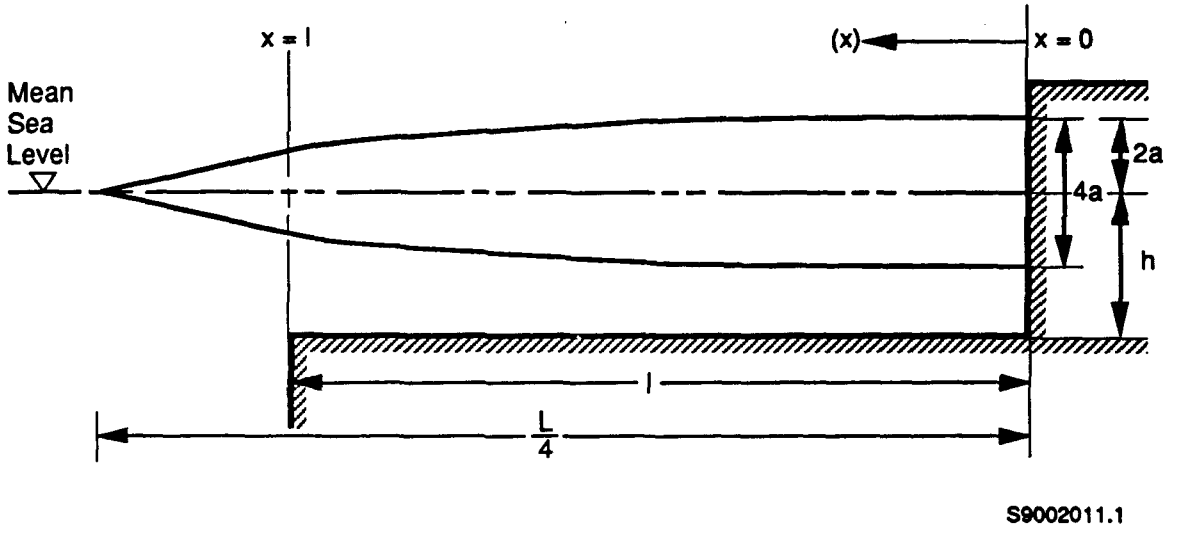

FIGURE E.33. WAVE ENTERING A CHANNEL OF FINITE LENGTH (AFTER IPPEN 1966)

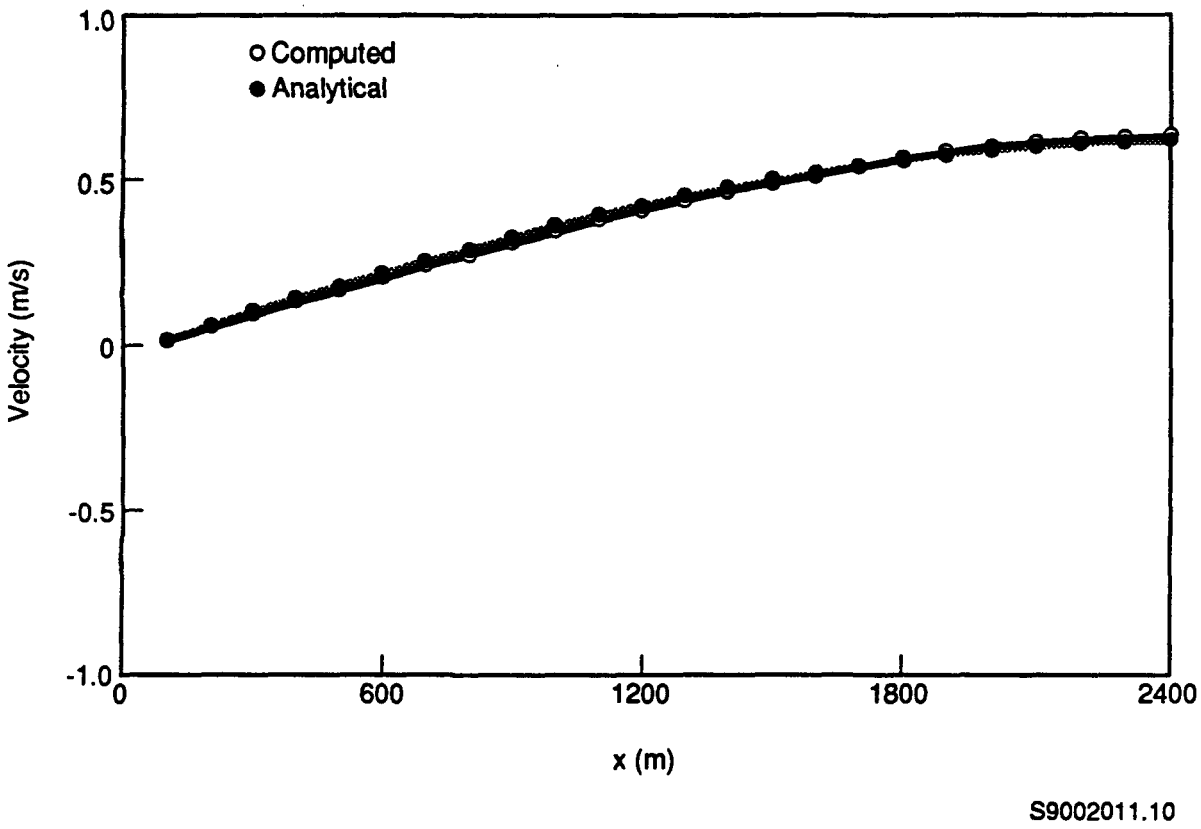

FIGURE E.34. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 1/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

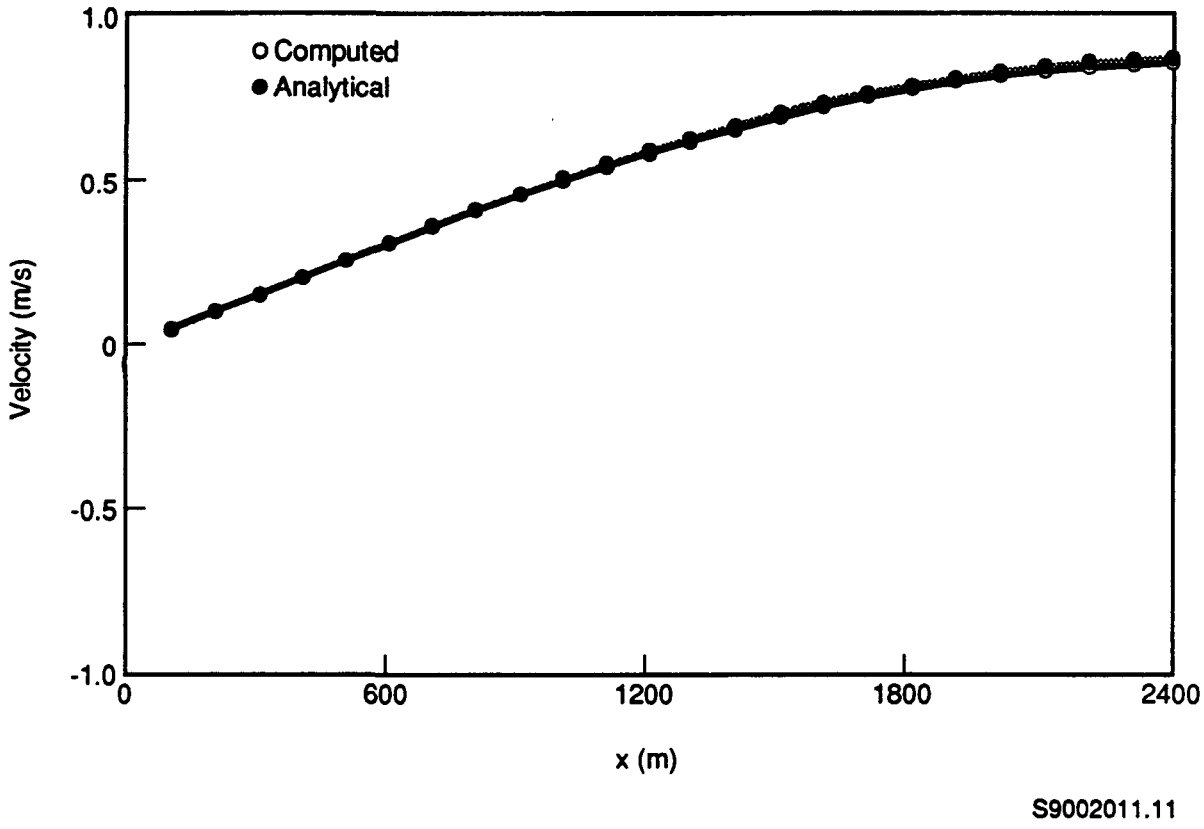

FIGURE E.35. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 2/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

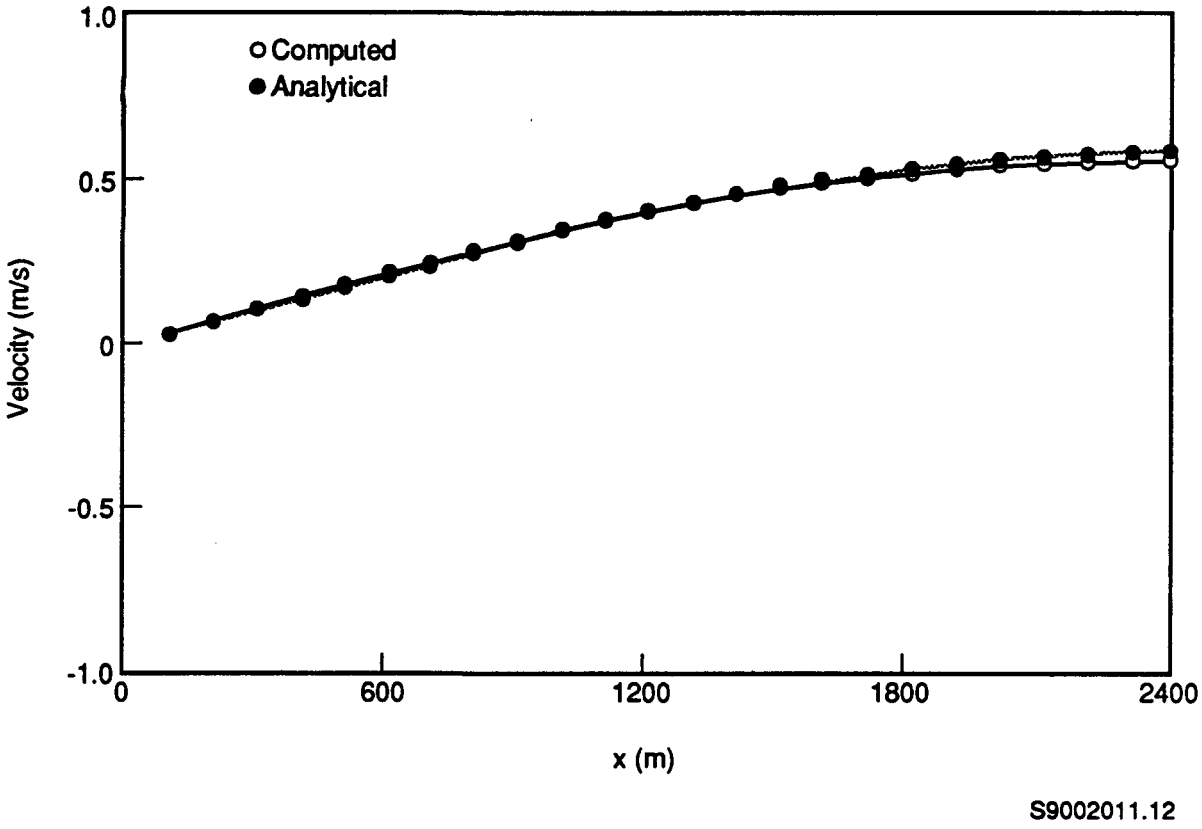

FIGURE E.36. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 3/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

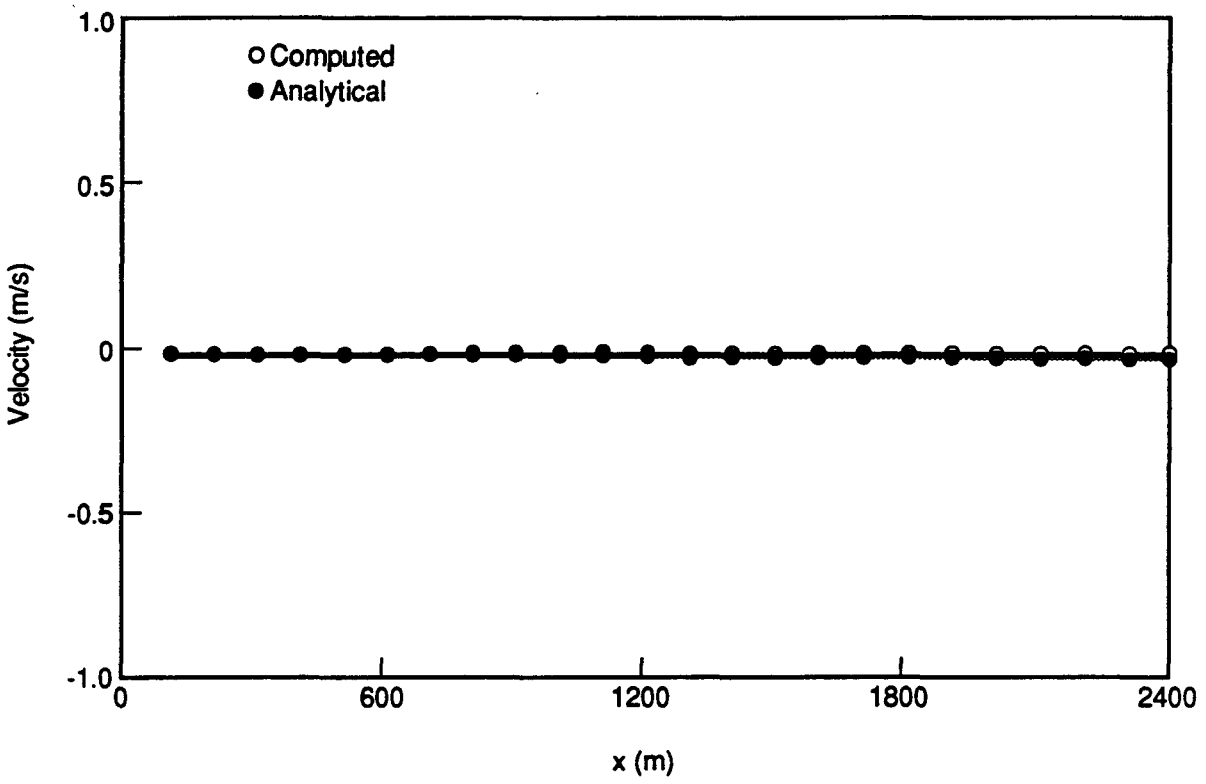

FIGURE E.37. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 4/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

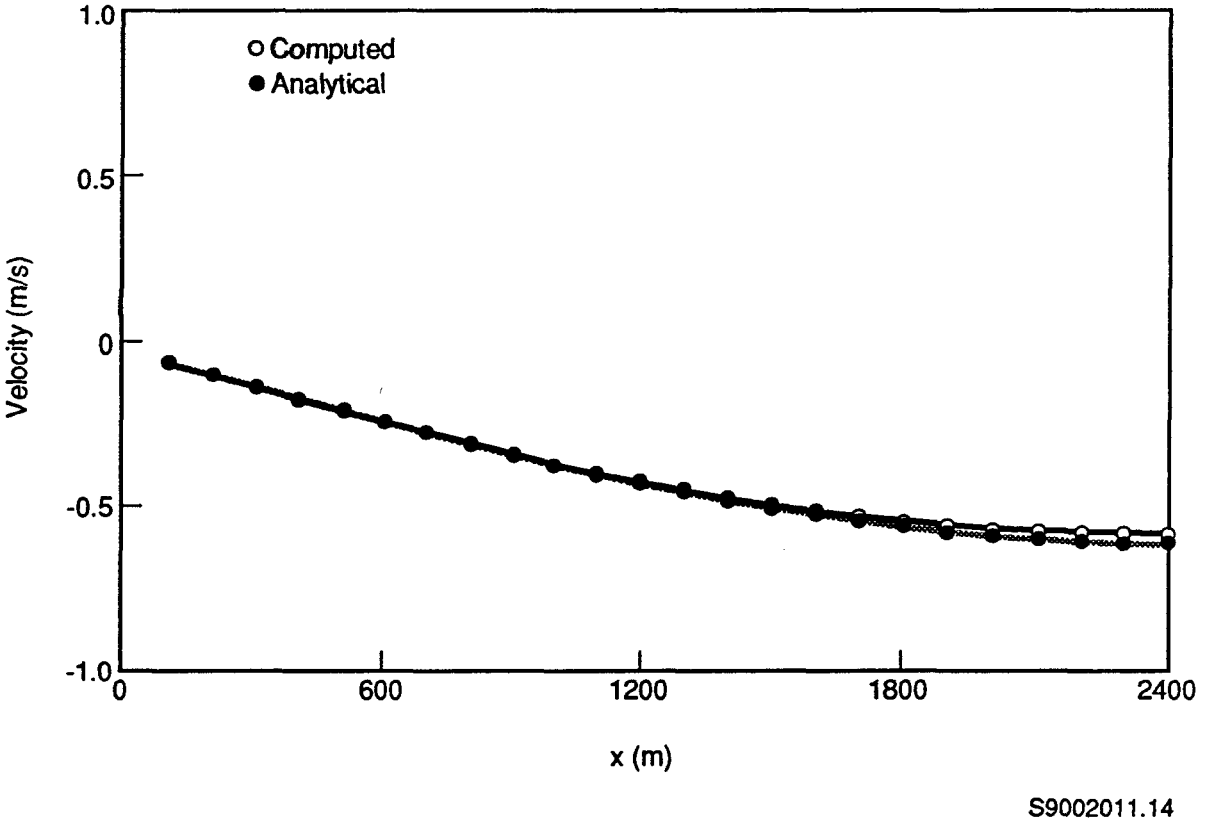

FIGURE E.38. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 5/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

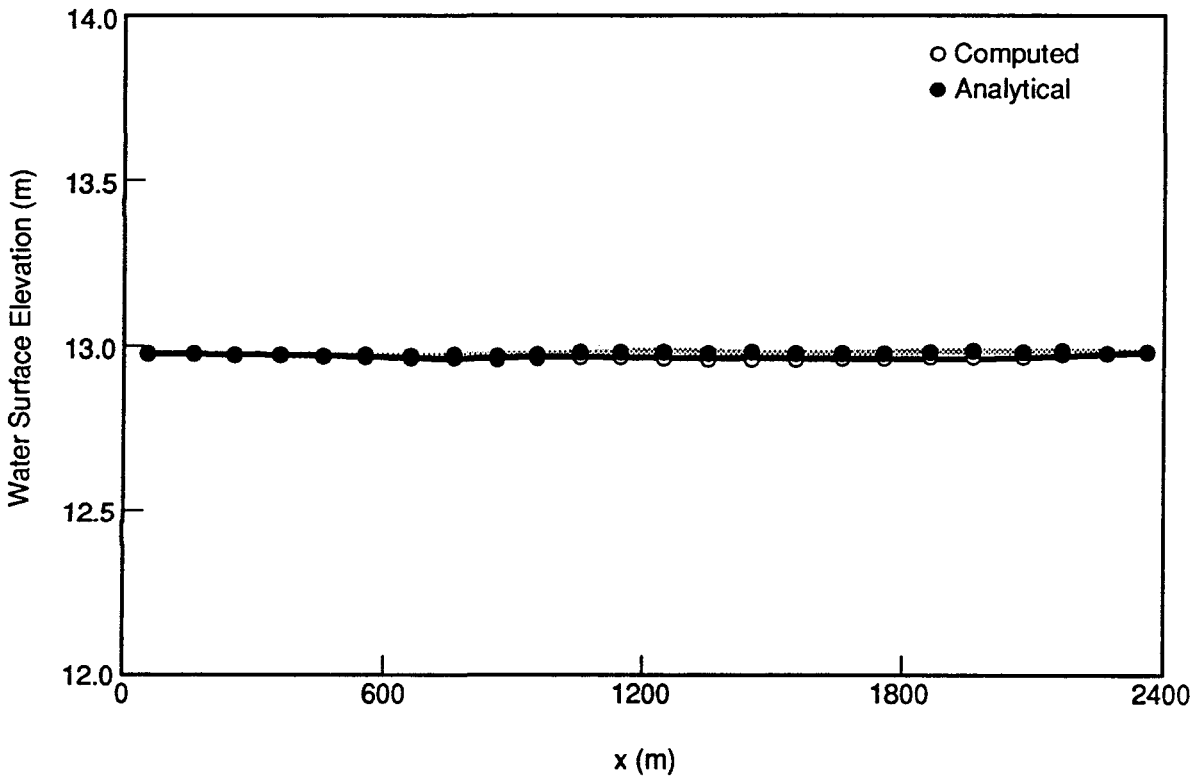

FIGURE E.39. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 6/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

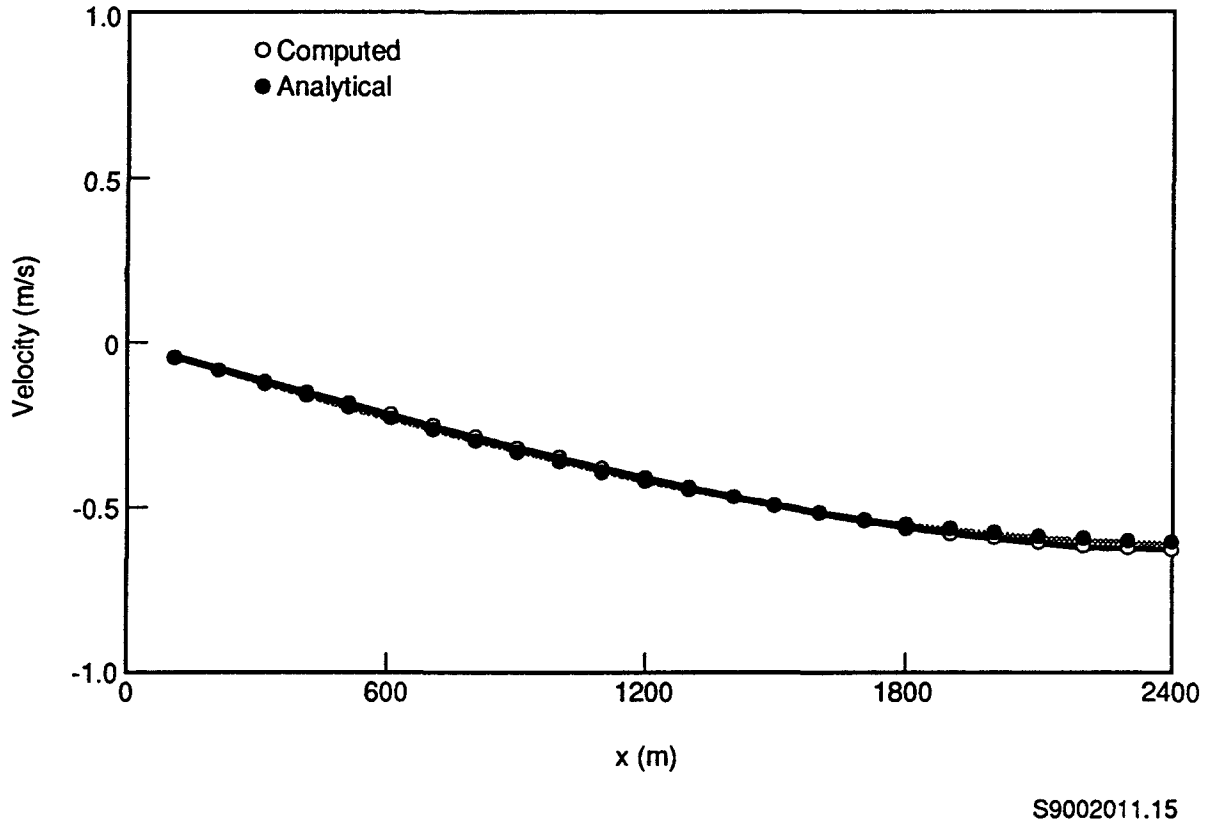

FIGURE E.40. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 7/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

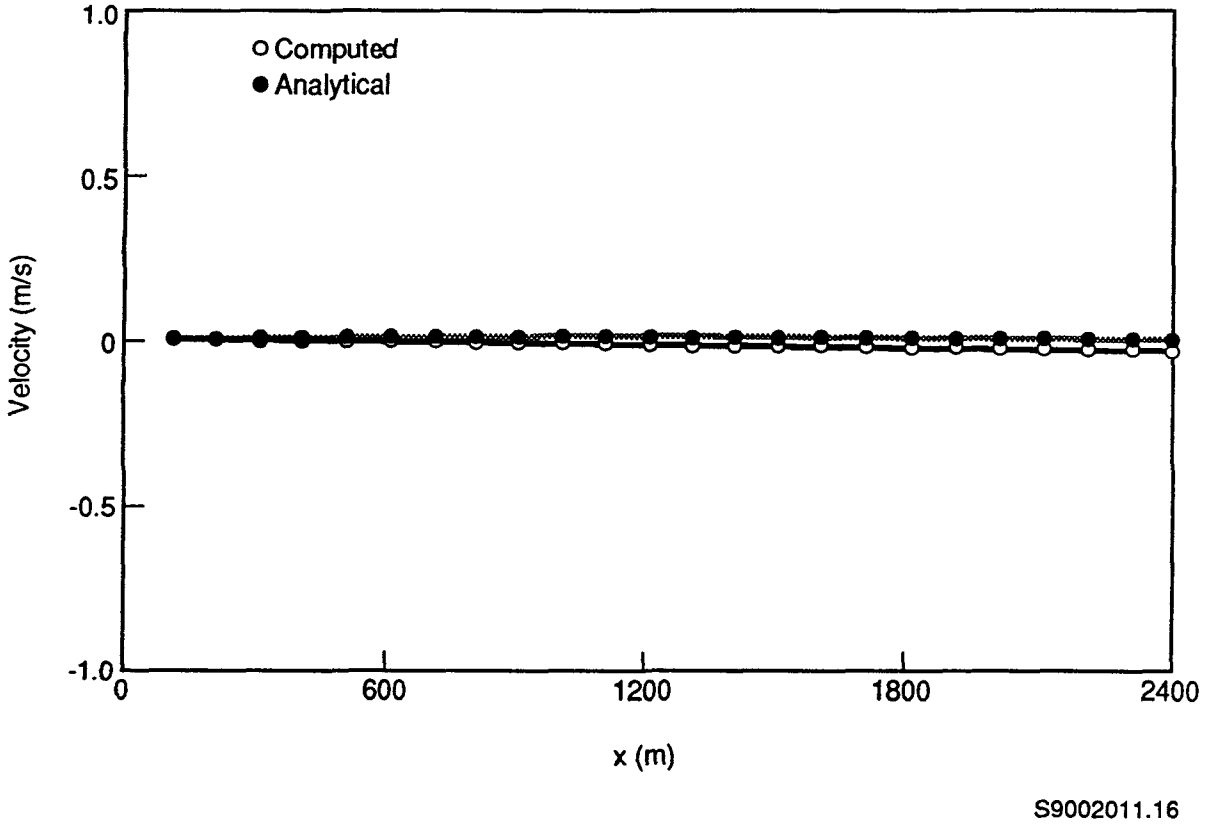

FIGURE E.41. VELOCITY PROFILE ALONG THE CHANNEL AT TIME = 8/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

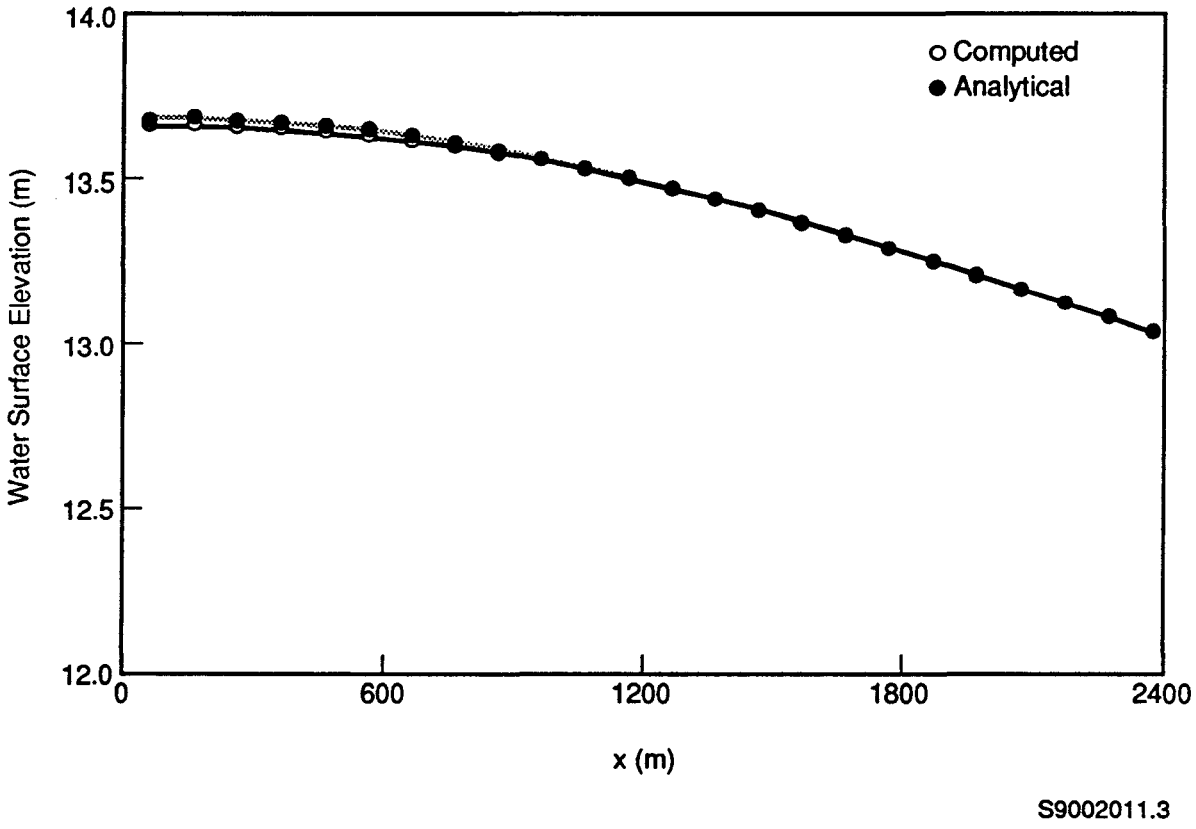

FIGURE E.42. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 1/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

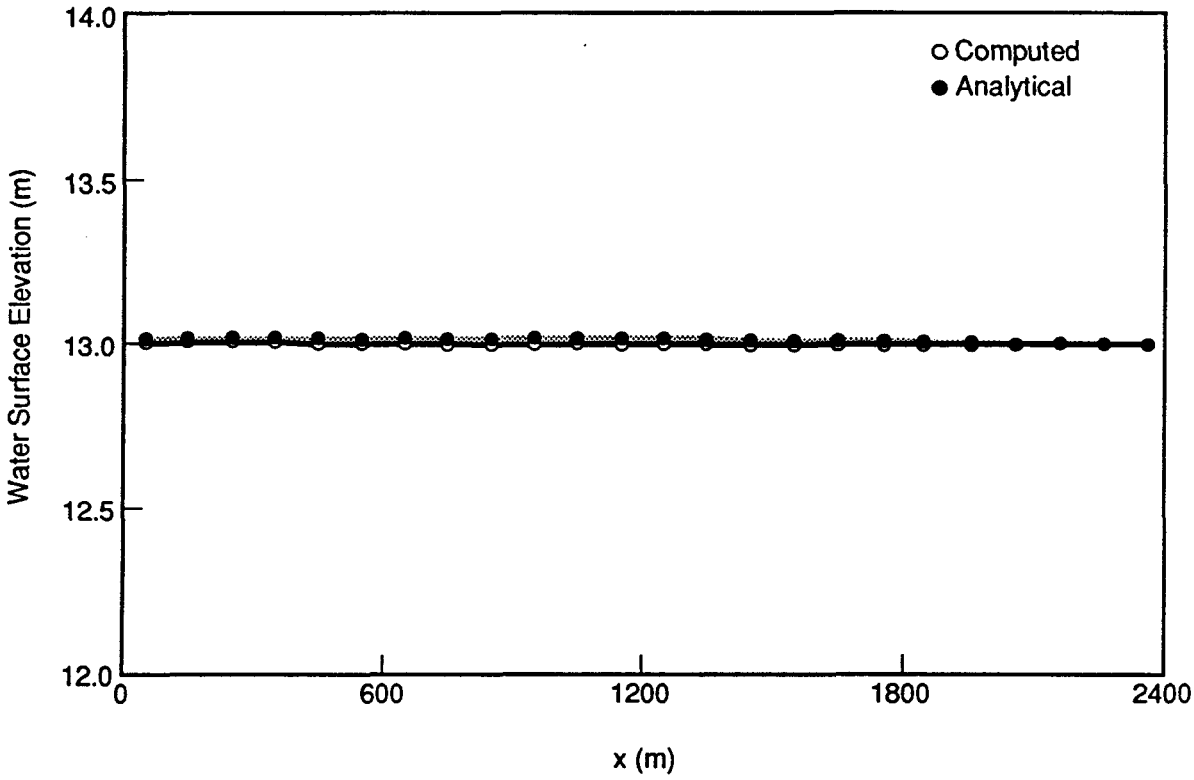

FIGURE E.43. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 2/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

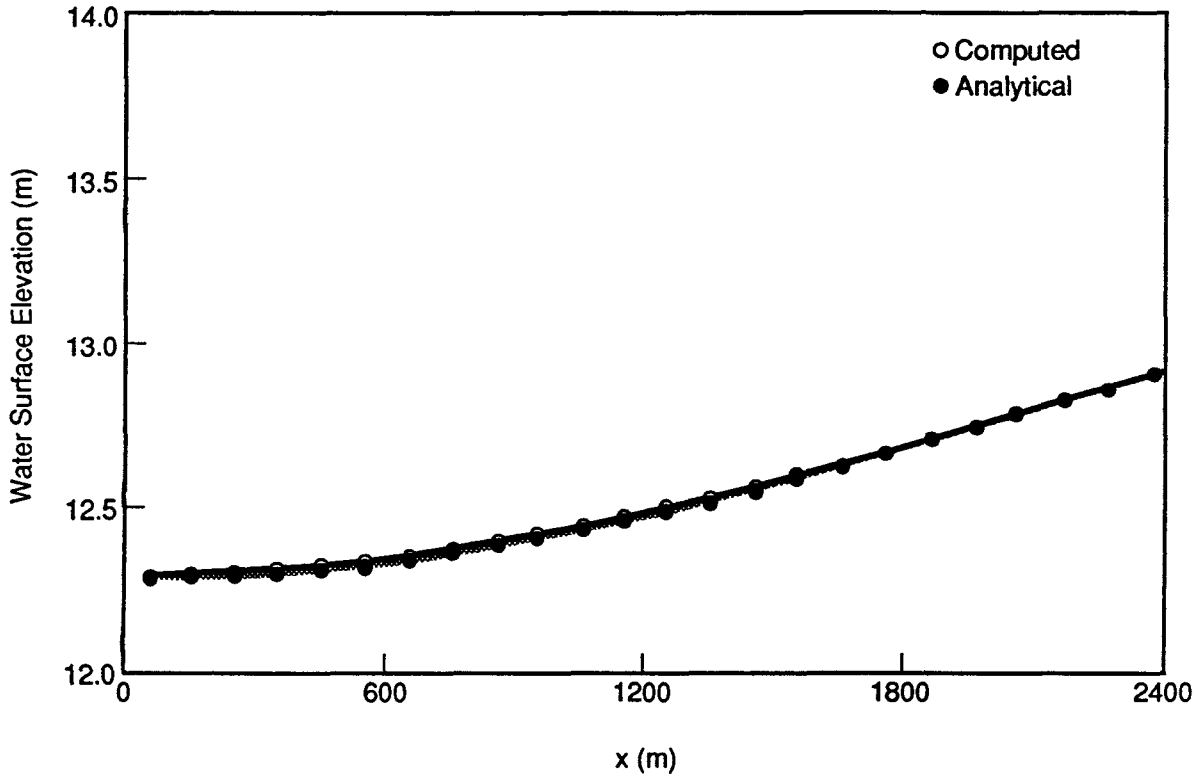

FIGURE E.44. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 3/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

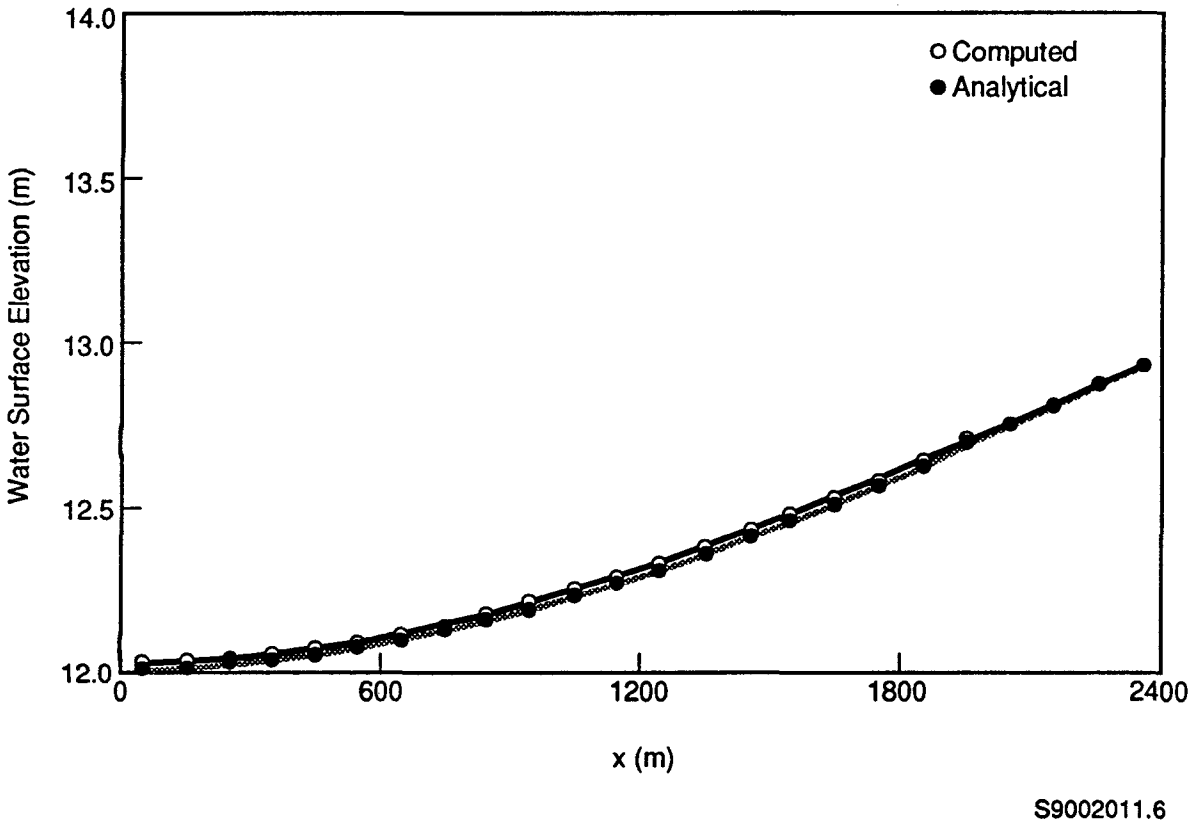

FIGURE E.45. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 4/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

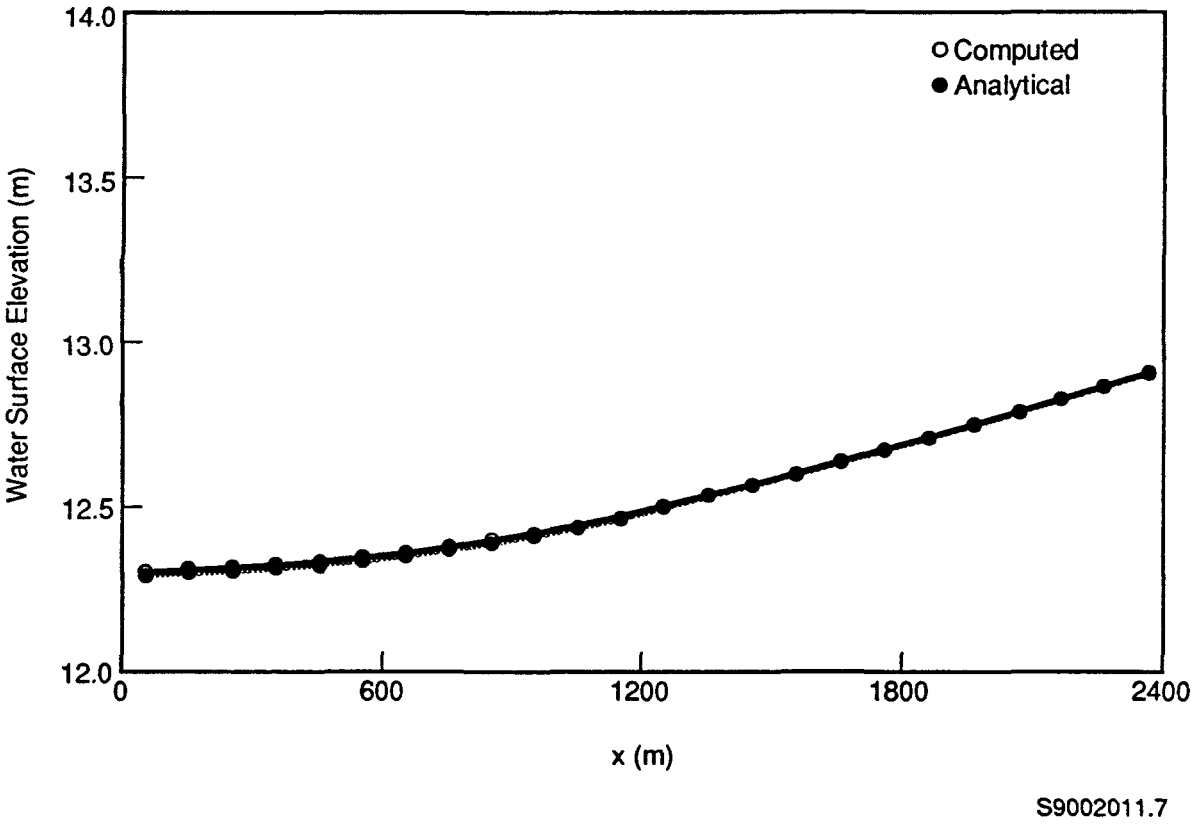

FIGURE E.46. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 5/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

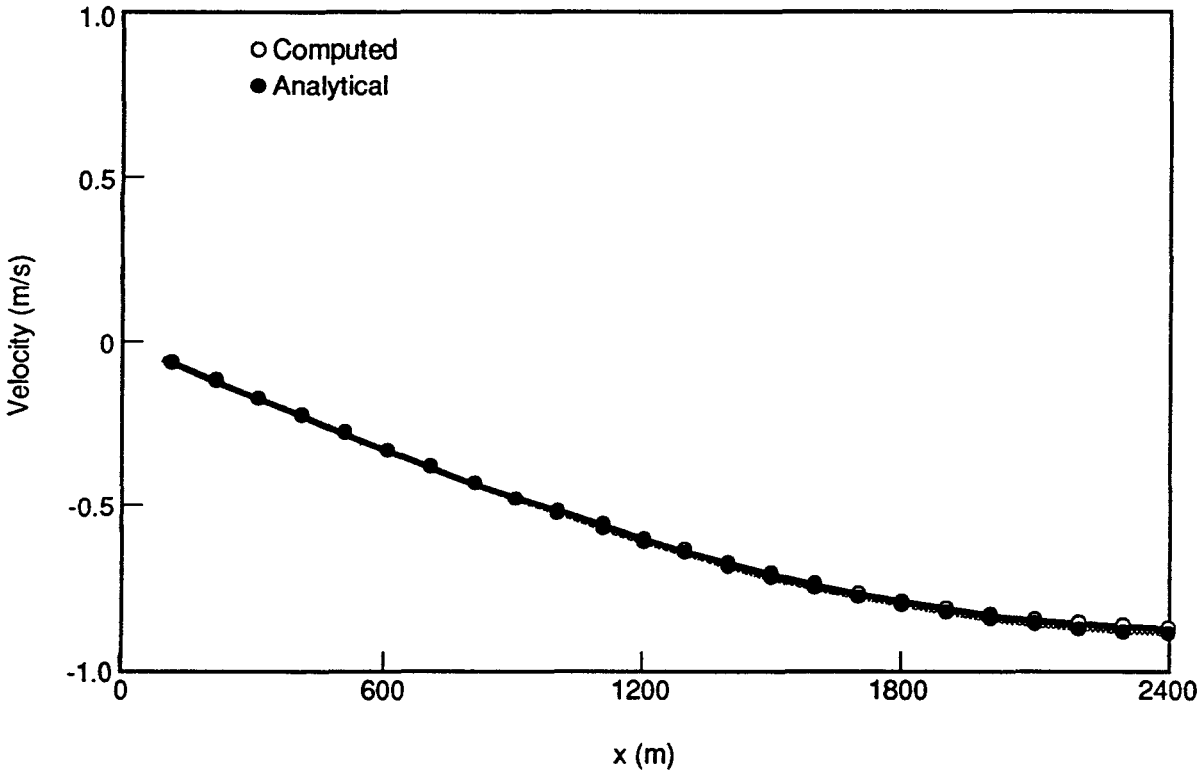

FIGURE E.47. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 6/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

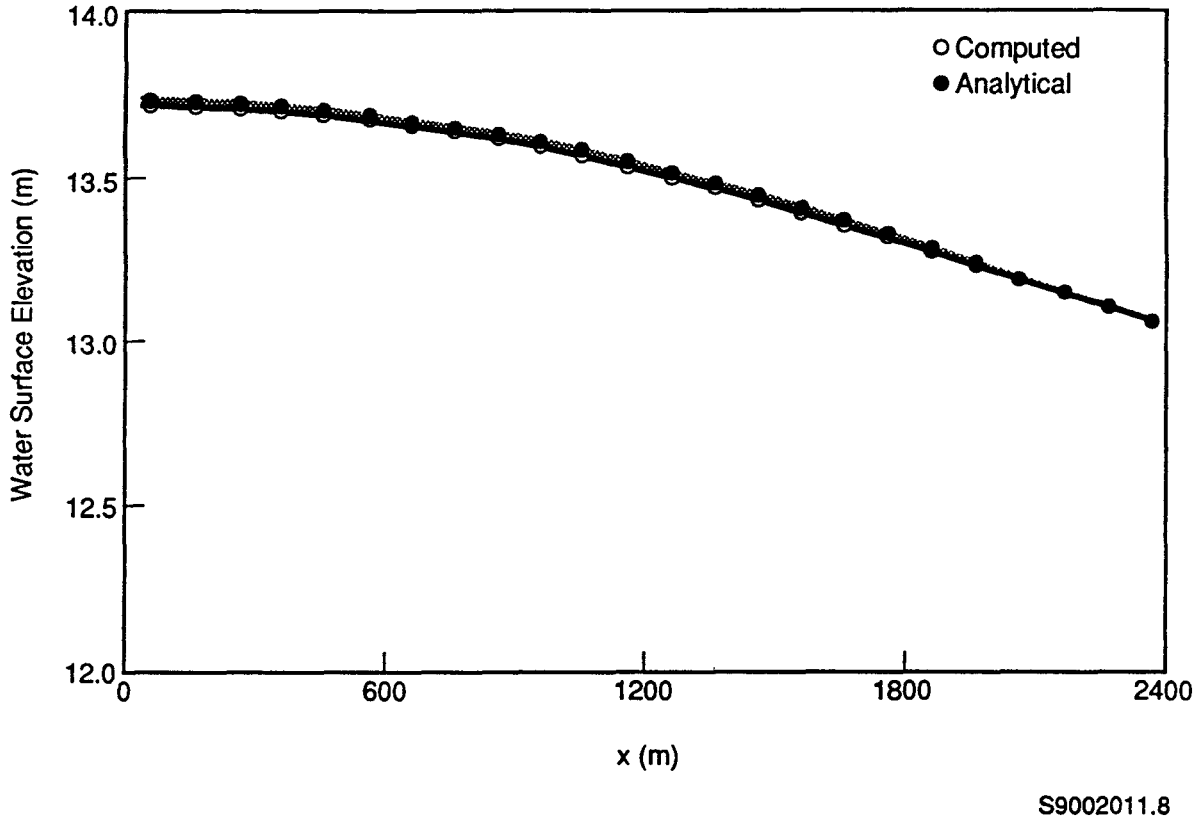

FIGURE E.48. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 7/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

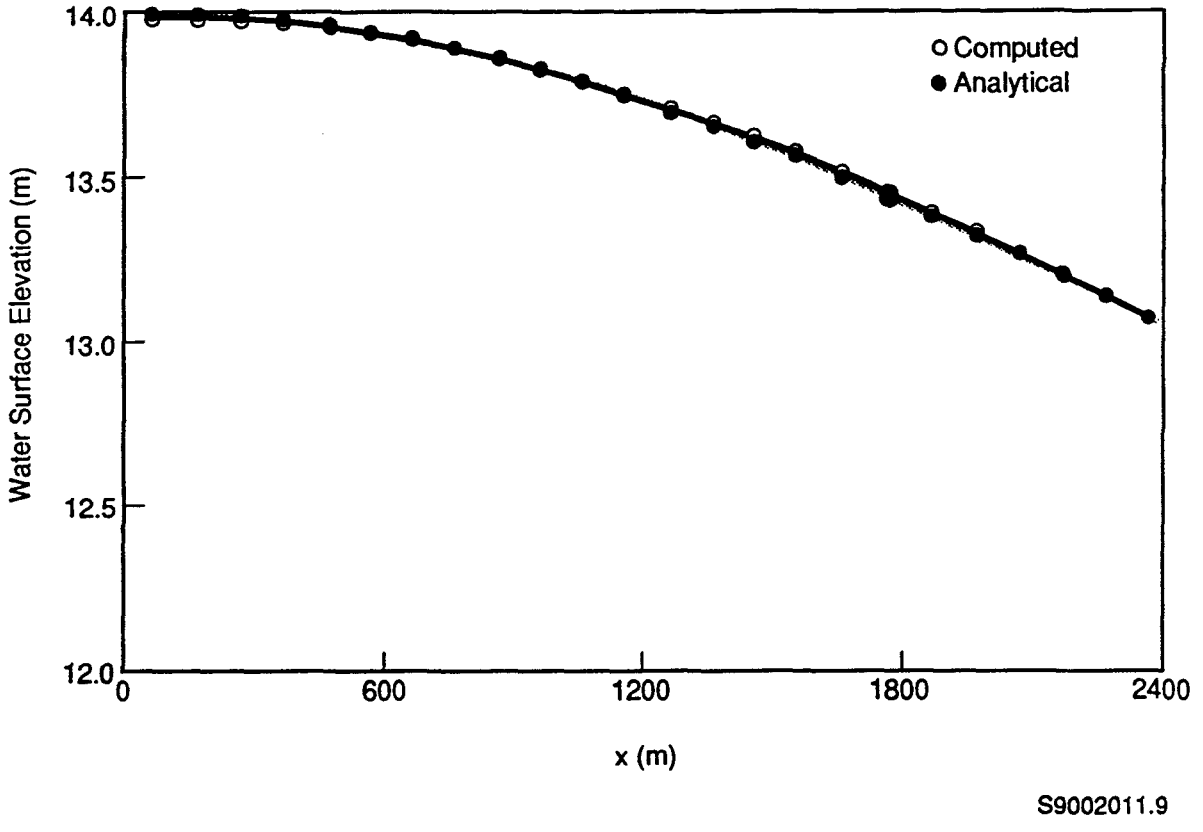

FIGURE E.49. WATER SURFACE PROFILE ALONG THE CHANNEL AT TIME = 8/8T FOR A WAVE ENTERING A CHANNEL OF FINITE LENGTH

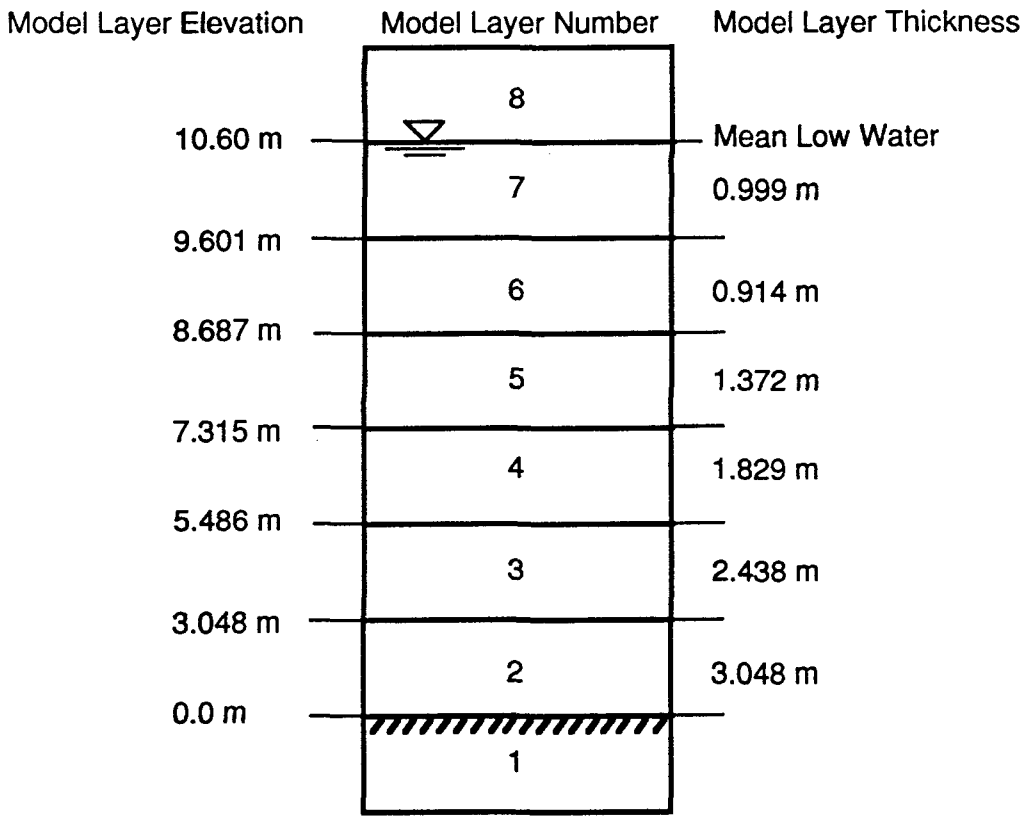

FIGURE E.50. VERTICAL GRID STRUCTURE FOR THE NEW BEDFORD HARBOR MODEL. LAYERS 1 AND 8 ARE USED INTERNALLY BY TEMPEST/FLESCOT TO ASSIGN BOUNDARY CONDITIONS

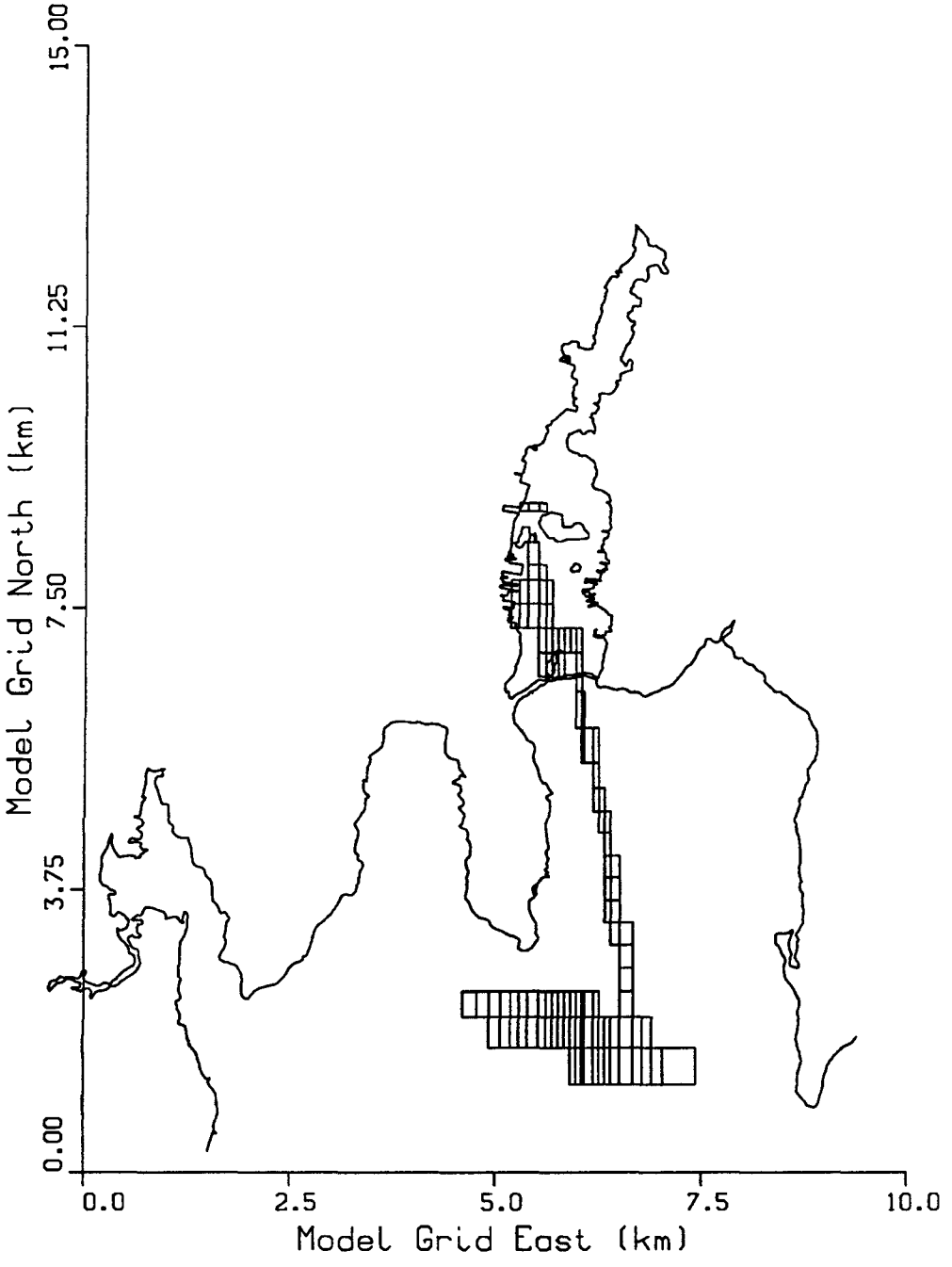

FIGURE E.51. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 2.

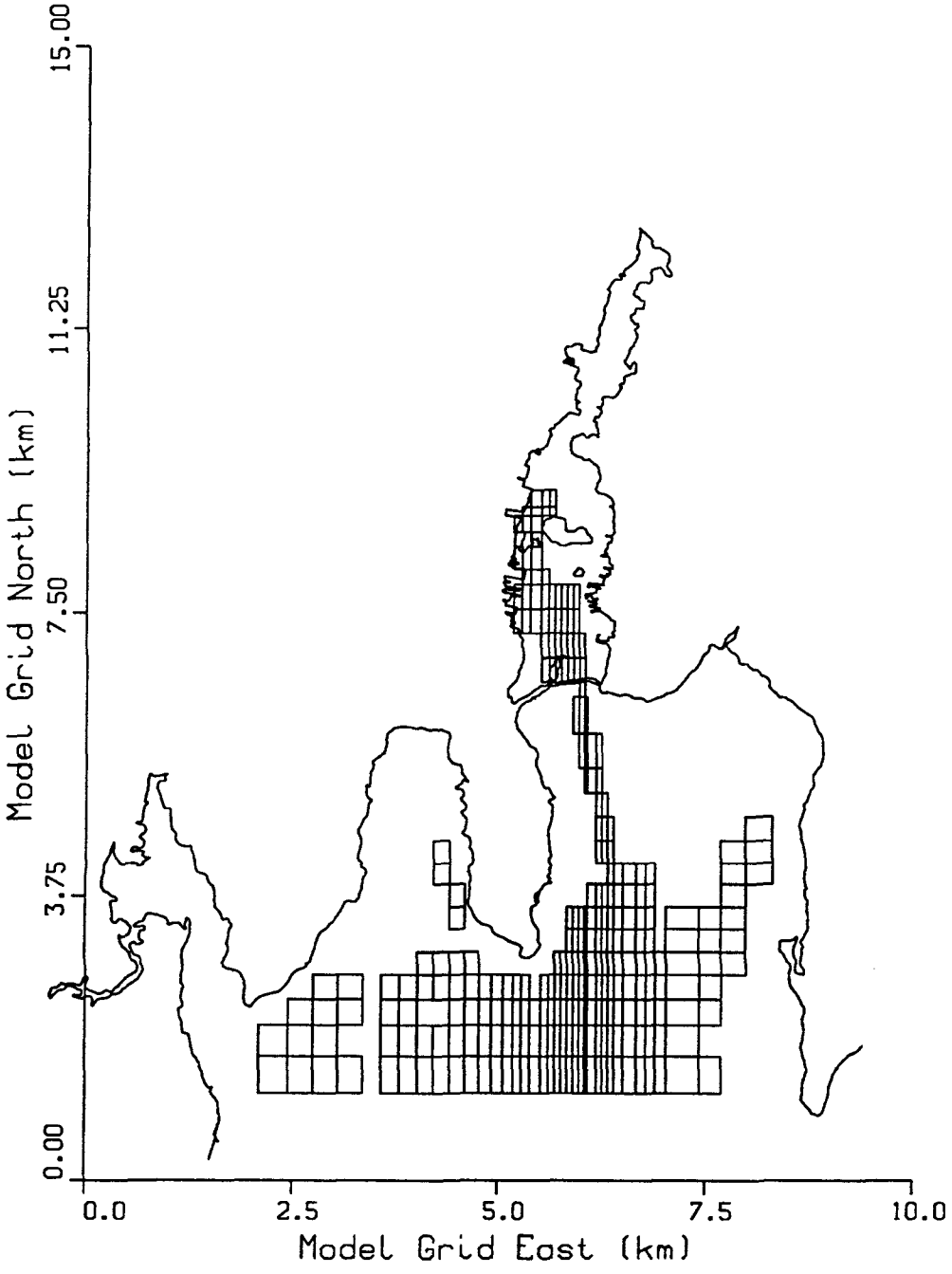

FIGURE E.52. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 3.

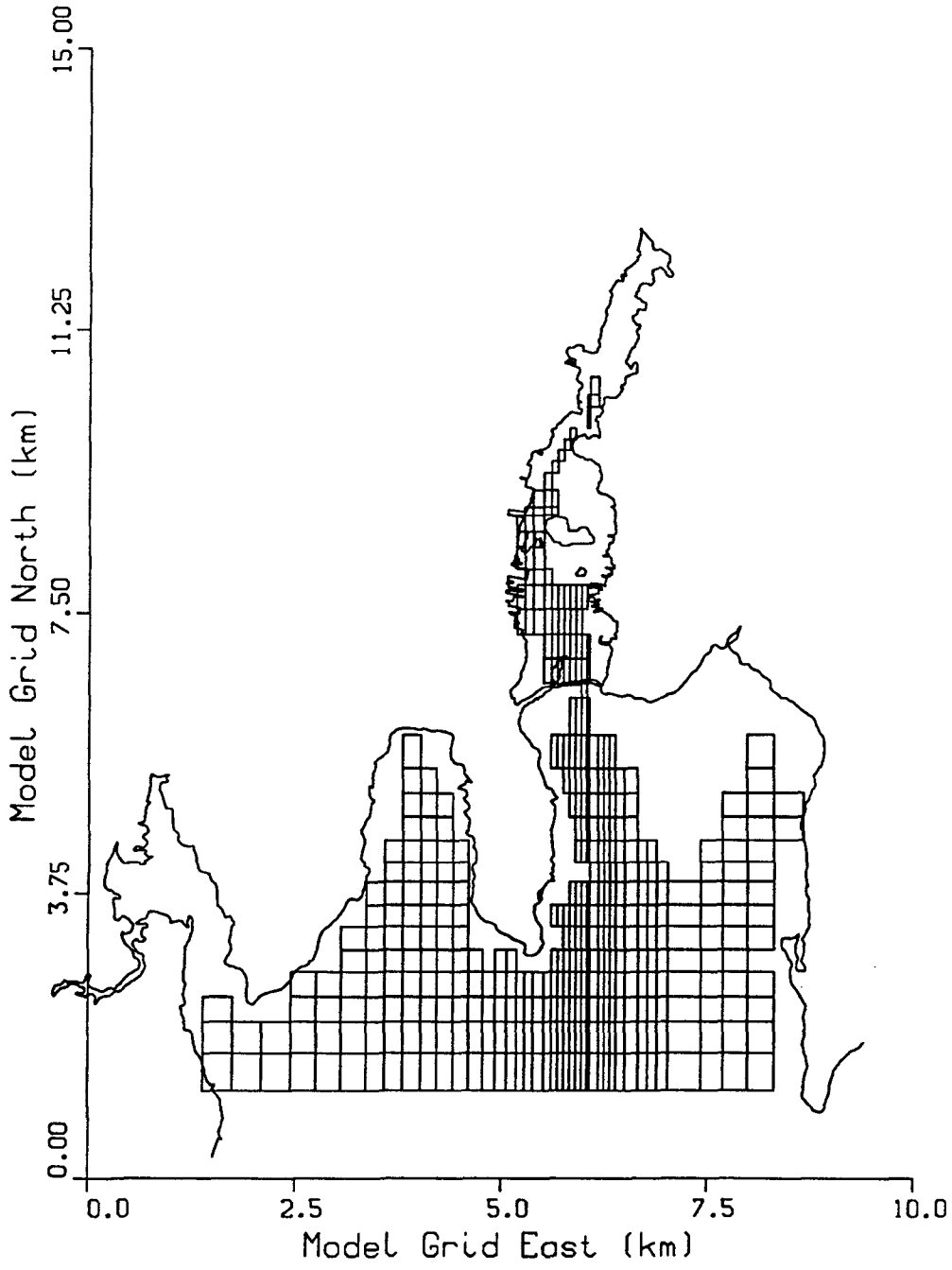

FIGURE E.53. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 4.

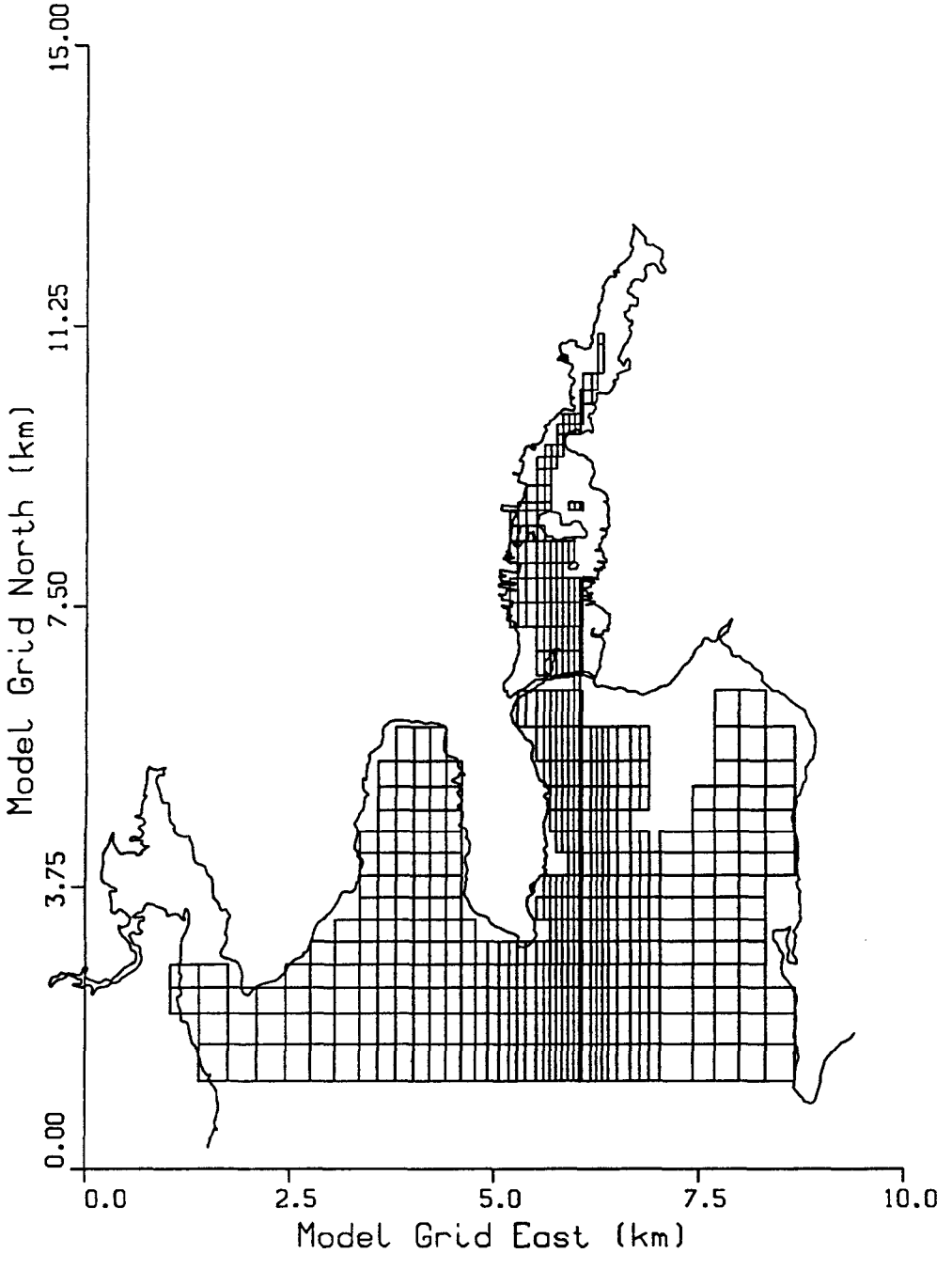

FIGURE E.54. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 5.

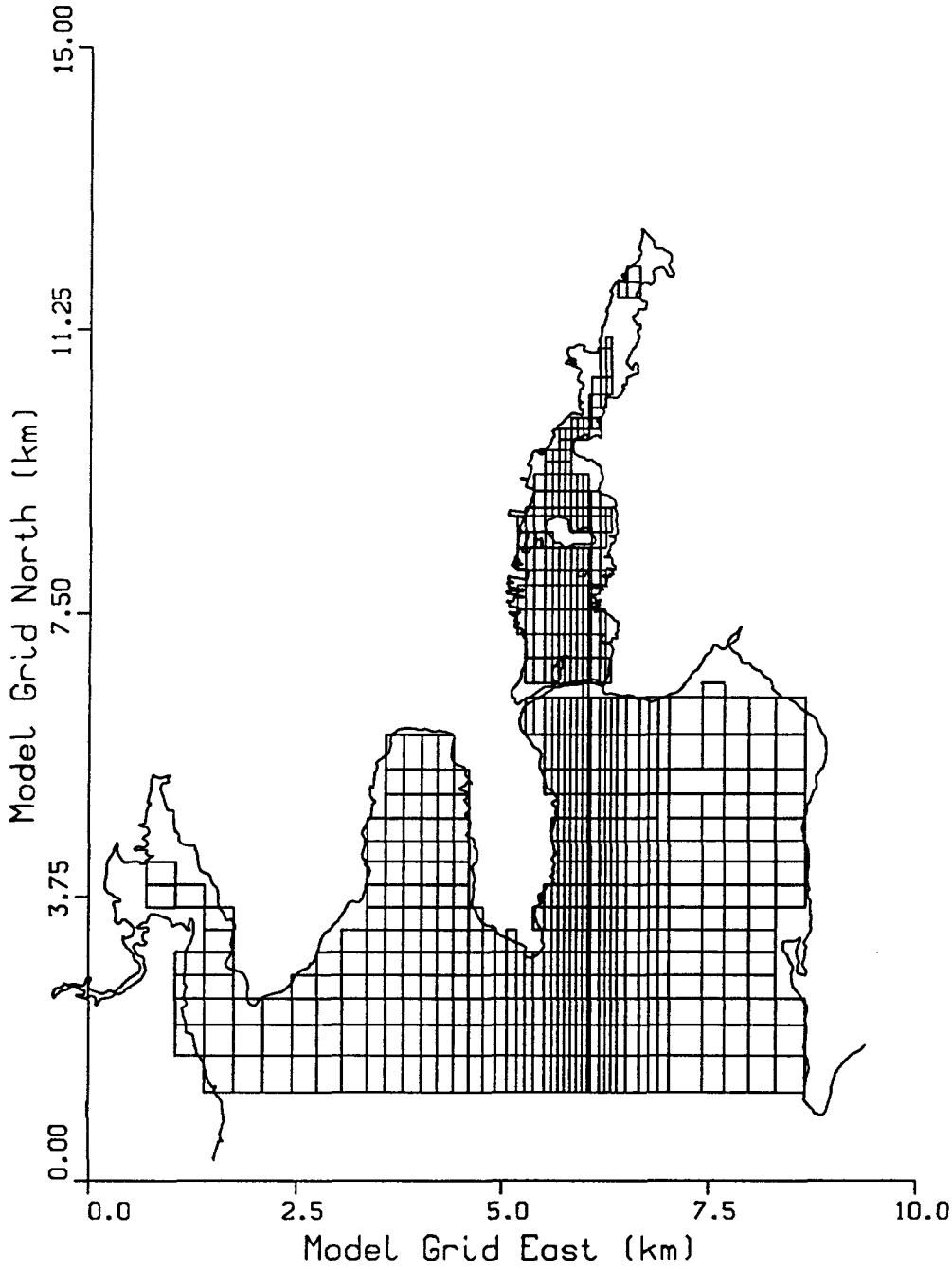

FIGURE E.55. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 6.

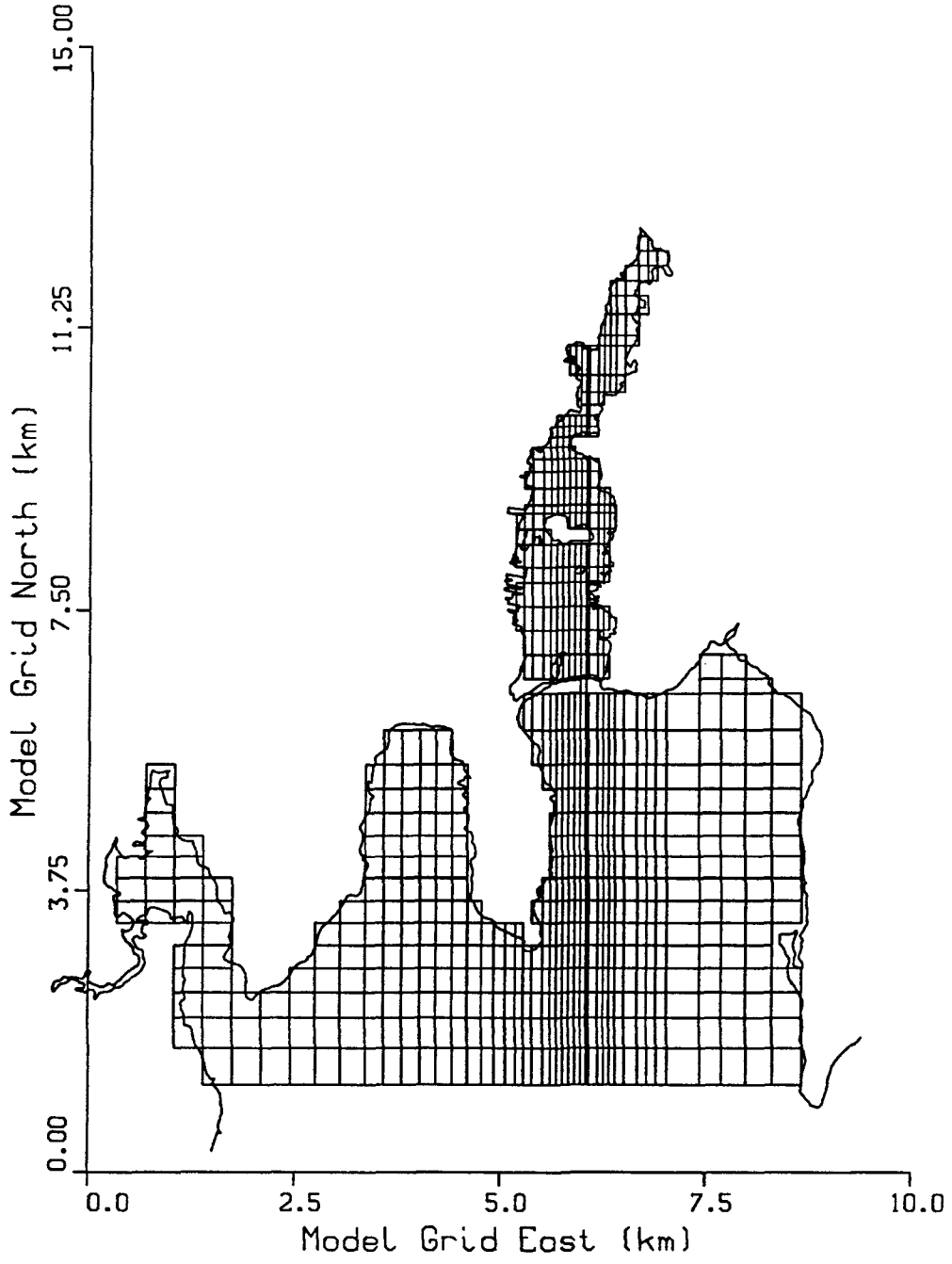

FIGURE E.56. PLAN VIEW OF THE NEW BEDFORD HARBOR MODEL GRID. GRID LAYER 7.

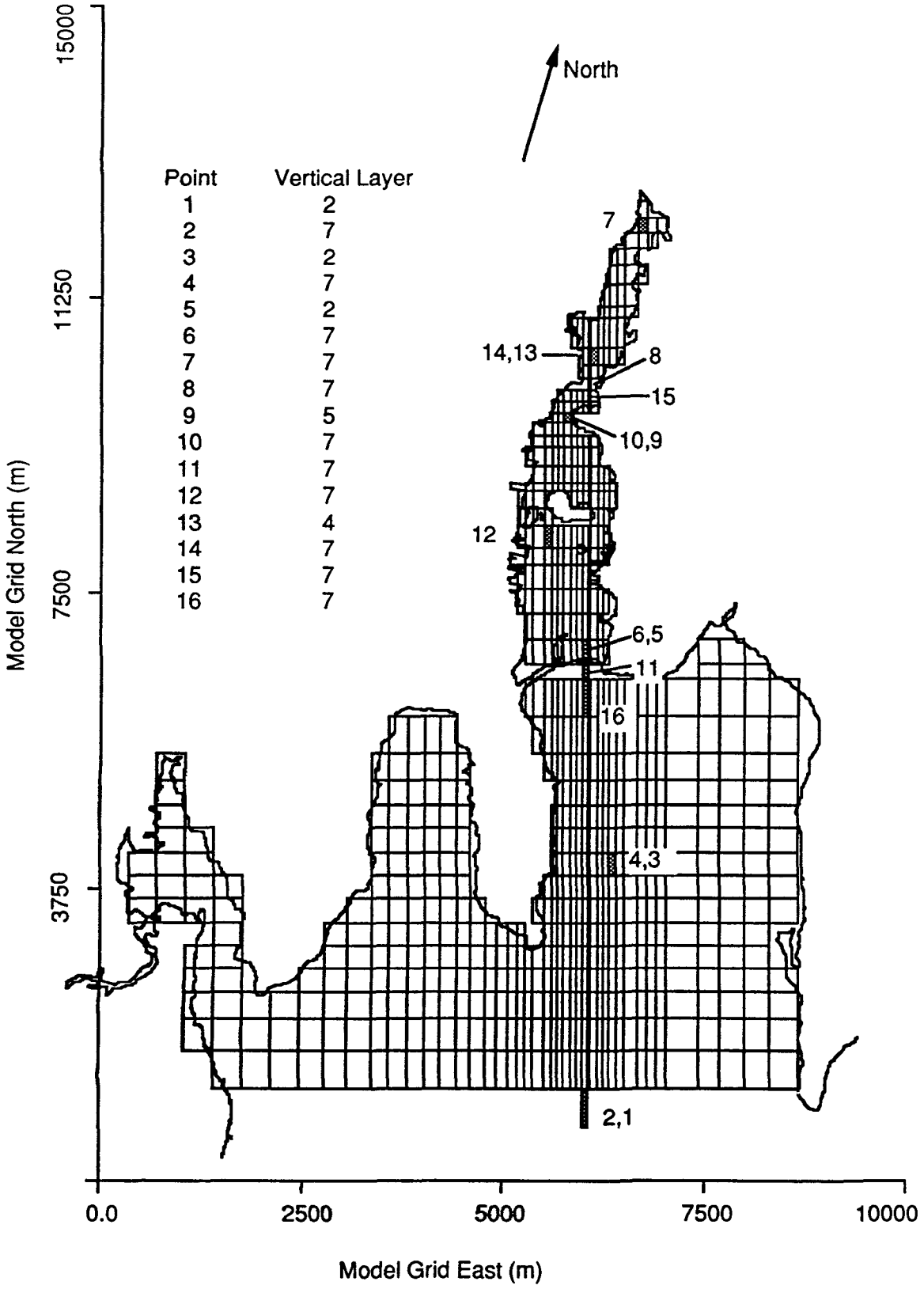

FIGURE E.57. LOCATION OF MODEL TIME-SERIES OUTPUT POINTS FOR M_2 TIDE AND CONSTANT WIND TESTS

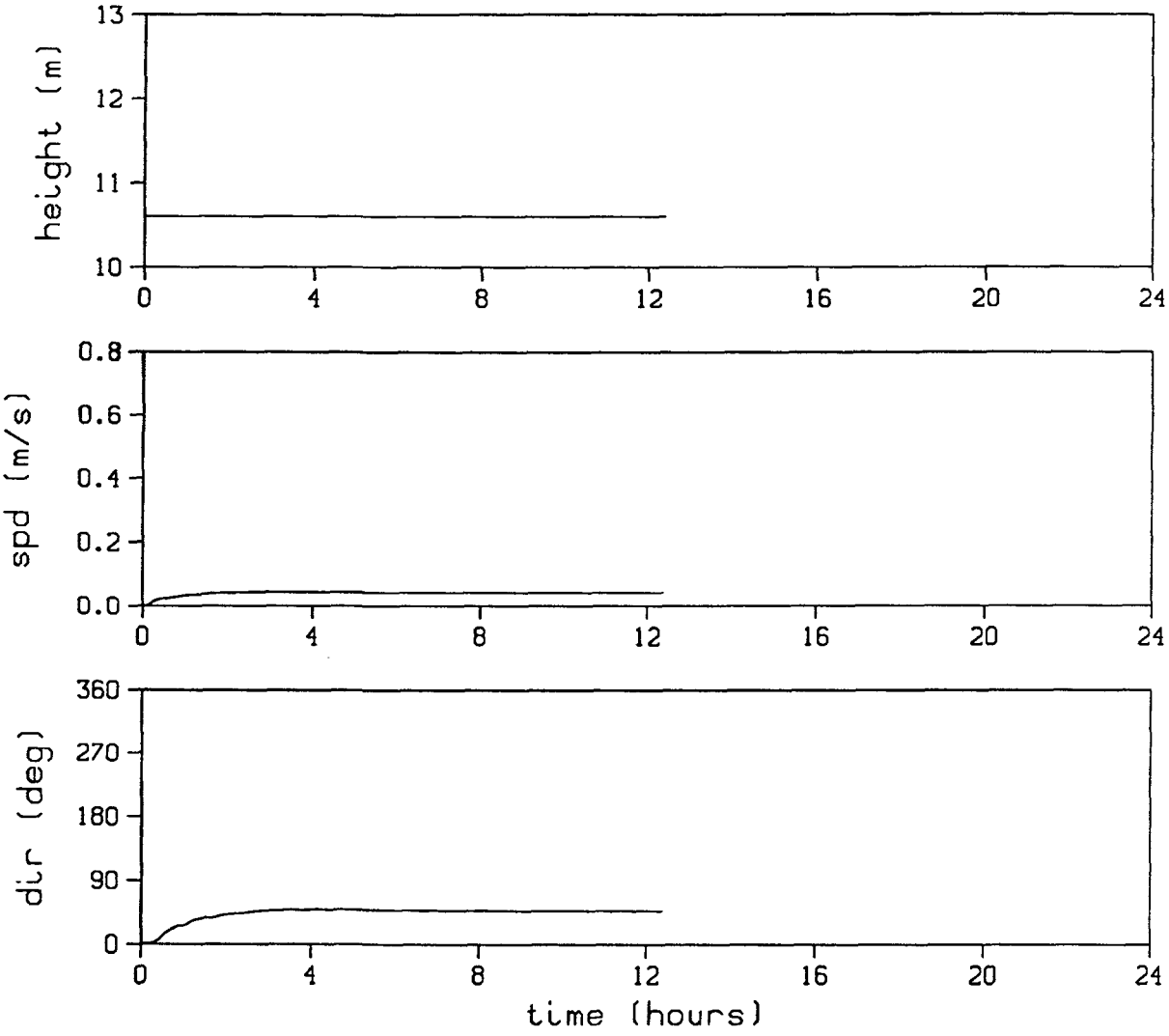

FIGURE E.58. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 4 FOR THE WIND FORCING TEST

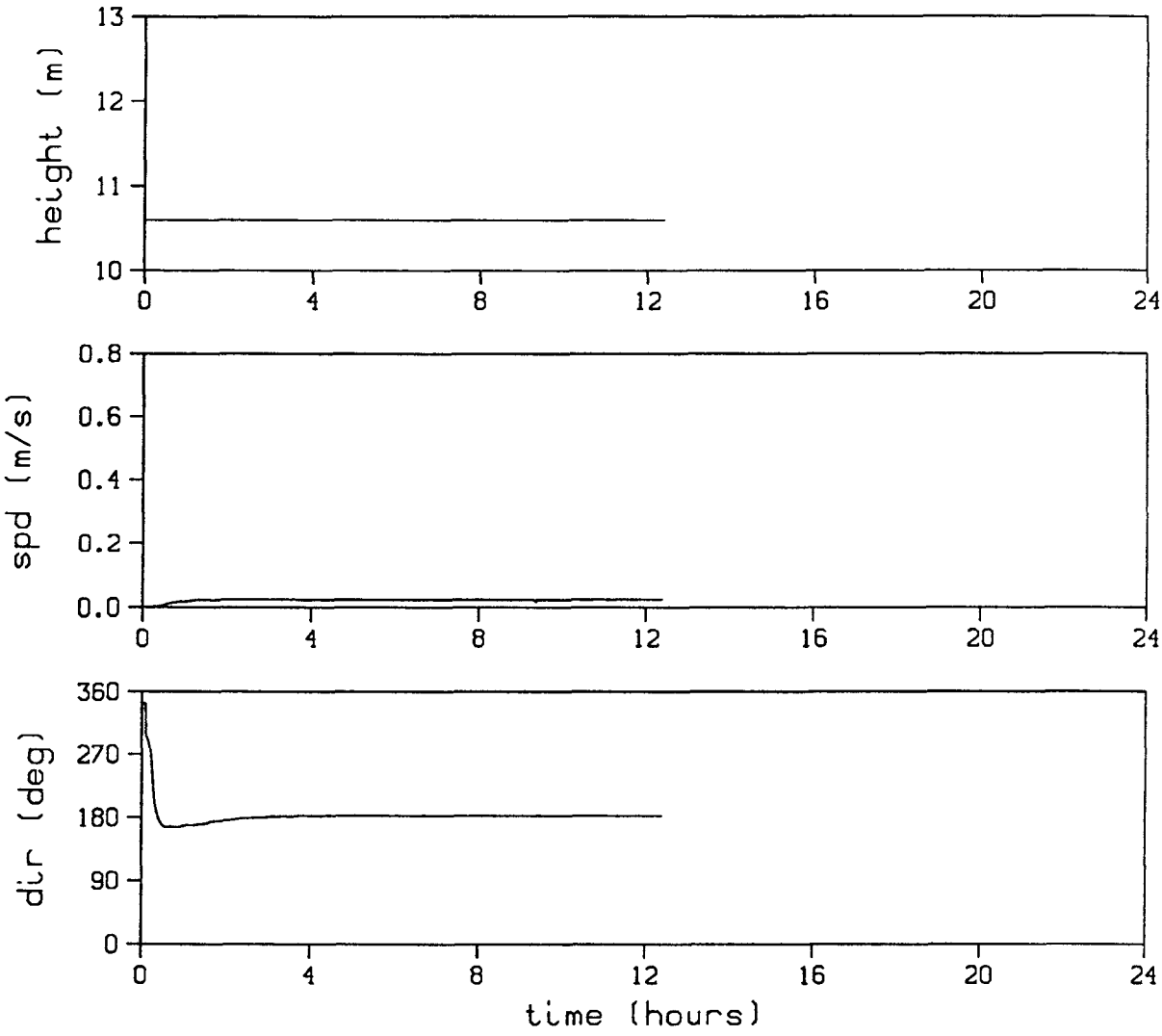

FIGURE E.59. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 3 FOR THE WIND FORCING TEST

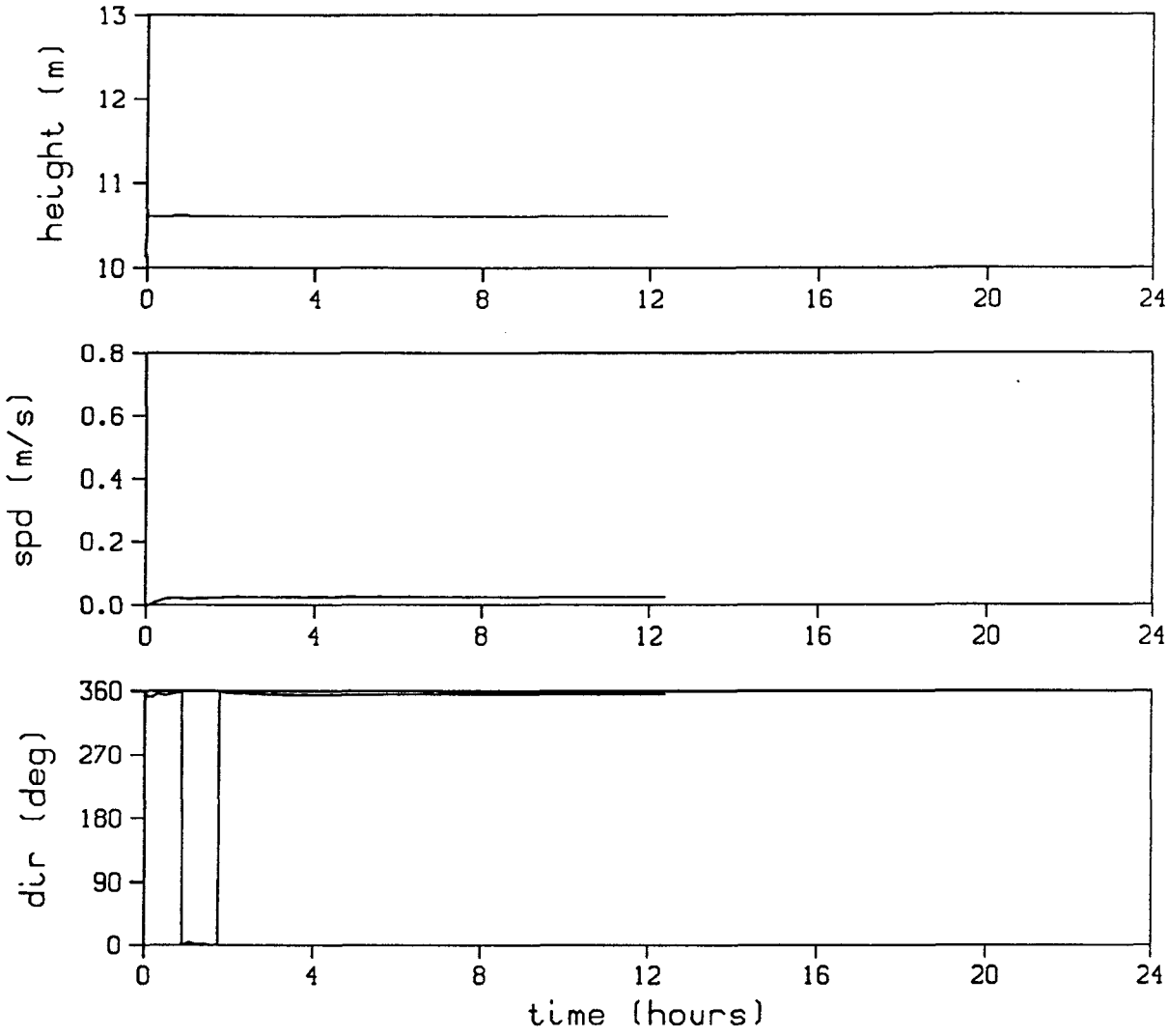

FIGURE E.60. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 12 FOR THE WIND FORCING TEST

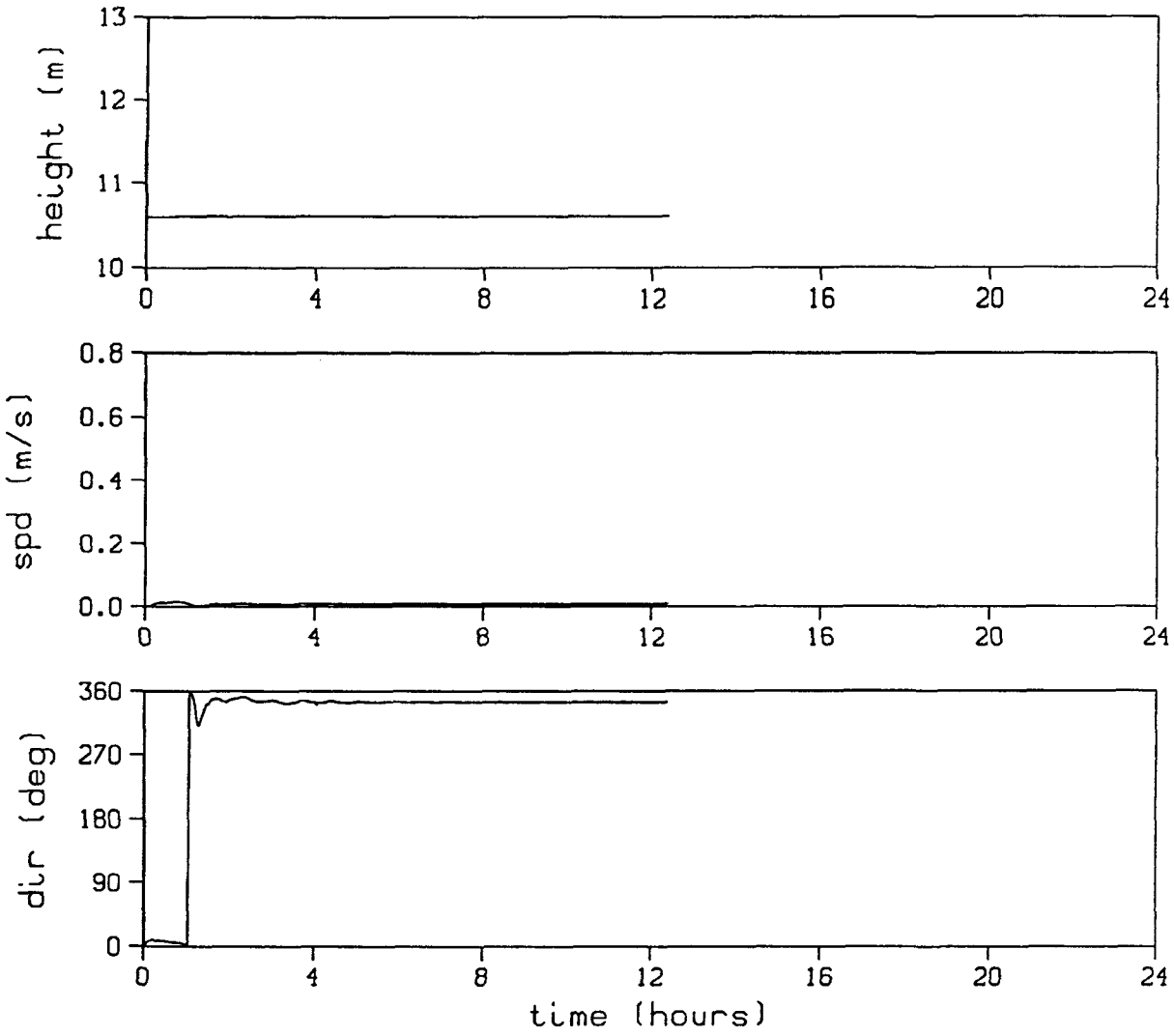

FIGURE E.61. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 14 FOR THE WIND FORCING TEST

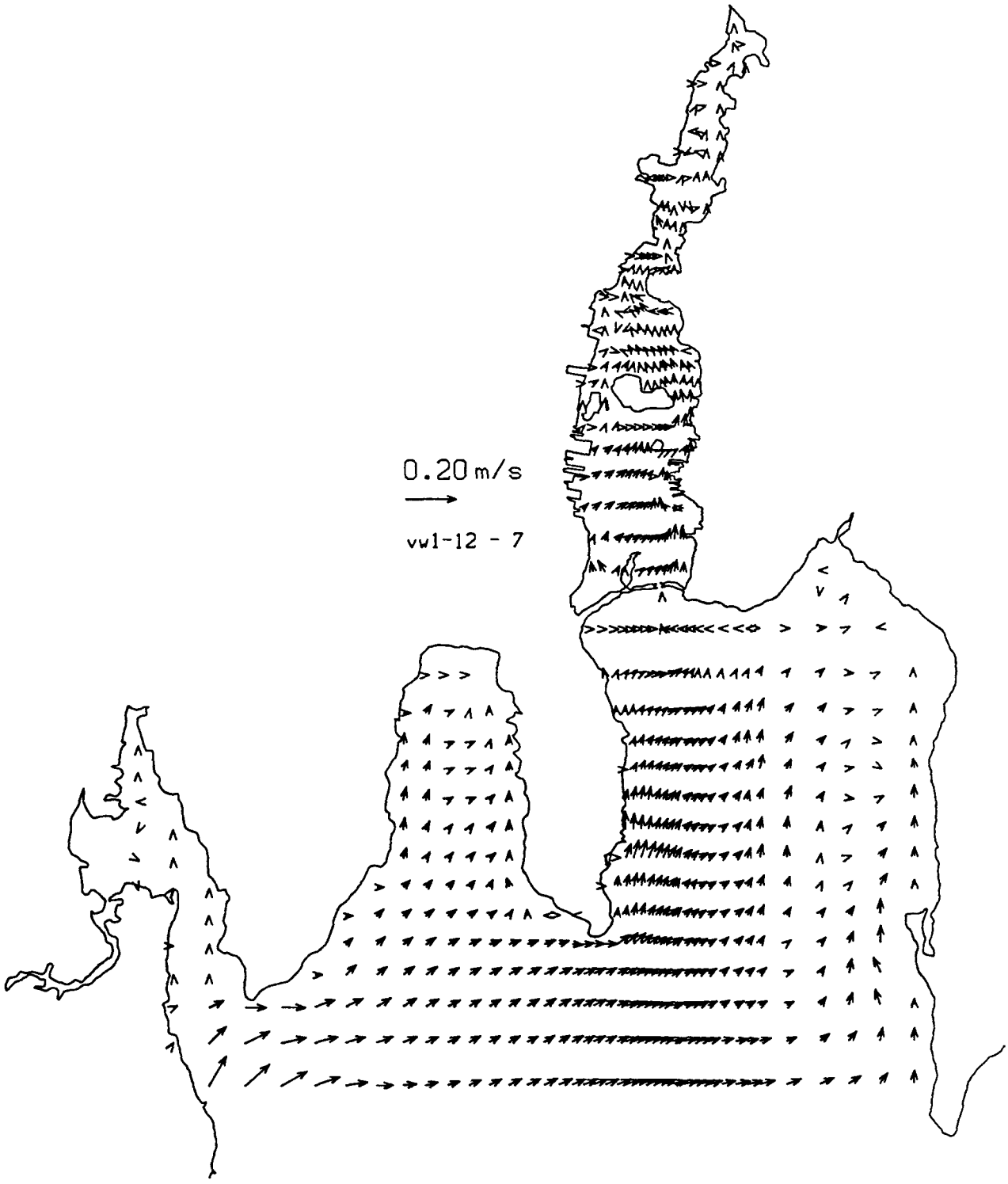

FIGURE E.62. WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 7 AT TIME = 12 h.

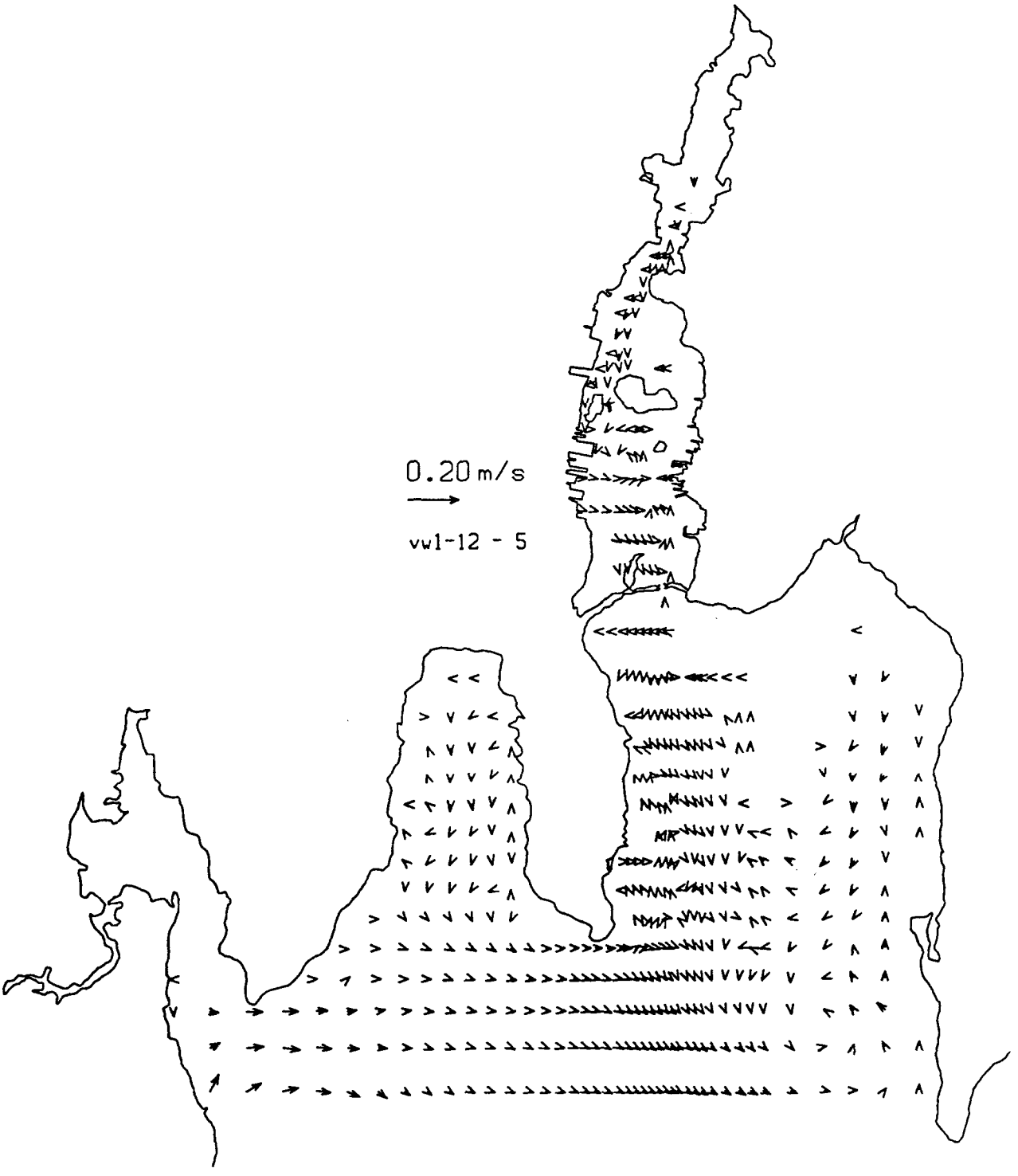

FIGURE E.63. WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 5 AT TIME = 26 h.

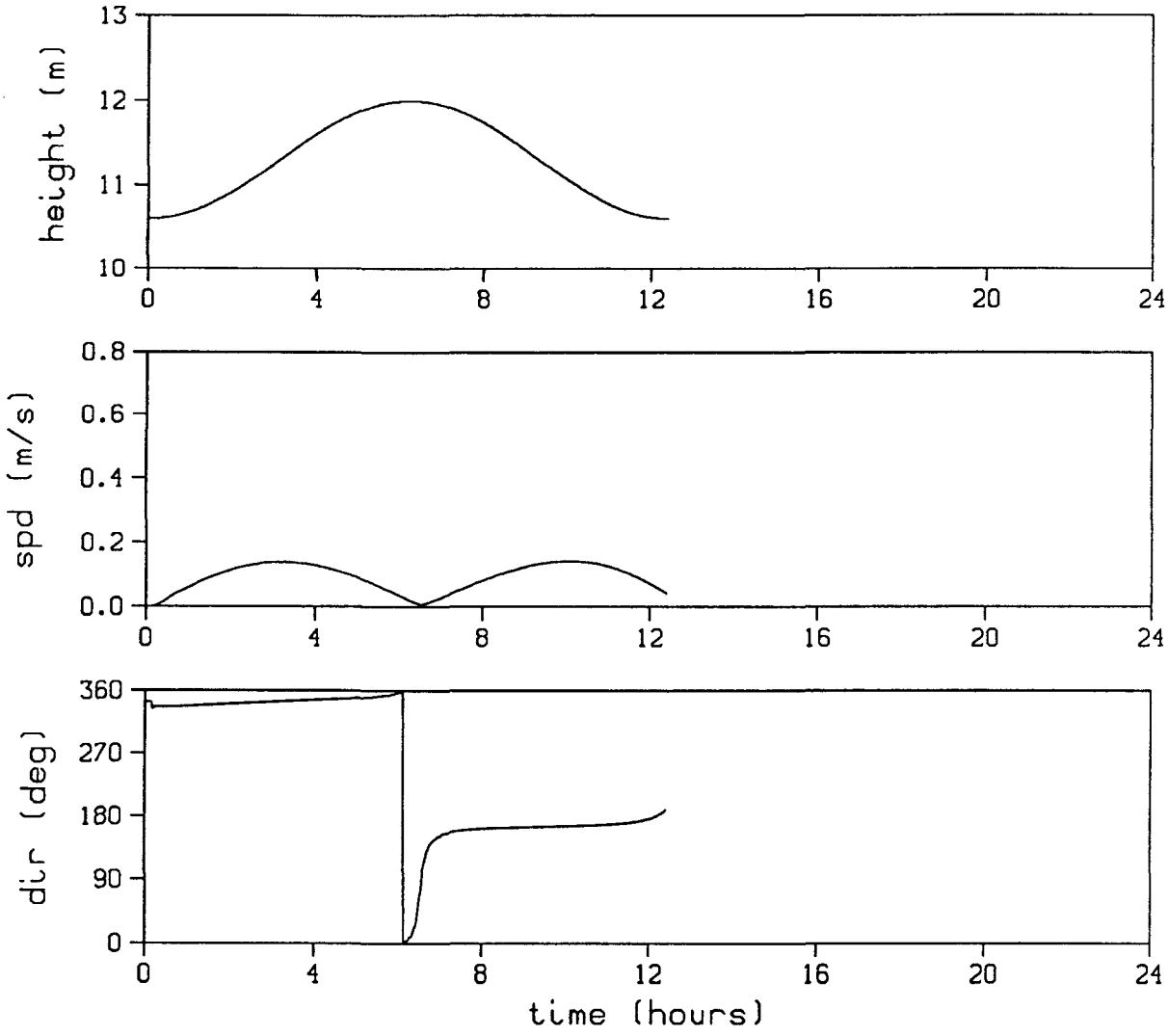

FIGURE E.64. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 4 FOR THE M_2 TIDE FORCING TEST

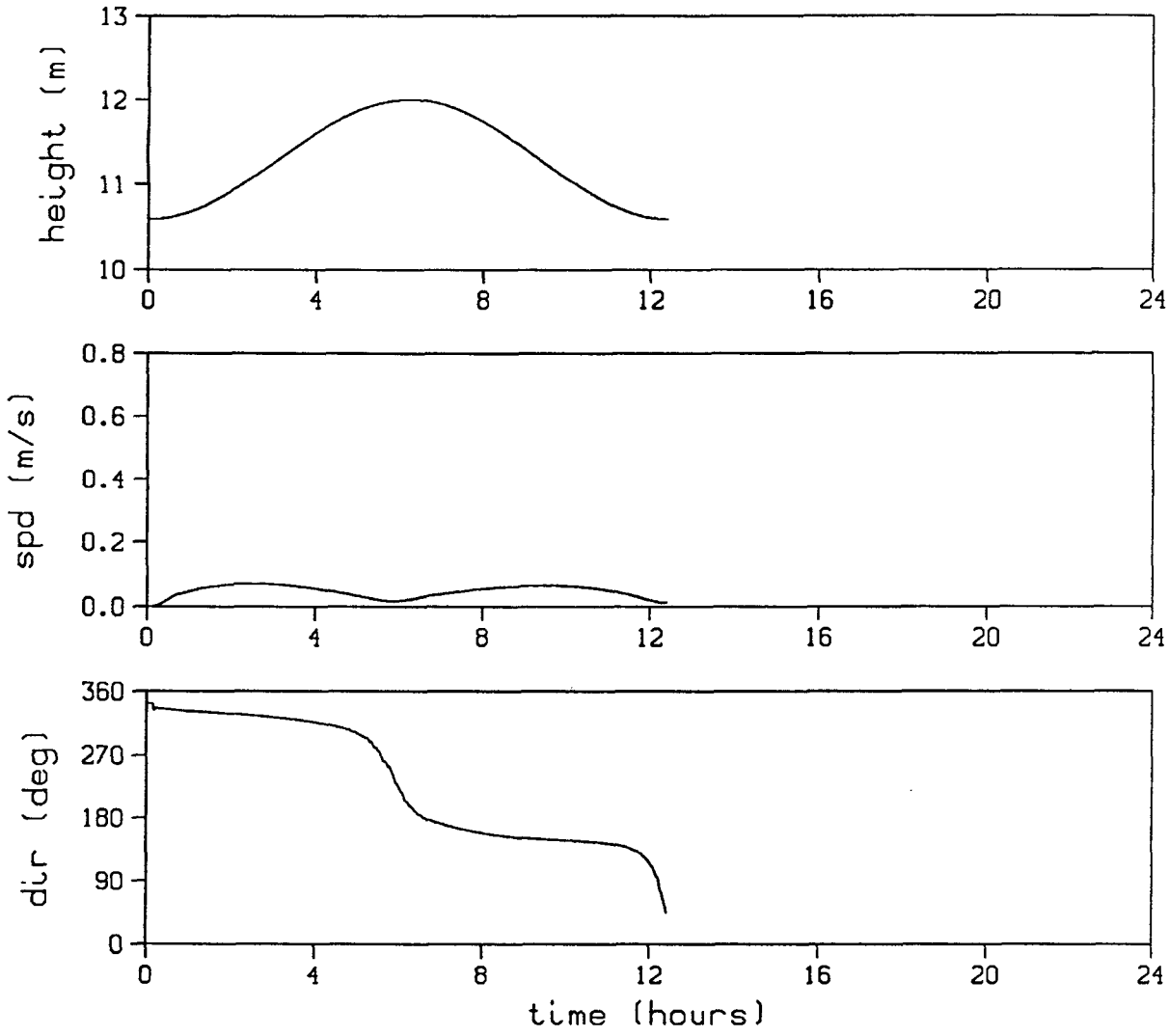

FIGURE E.65. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 3 FOR THE M_2 TIDE FORCING TEST

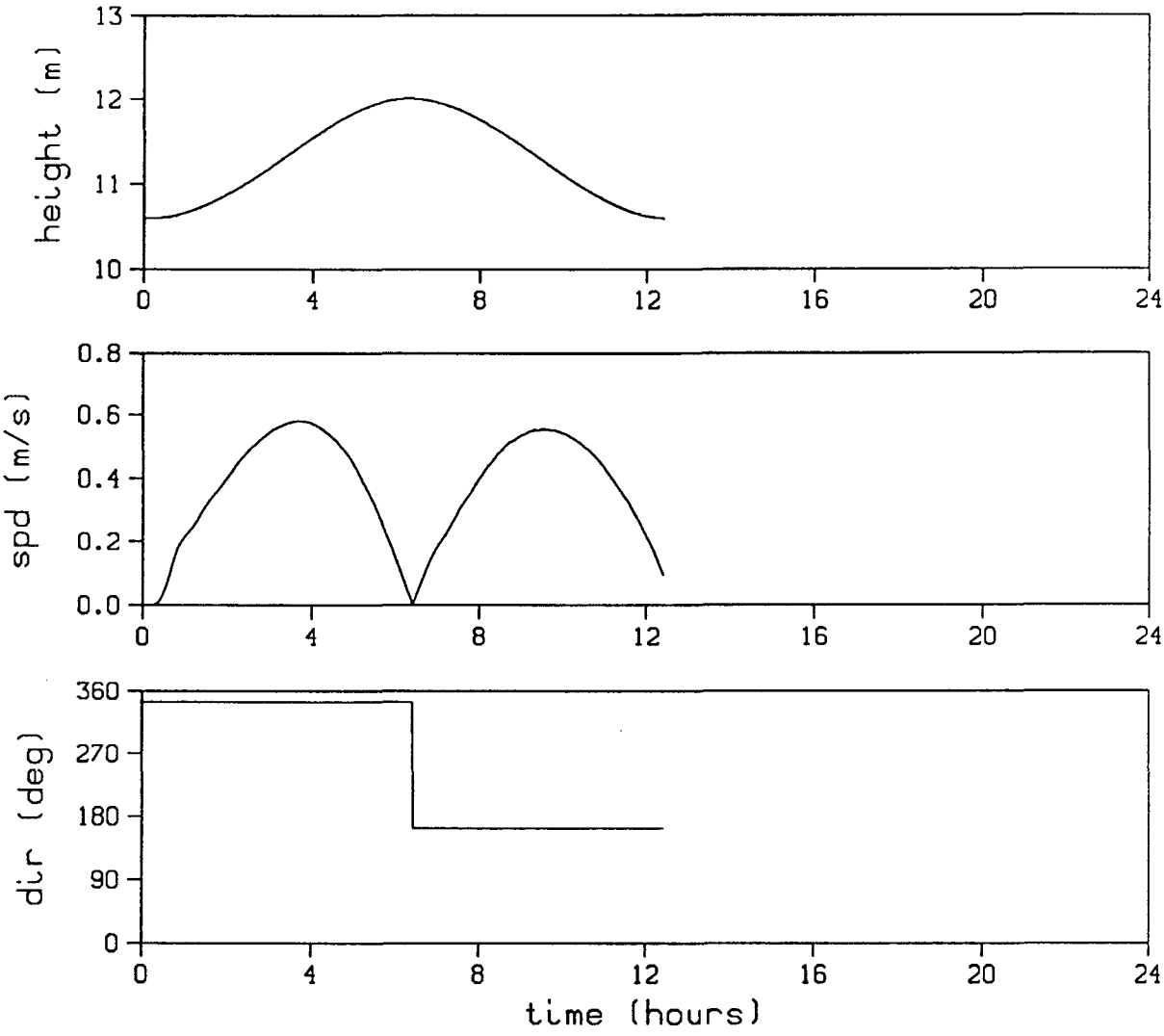

FIGURE E.66. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 11 FOR THE M_2 TIDE FORCING TEST

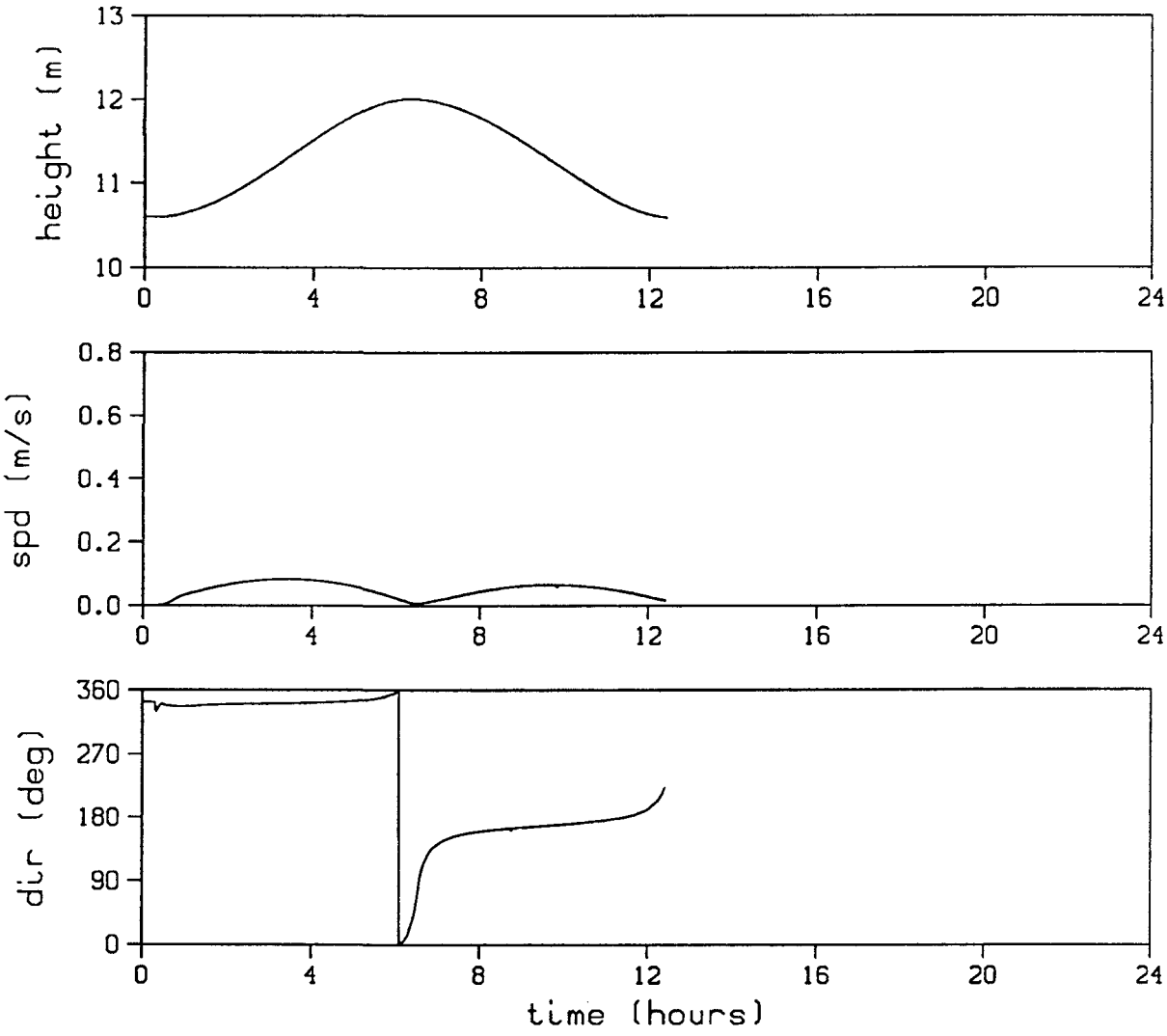

FIGURE E.67. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 12 FOR THE M_2 TIDE FORCING TEST

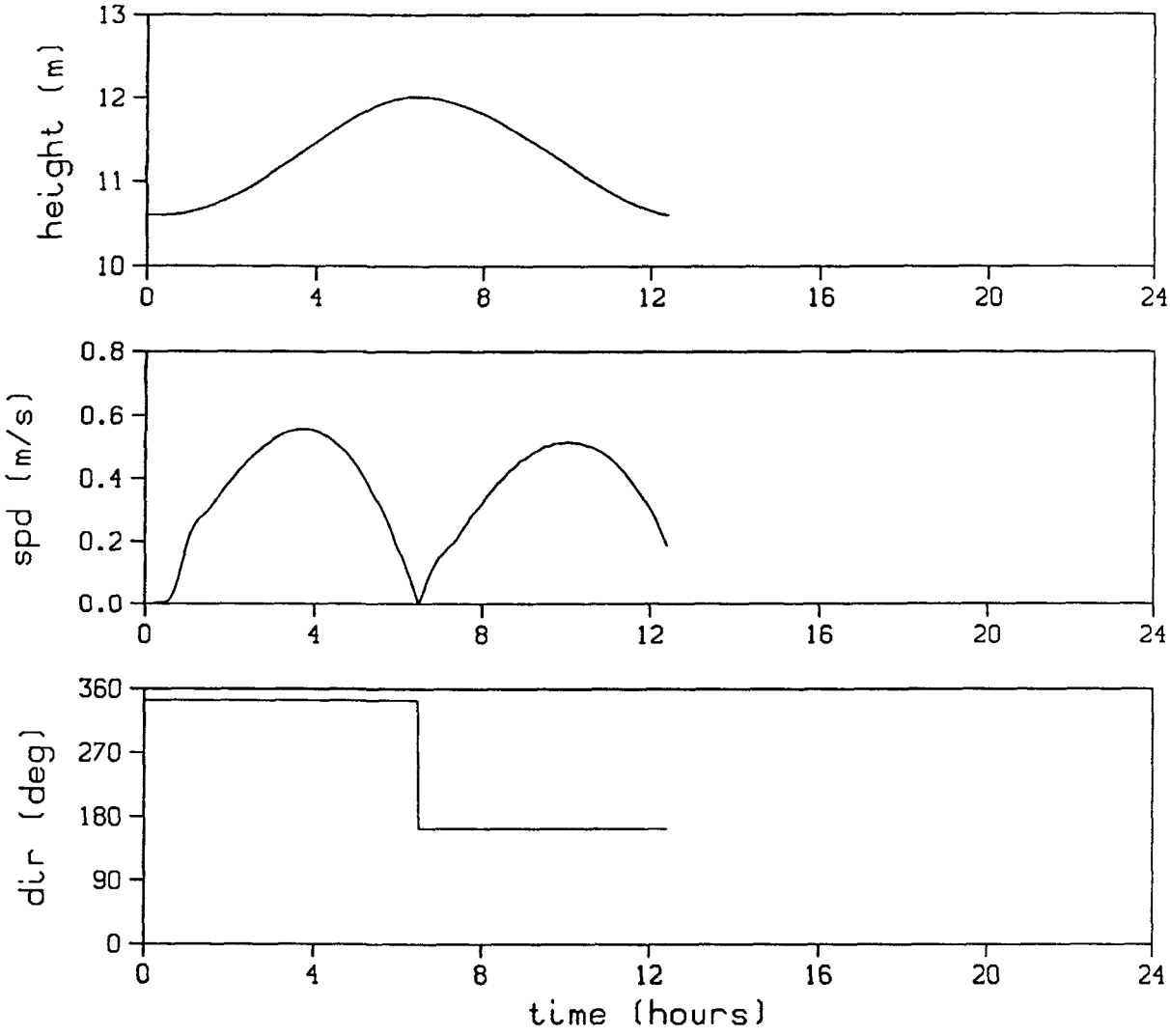

FIGURE E.68. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 8 FOR THE M_2 TIDE FORCING TEST

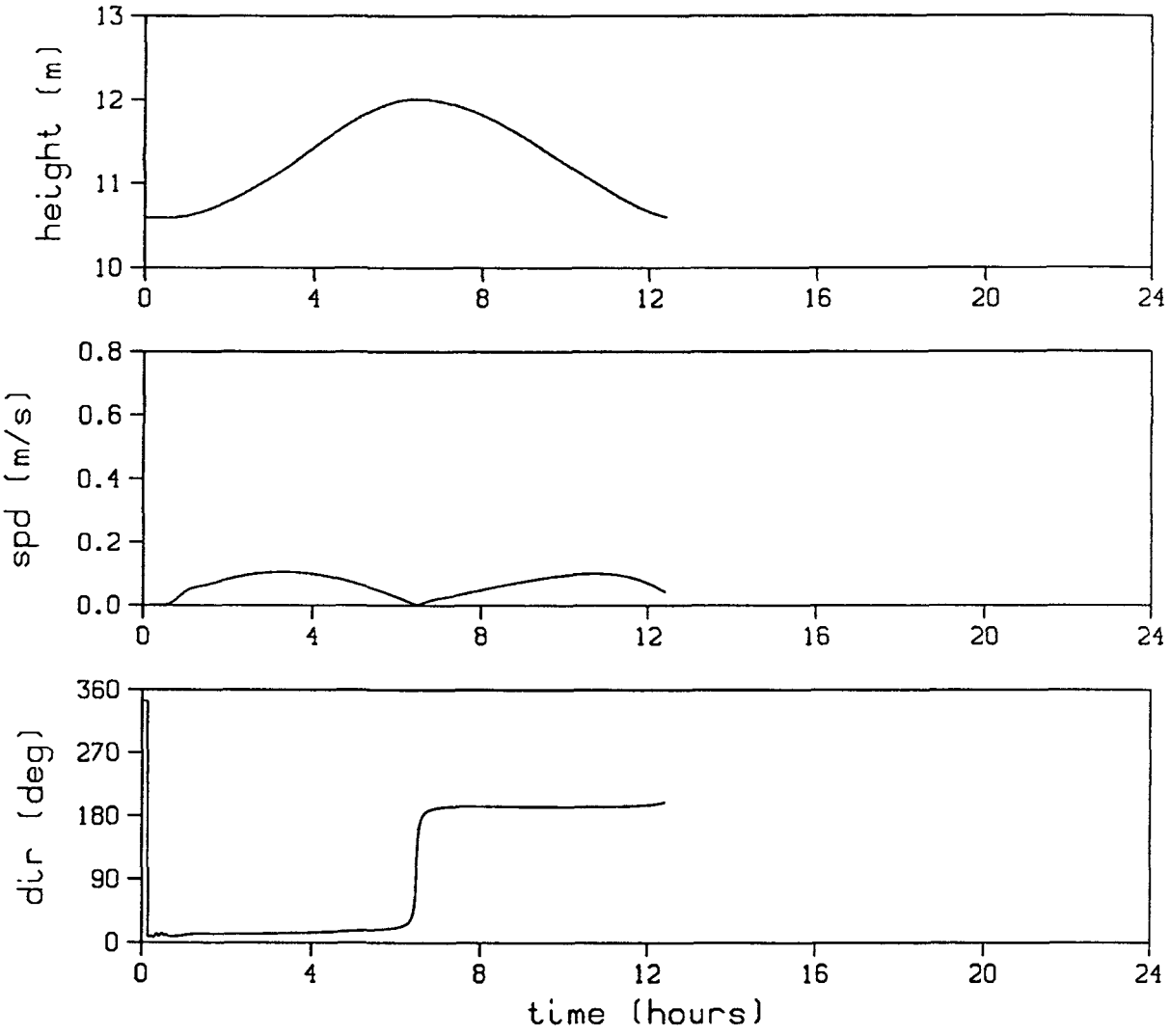

FIGURE E.69. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 14 FOR THE M_2 TIDE FORCING TEST

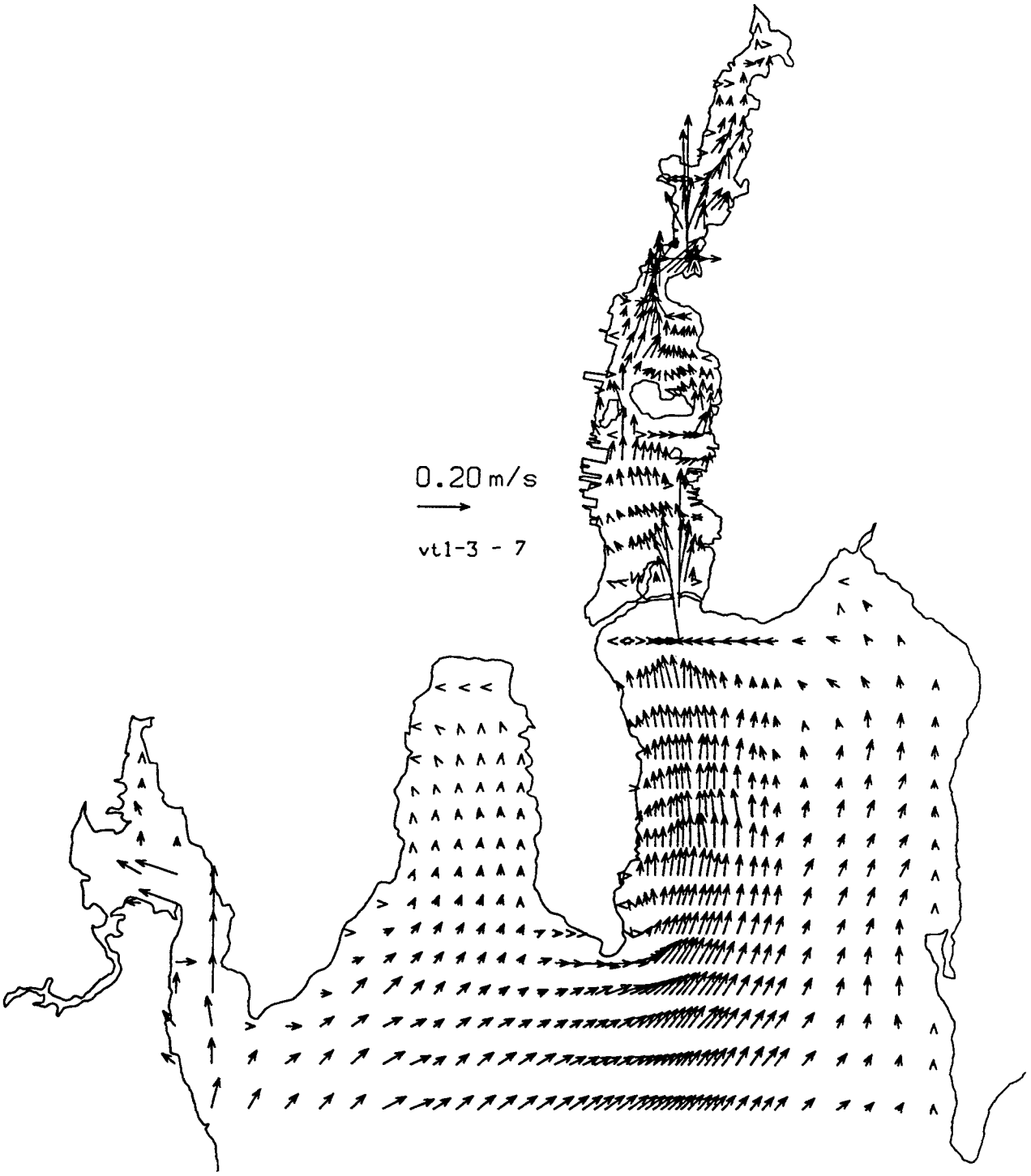

FIGURE E.70. M_2 TIDE FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 7 AT TIME = 3 h.

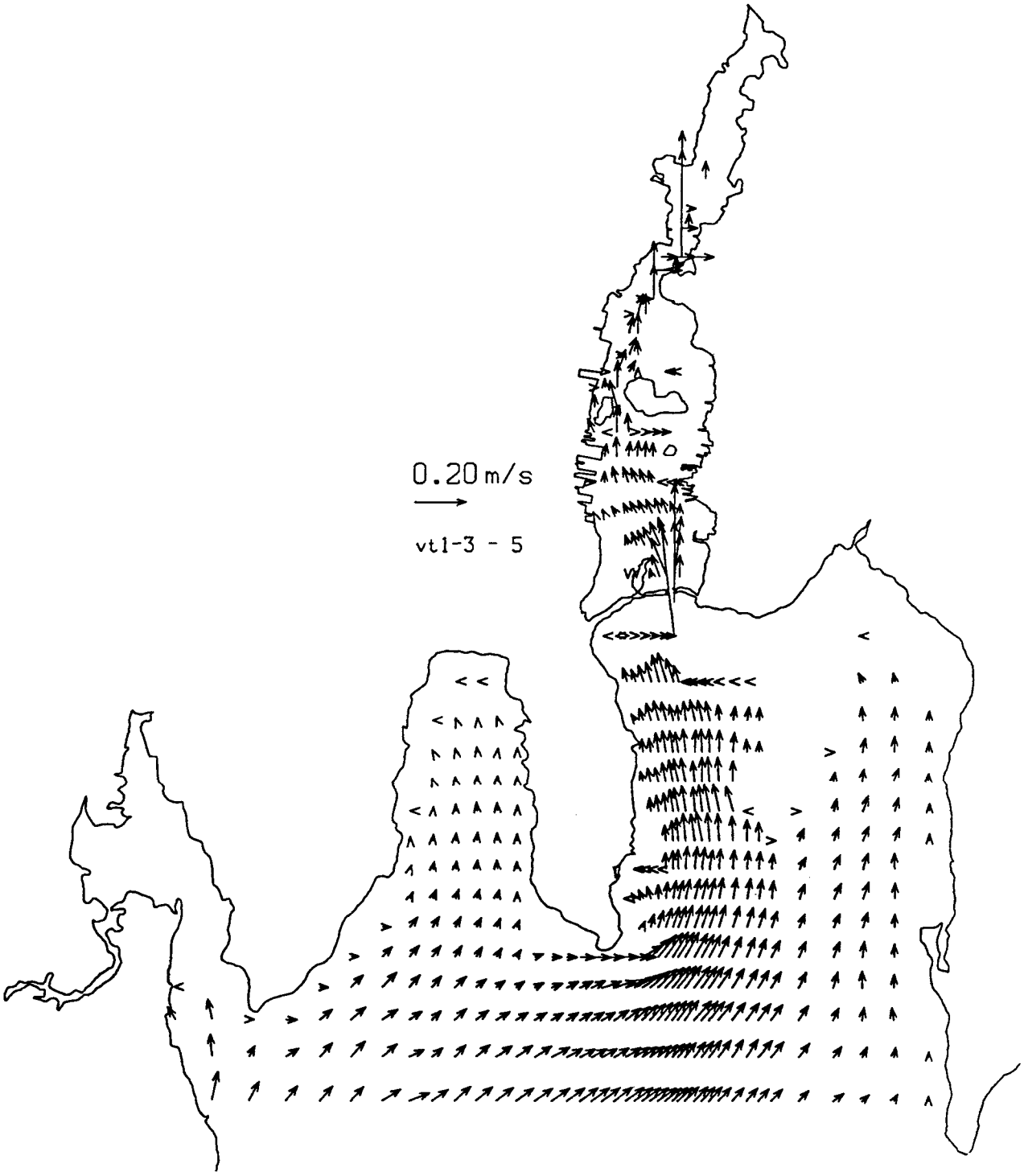

FIGURE E.71. M_2 TIDE FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 5 AT TIME = 3 h.

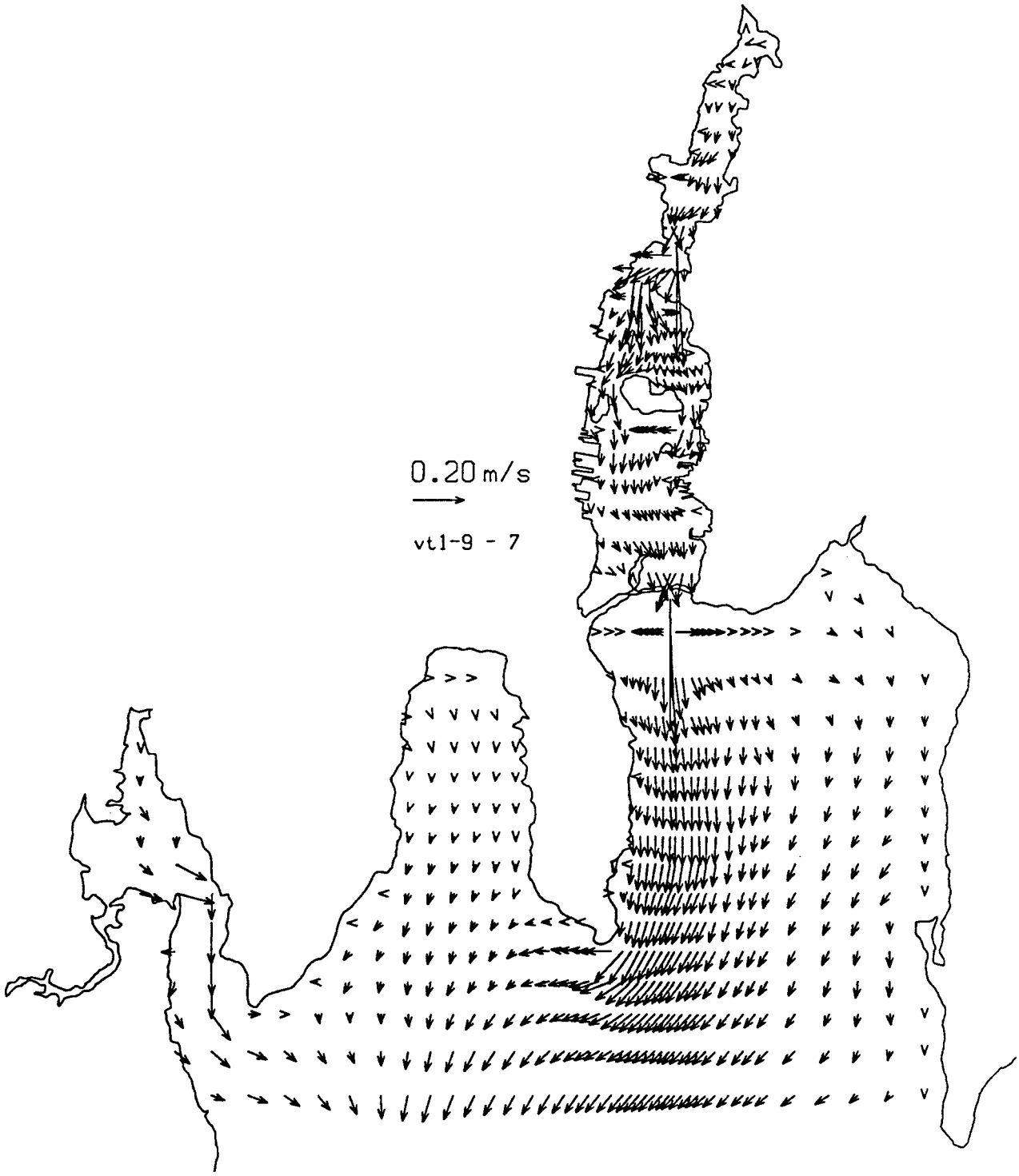

FIGURE E.72. M_2 TIDE FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 7 AT TIME = 9 h.

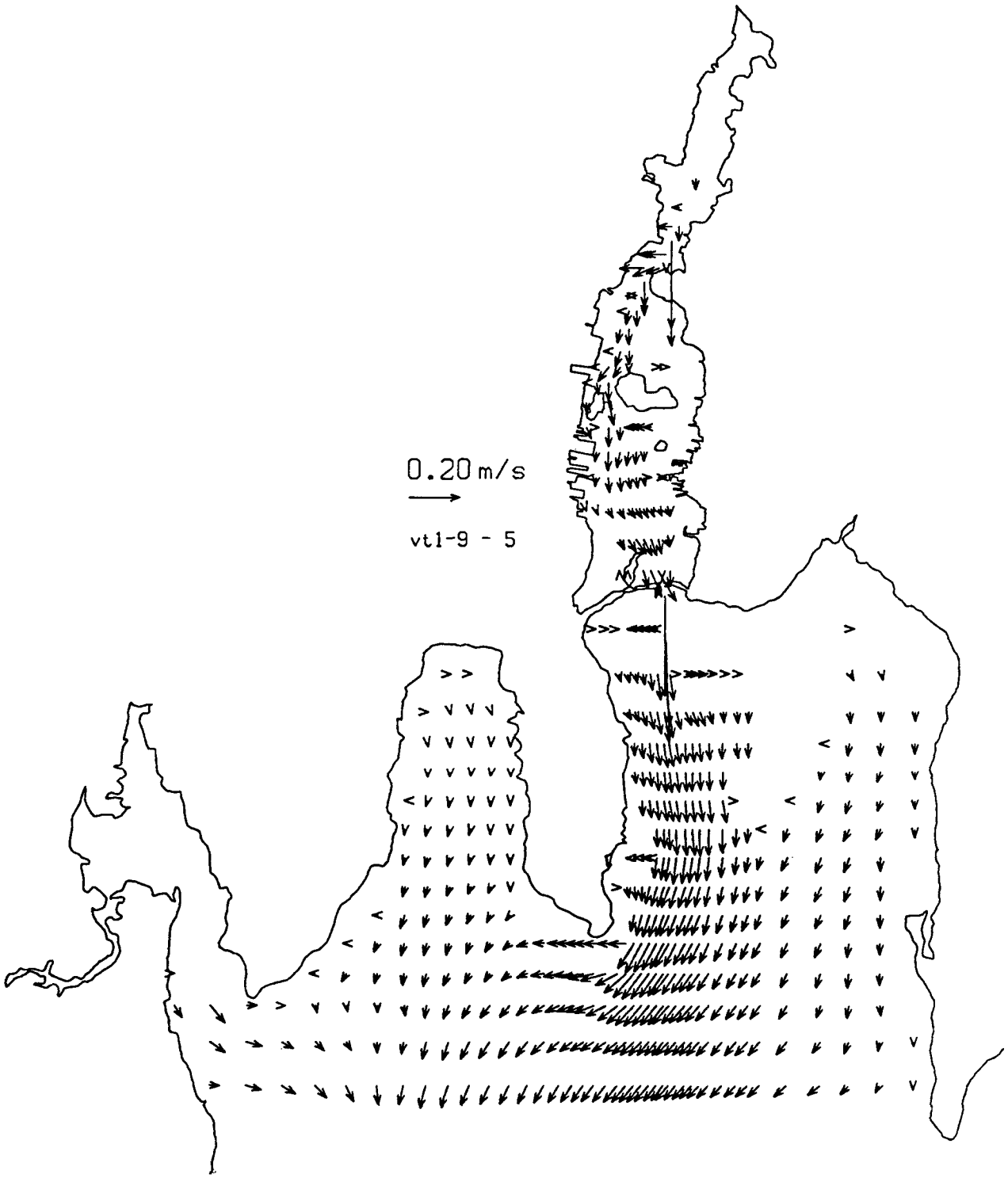

FIGURE E.73. M_2 TIDE FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 5 AT TIME = 9 h.

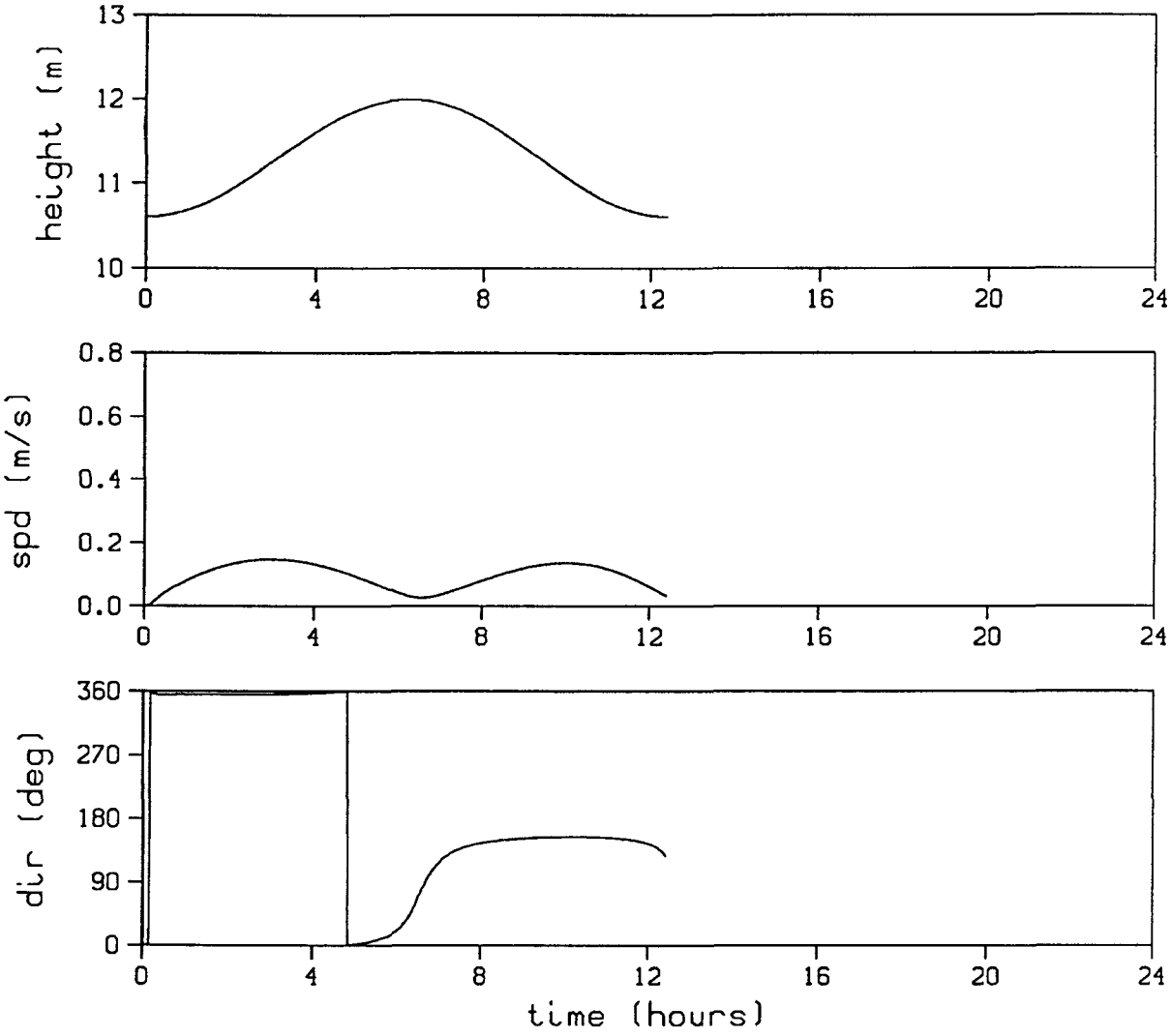

FIGURE E.74. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 4 FOR THE M_2 TIDE AND WIND FORCING TEST

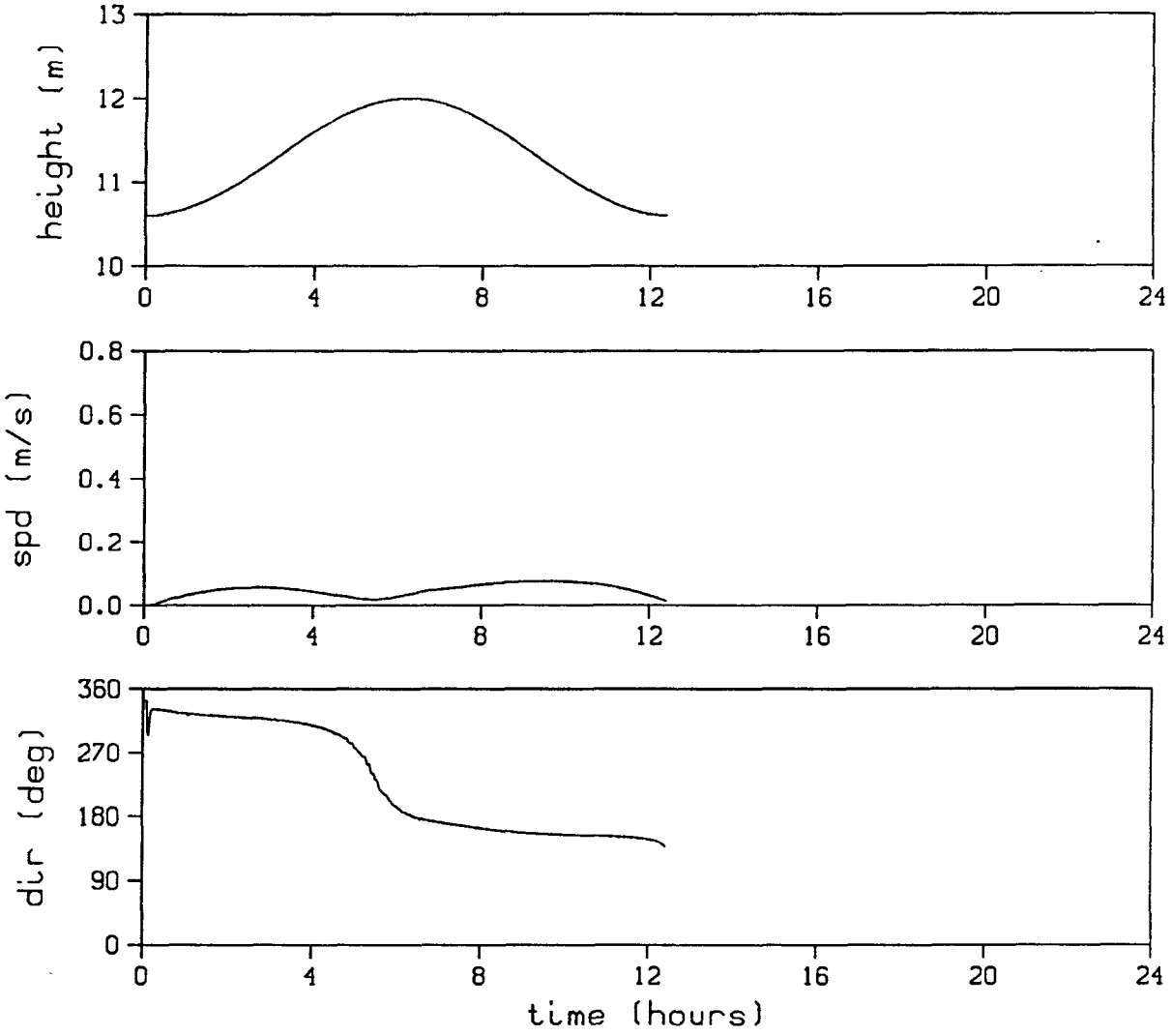

FIGURE E.75. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 3 FOR THE M_2 TIDE AND WIND FORCING TEST

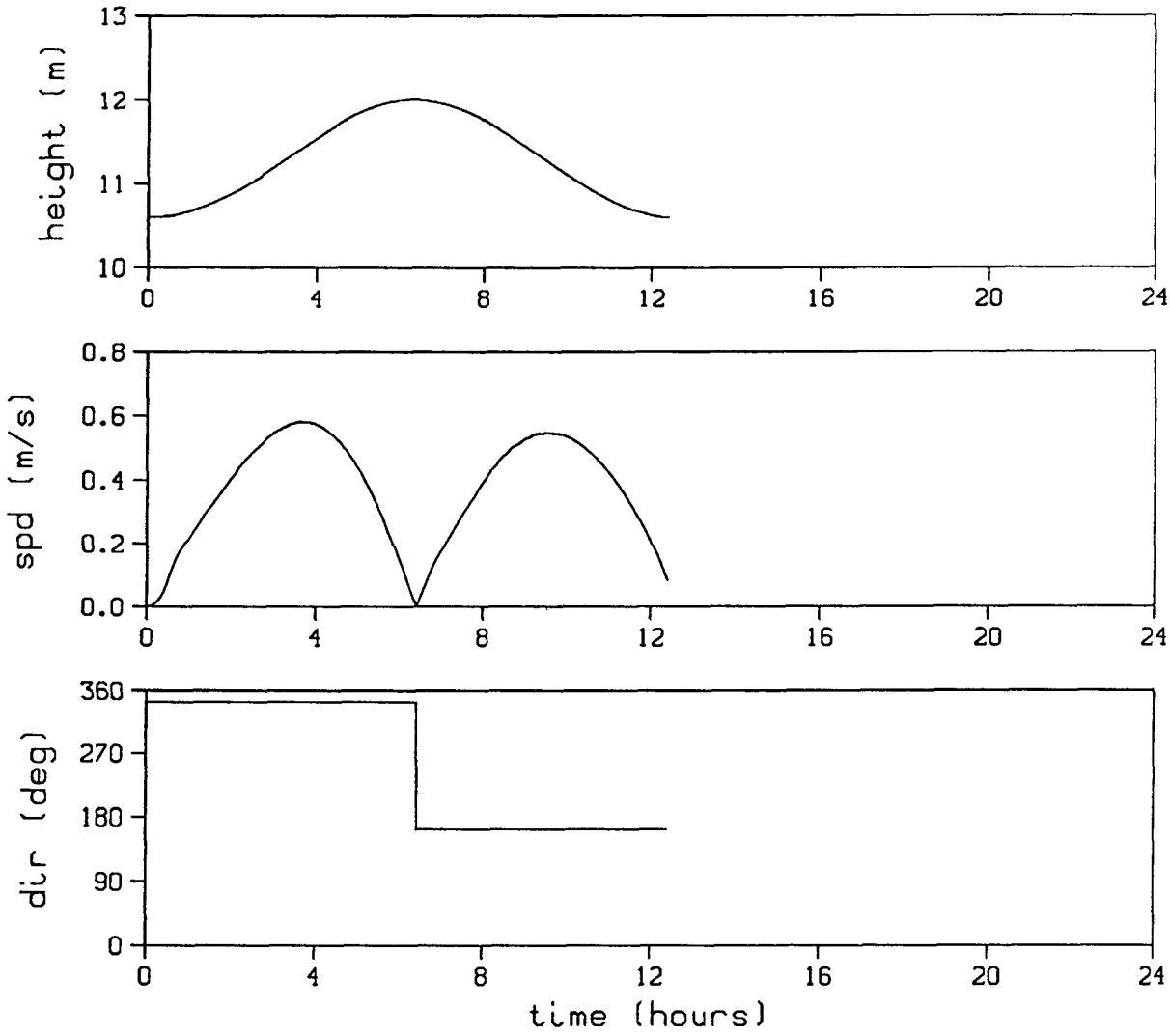

FIGURE E.76. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 11 FOR THE M_2 TIDE AND WIND FORCING TEST

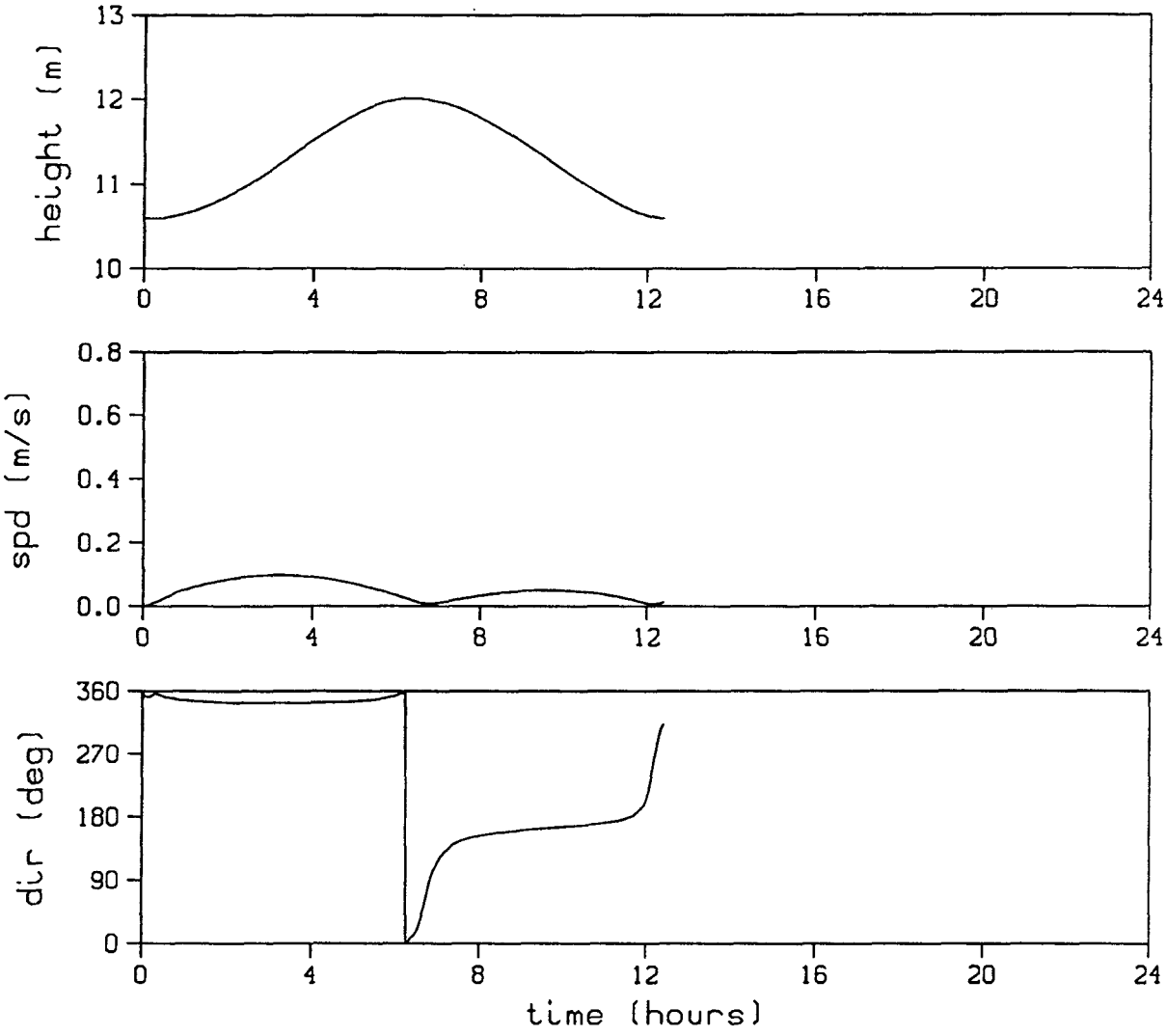

FIGURE E.77. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 12 FOR THE M_2 TIDE AND WIND FORCING TEST

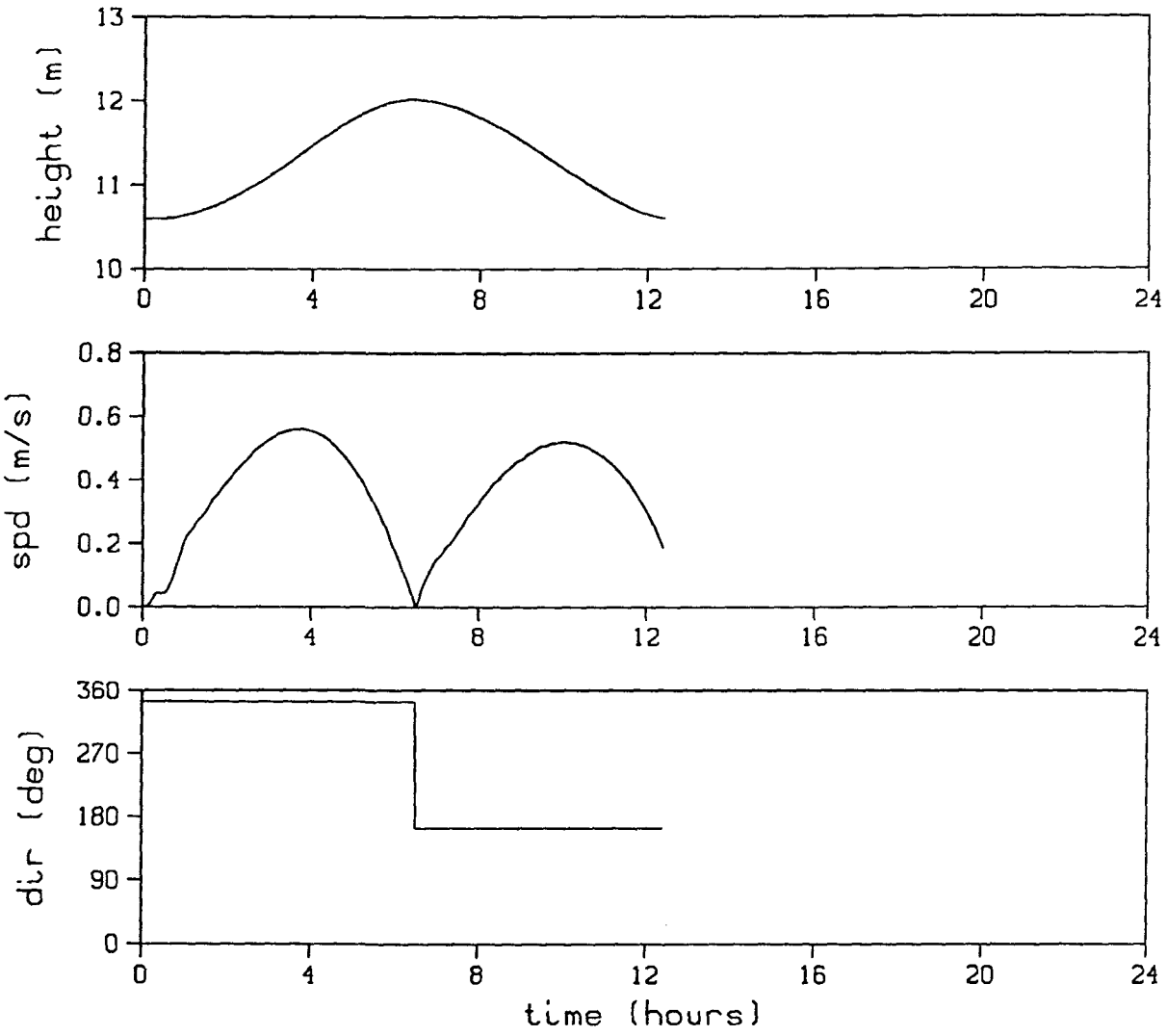

FIGURE E.78. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 8 FOR THE M_2 TIDE AND WIND FORCING TEST

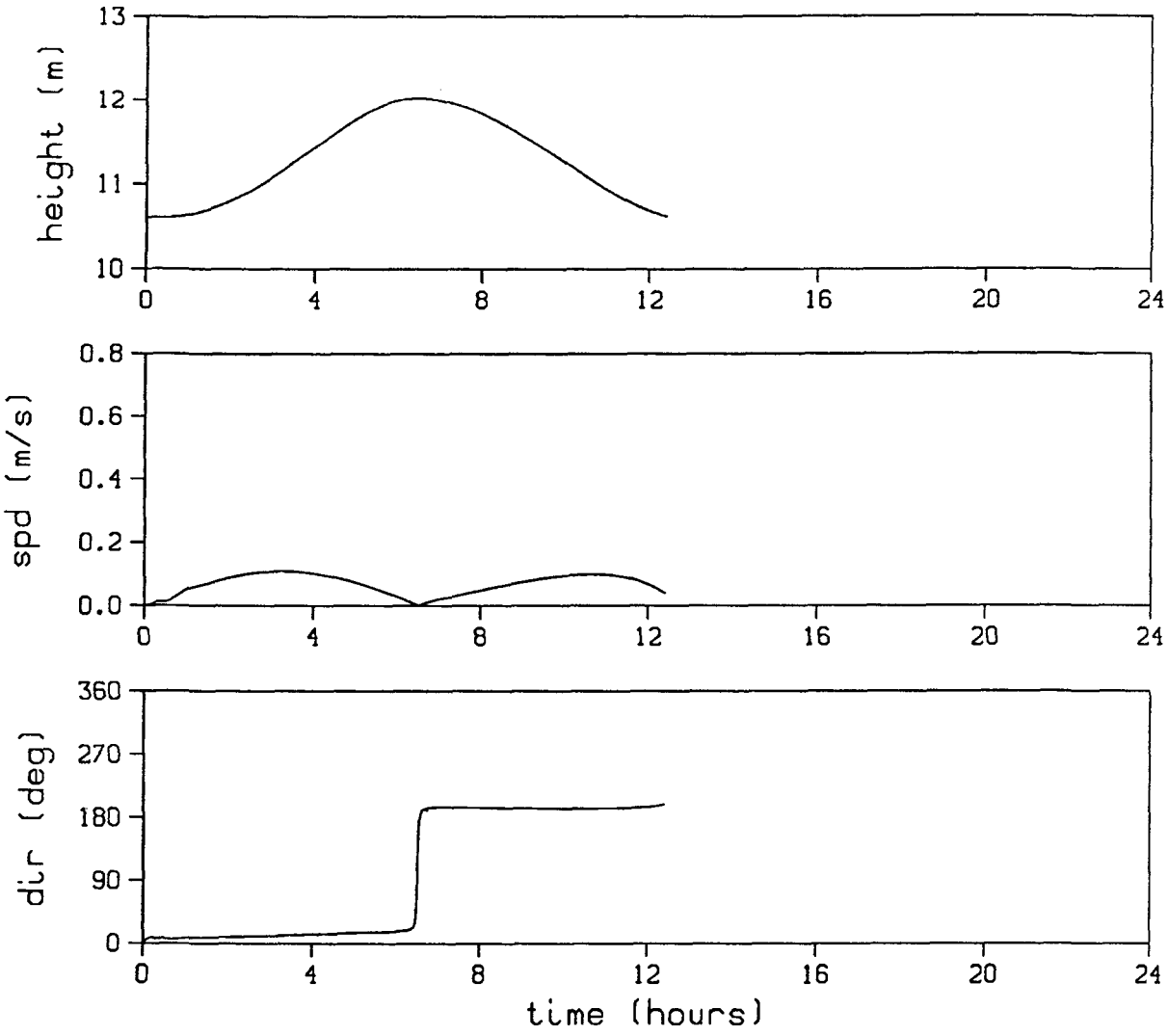

FIGURE E.79. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 14 FOR THE M_2 TIDE AND WIND FORCING TEST

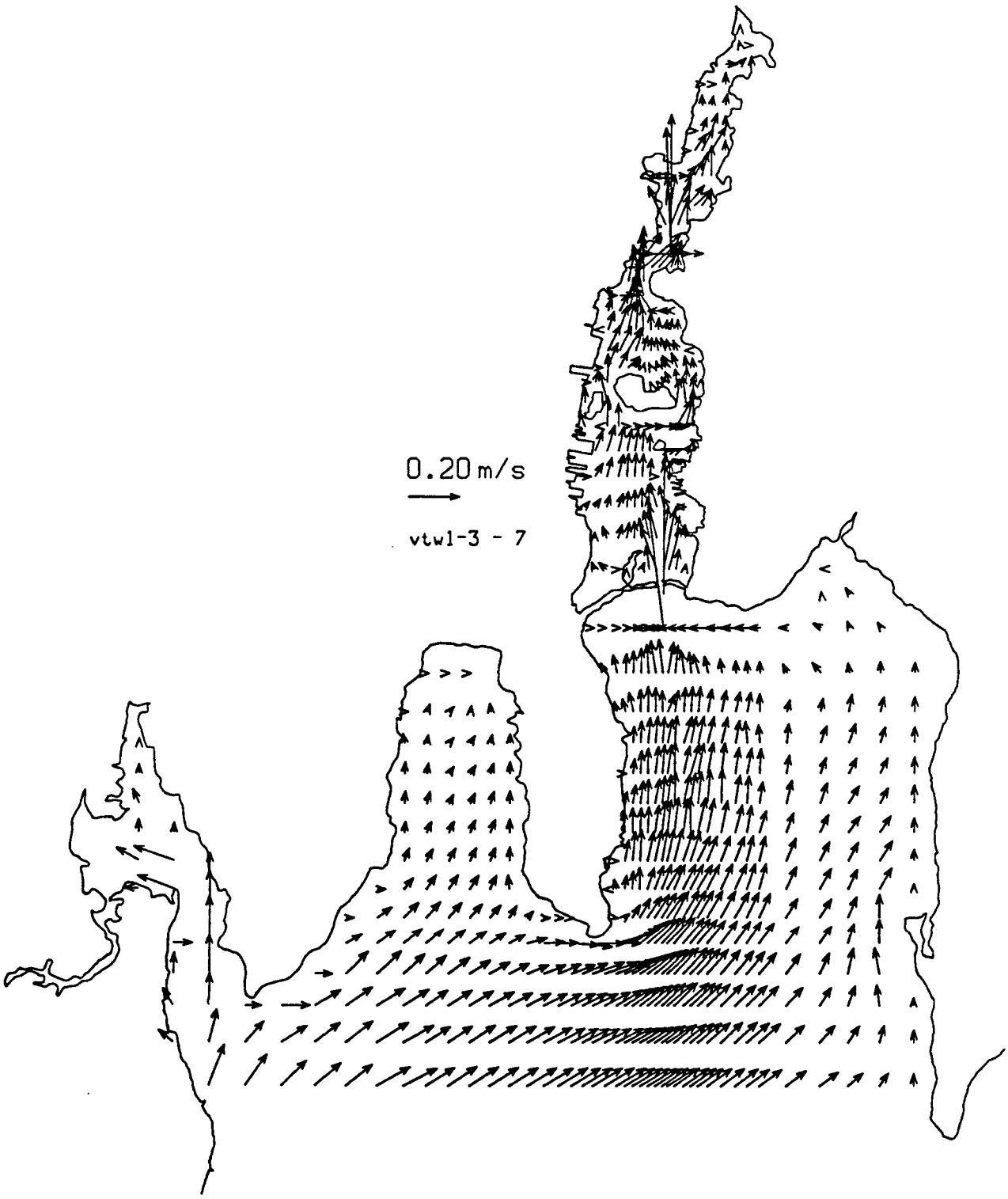

FIGURE E.80. M_2 TIDE AND WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 7 AT TIME = 3 h.

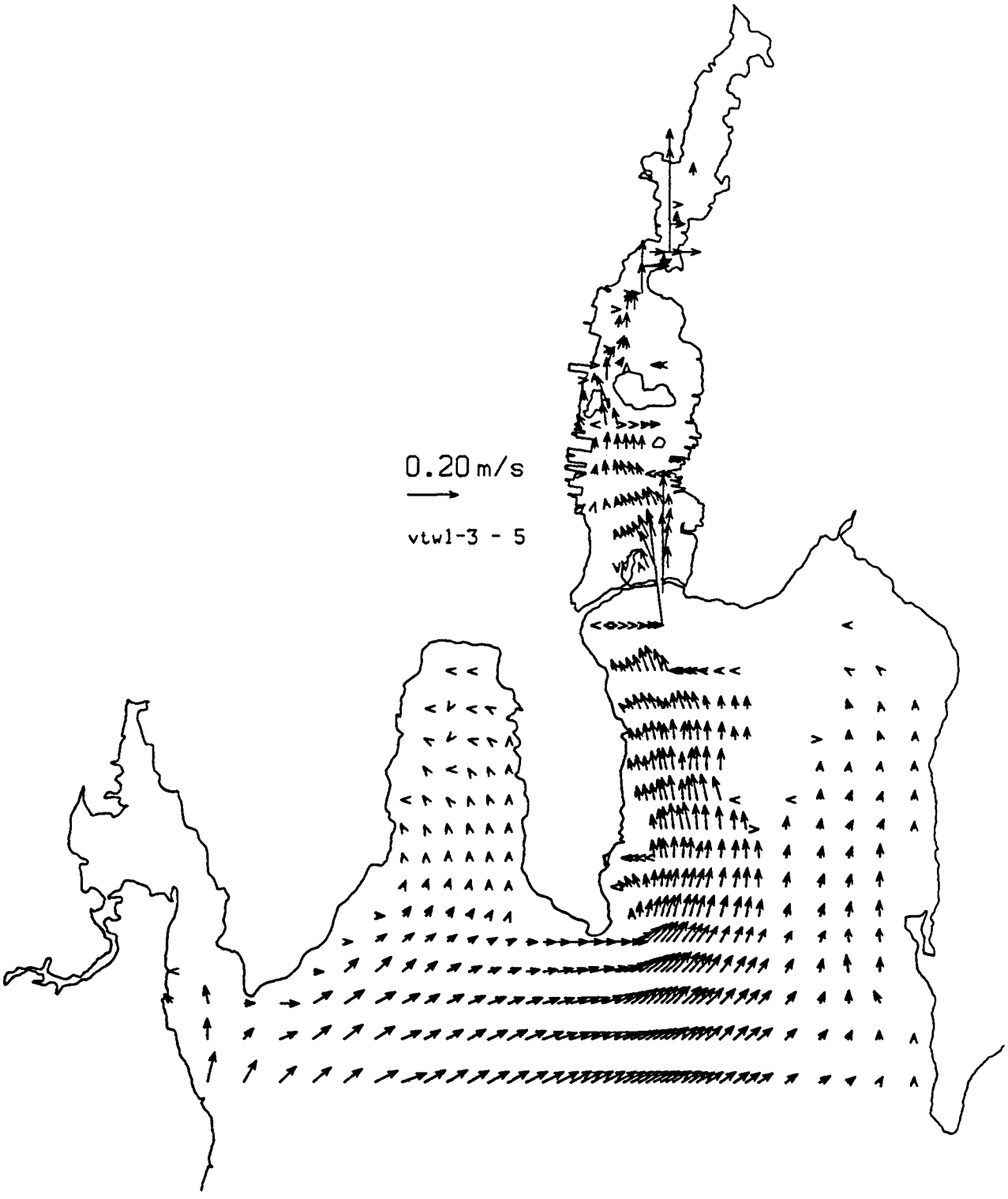

FIGURE E.81. M_2 TIDE AND WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 5 AT TIME = 3 h.

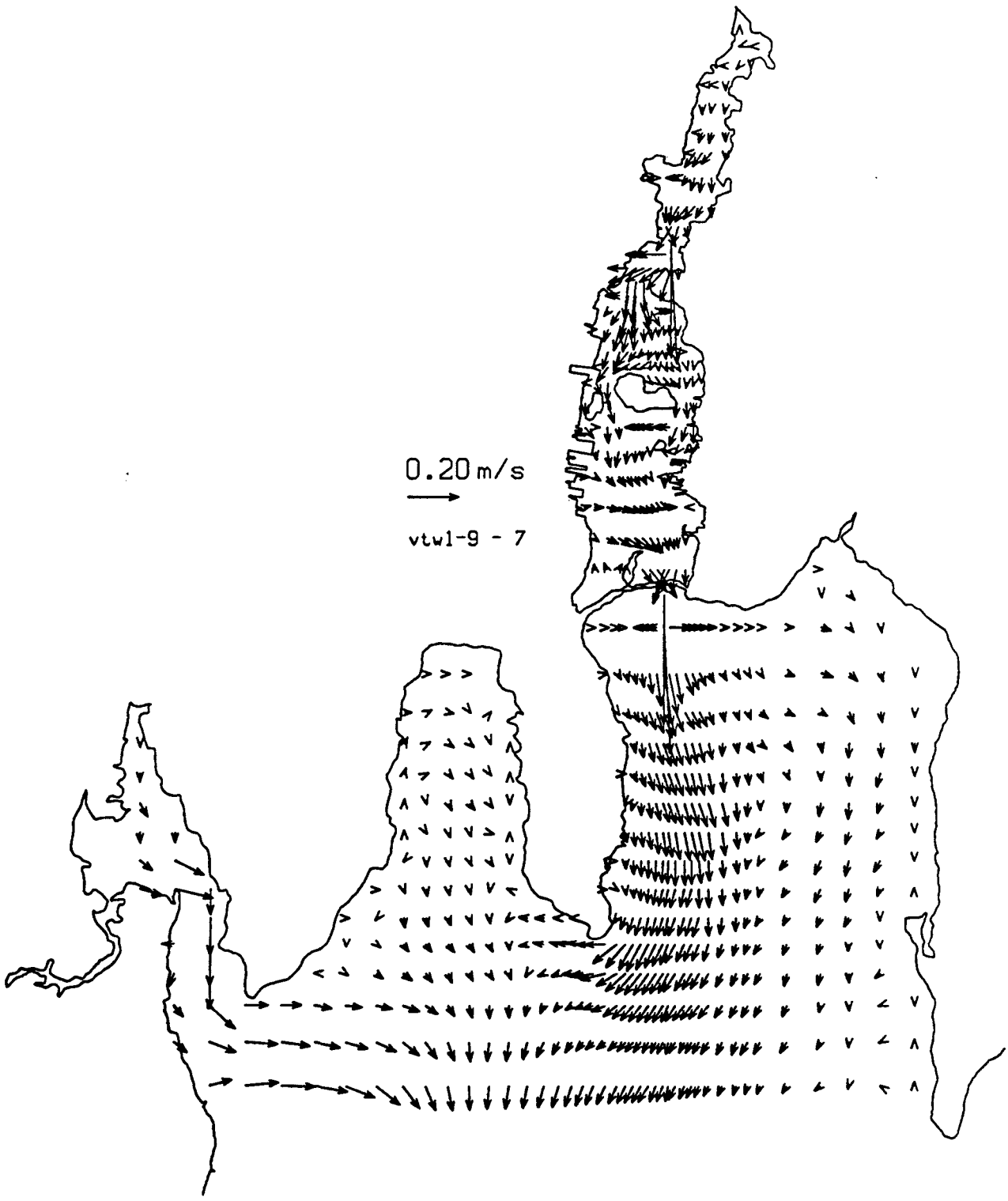

FIGURE E.82. M_2 TIDE AND WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 7 AT TIME = 9 h.

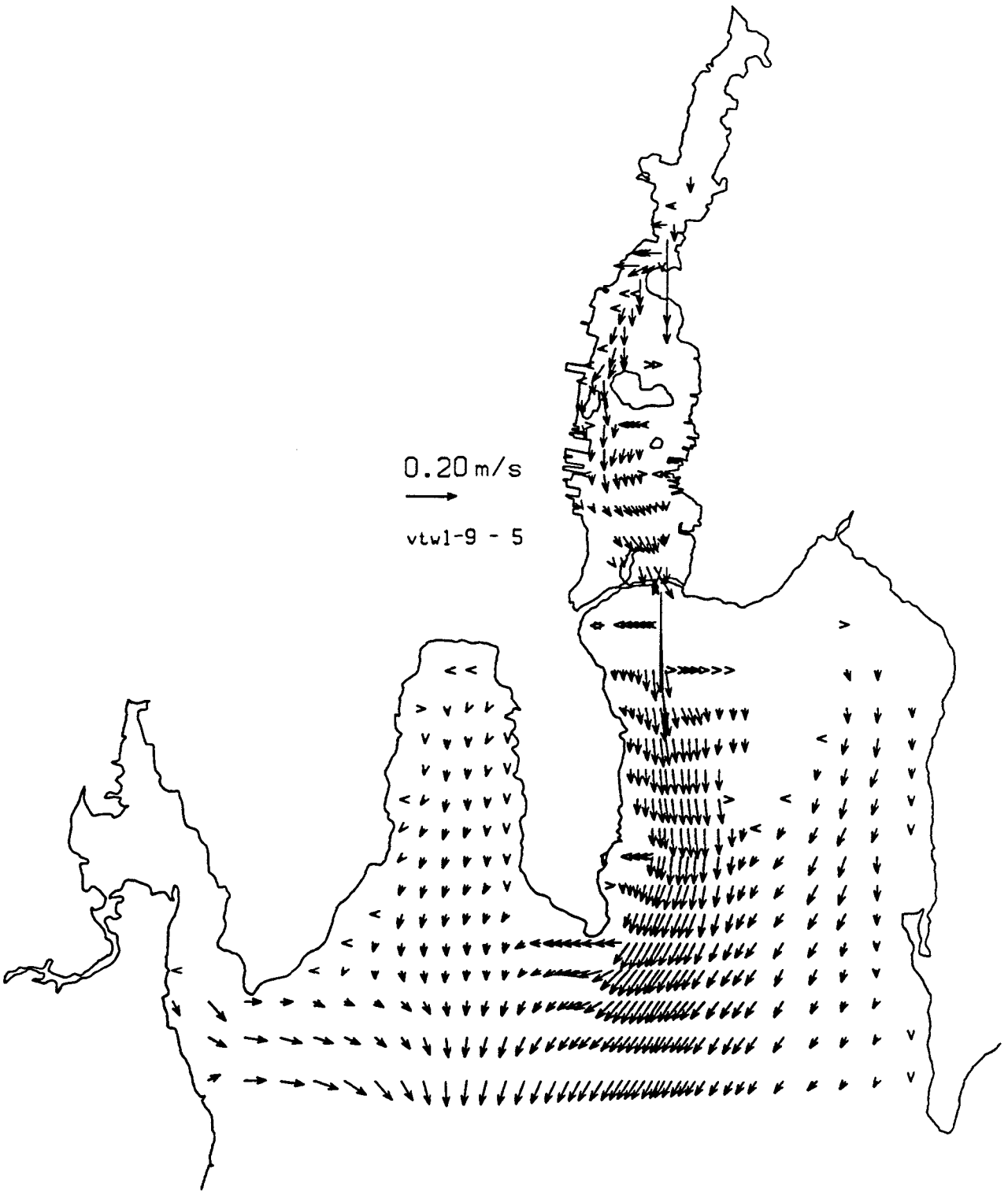

FIGURE E.83. M_2 TIDE AND WIND FORCING TEST. VELOCITY VECTORS FOR GRID LAYER 5 AT TIME = 9 h.

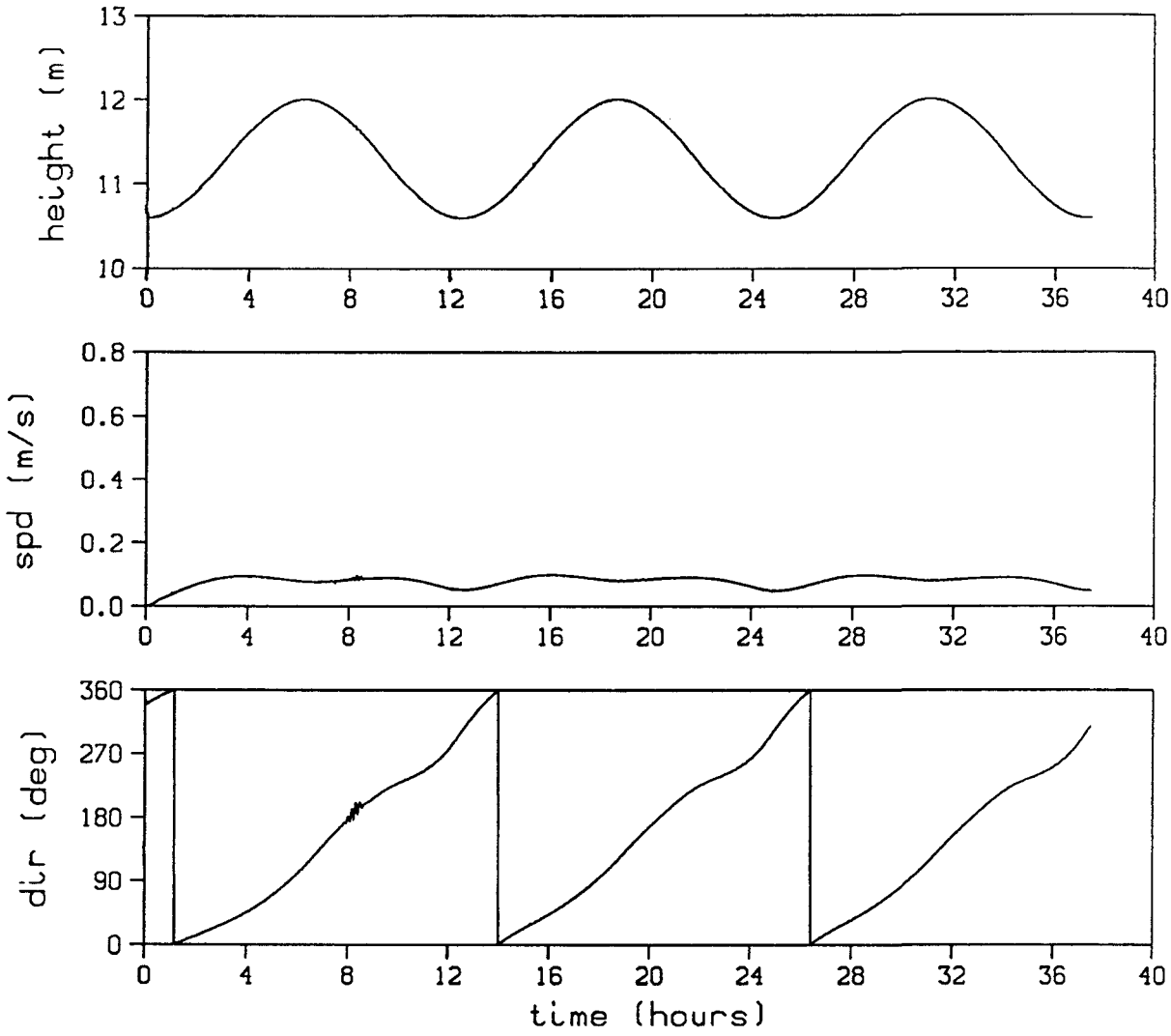

FIGURE E.84. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 2 FOR THE QUASI-STEADY STABILIZATION TEST

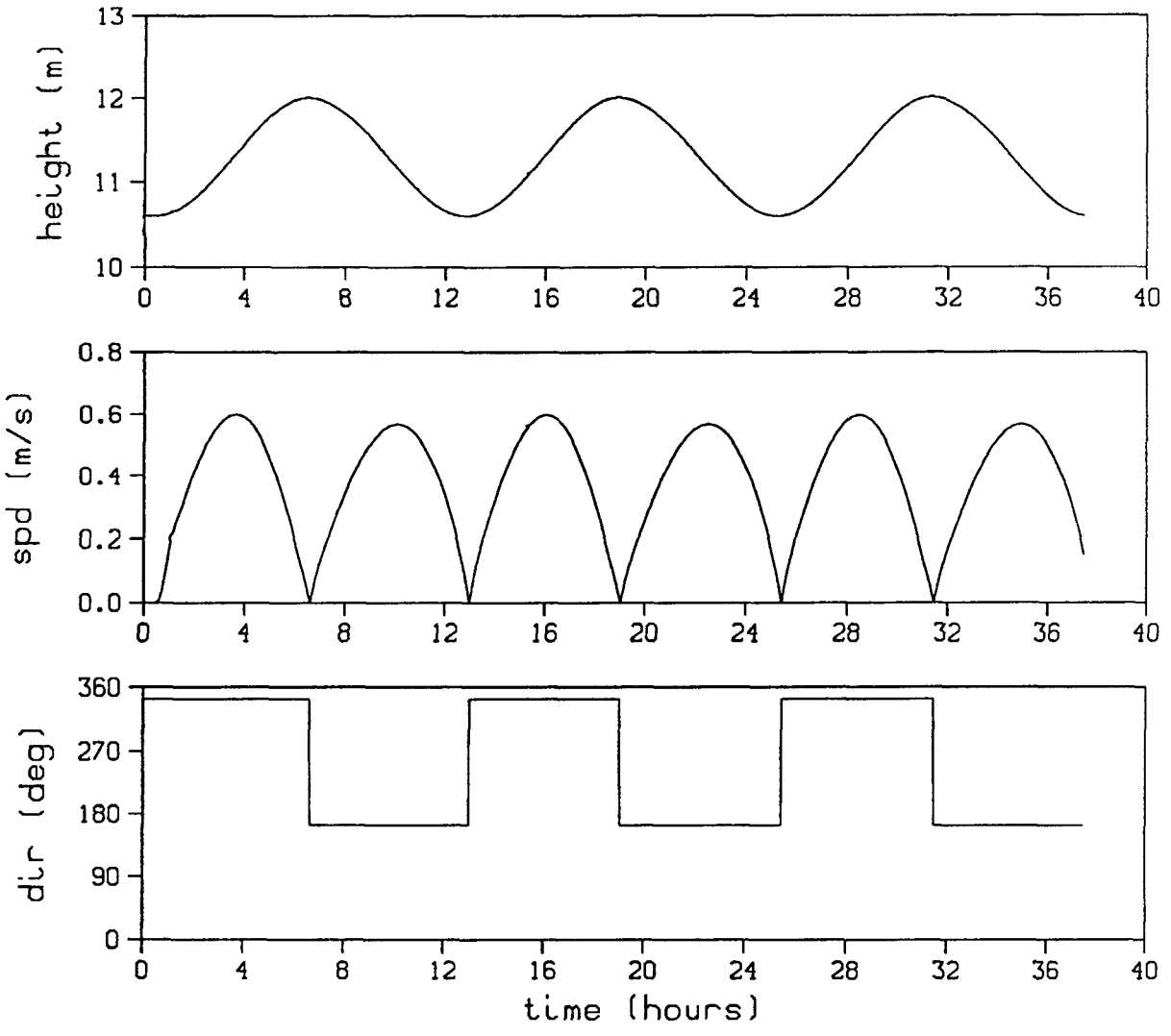

FIGURE E.85. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 8 FOR THE QUASI-STEADY STABILIZATION TEST

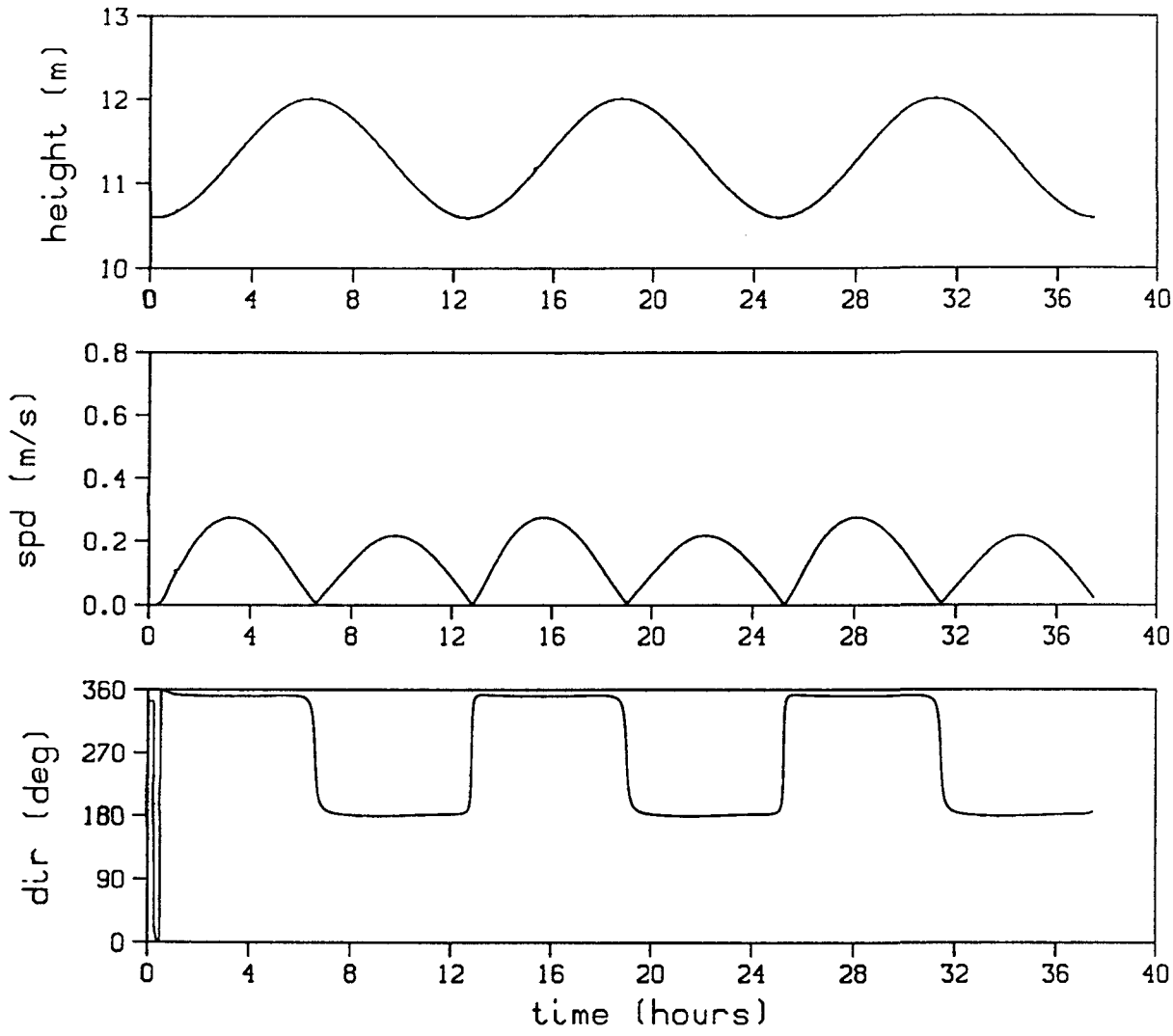

FIGURE E.86. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 6 FOR THE QUASI-STEADY STABILIZATION TEST

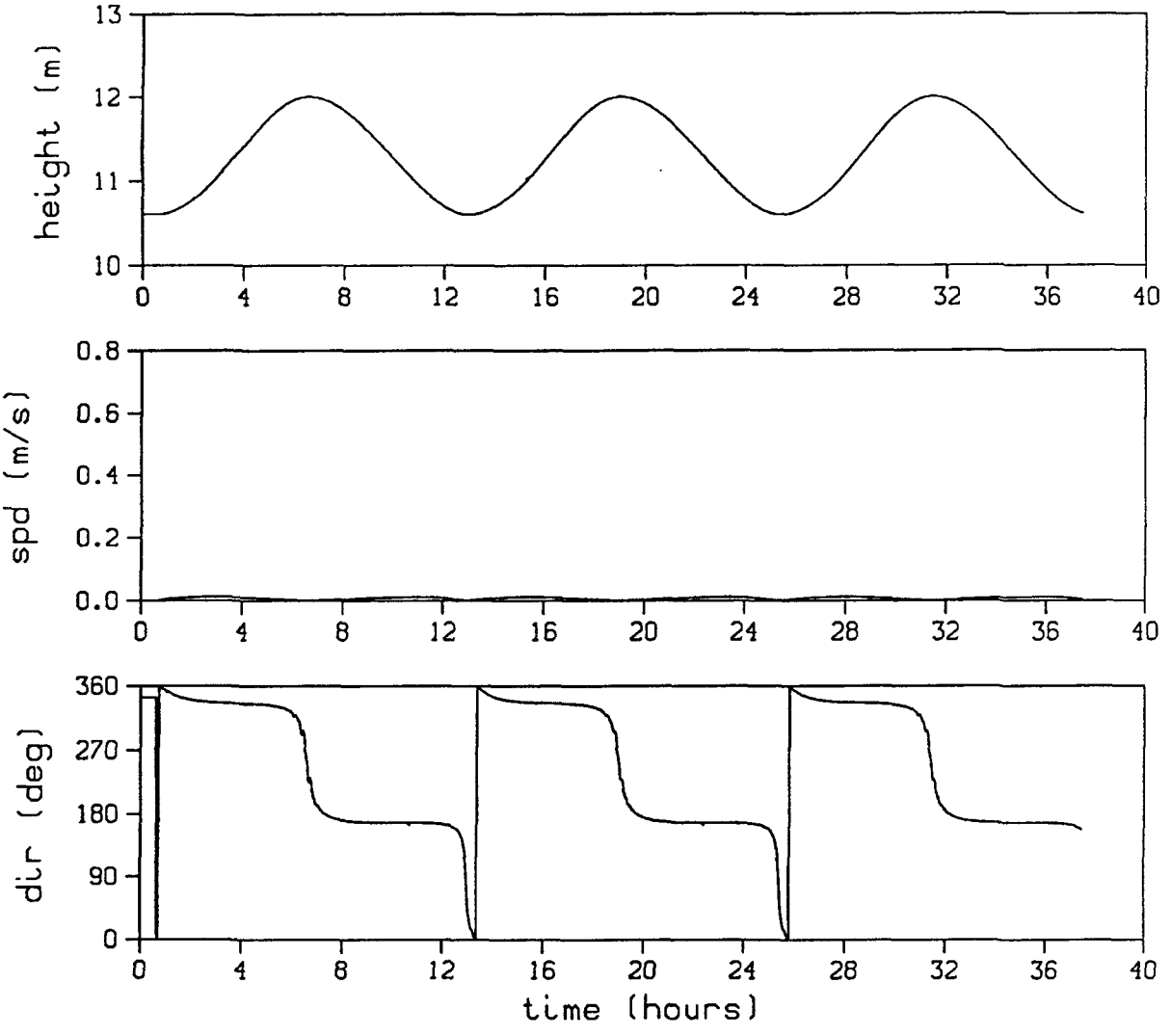

FIGURE E.87. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 7 FOR THE QUASI-STEADY STABILIZATION TEST

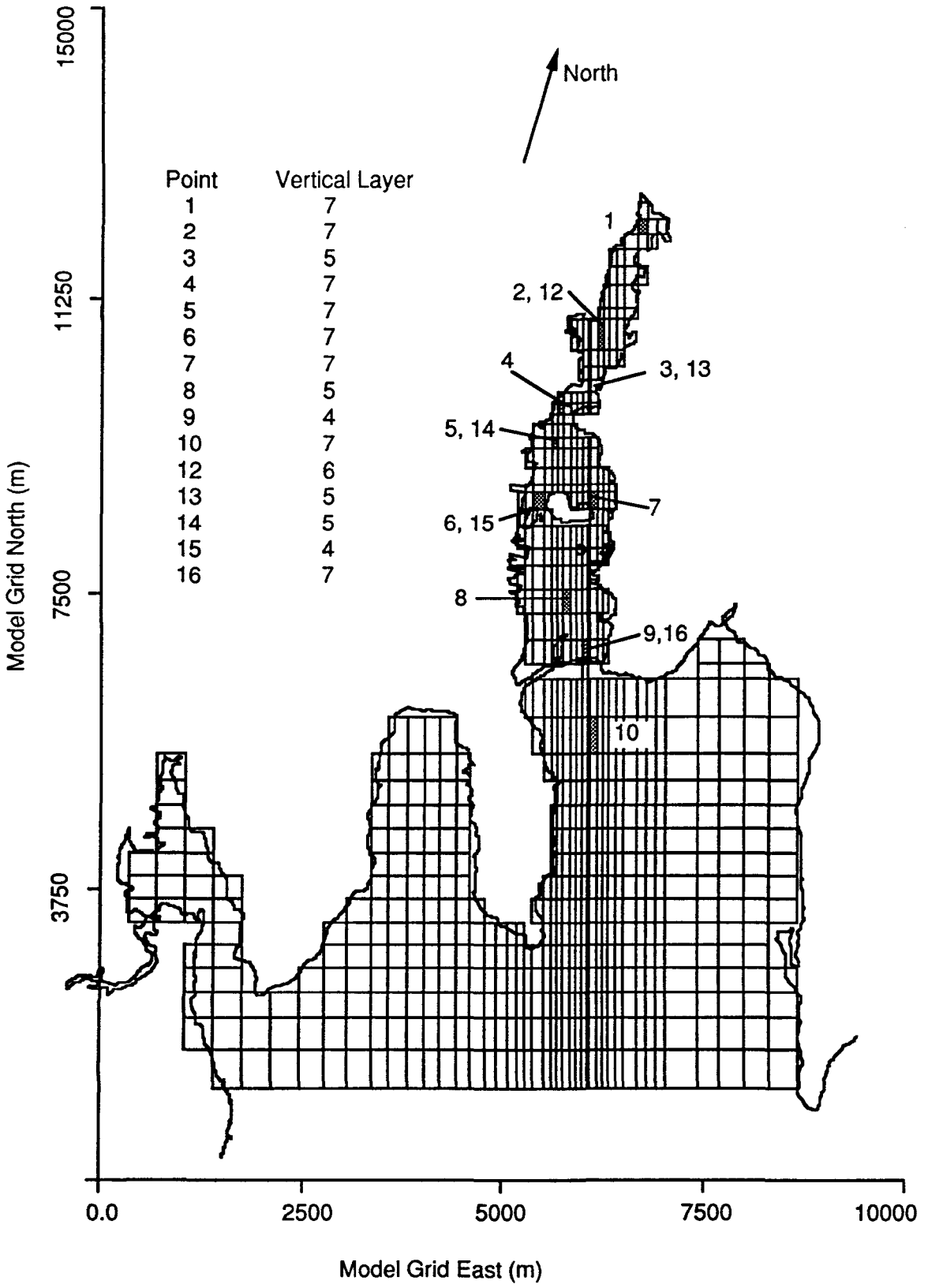

FIGURE E.88. LOCATION OF THE MODEL TIME-SERIES OUTPUT FOR THE TRACER DISPERSION TEST.

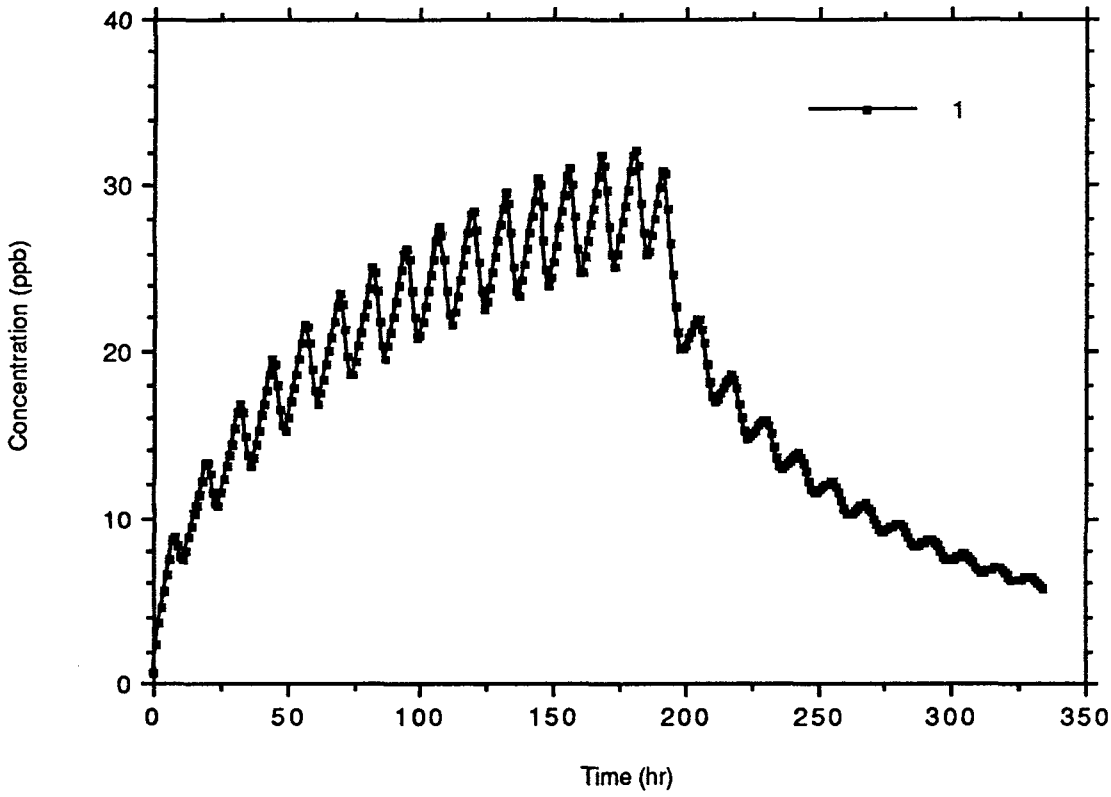

FIGURE E.89. COMPUTED CONCENTRATION TIME-SERIES AT LOCATION 1

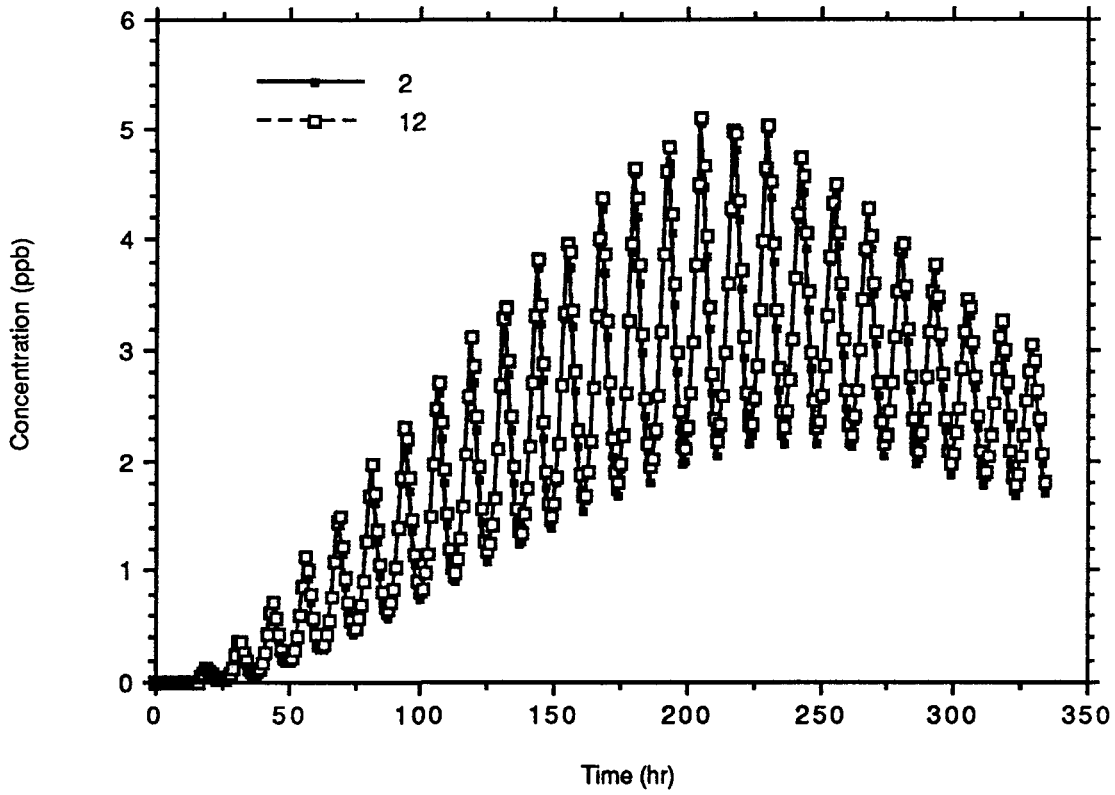

FIGURE E.90. COMPUTED CONCENTRATION TIME-SERIES AT LOCATIONS 2 AND 12. LOCATION 2 IS IN LAYER 7 AND LOCATION 12 IS IN LAYER 5.

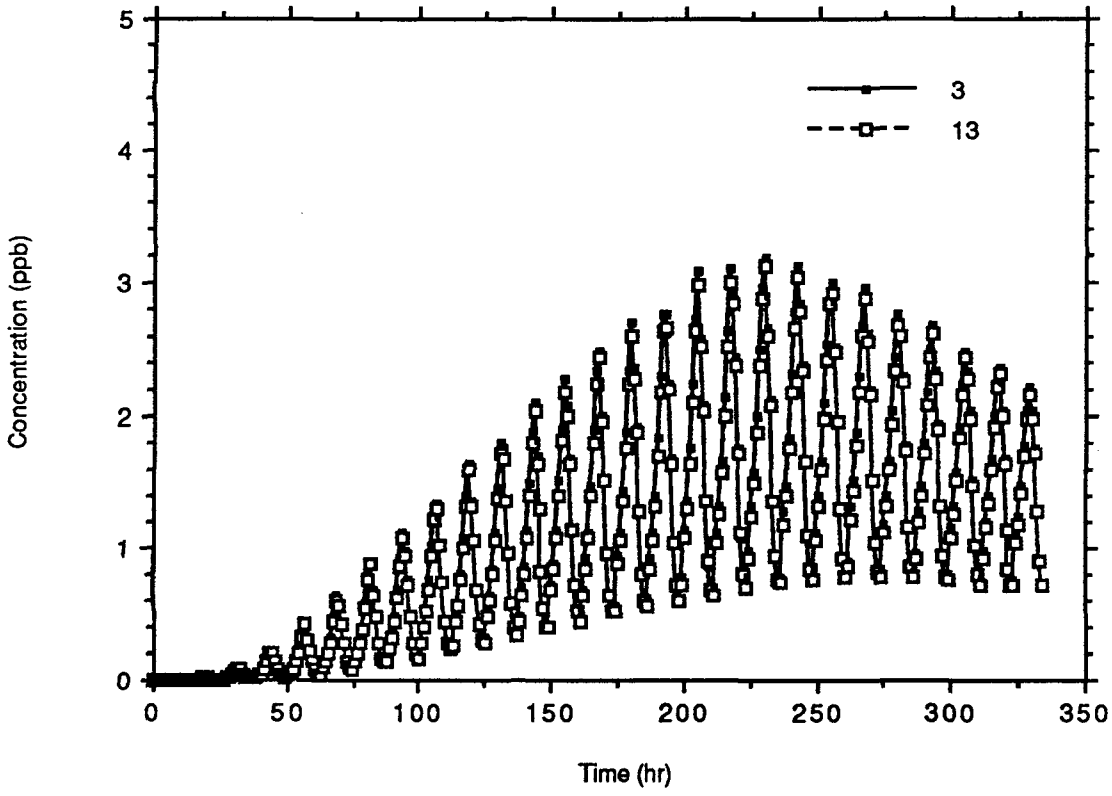

FIGURE E.91. COMPUTED CONCENTRATION TIME-SERIES AT LOCATIONS 3 AND 13. LOCATION 3 IS IN LAYER 7 AND LOCATION 12 IS IN LAYER 5.

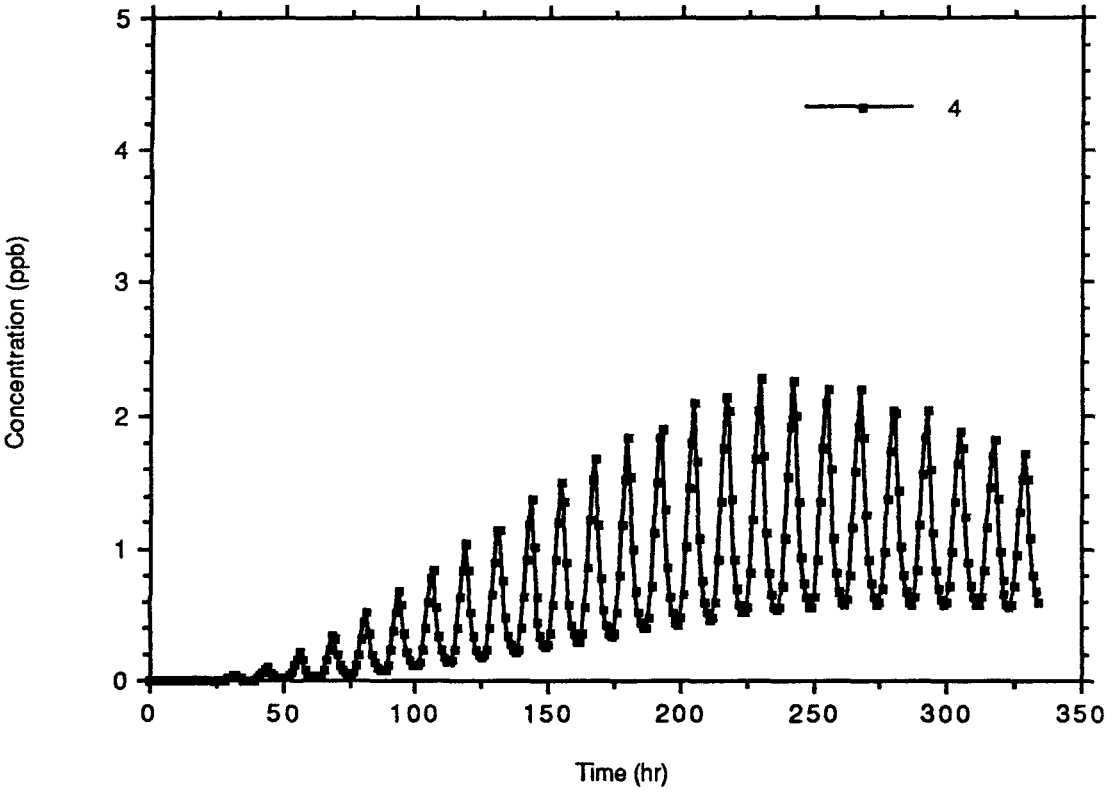

FIGURE E.92. COMPUTED CONCENTRATION TIME-SERIES AT LOCATION 4

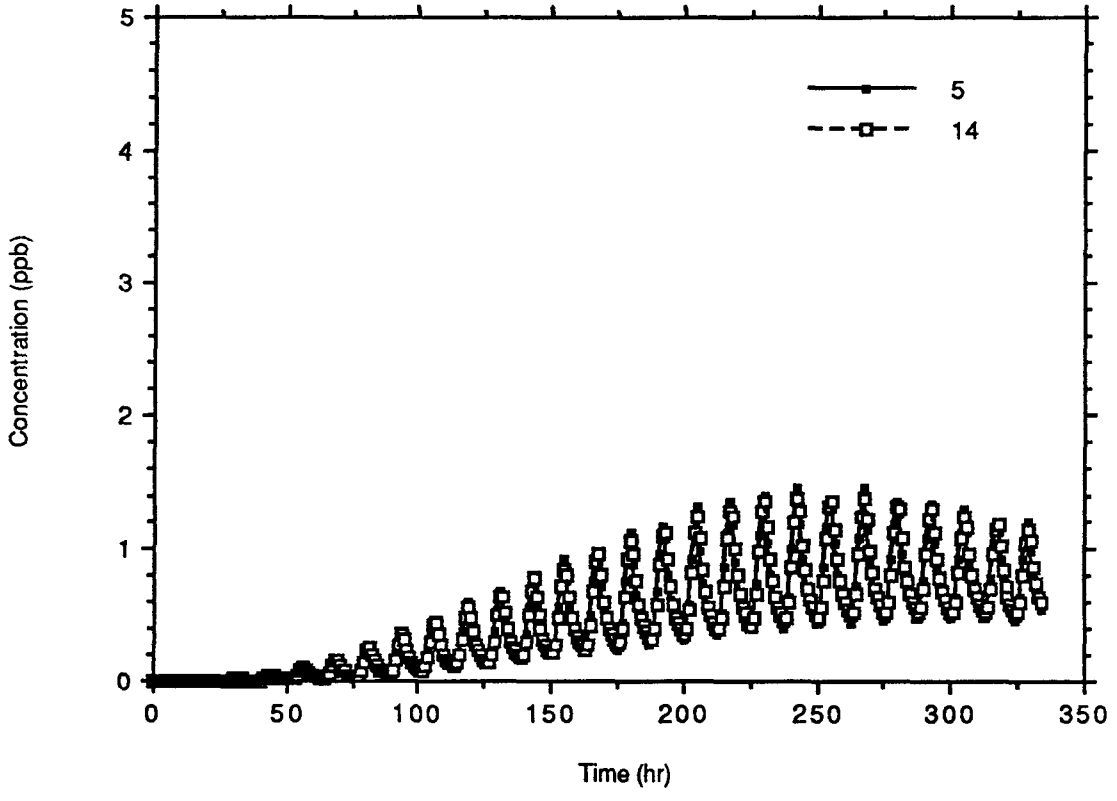

FIGURE E.93. COMPUTED CONCENTRATION TIME-SERIES AT LOCATIONS 5 AND 14. LOCATION 5 IS IN LAYER 7 AND LOCATION 14 IS IN LAYER 5.

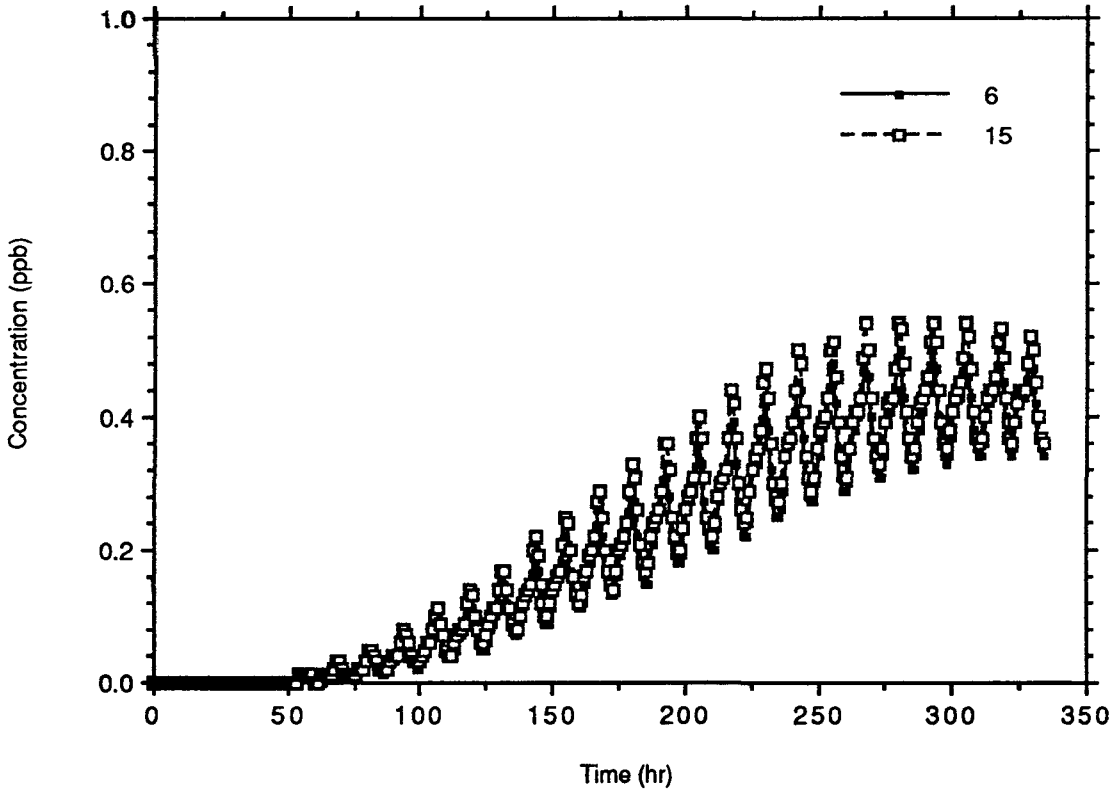

FIGURE E.94. COMPUTED CONCENTRATION TIME-SERIES AT LOCATIONS 6 AND 15. LOCATION 6 IS IN LAYER 7 AND LOCATION 15 IS IN LAYER 4.

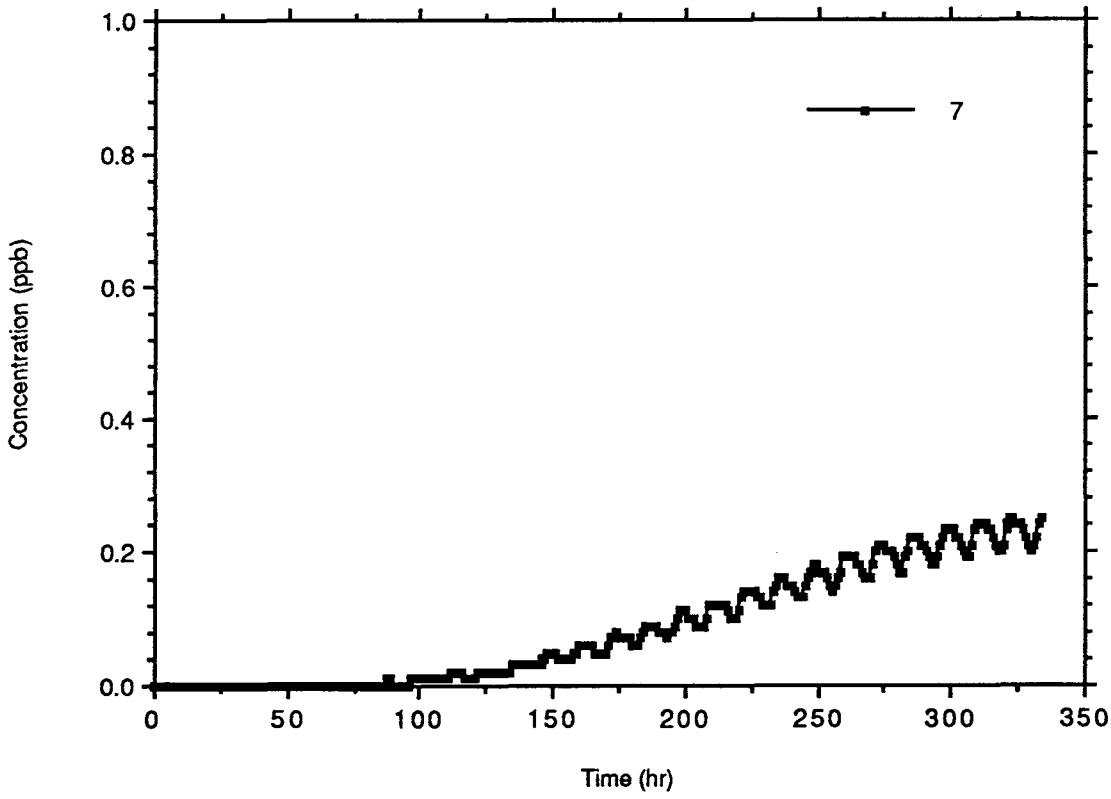

FIGURE E.95. COMPUTED CONCENTRATION TIME-SERIES AT LOCATION 7

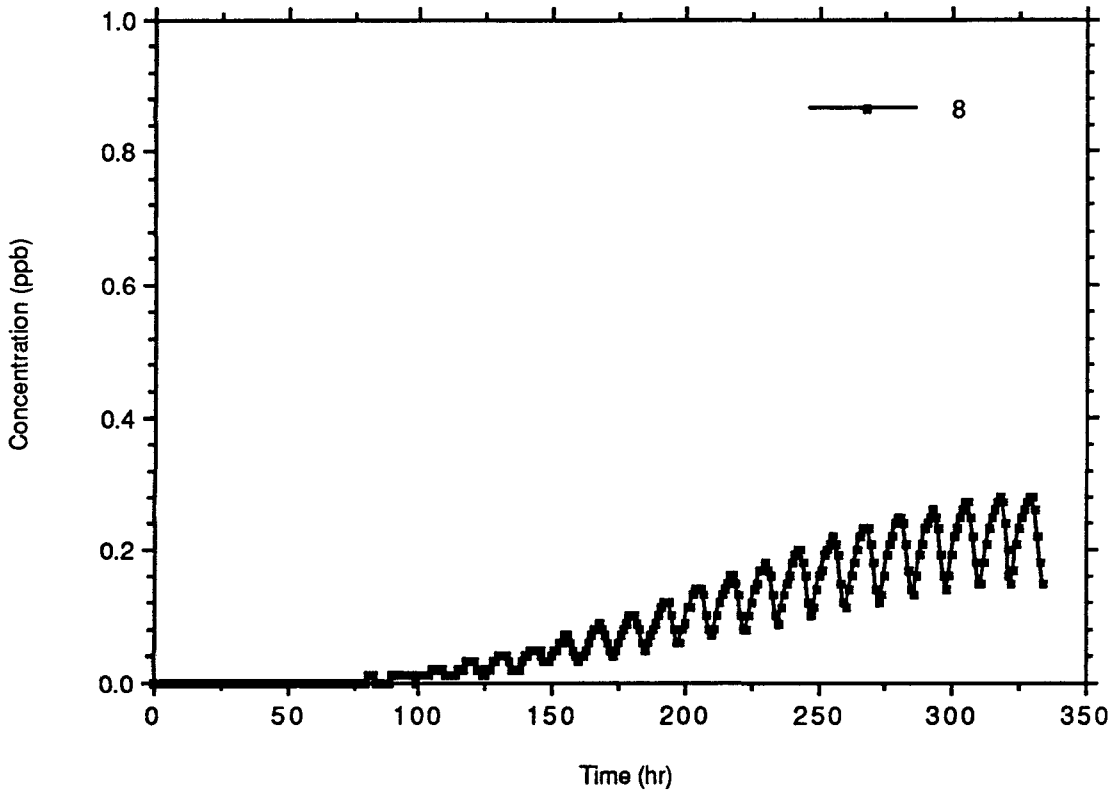

FIGURE E.96. COMPUTED CONCENTRATION TIME-SERIES AT LOCATION 8

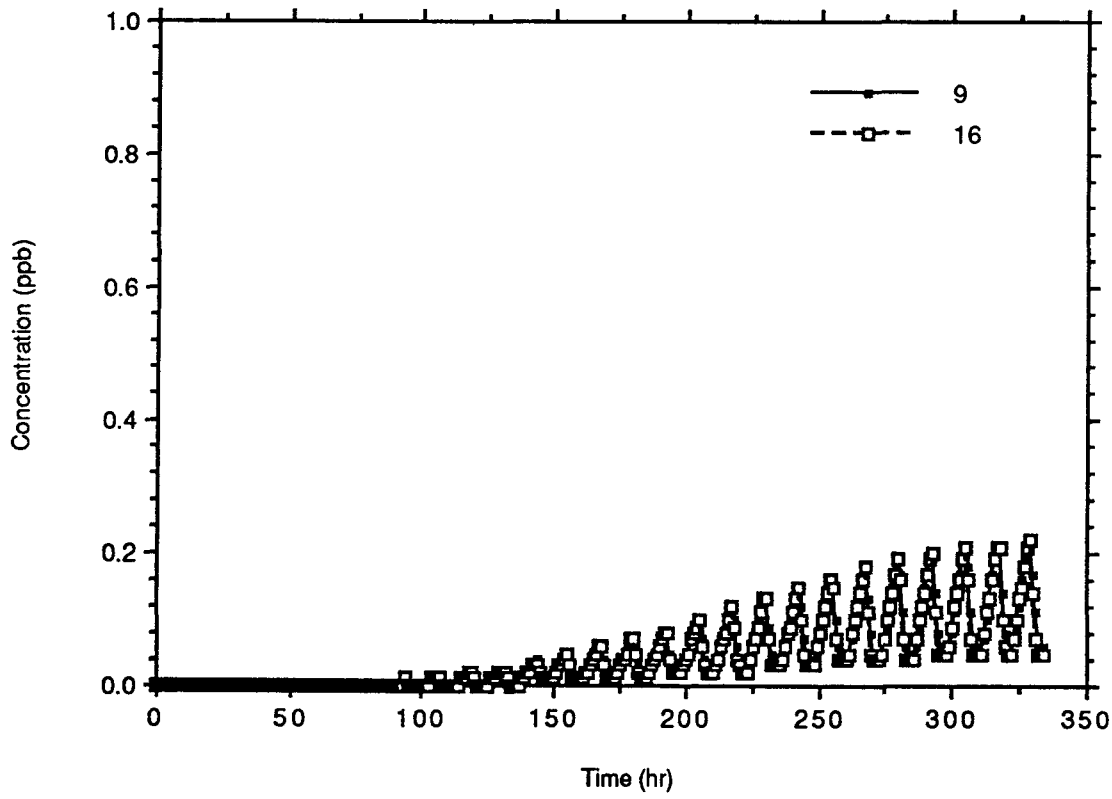

FIGURE E.97. COMPUTED CONCENTRATION TIME-SERIES AT LOCATIONS 9 AND 16. LOCATION 16 IS IN LAYER 7 AND LOCATION 9 IS IN LAYER 4.

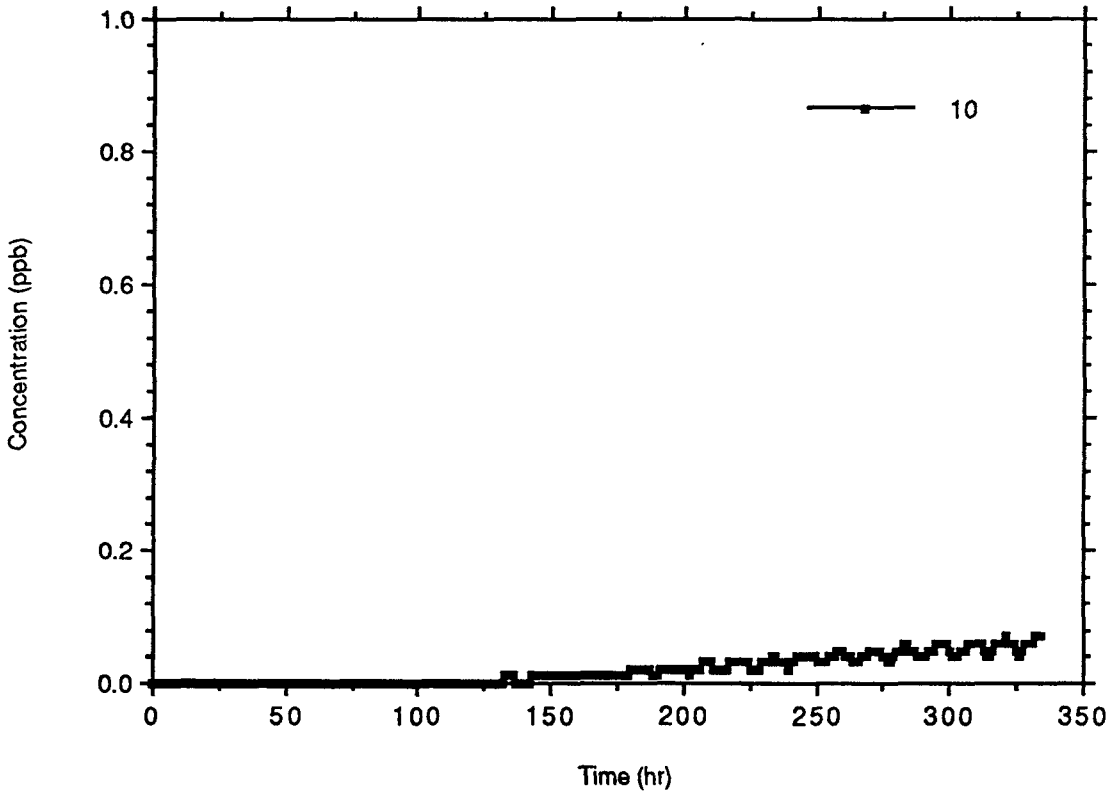

FIGURE E.98. COMPUTED CONCENTRATION TIME-SERIES AT LOCATION 10

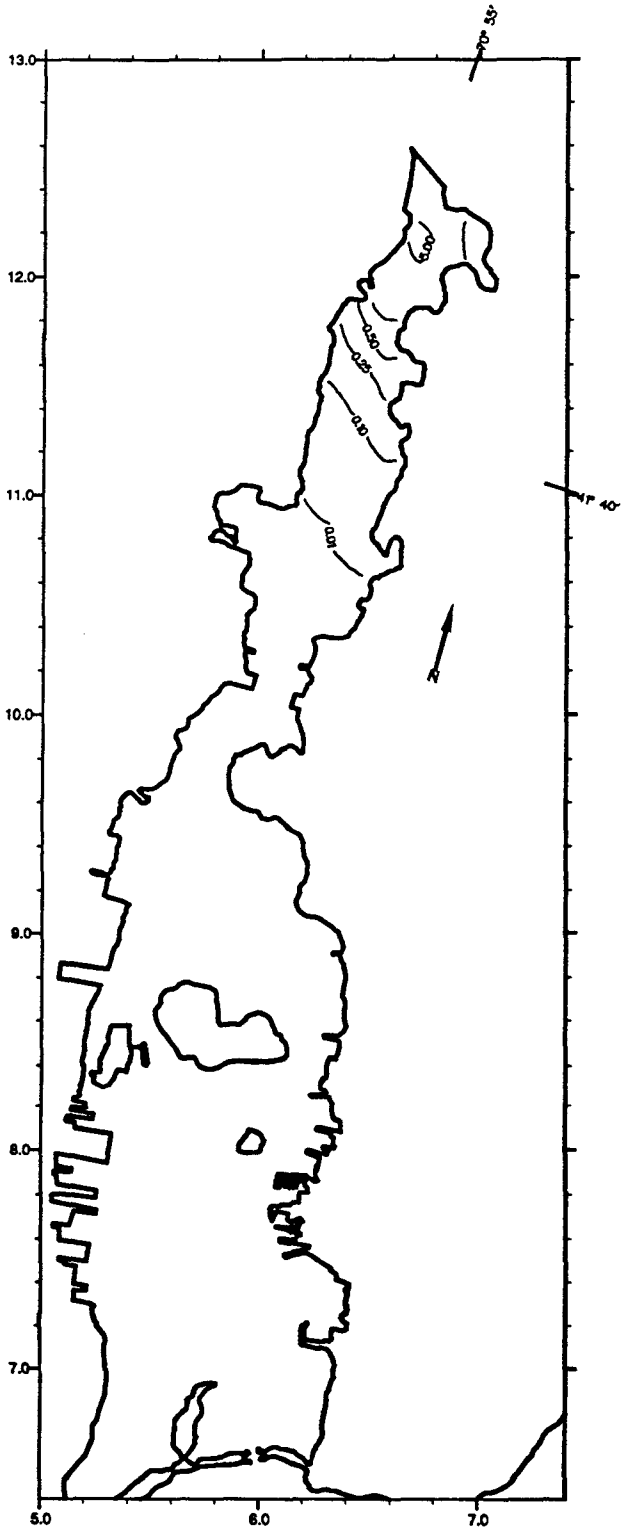

FIGURE E.99. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 6 h AFTER START OF RELEASE

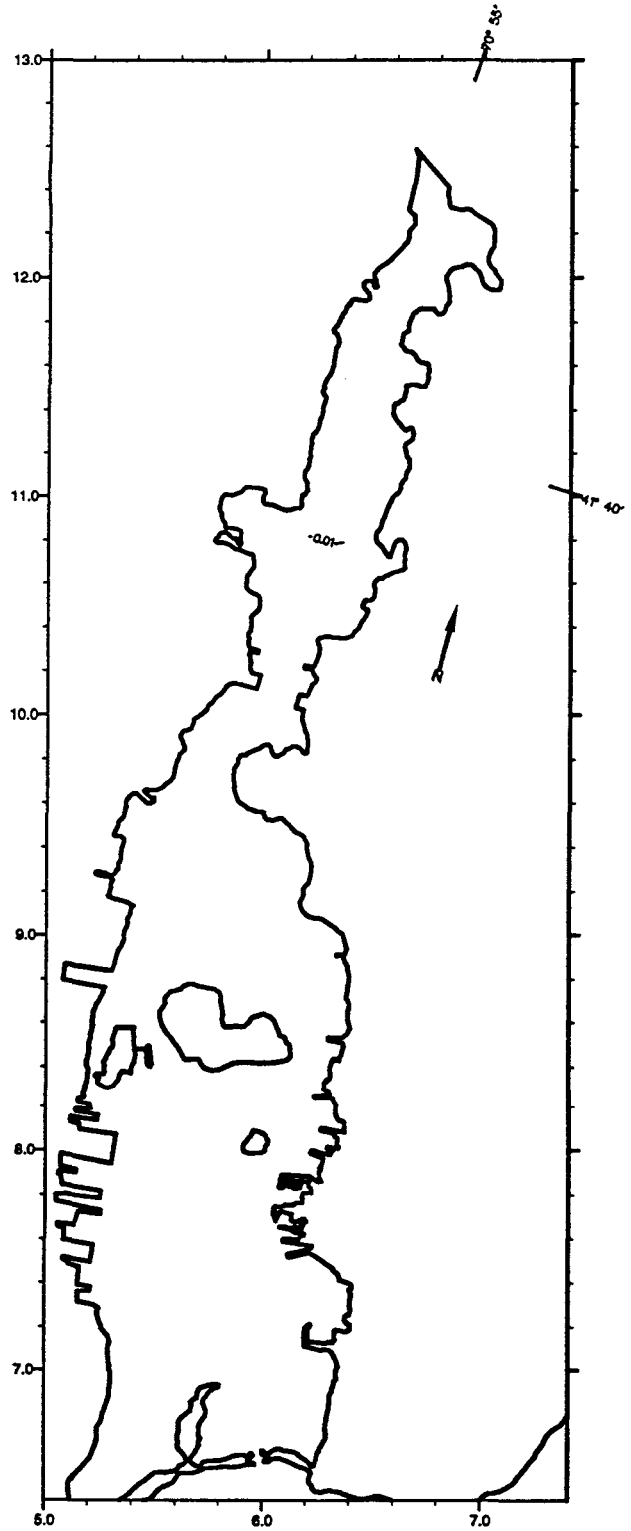

FIGURE E.100. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 6 h AFTER START OF RELEASE

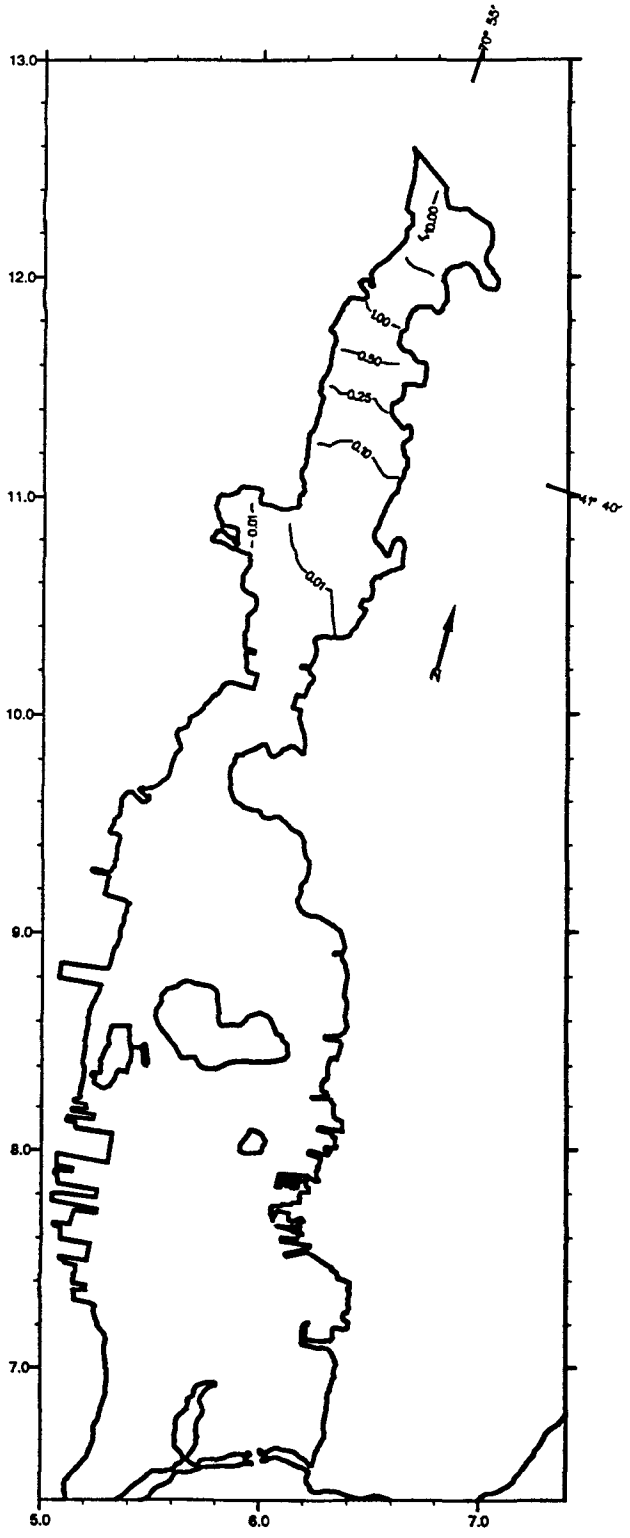

FIGURE E.101. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 24 h AFTER START OF RELEASE

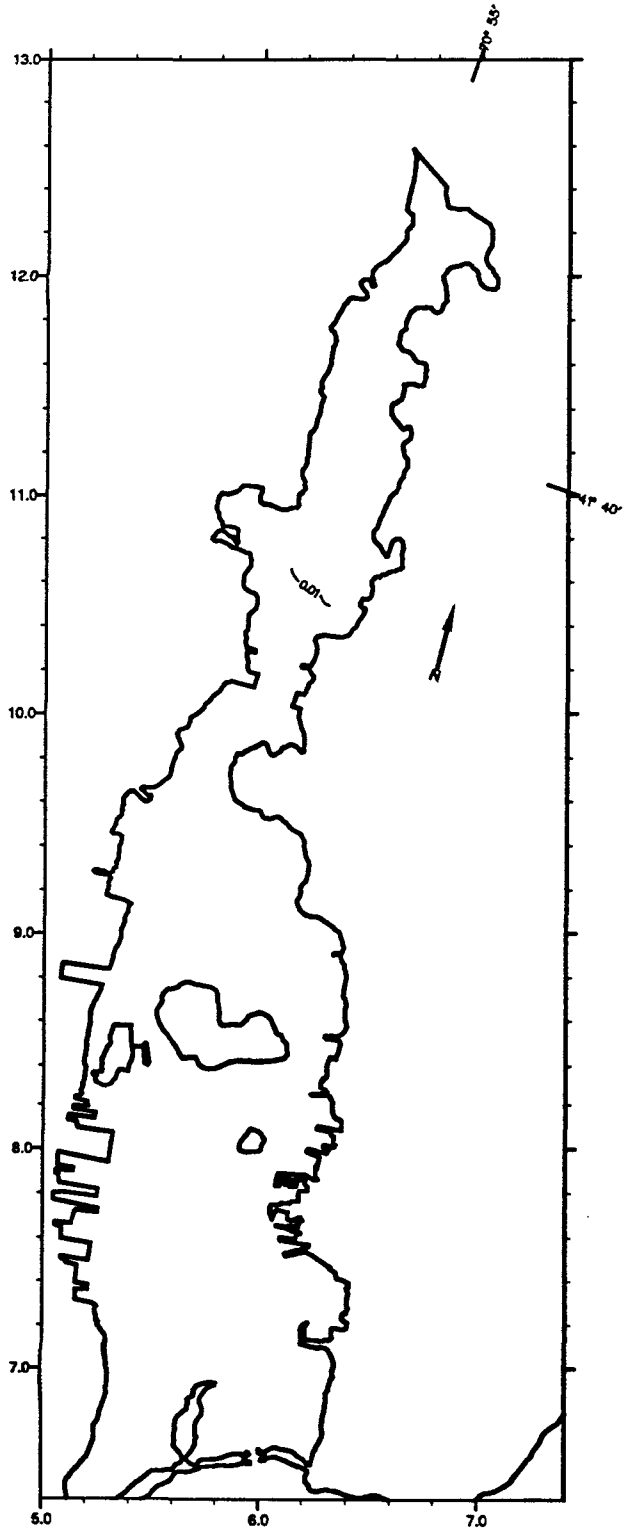

FIGURE E.102. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 24 h AFTER START OF RELEASE

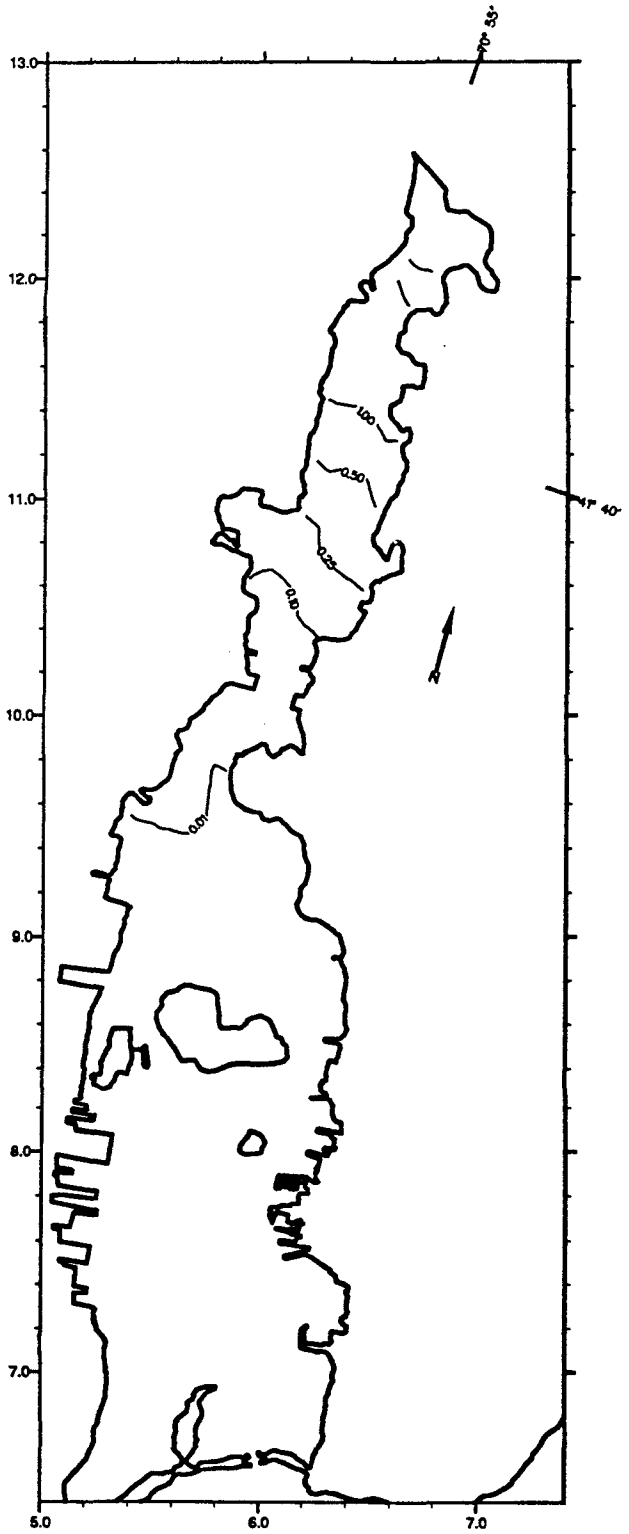

FIGURE E.103. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 48 h AFTER START OF RELEASE

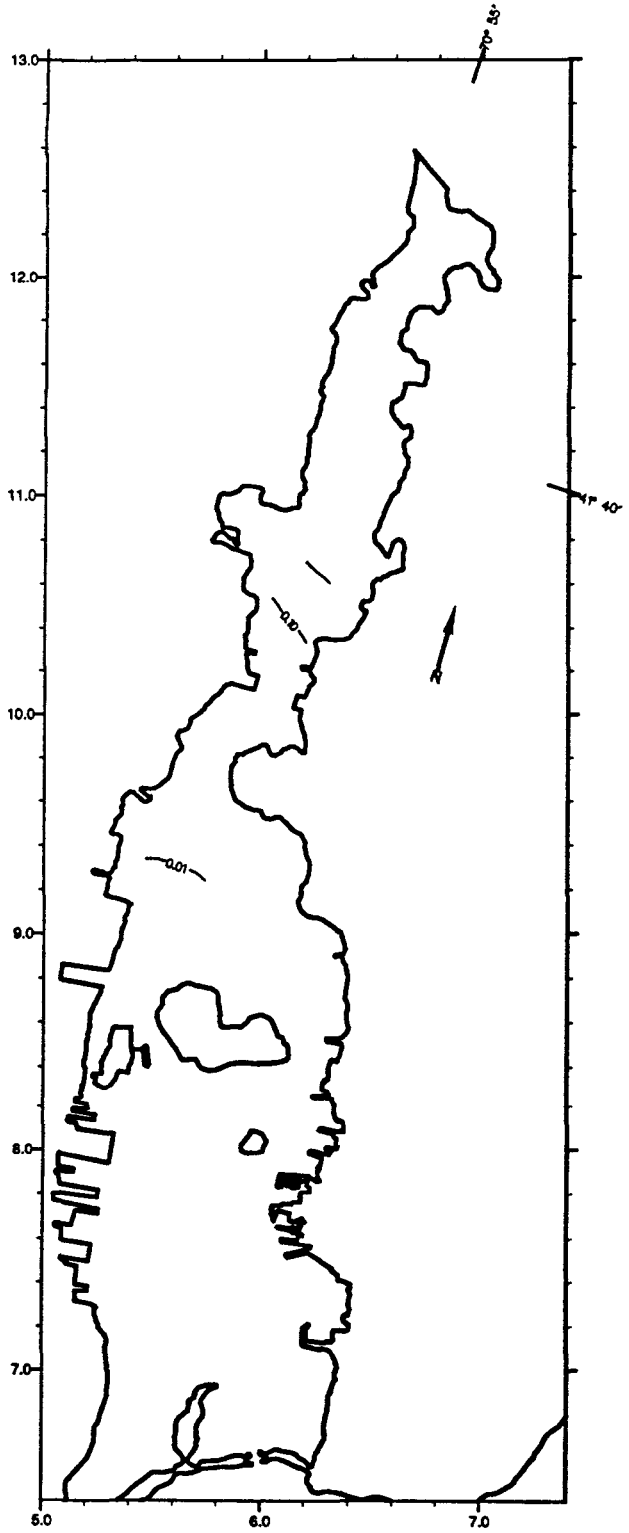

FIGURE E.104. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 48 h AFTER START OF RELEASE

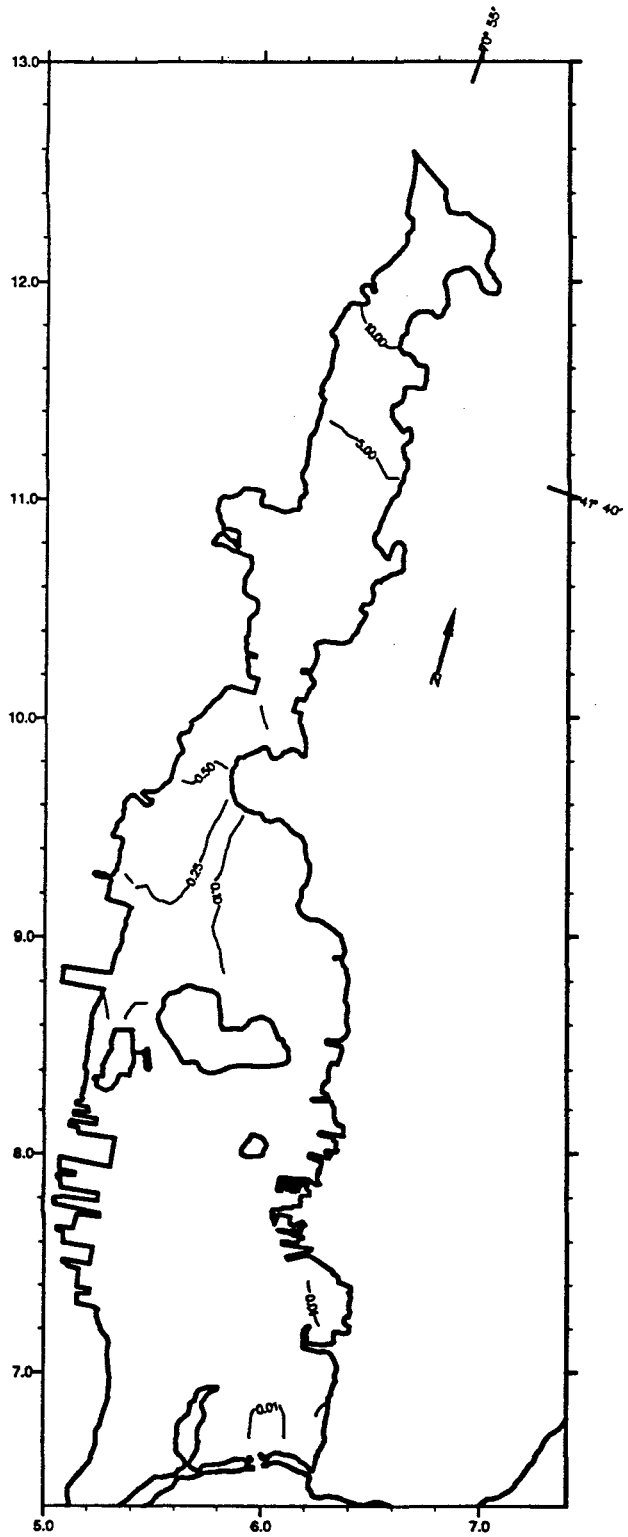

FIGURE E.105. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 120 h AFTER START OF RELEASE

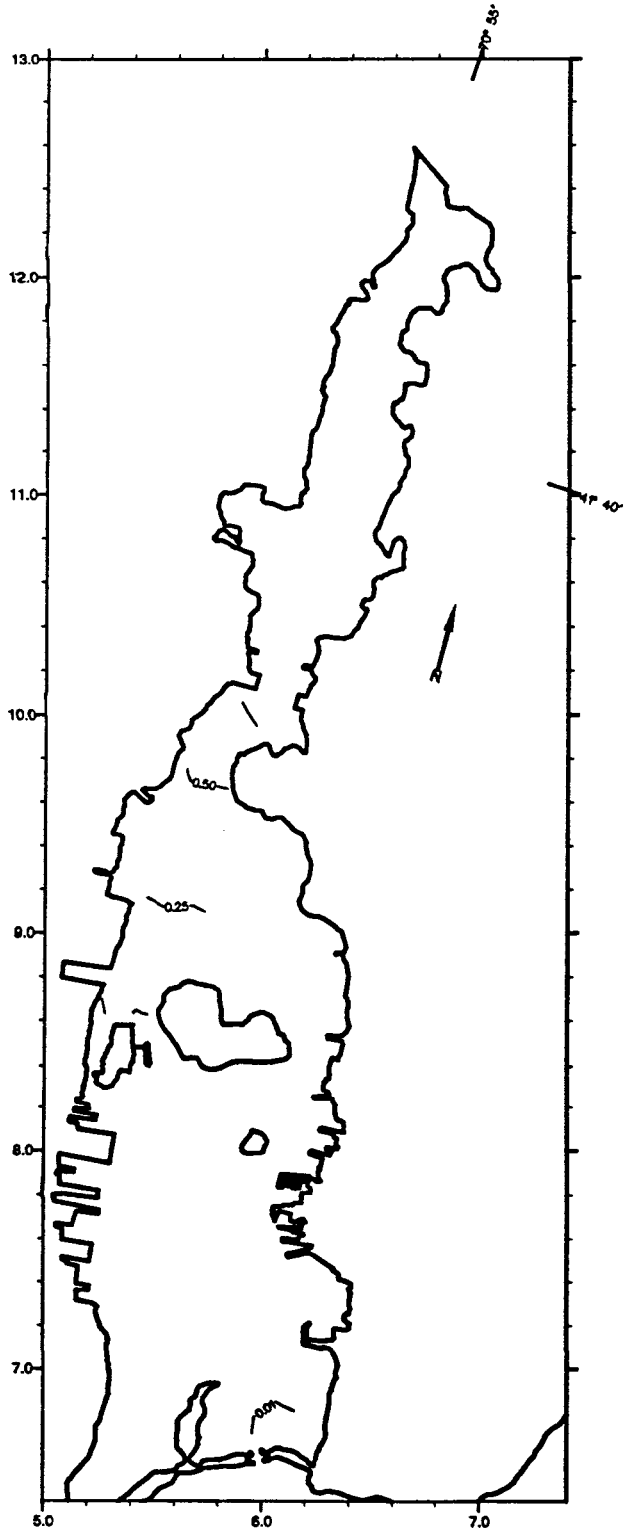

FIGURE E.106. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 120 h AFTER START OF RELEASE

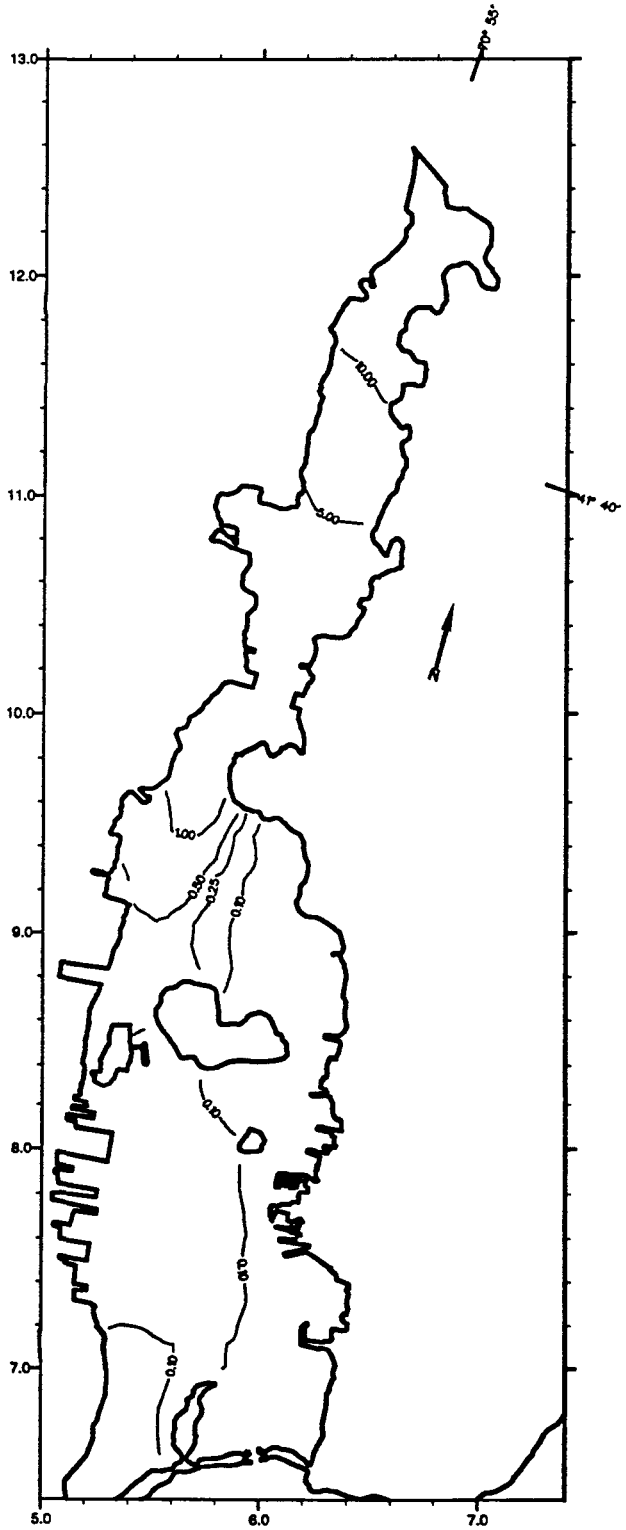

FIGURE E.107. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 192 h AFTER START OF RELEASE. THE TRACER RELEASE HAS STOPPED AT TIME = 192 h.

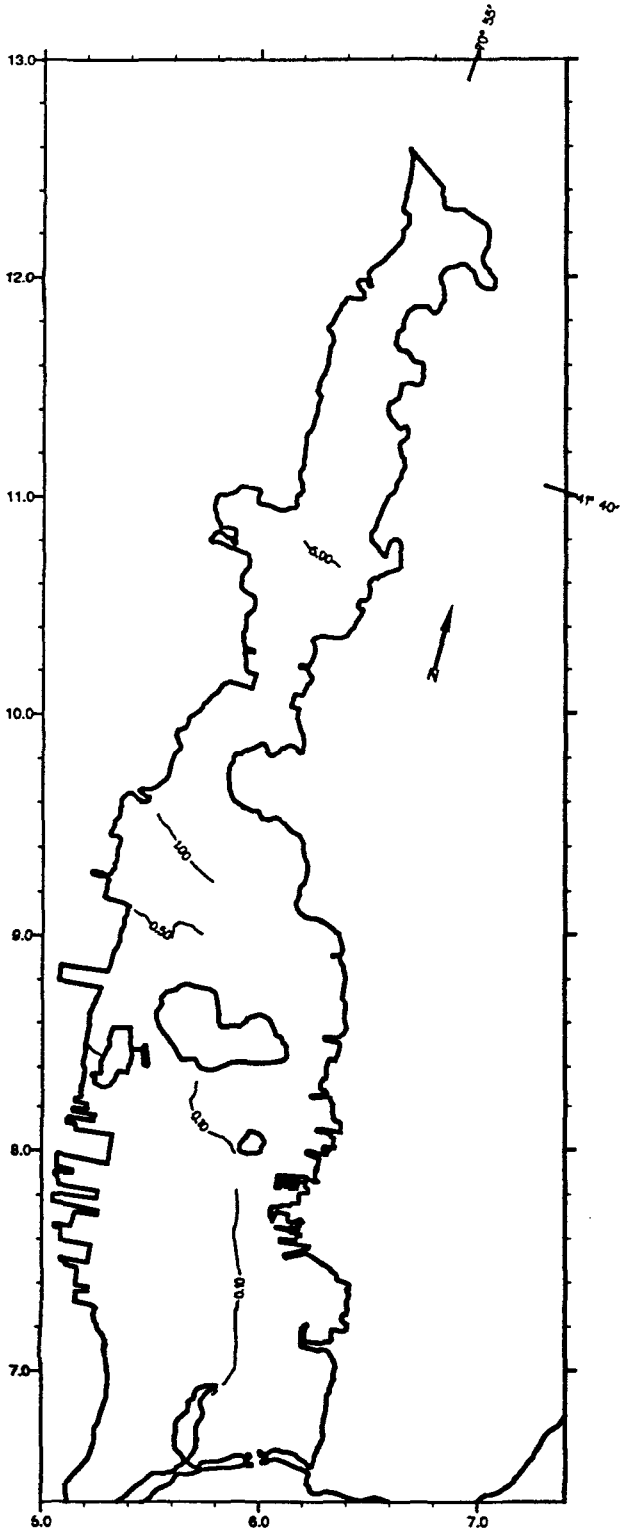

FIGURE E.108. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 192 h AFTER START OF RELEASE. THE TRACER RELEASE HAS STOPPED AT TIME = 192 h.

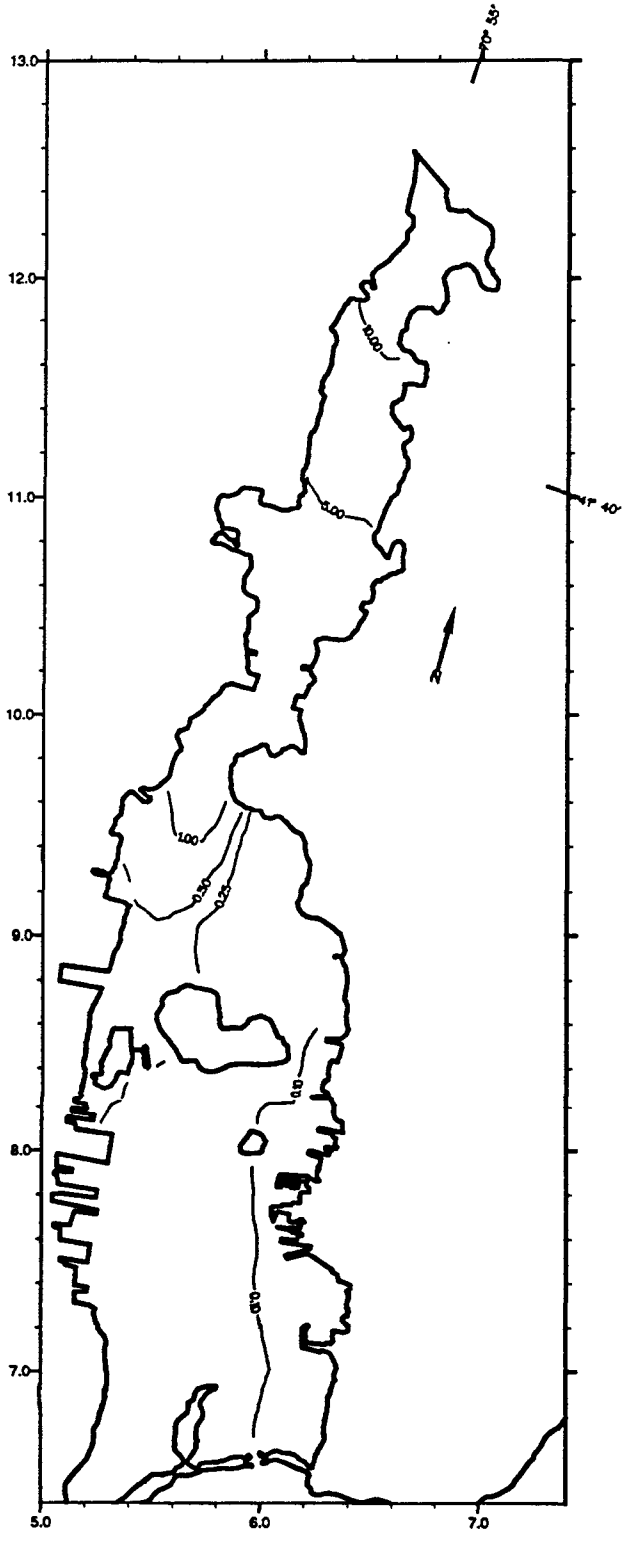

FIGURE E.109. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 216 h AFTER START OF RELEASE (24 h AFTER STOP OF RELEASE)

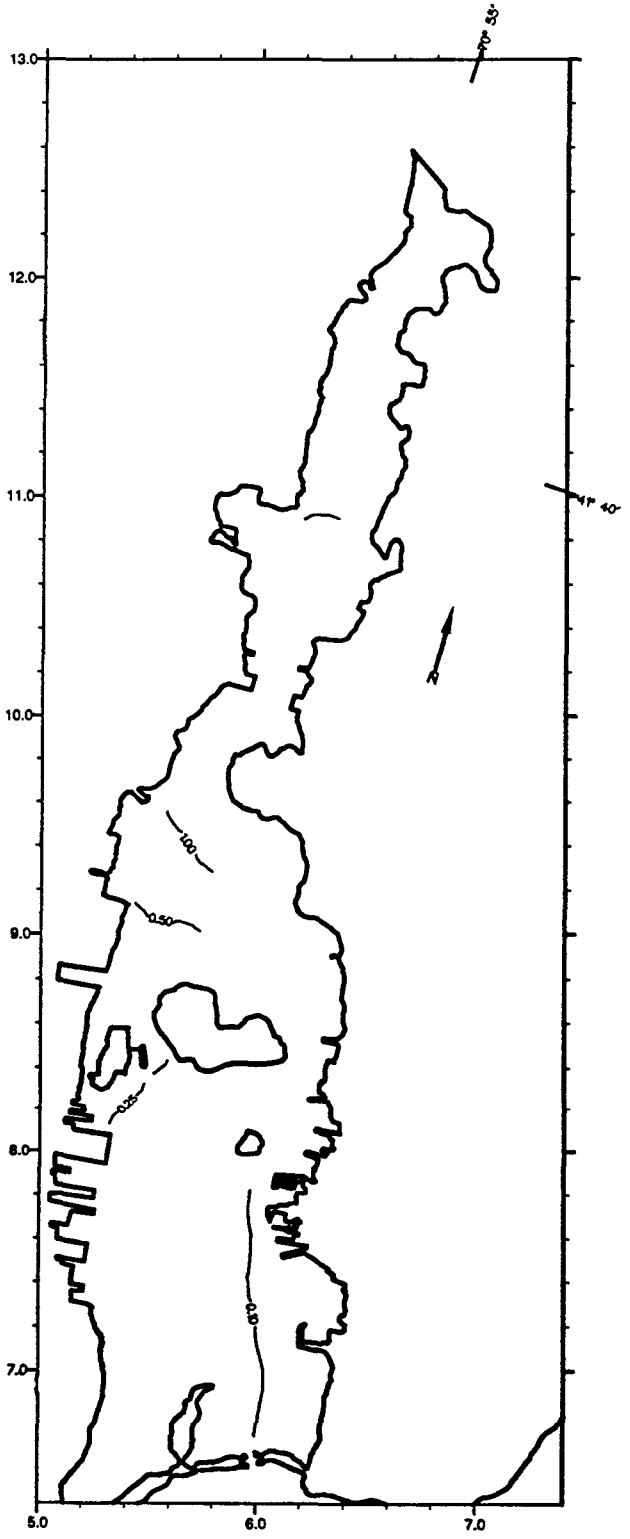

FIGURE E.110. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 216 h AFTER START OF RELEASE (24 h AFTER STOP OF RELEASE)

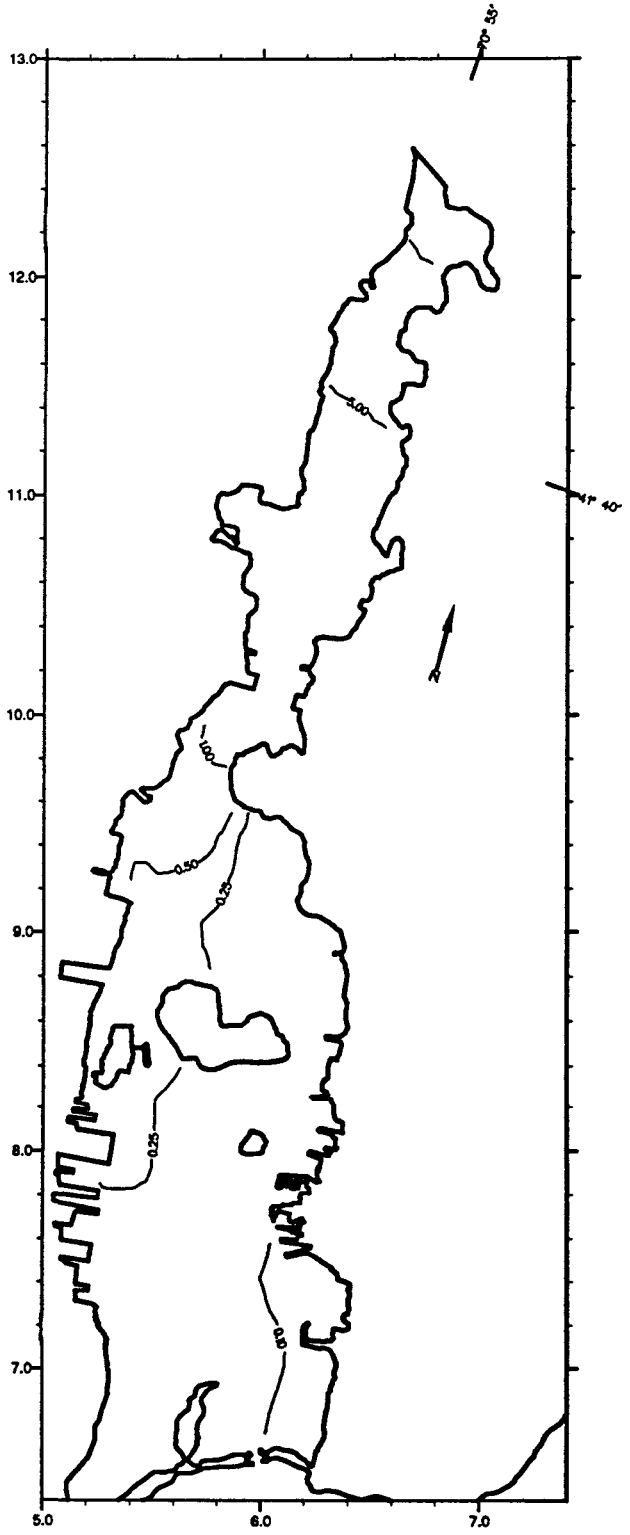

FIGURE E.111. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 264 h AFTER START OF RELEASE (72 h AFTER STOP OF RELEASE)

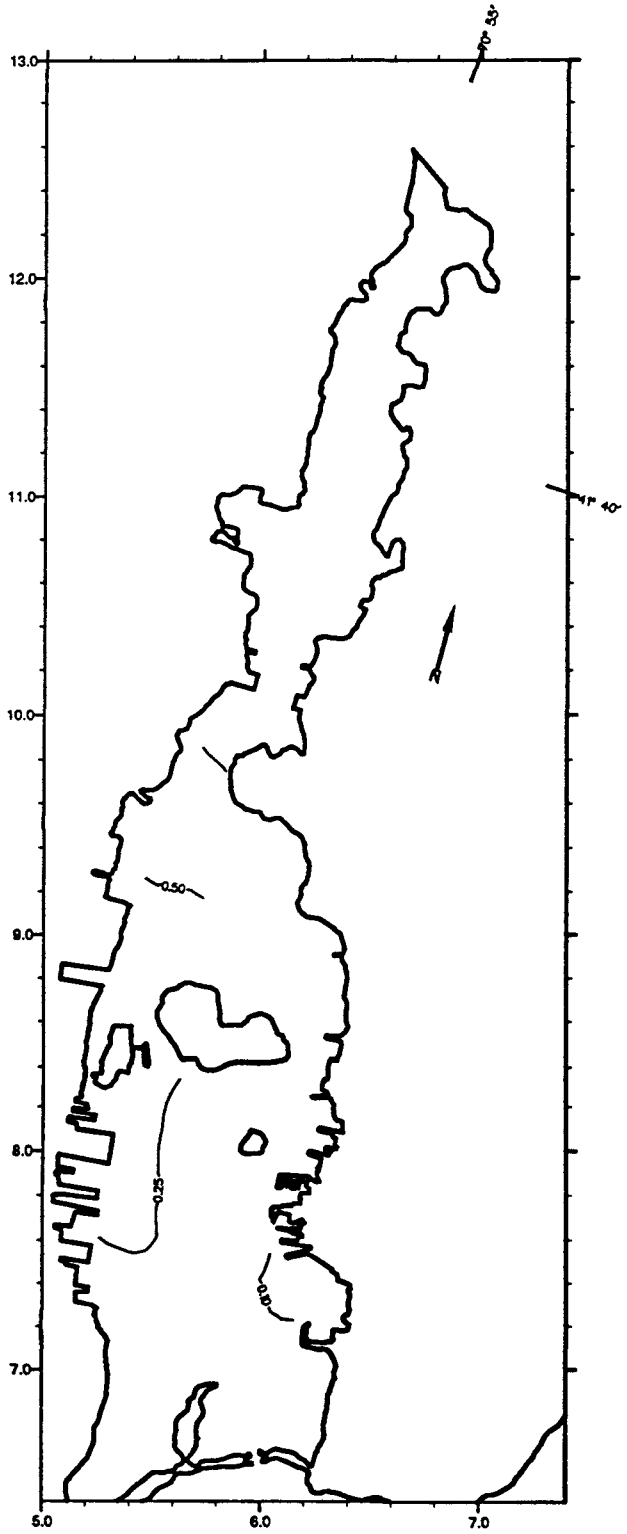

FIGURE E.112. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 264 h AFTER START OF RELEASE (72 h AFTER STOP OF RELEASE)

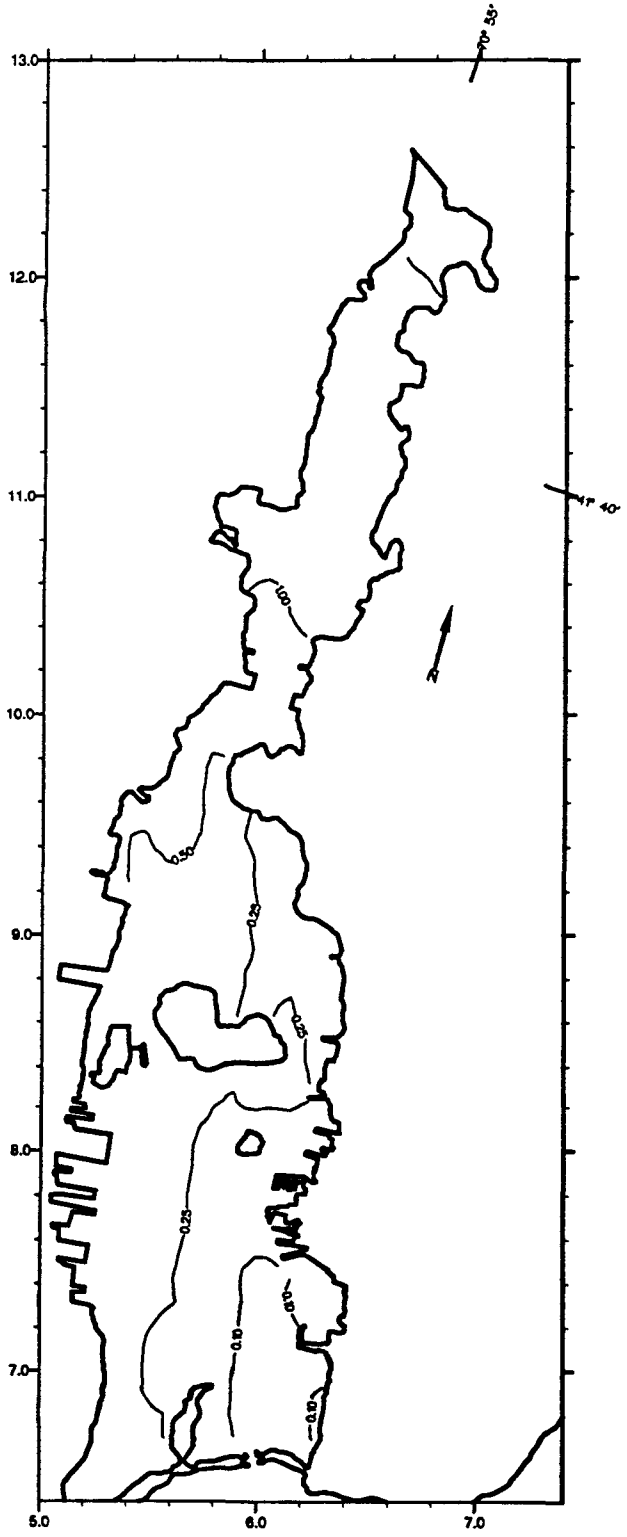

FIGURE E.113. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 7 AT TIME = 336 h AFTER START OF RELEASE (144 h AFTER STOP OF RELEASE)

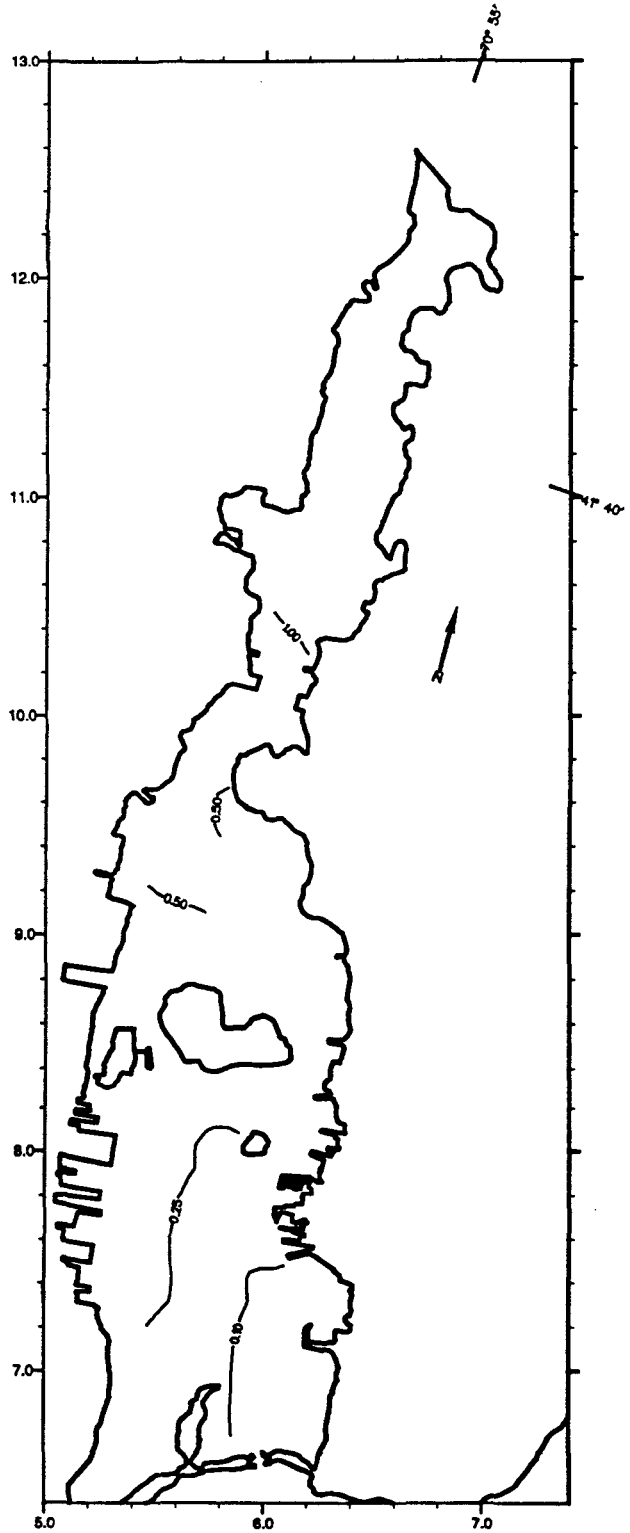

FIGURE E.114. CONCENTRATION (ppb) DISTRIBUTION IN LAYER 5 AT TIME = 336 h AFTER START OF RELEASE (144 h AFTER STOP OF RELEASE)

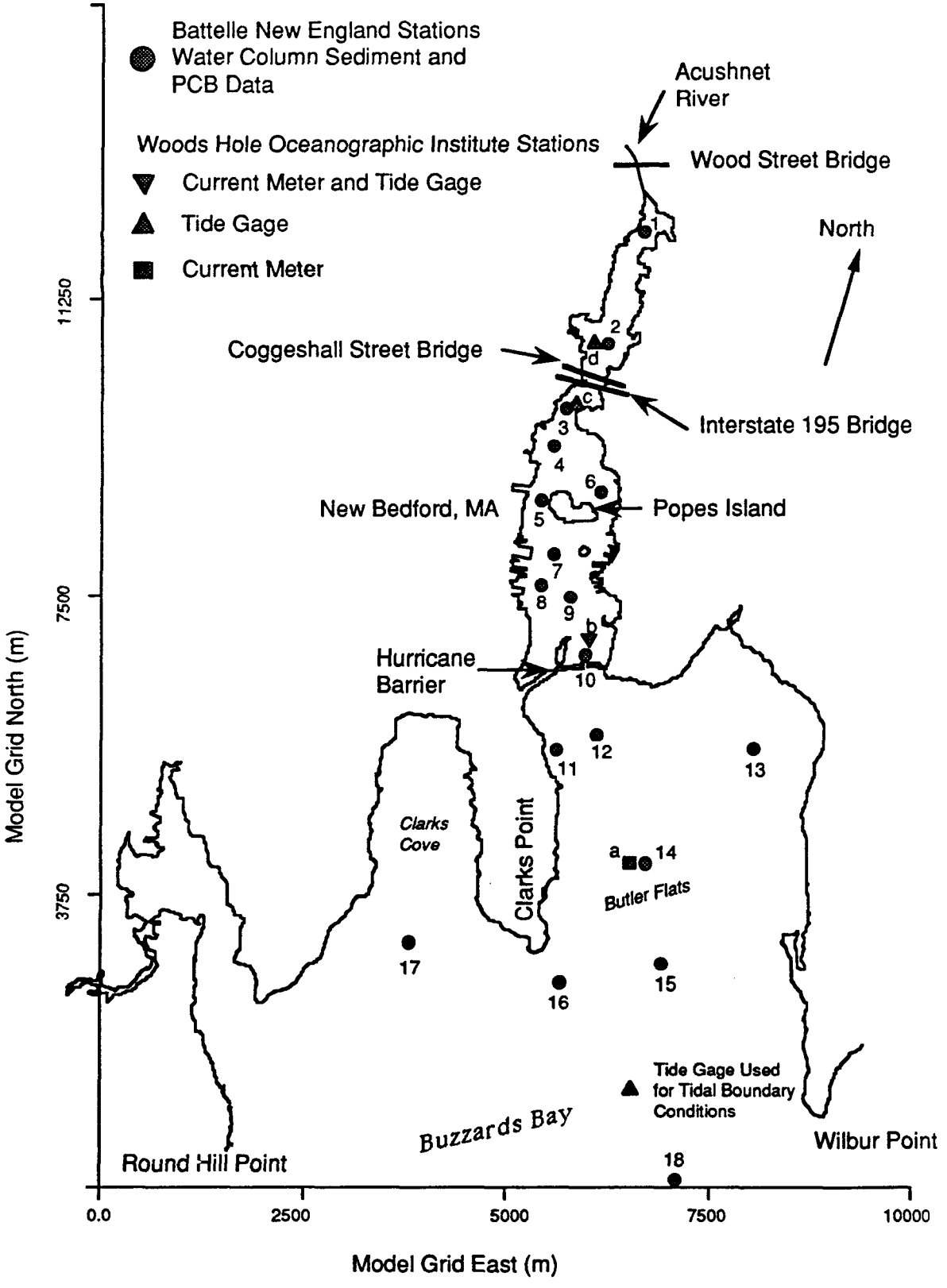

FIGURE E.115. LOCATIONS OF FIELD MEASUREMENT STATIONS

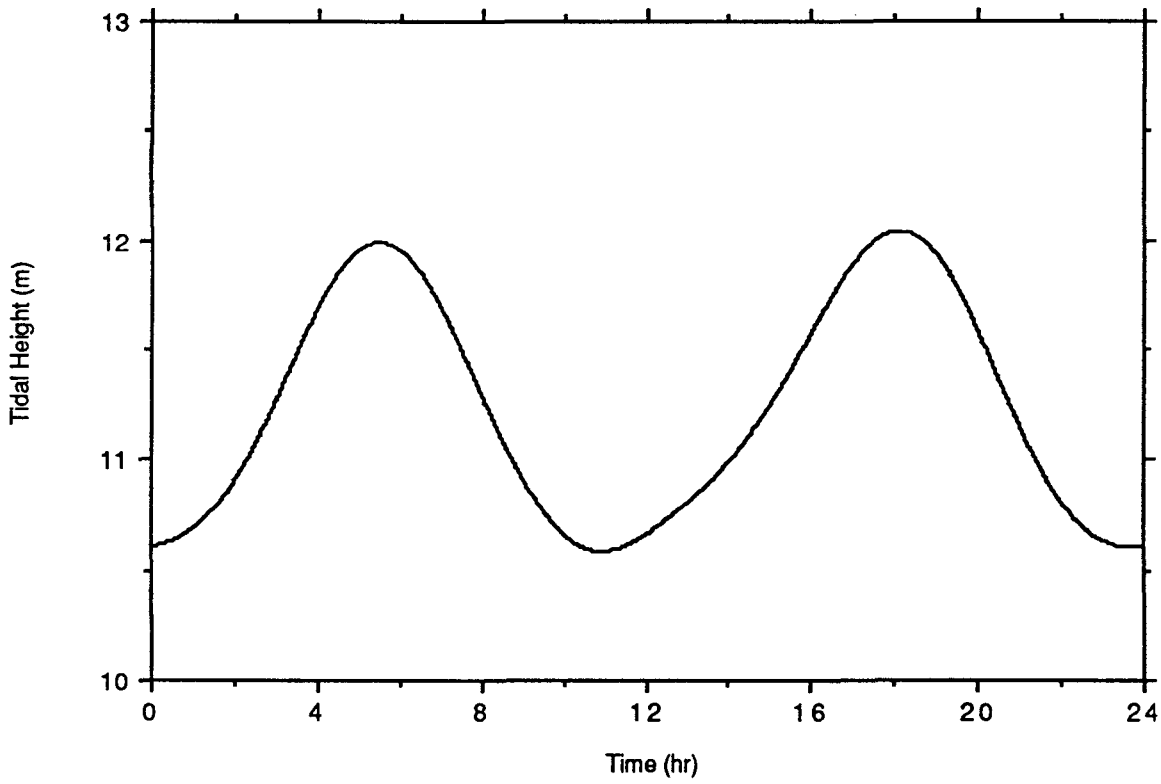

FIGURE E.116. TIDAL HEIGHT IMPOSED AT THE OPEN BOUNDARY FOR THE JULY 23, 1986 CALIBRATION CASE

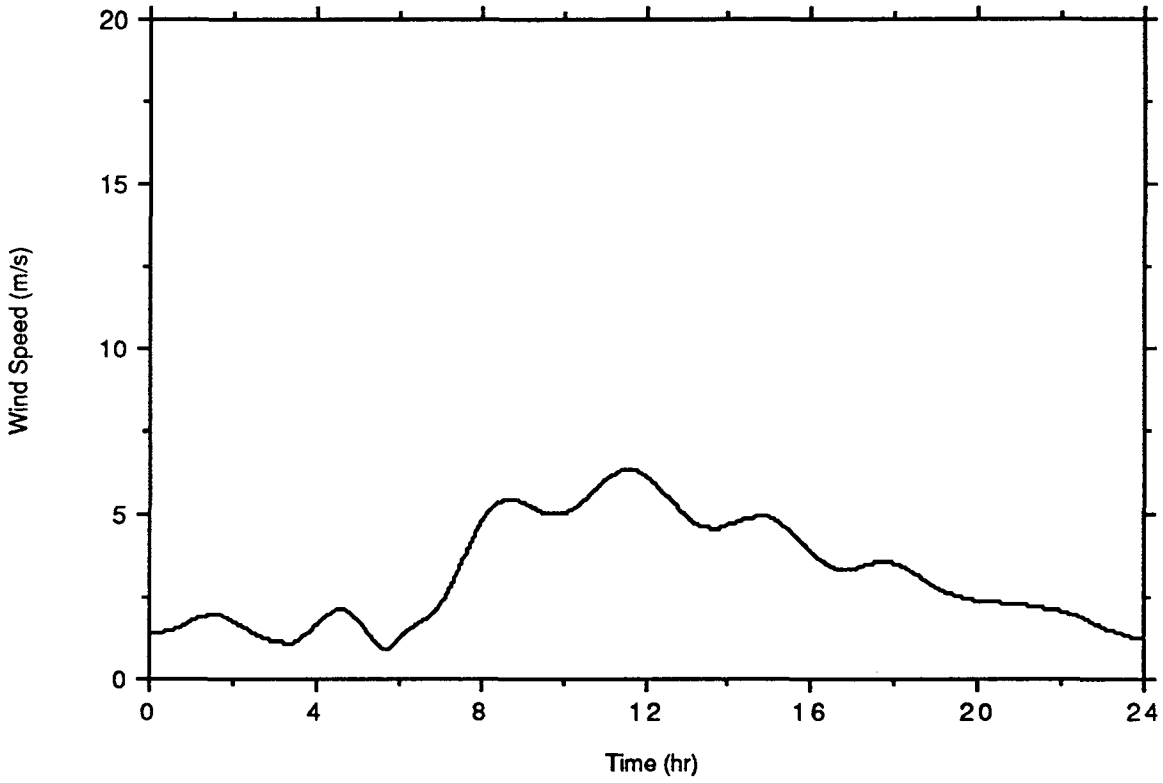

FIGURE E.117. WIND SPEED IMPOSED FOR THE JULY 23, 1986 CALIBRATION CASE

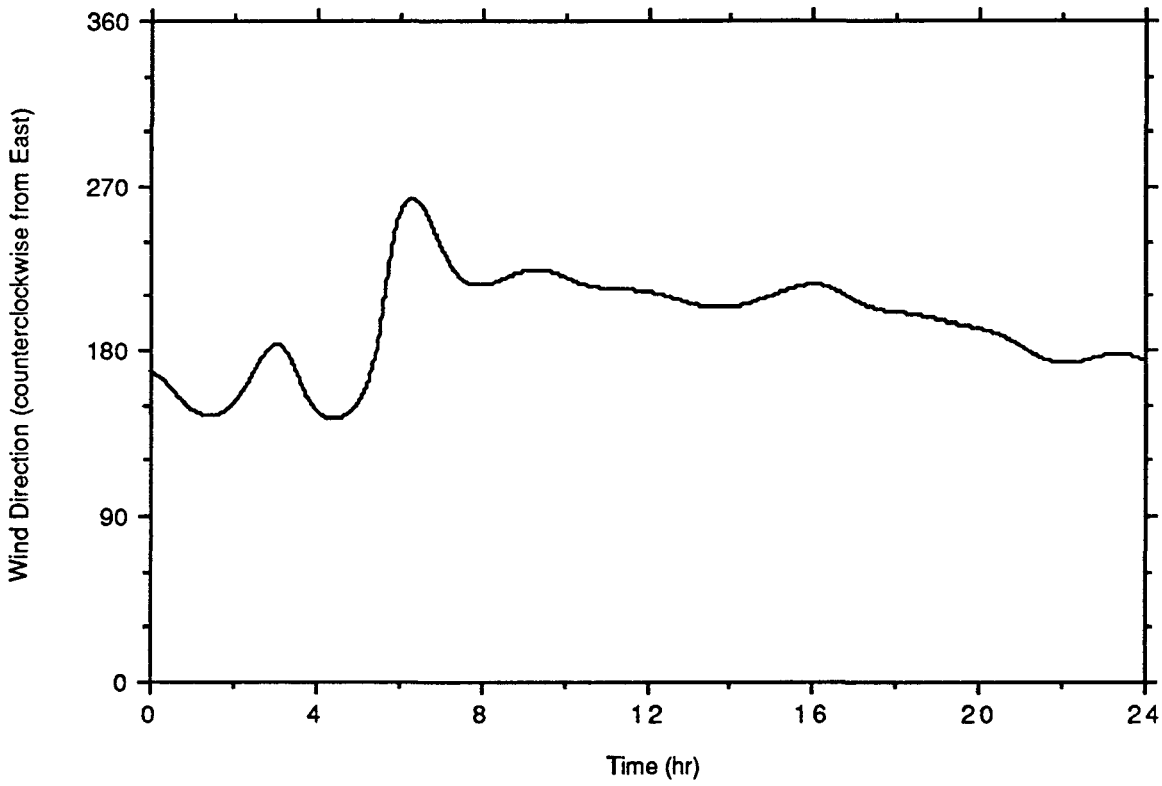

FIGURE E.118. WIND DIRECTION IMPOSED FOR THE JULY 23, 1986 CALIBRATION CASE

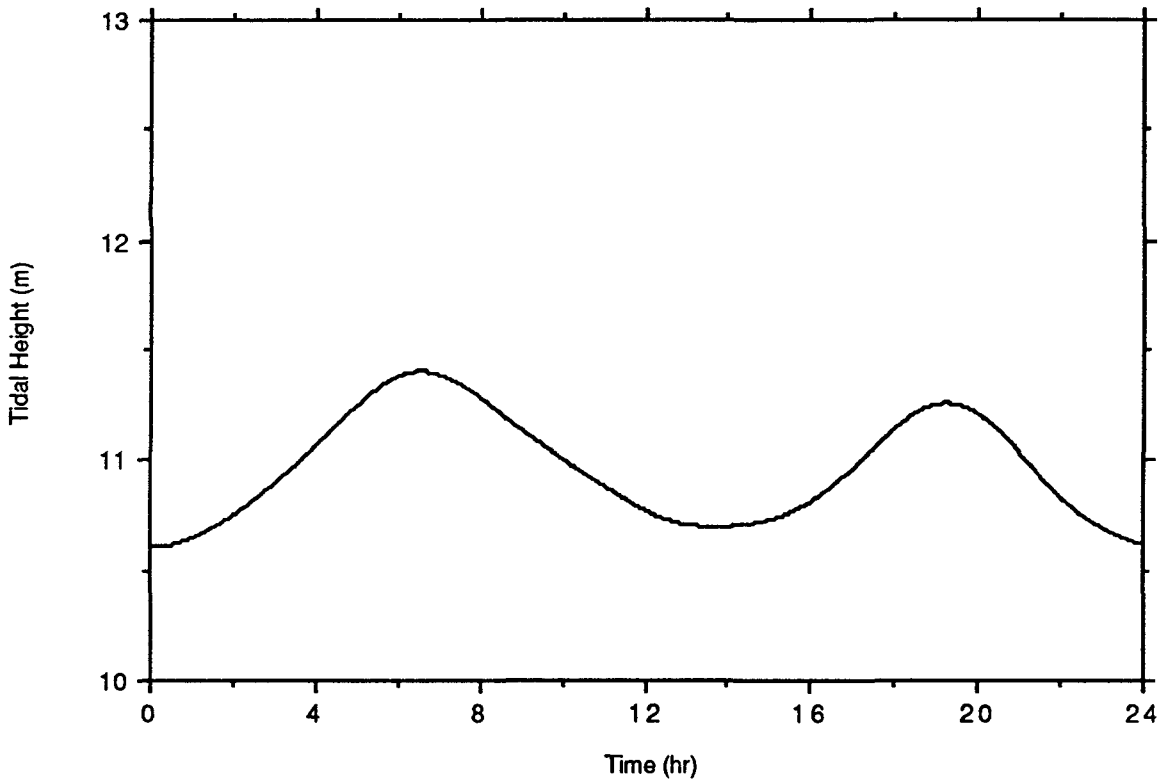

FIGURE E.119. TIDAL HEIGHT IMPOSED AT THE OPEN BOUNDARY FOR THE JULY 31, 1986 CALIBRATION CASE

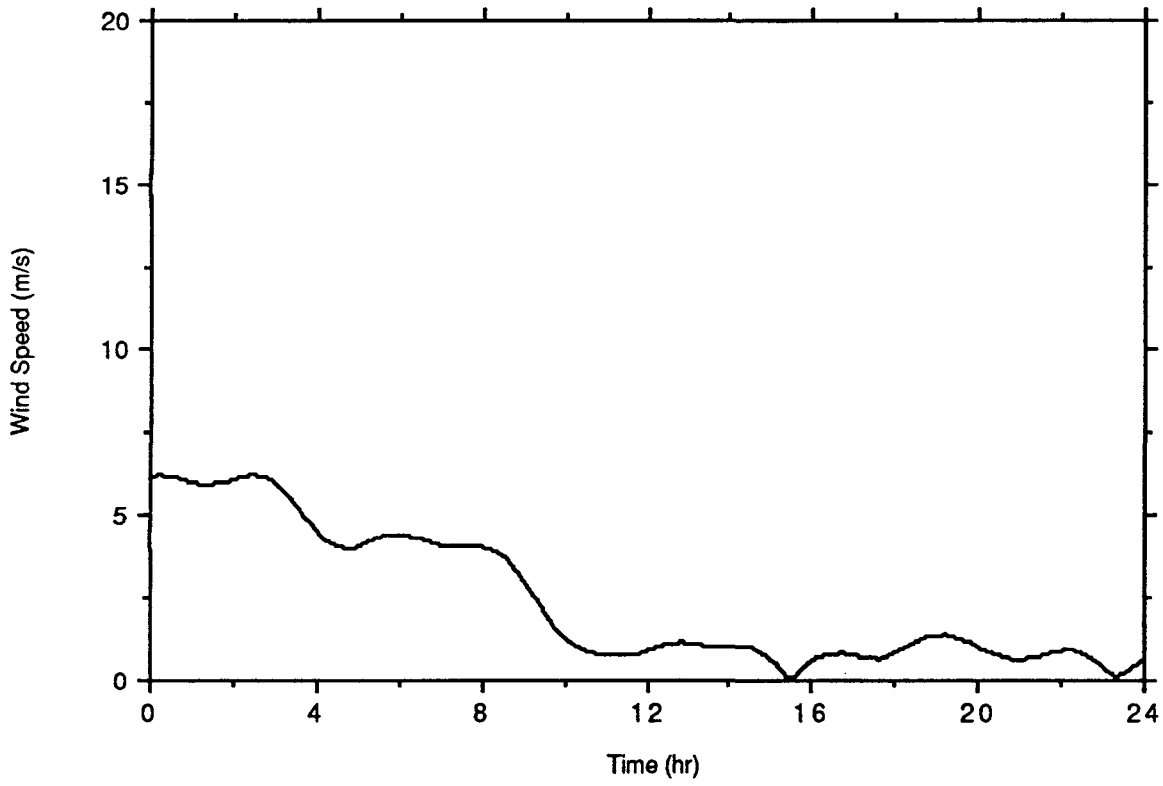

FIGURE E.120. WIND SPEED IMPOSED FOR THE JULY 31, 1986 CALIBRATION CASE

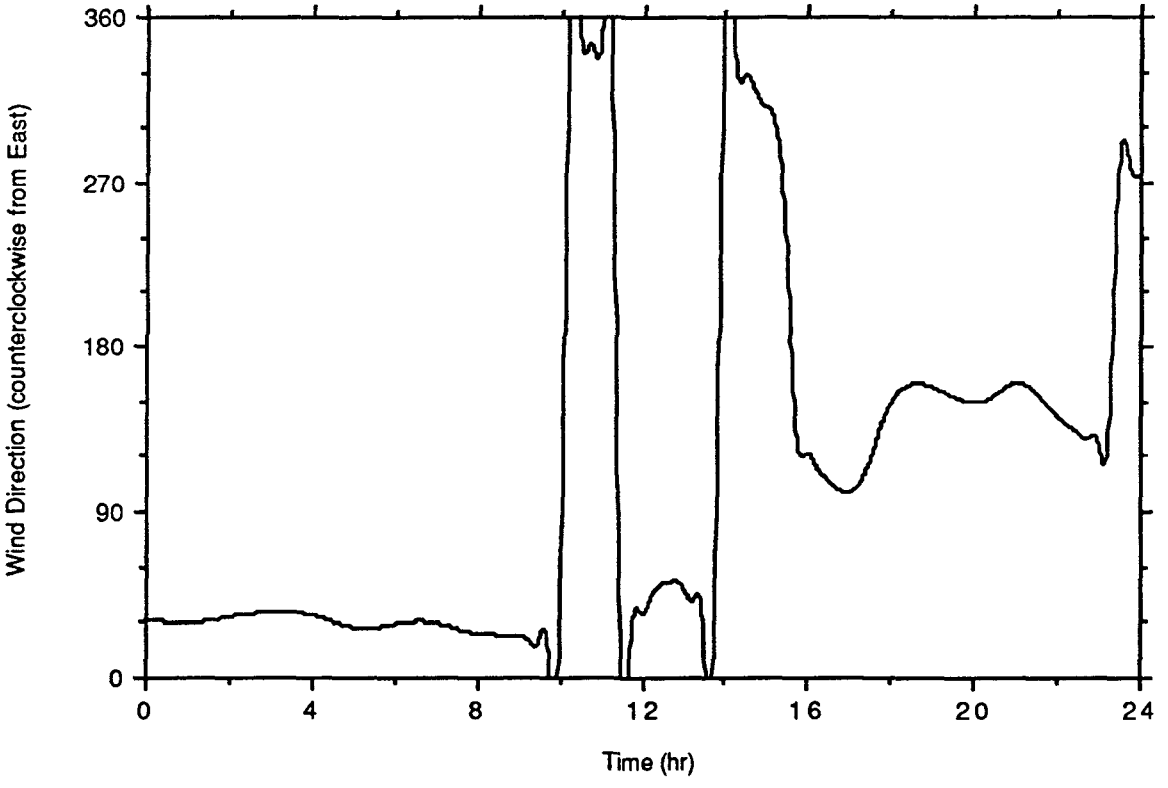

FIGURE E.121. WIND DIRECTION IMPOSED FOR THE JULY 31, 1986 CALIBRATION CASE

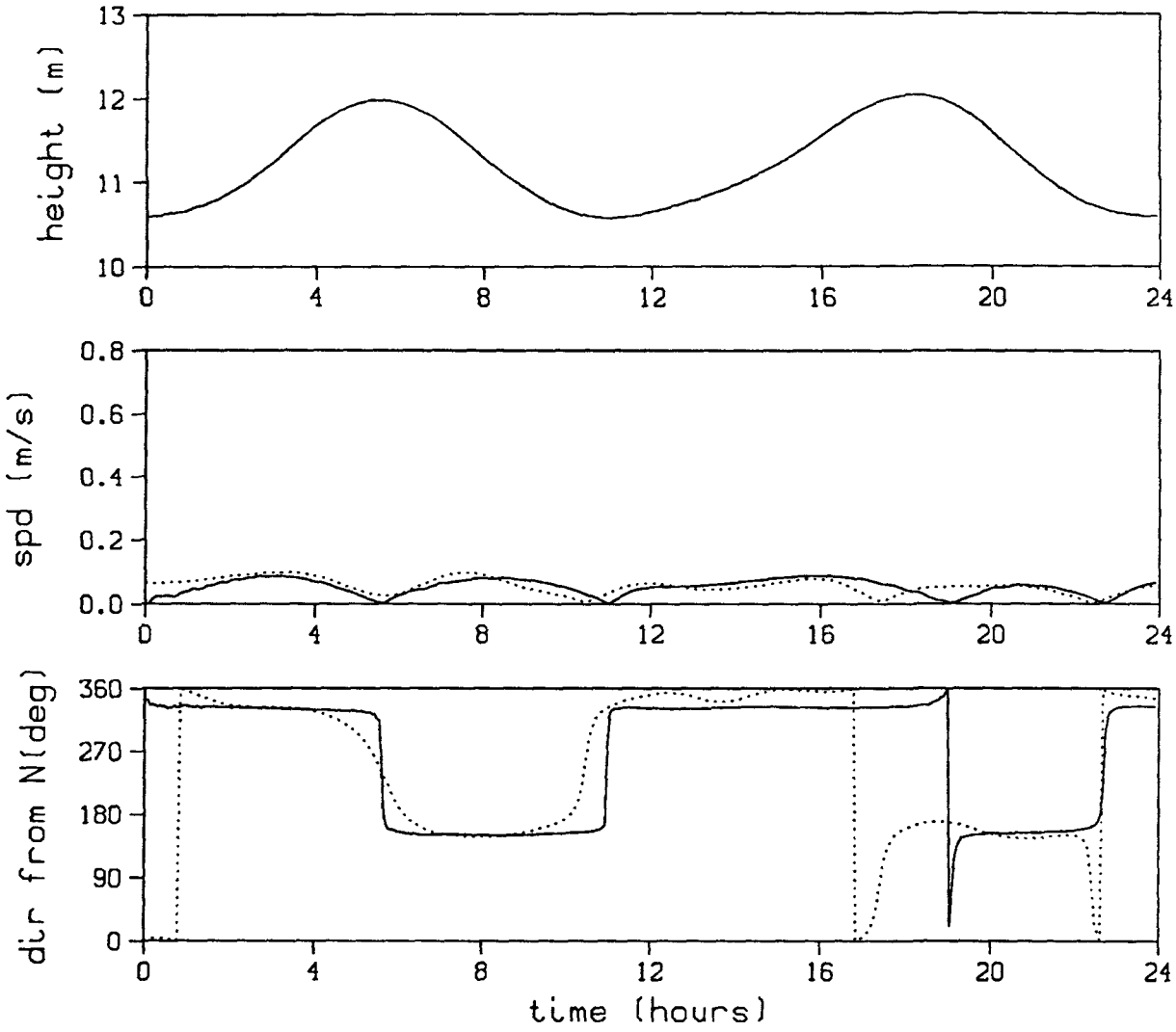

FIGURE E.122. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION A FOR THE JULY 23, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

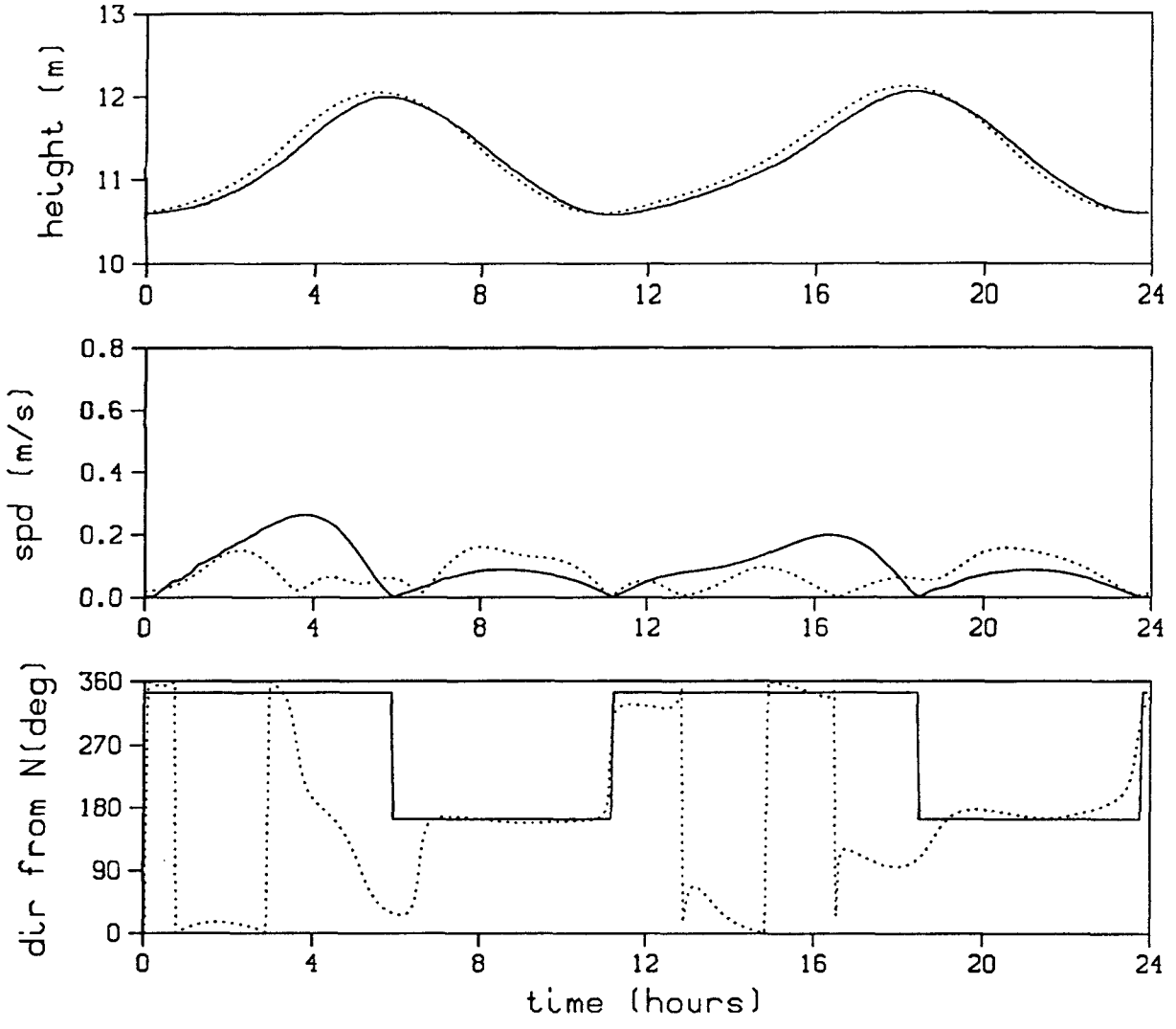

FIGURE E.123. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION B FOR THE JULY 23, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

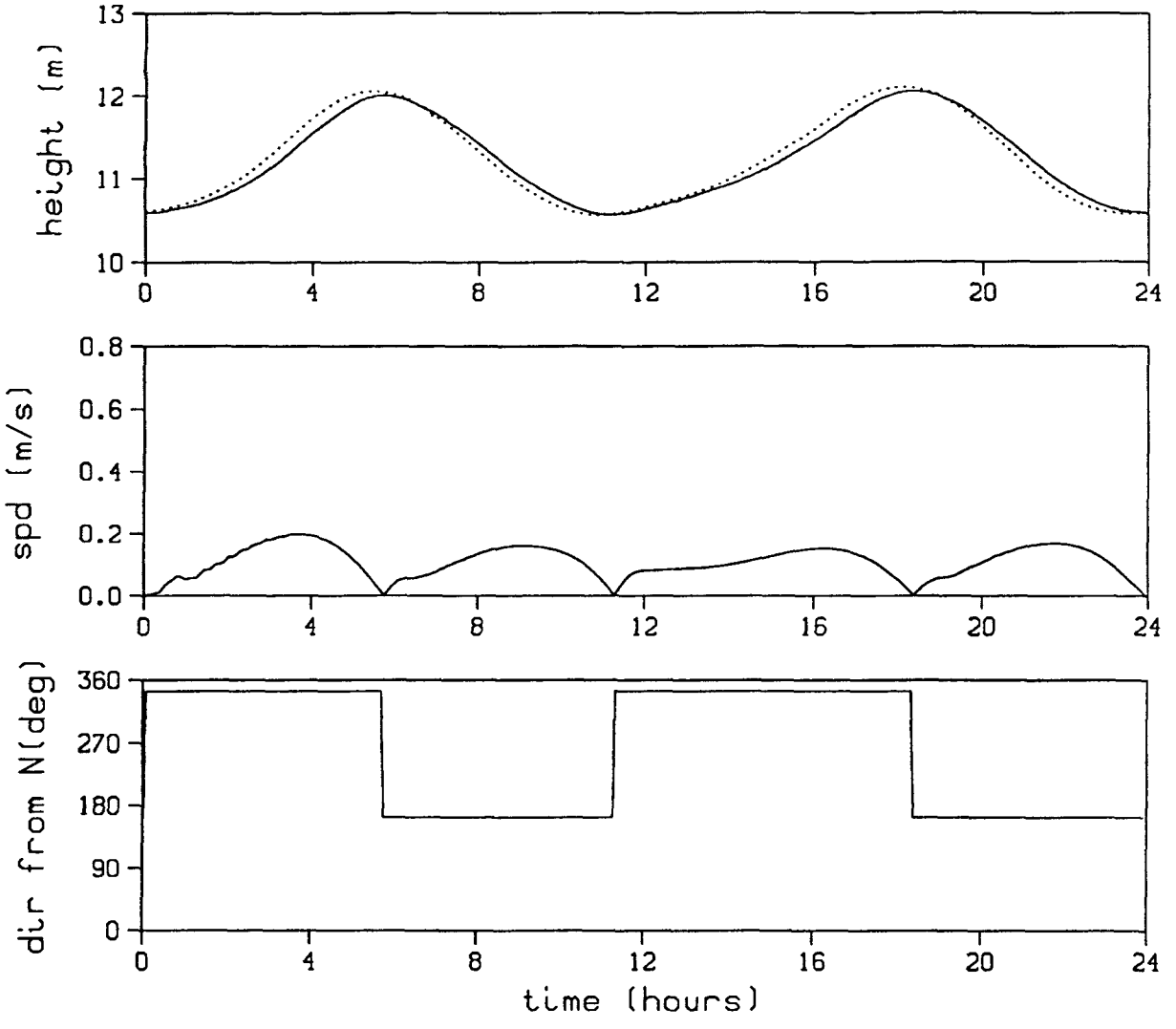

FIGURE E.124. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION C FOR THE JULY 23, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

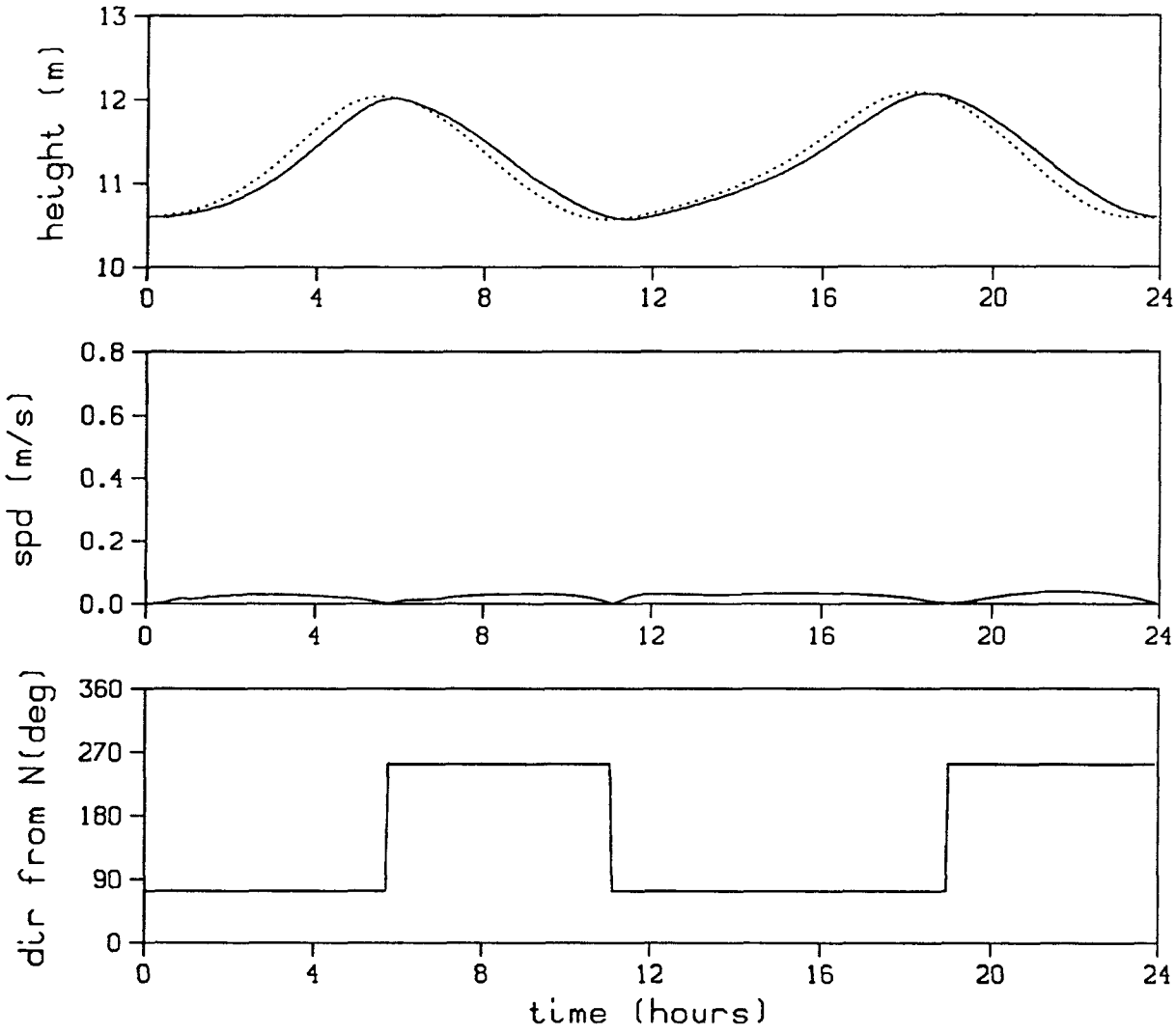

FIGURE E.125. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION D FOR THE JULY 23, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

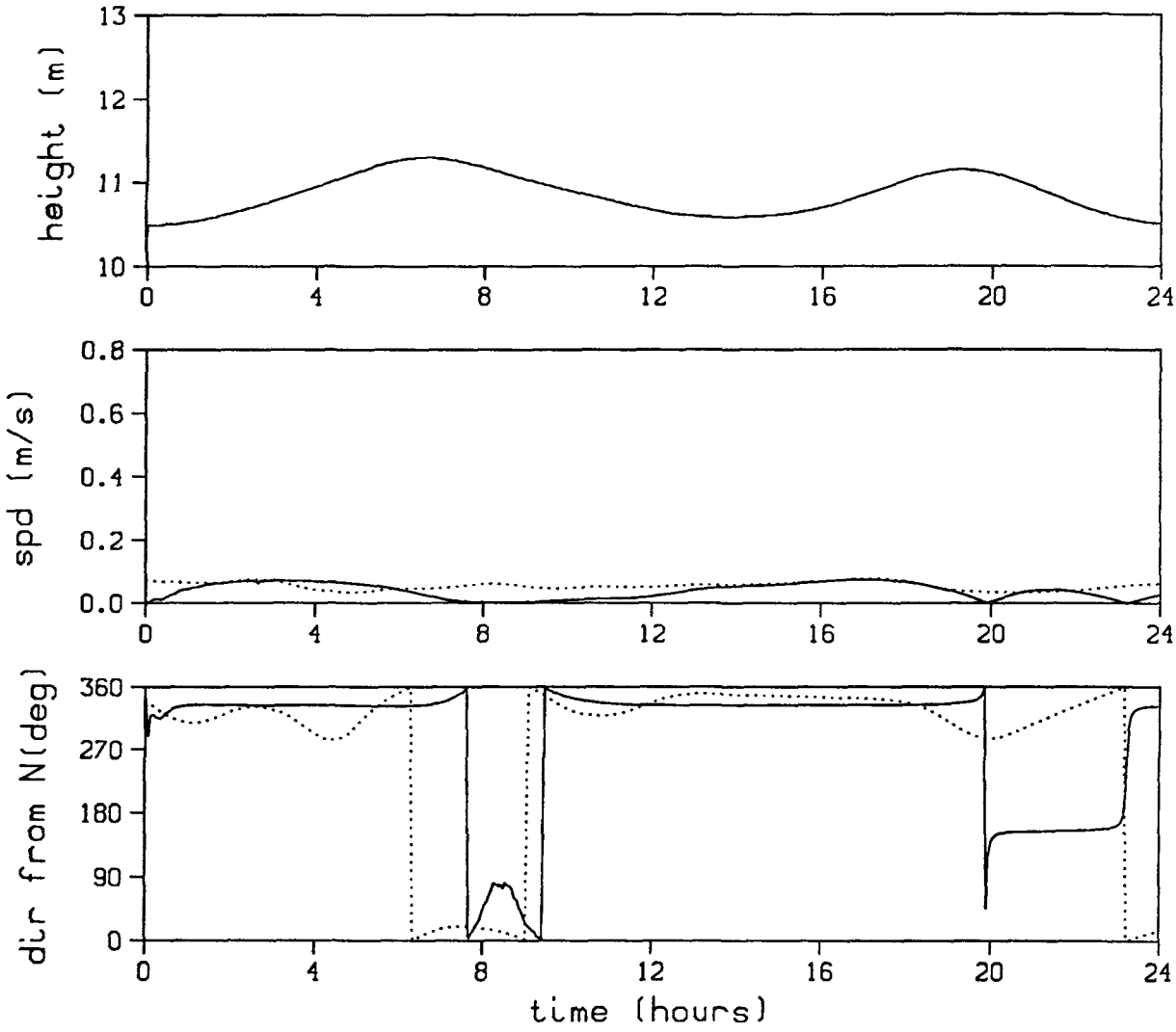

FIGURE E.126. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION A FOR THE JULY 31, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

5.6.1-12

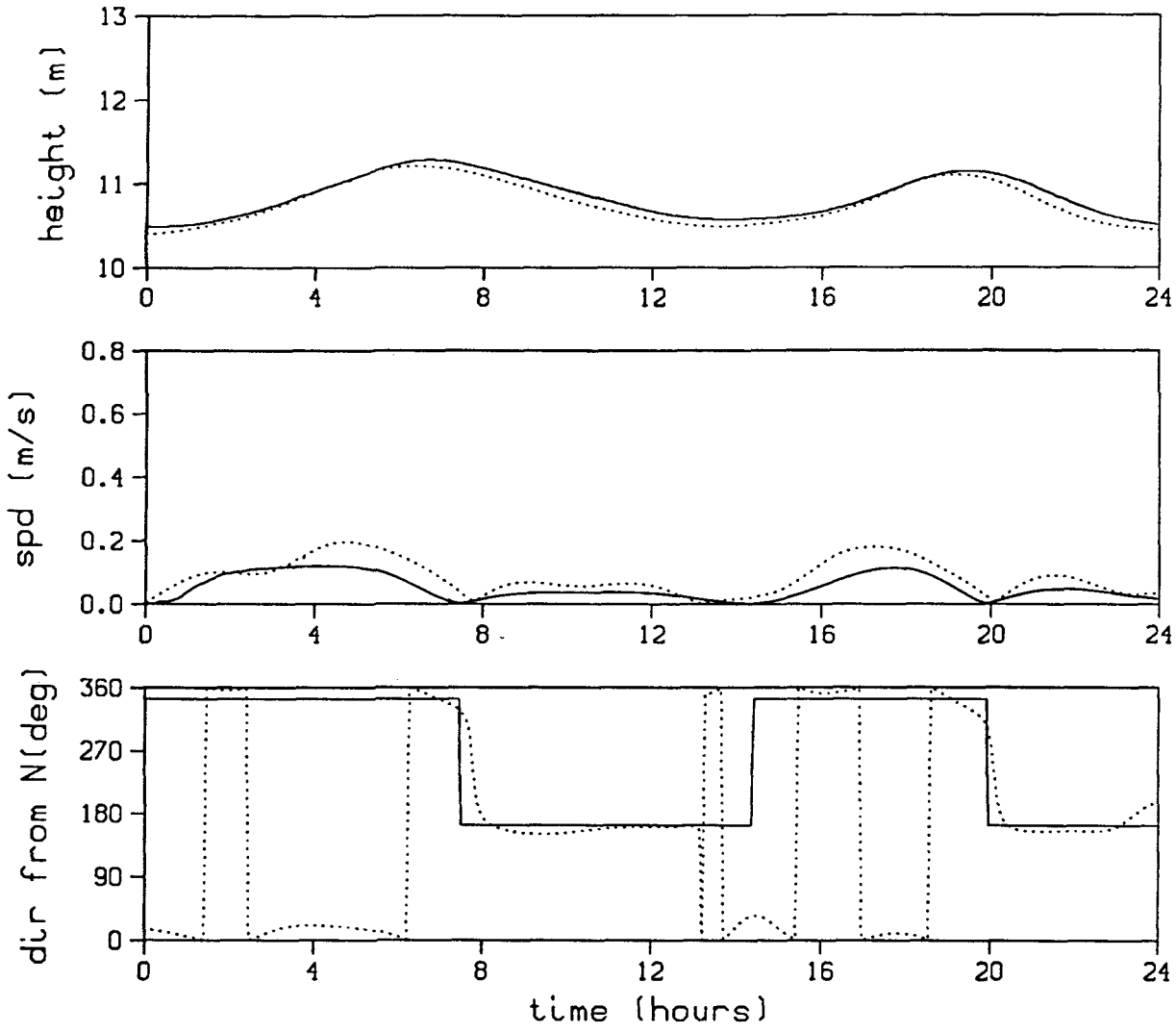

FIGURE E.127. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION B FOR THE JULY 31, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

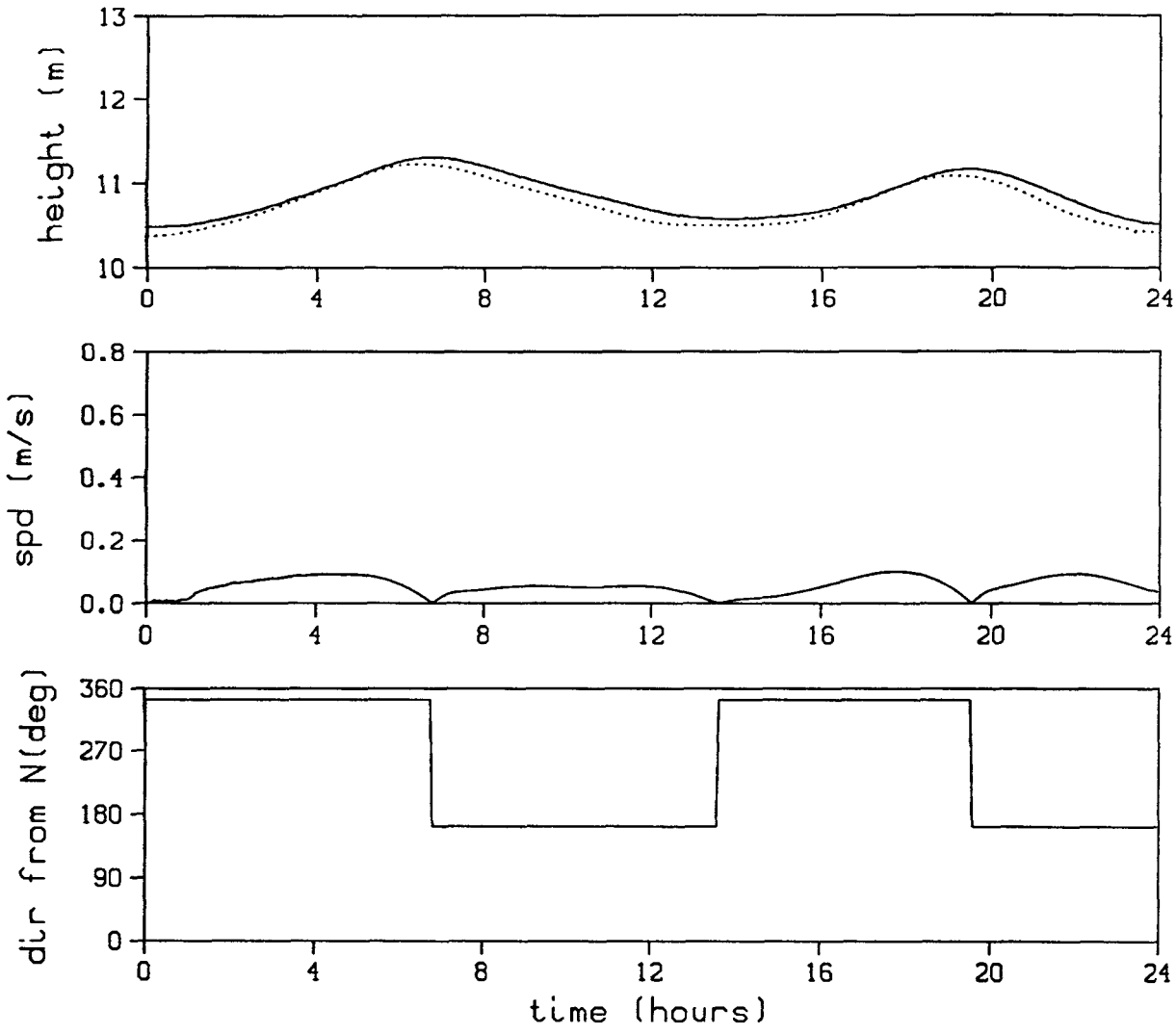

FIGURE E.128. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION C FOR THE JULY 31, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

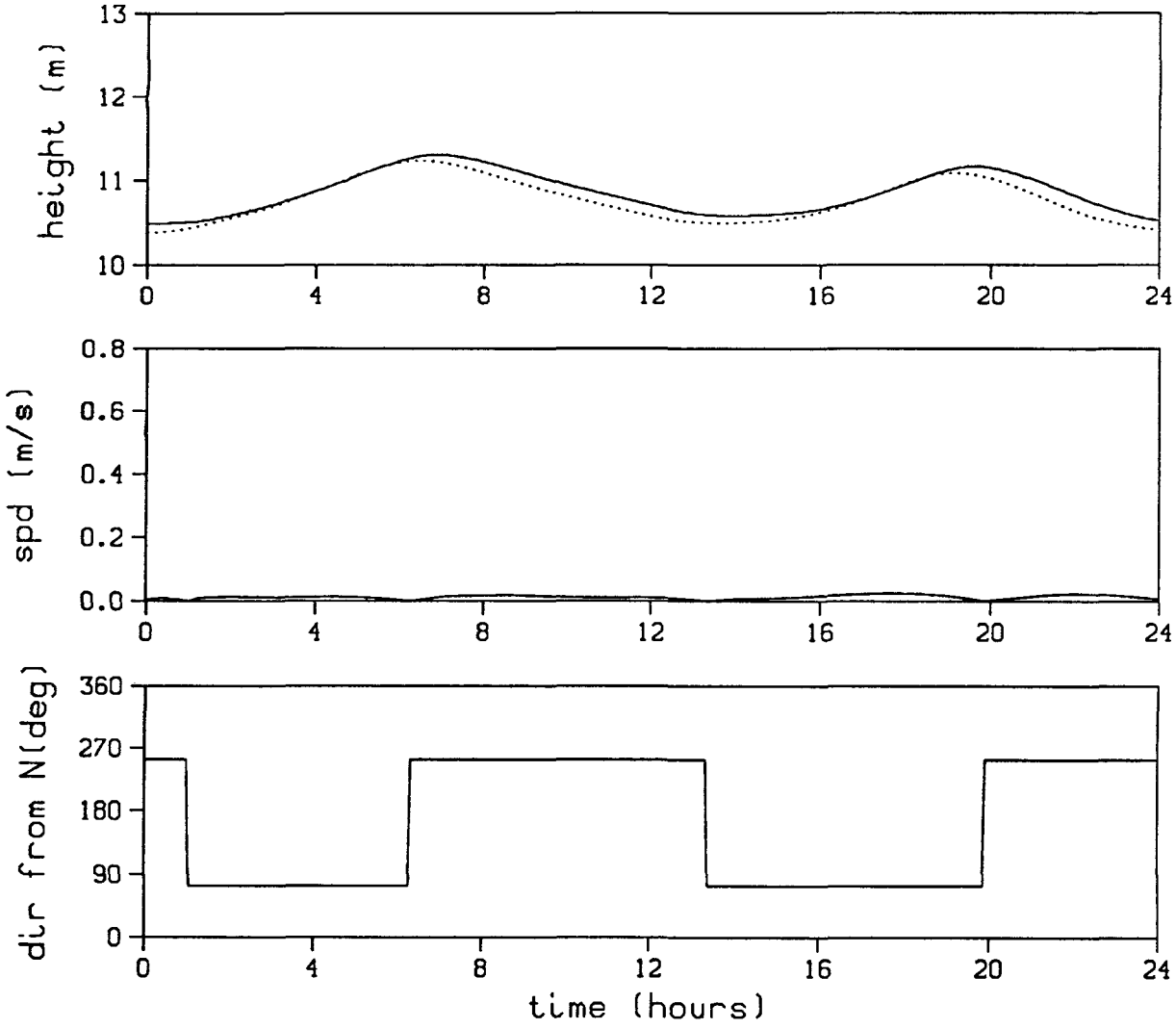

FIGURE E.129. WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT WOODS HOLE OCEANOGRAPHIC INSTITUTE (WHOI) STATION D FOR THE JULY 31, 1986 CALIBRATION CASE. (----) = COMPUTED AND (.....) = MEASURED BY WHOI.

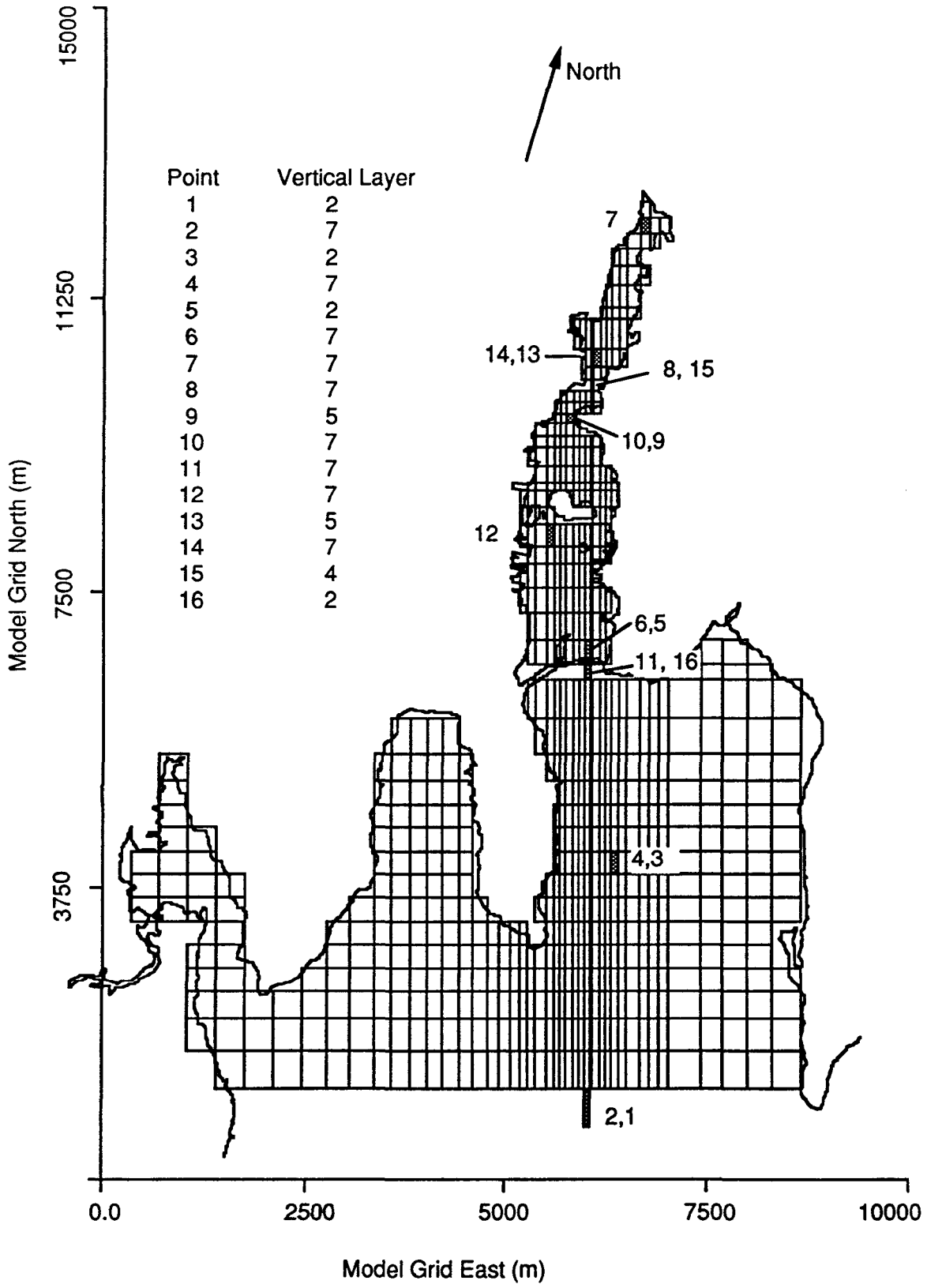

FIGURE E.130. LOCATION OF MODEL TIME-SERIES OUTPUT POINTS FOR THE JULY 23 AND 31, 1986 HYDRODYNAMICS CALIBRATION CASES

5.6.1-16

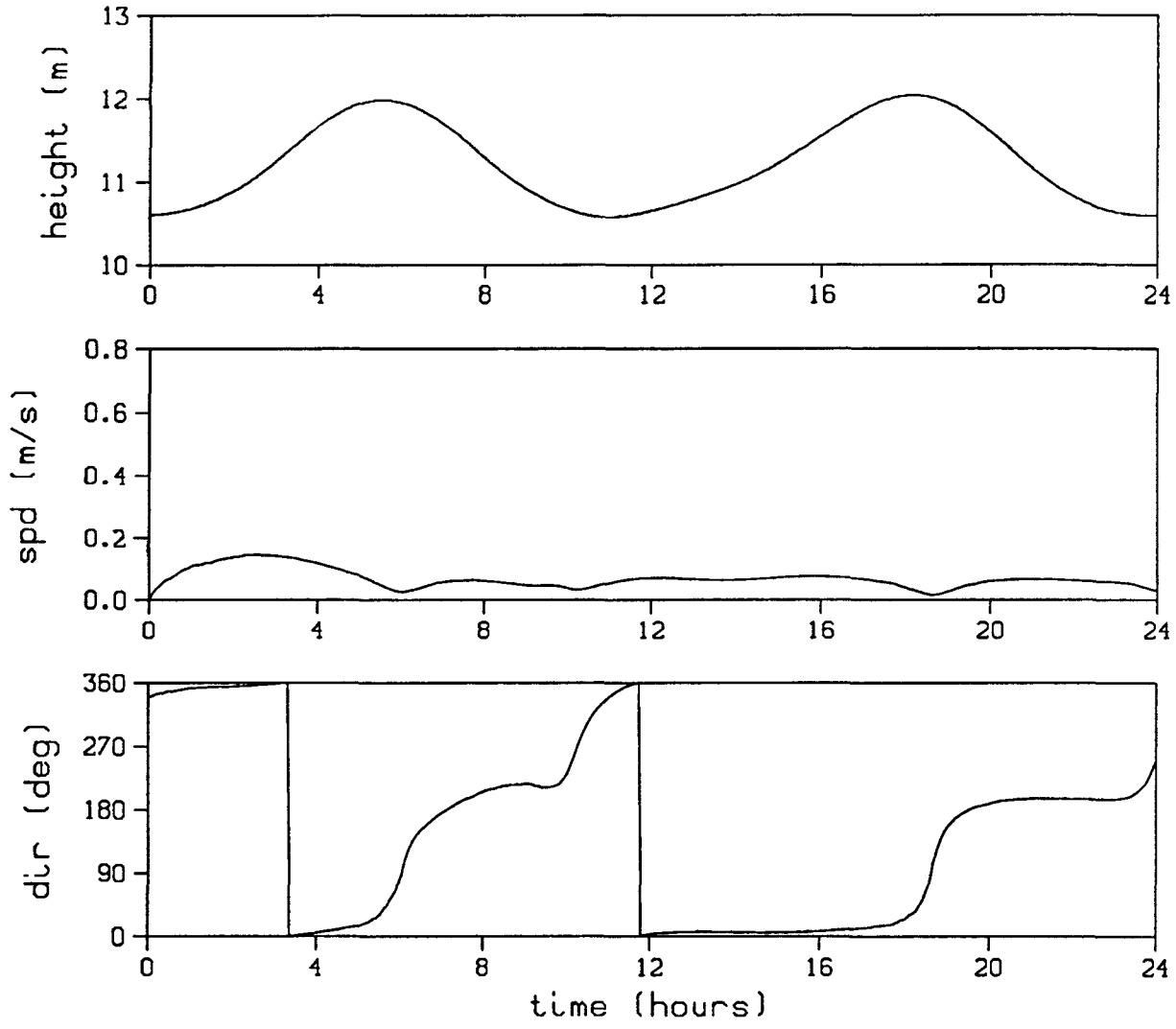

FIGURE E.131. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 1 FOR THE JULY 23, 1986 CALIBRATION CASE

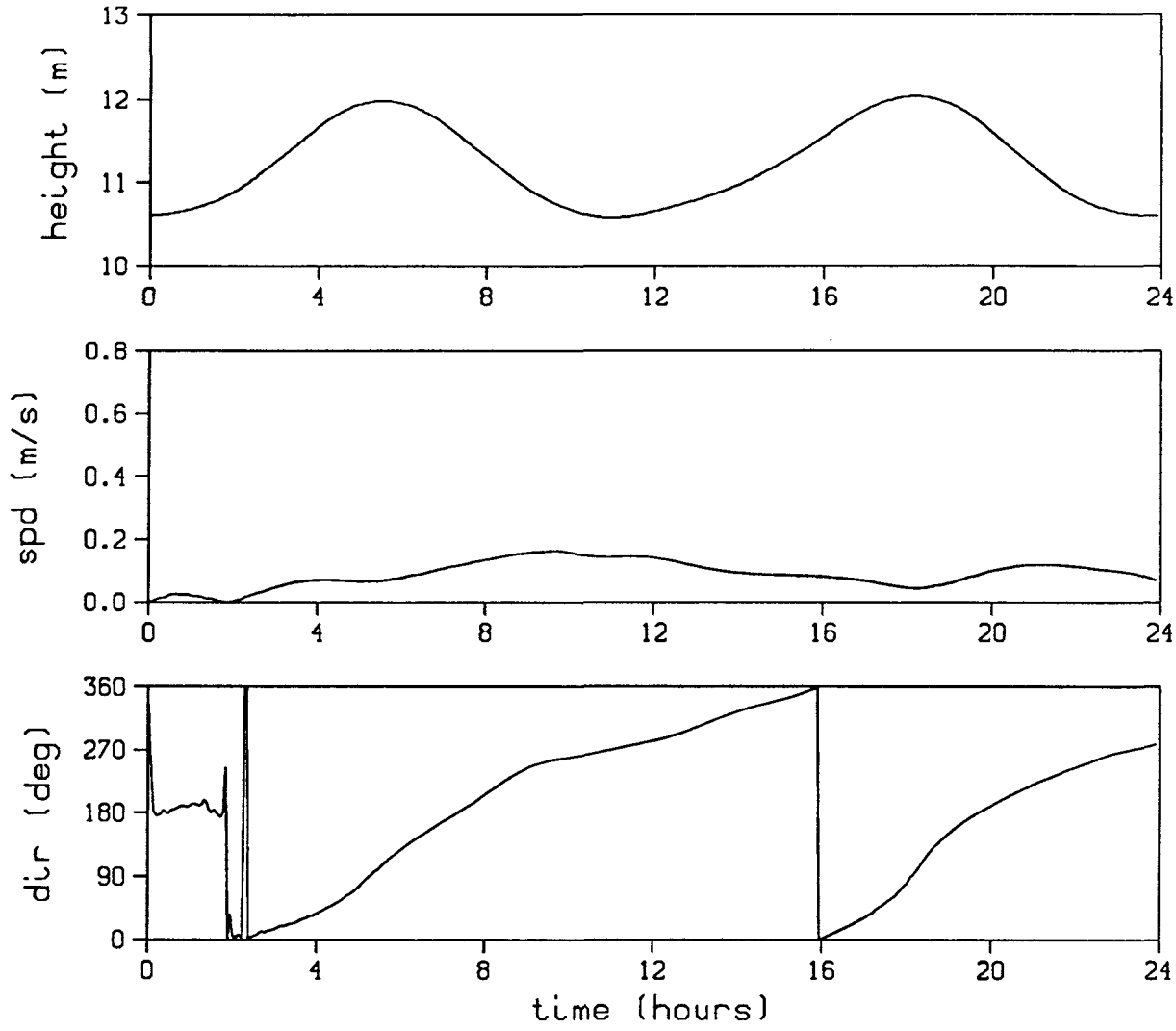

FIGURE E.132. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 2 FOR THE JULY 23, 1986 CALIBRATION CASE

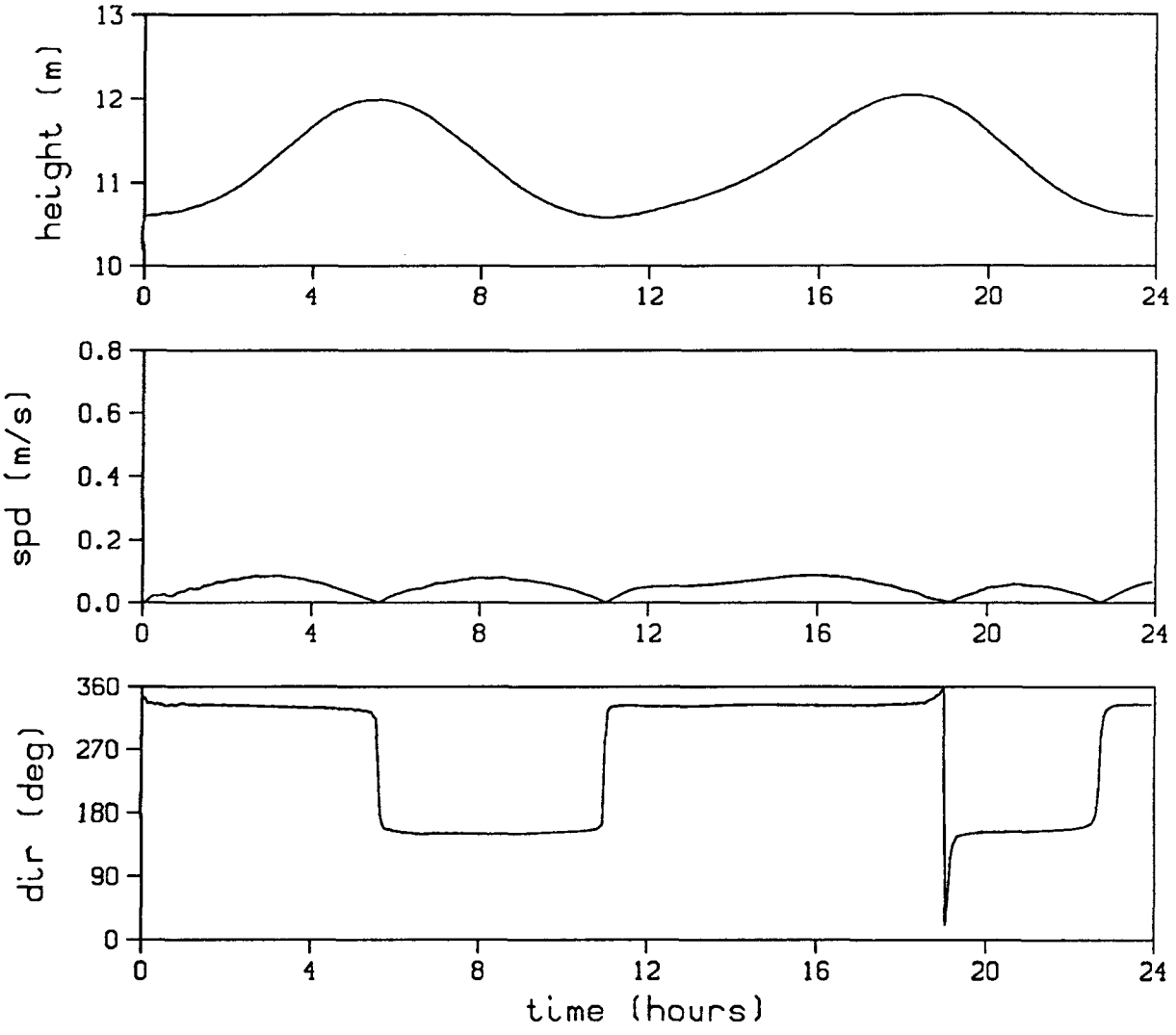

FIGURE E.133. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 3 FOR THE JULY 23, 1986 CALIBRATION CASE

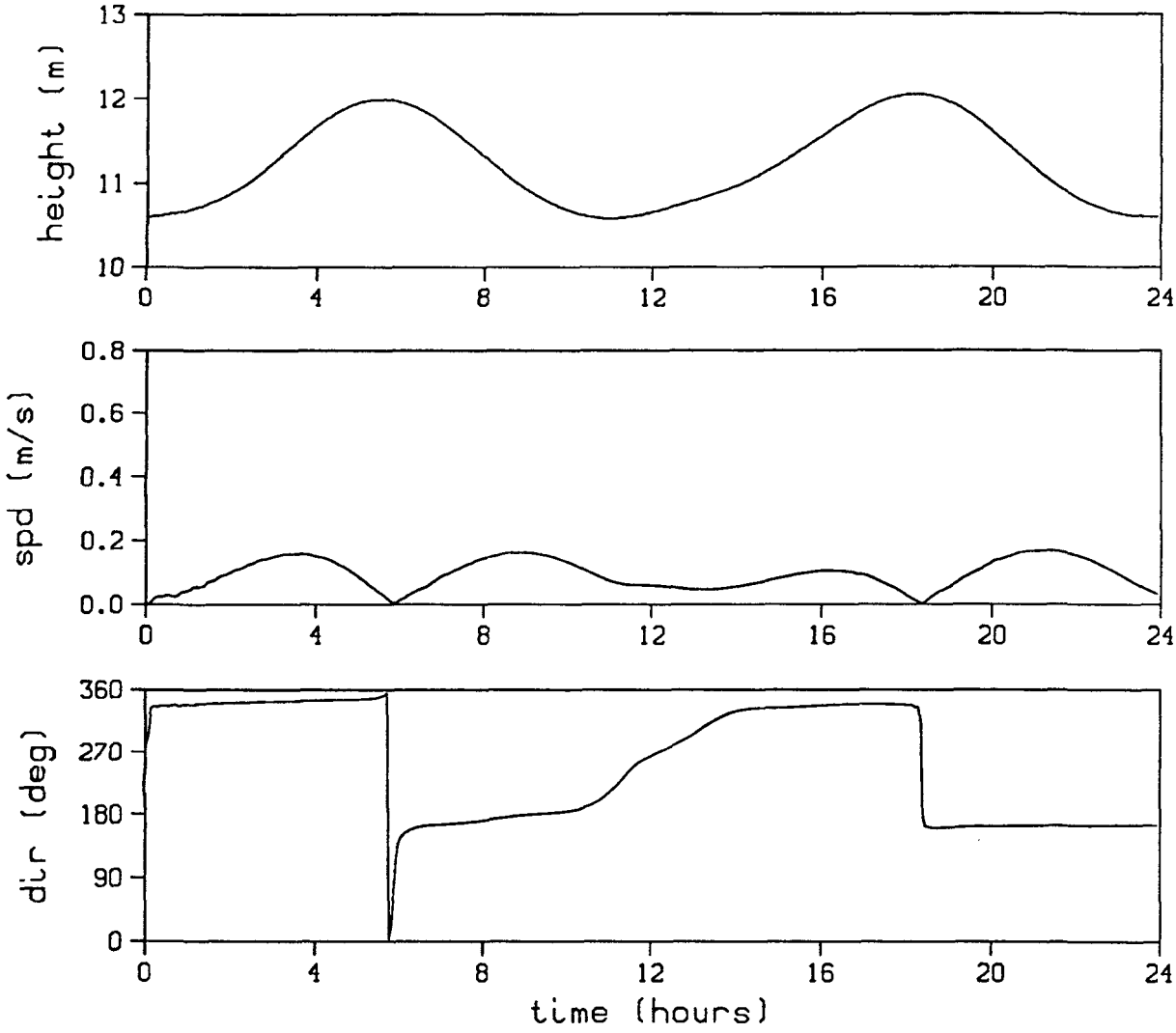

FIGURE E.134. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 4 FOR THE JULY 23, 1986 CALIBRATION CASE

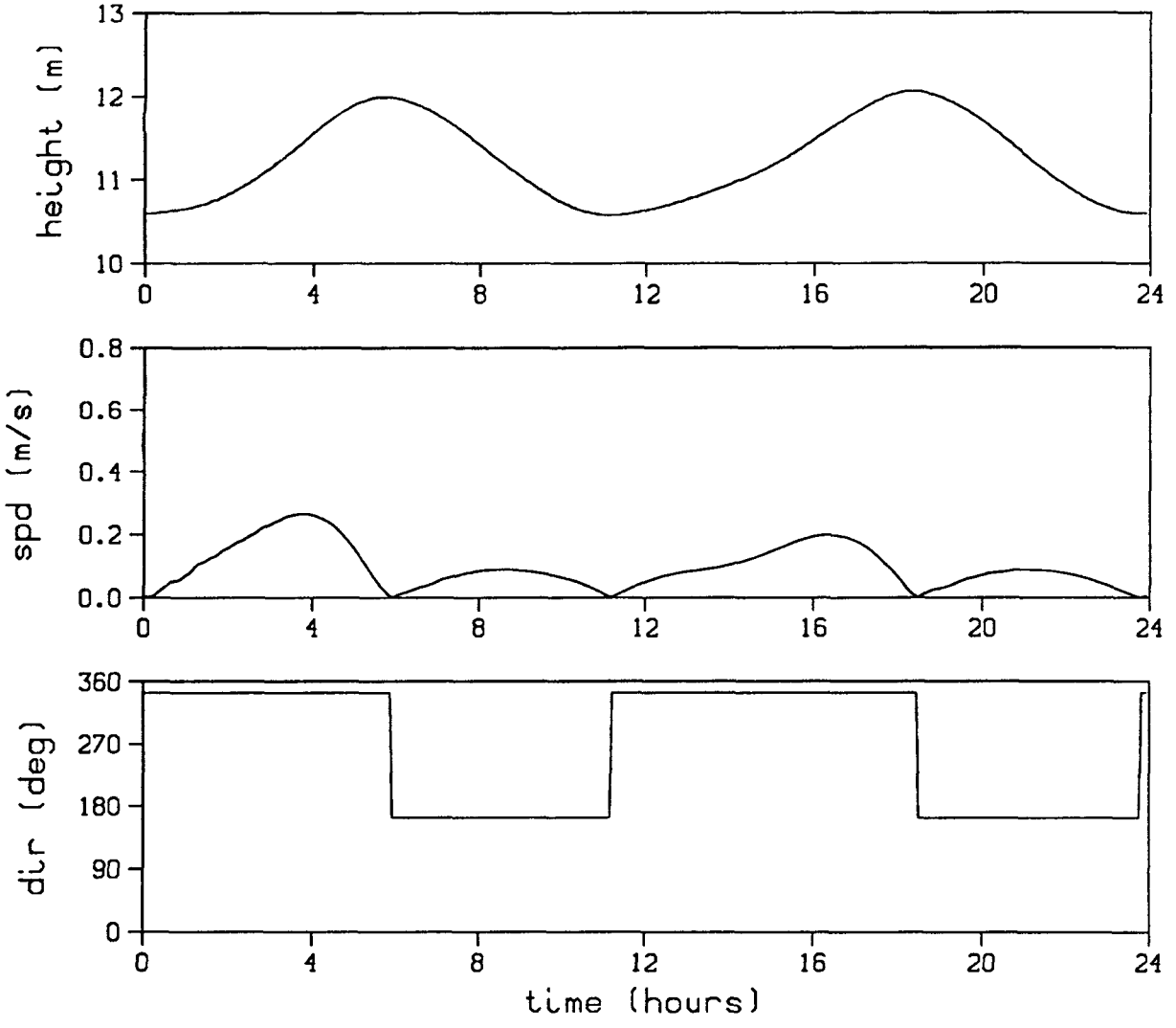

FIGURE E.135. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 5 FOR THE JULY 23, 1986 CALIBRATION CASE

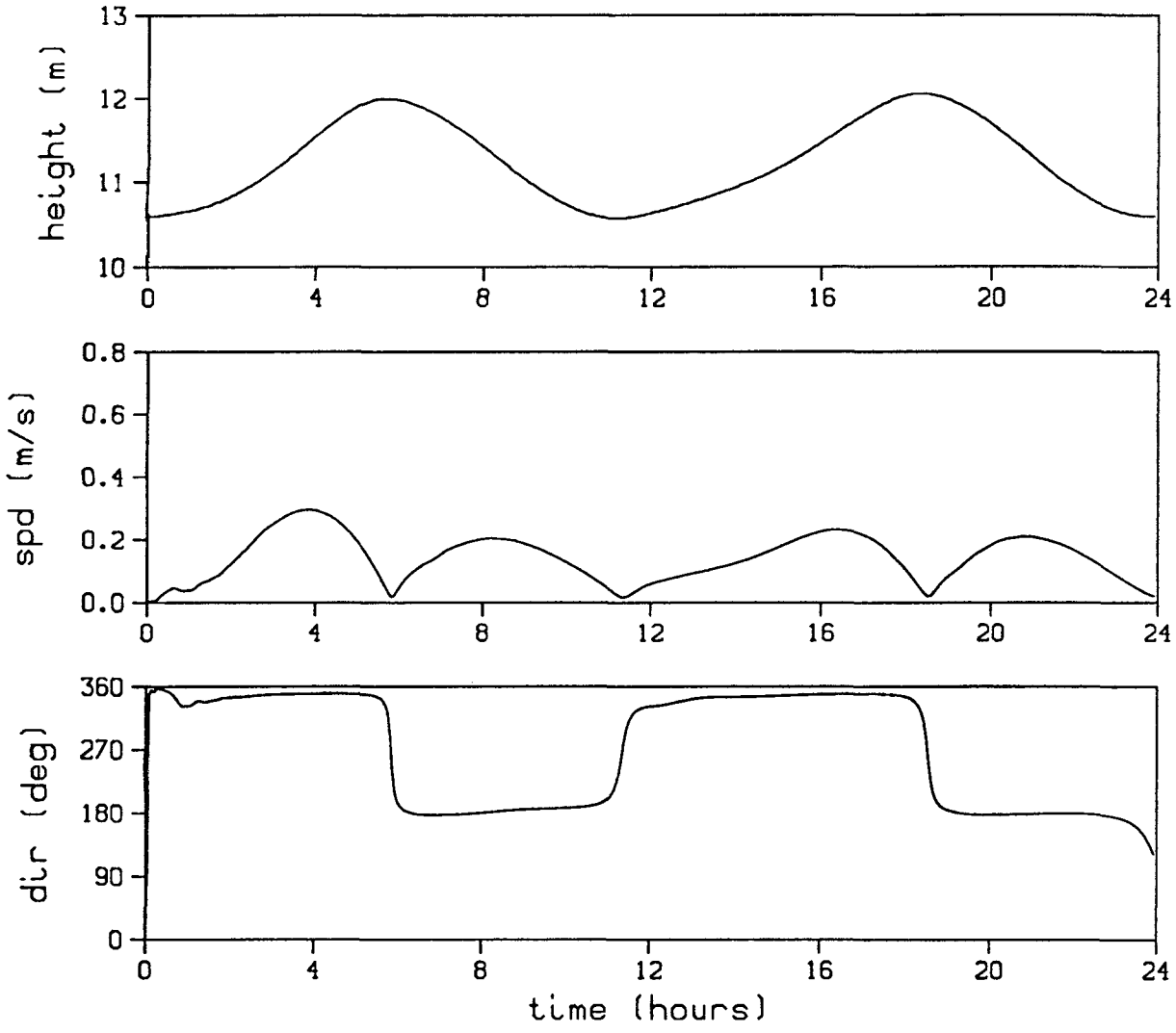

FIGURE E.136. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 6 FOR THE JULY 23, 1986 CALIBRATION CASE

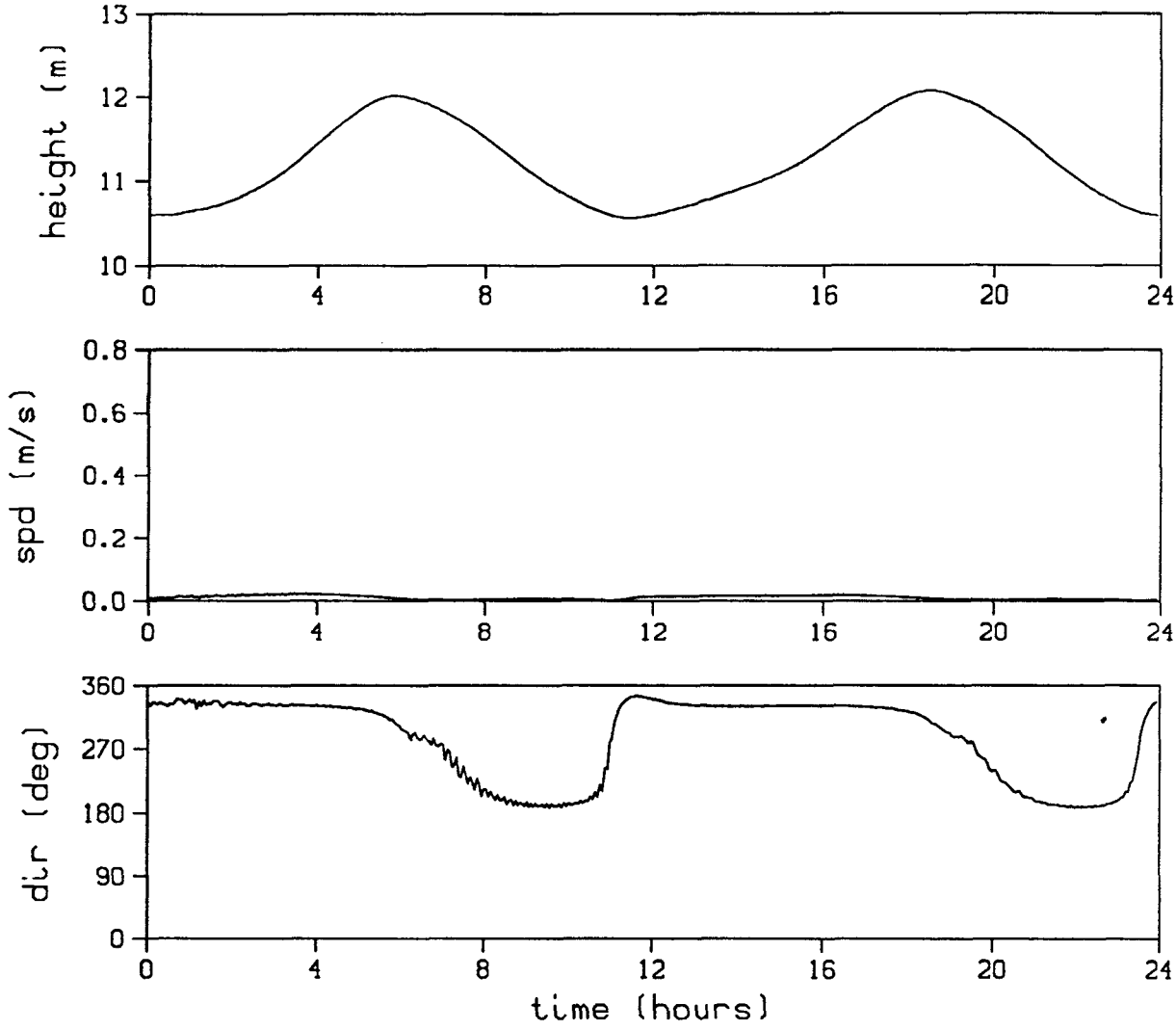

FIGURE E.137. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 7 FOR THE JULY 23, 1986 CALIBRATION CASE

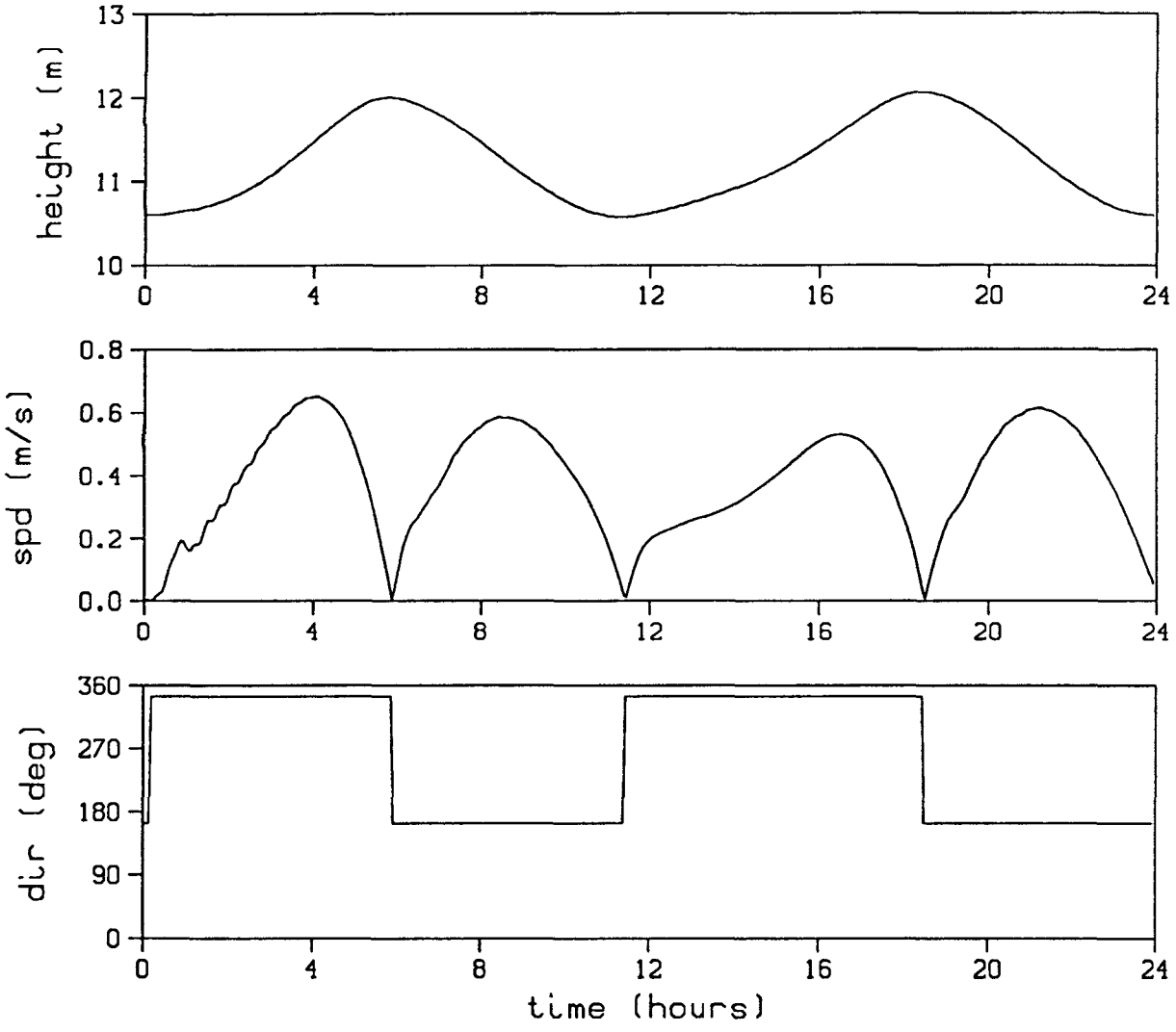

FIGURE E.138. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 8 FOR THE JULY 23, 1986 CALIBRATION CASE

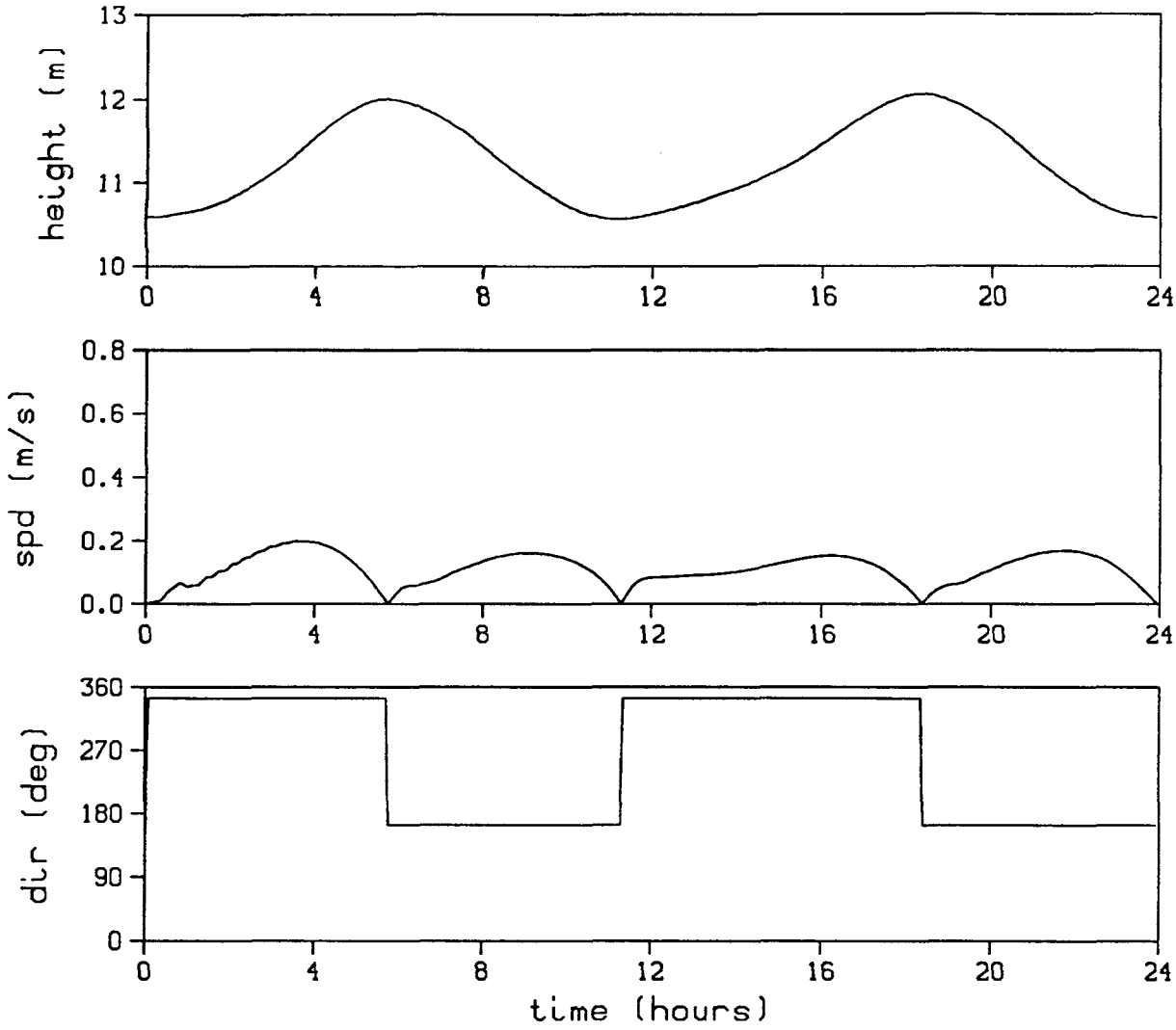

FIGURE E.139. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 9 FOR THE JULY 23, 1986 CALIBRATION CASE

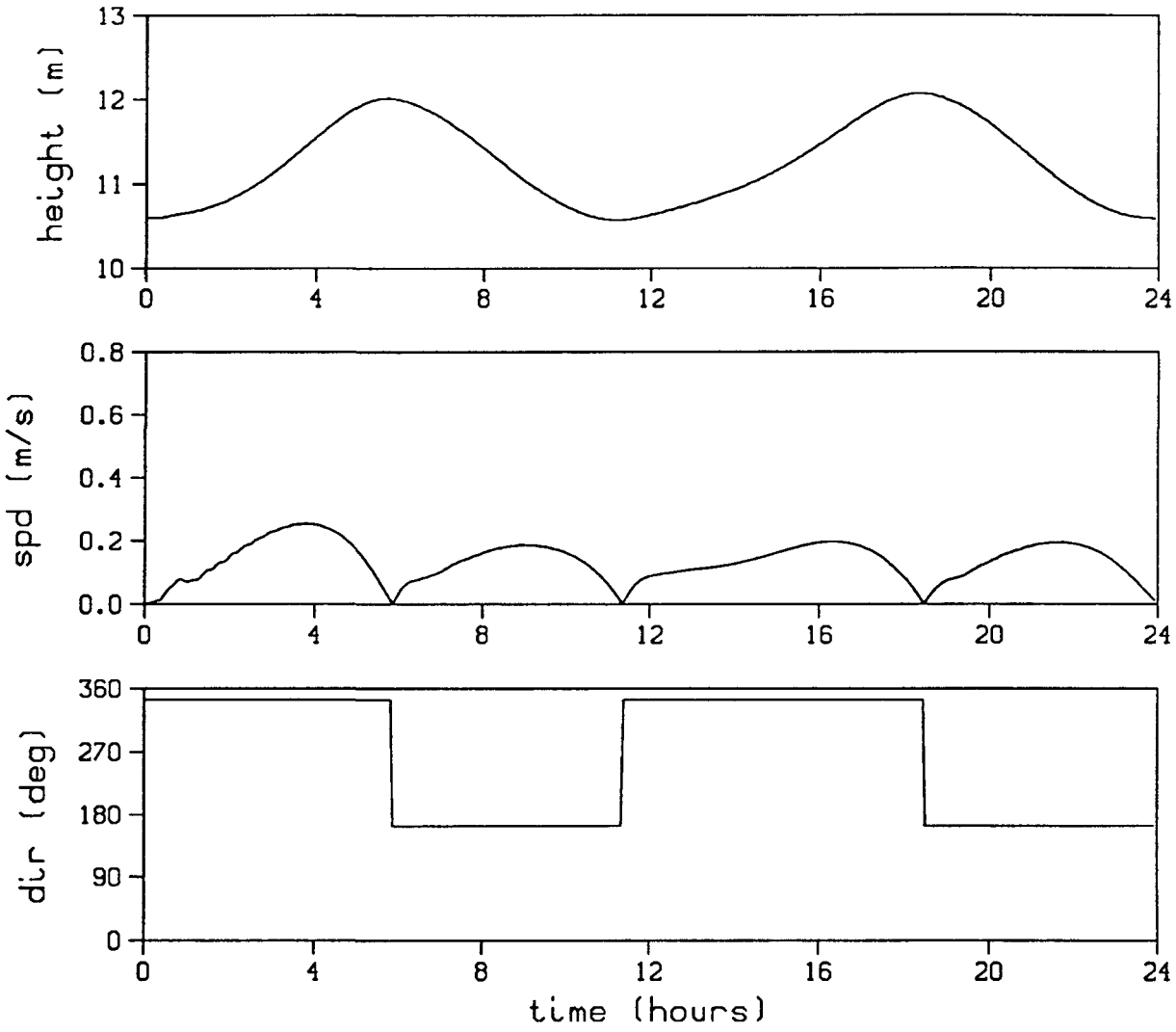

FIGURE E.140. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 10 FOR THE JULY 23, 1986 CALIBRATION CASE

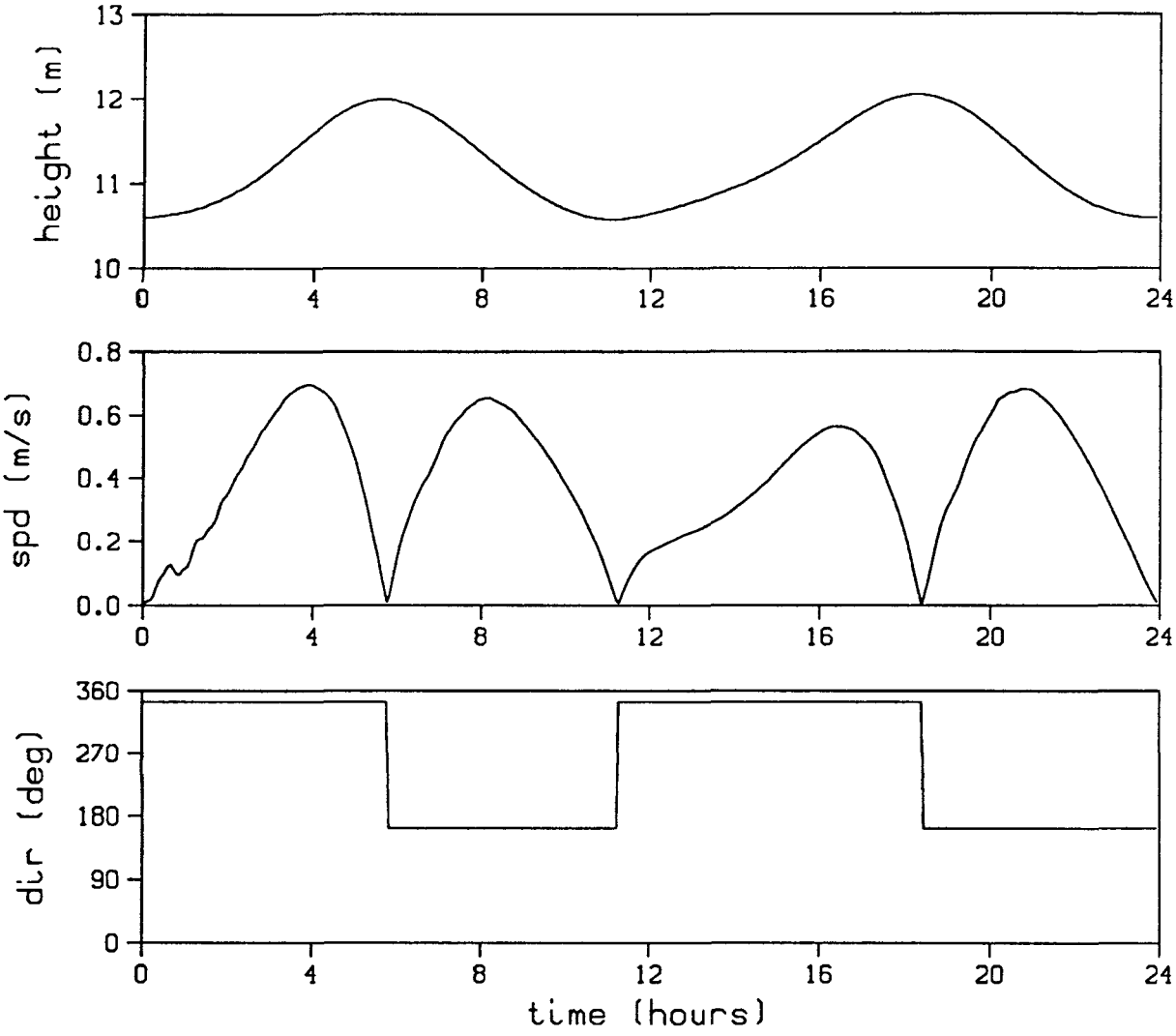

FIGURE E.141. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 11 FOR THE JULY 23, 1986 CALIBRATION CASE

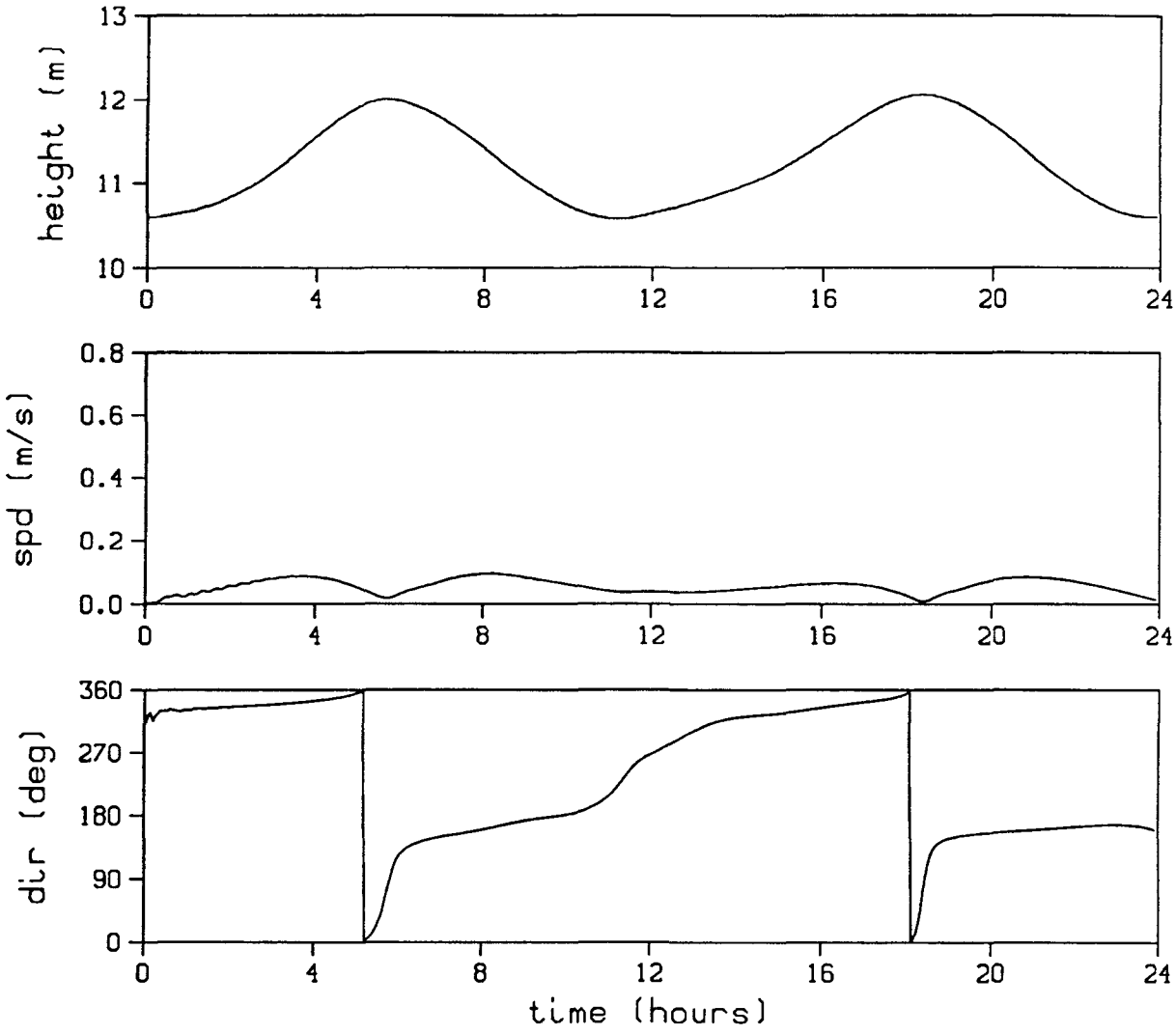

FIGURE E.142. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 12 FOR THE JULY 23, 1986 CALIBRATION CASE

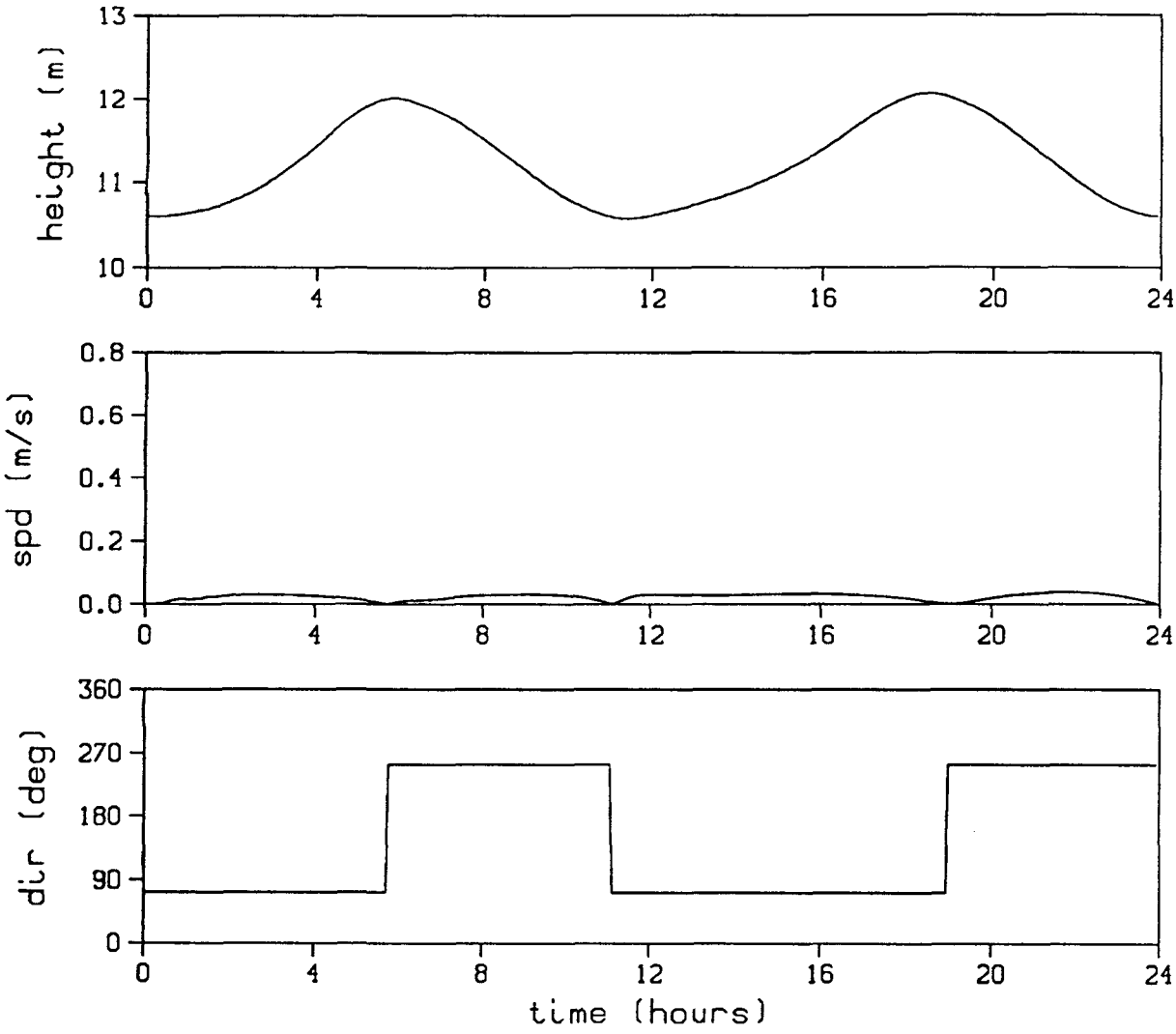

FIGURE E.143. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 13 FOR THE JULY 23, 1986 CALIBRATION CASE

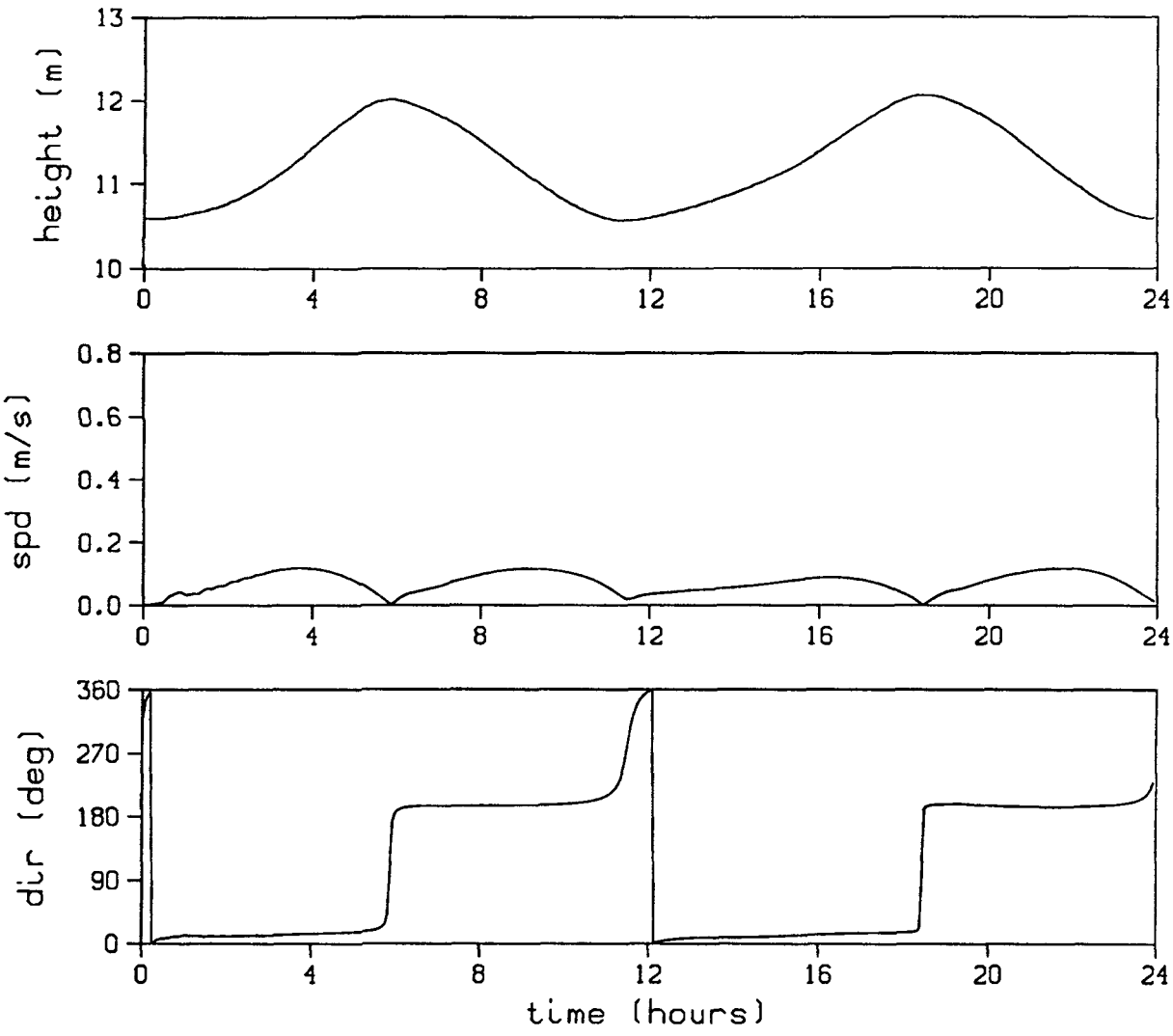

FIGURE E.144. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 14 FOR THE JULY 23, 1986 CALIBRATION CASE

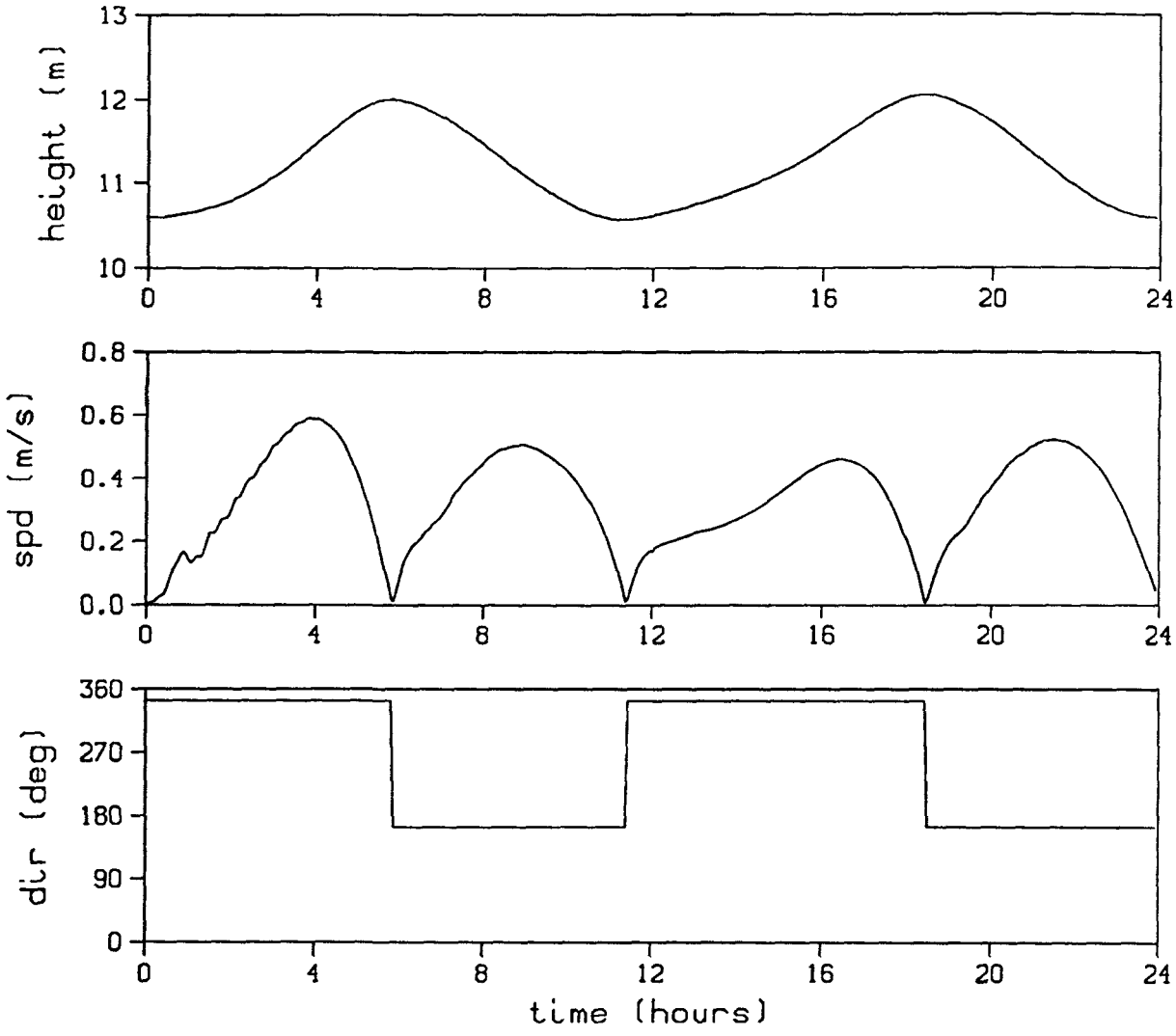

FIGURE E.145. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 15 FOR THE JULY 23, 1986 CALIBRATION CASE

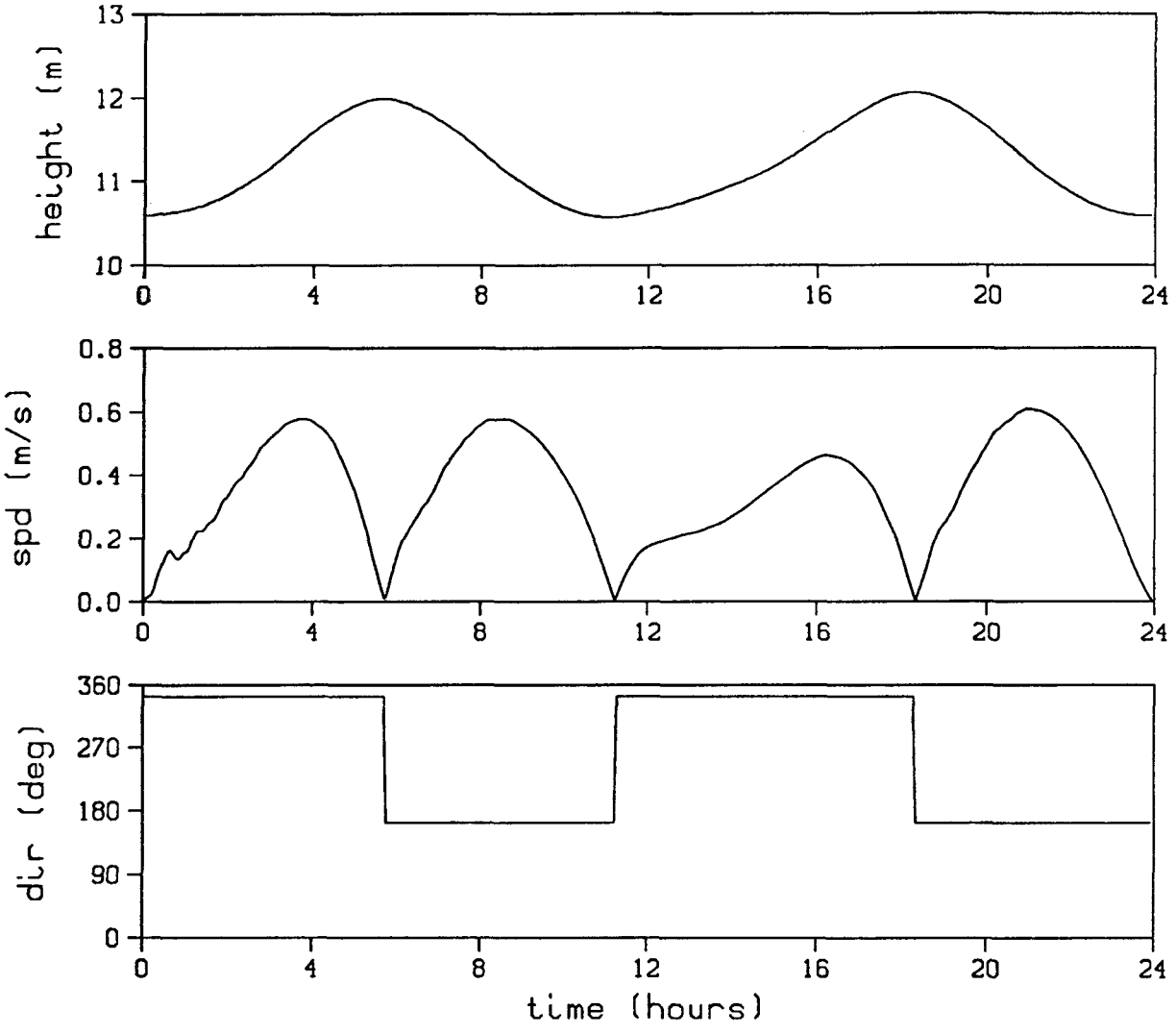

FIGURE E.146. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 16 FOR THE JULY 23, 1986 CALIBRATION CASE

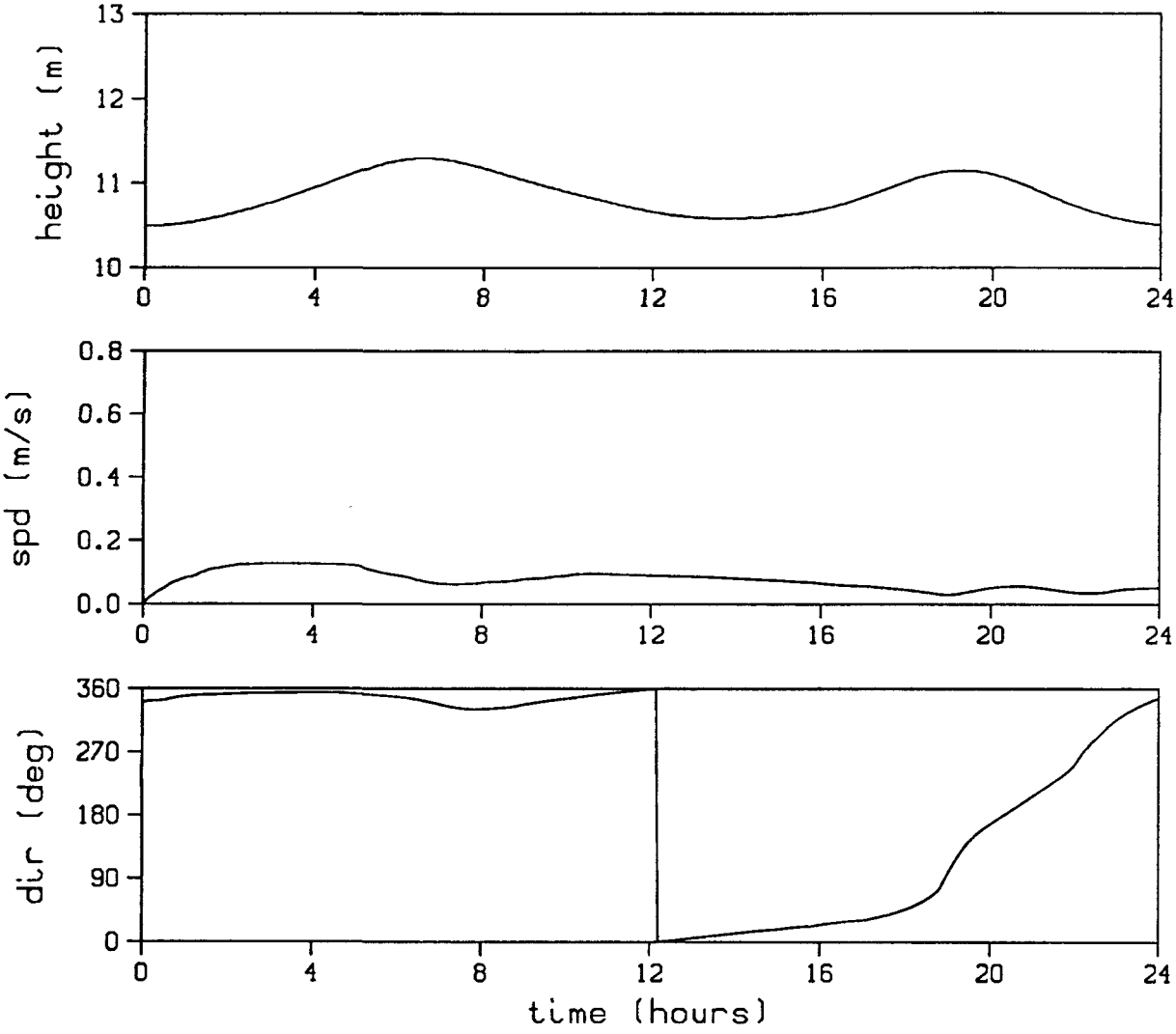

FIGURE E.147. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 1 FOR THE JULY 31, 1986 CALIBRATION CASE

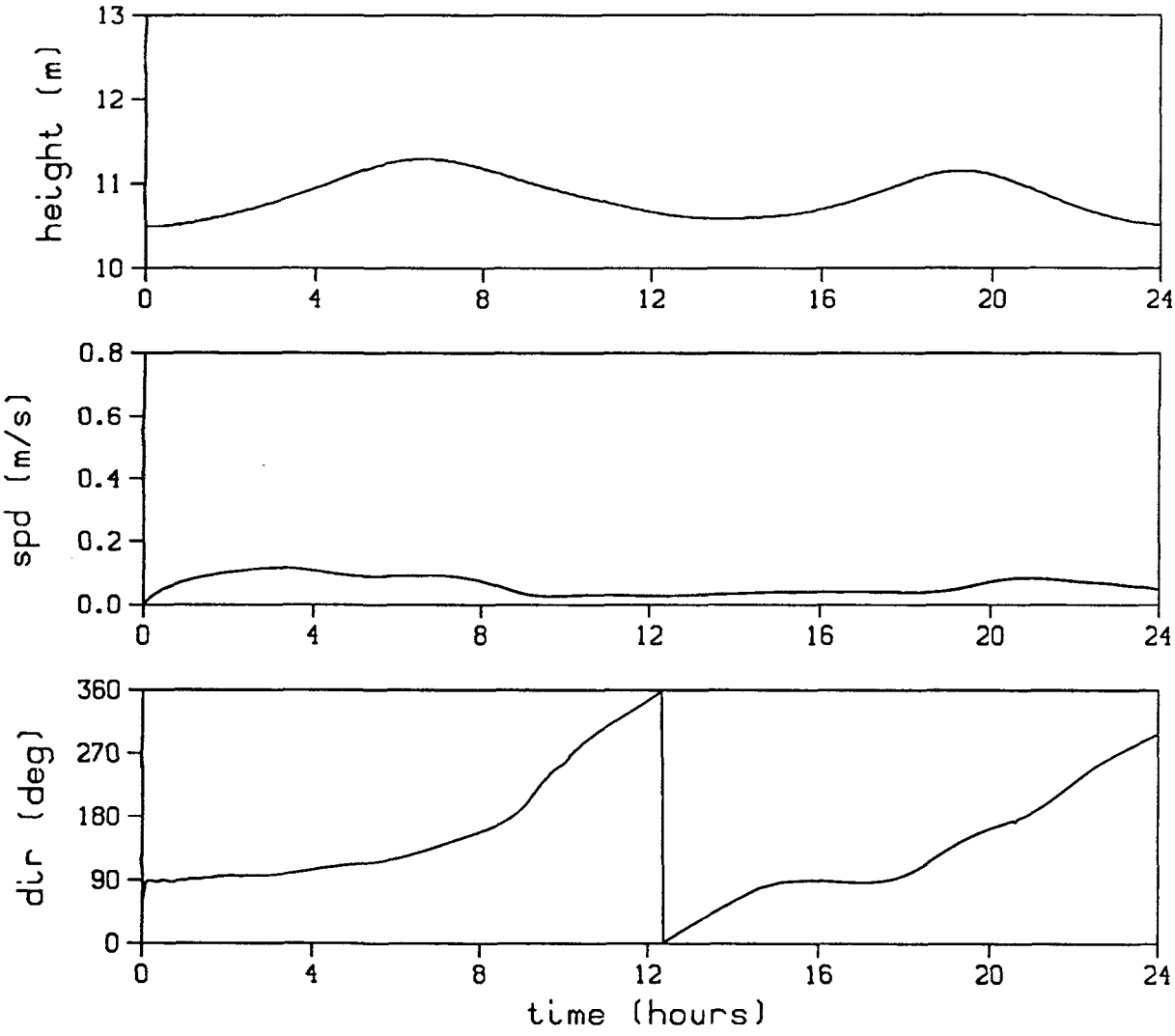

FIGURE E.148. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 2 FOR THE JULY 31, 1986 CALIBRATION CASE

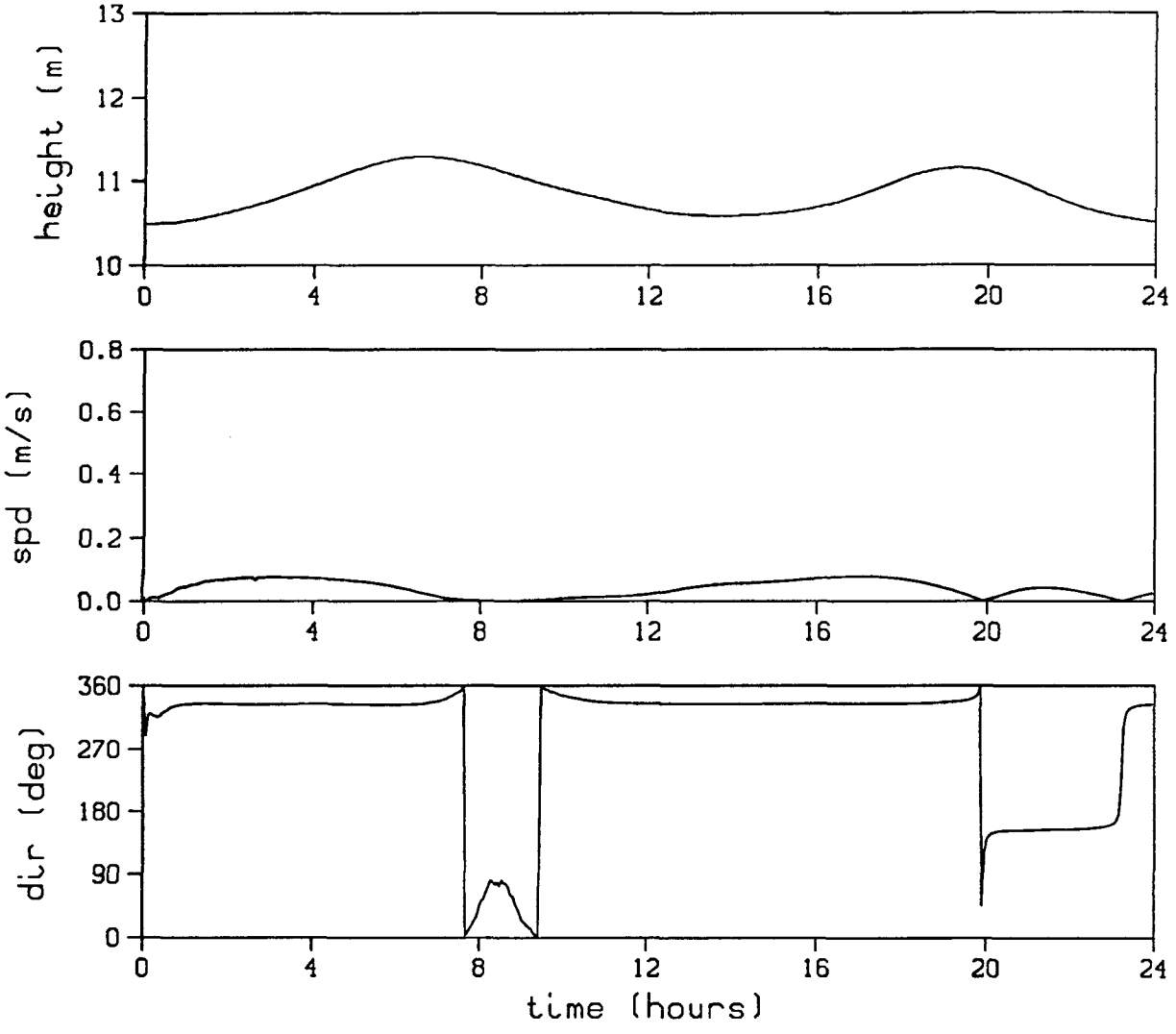

FIGURE E.149. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 3 FOR THE JULY 31, 1986 CALIBRATION CASE

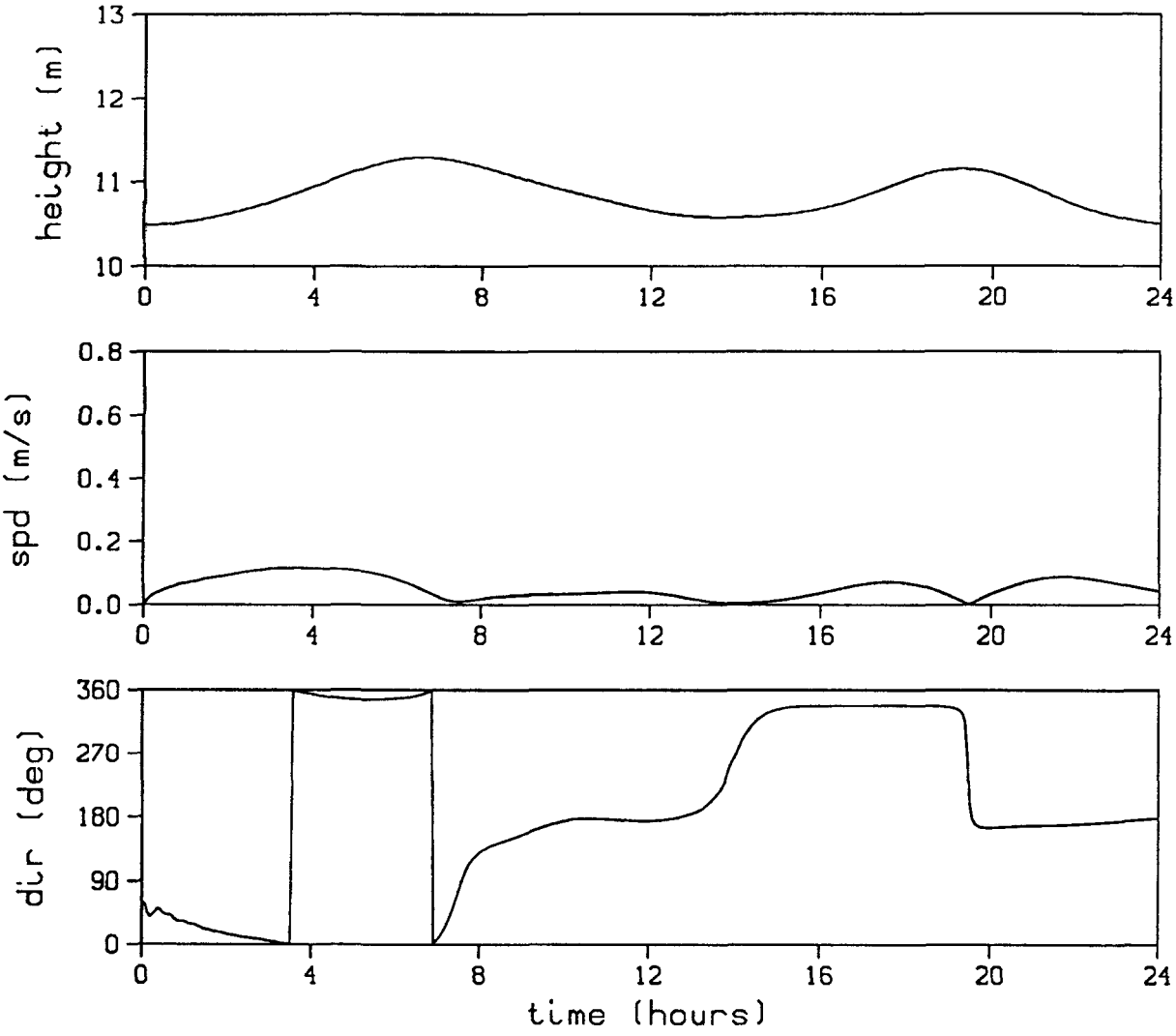

FIGURE E.150. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 4 FOR THE JULY 31, 1986 CALIBRATION CASE

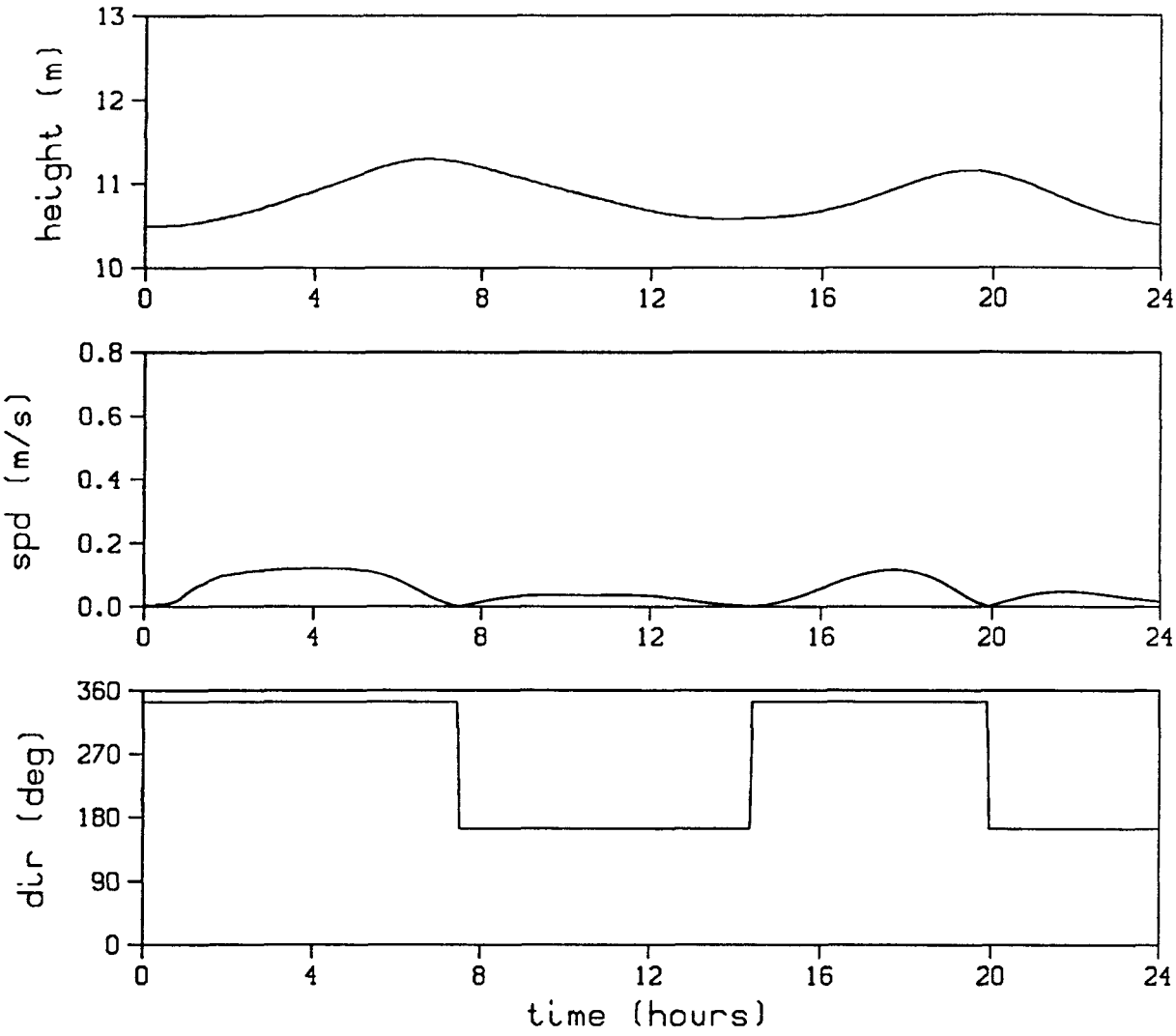

FIGURE E.151. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 5 FOR THE JULY 31, 1986 CALIBRATION CASE

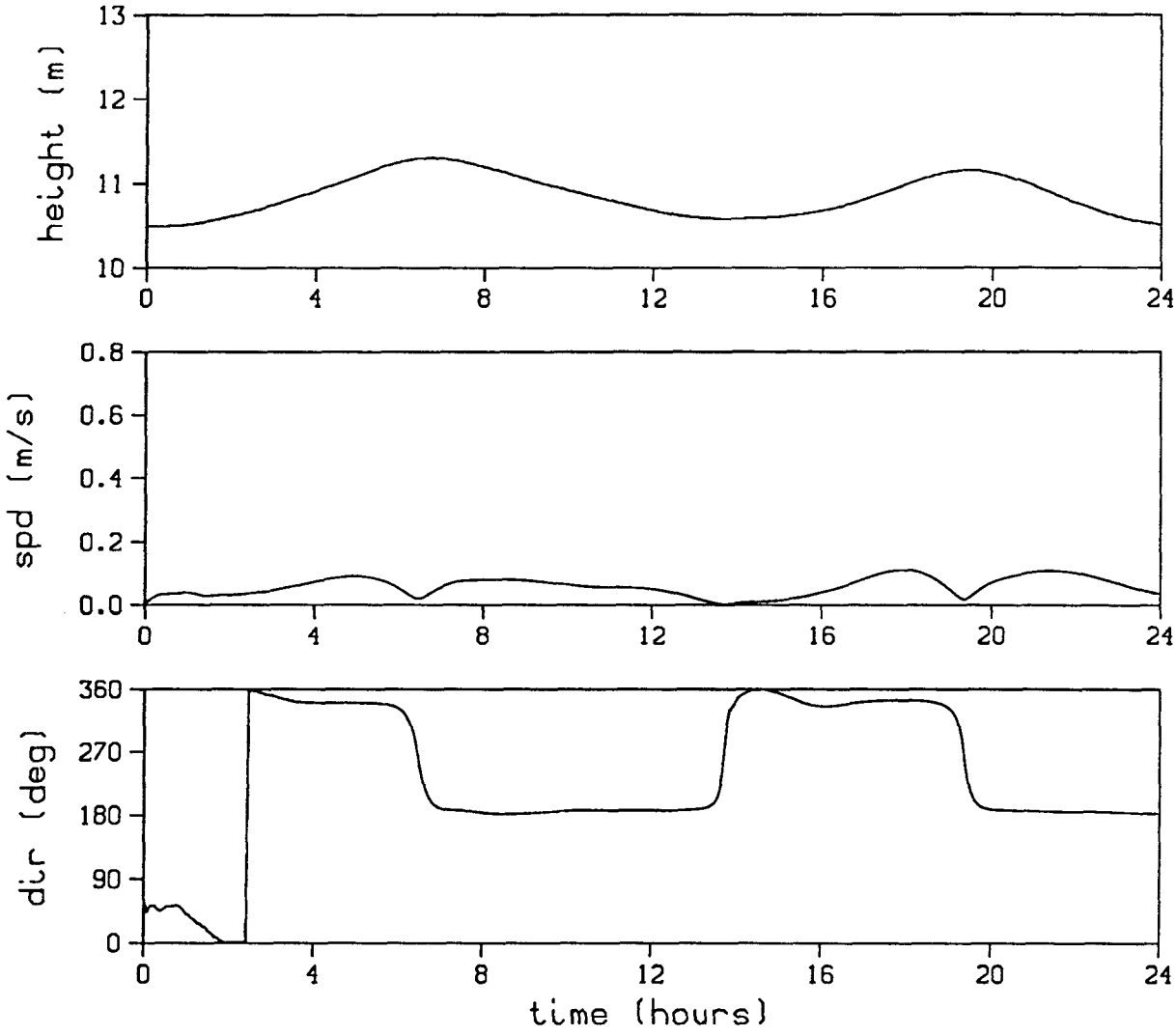

FIGURE E.152. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 6 FOR THE JULY 31, 1986 CALIBRATION CASE

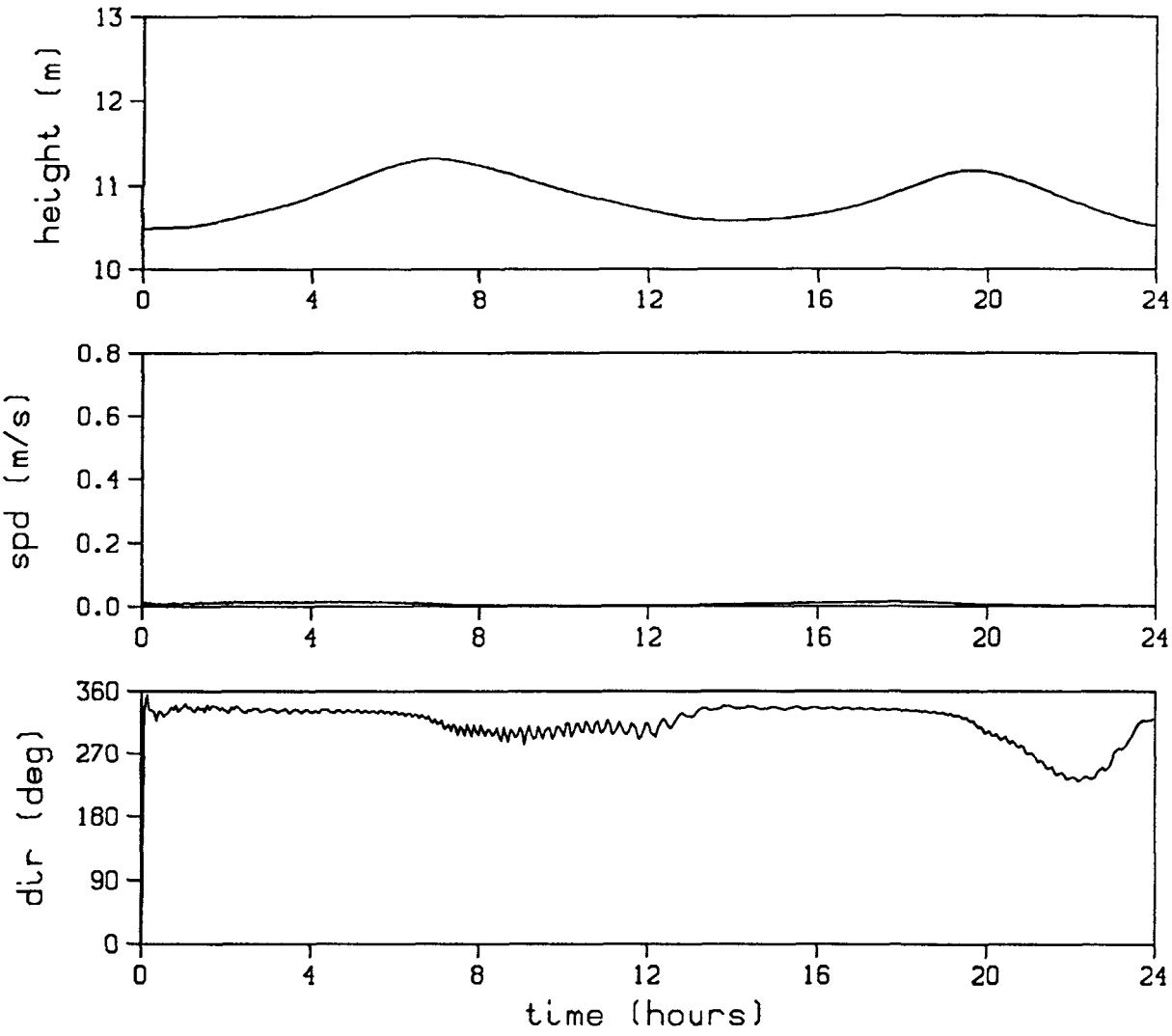

FIGURE E.153. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 7 FOR THE JULY 31, 1986 CALIBRATION CASE

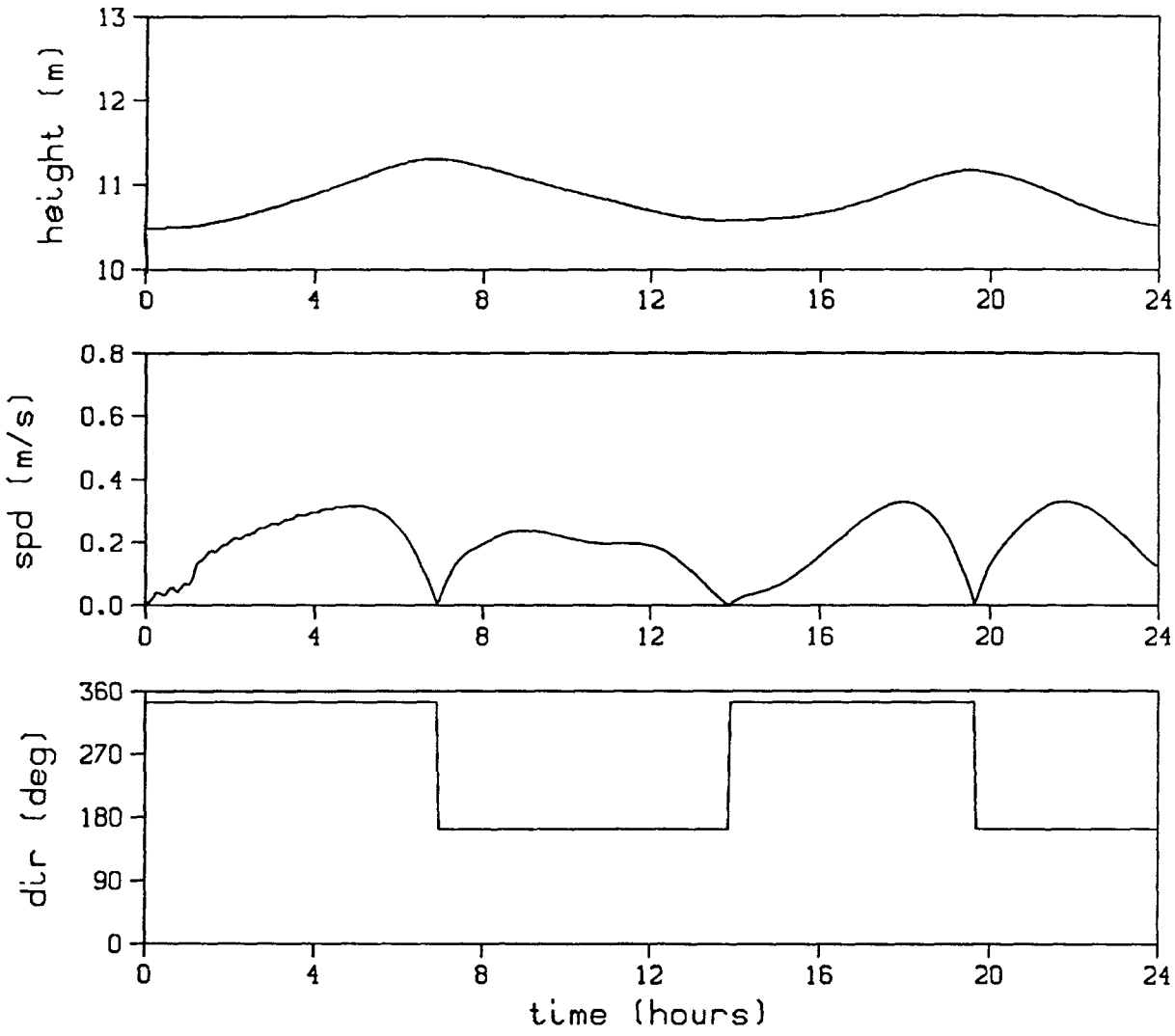

FIGURE E.154. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 8 FOR THE JULY 31, 1986 CALIBRATION CASE

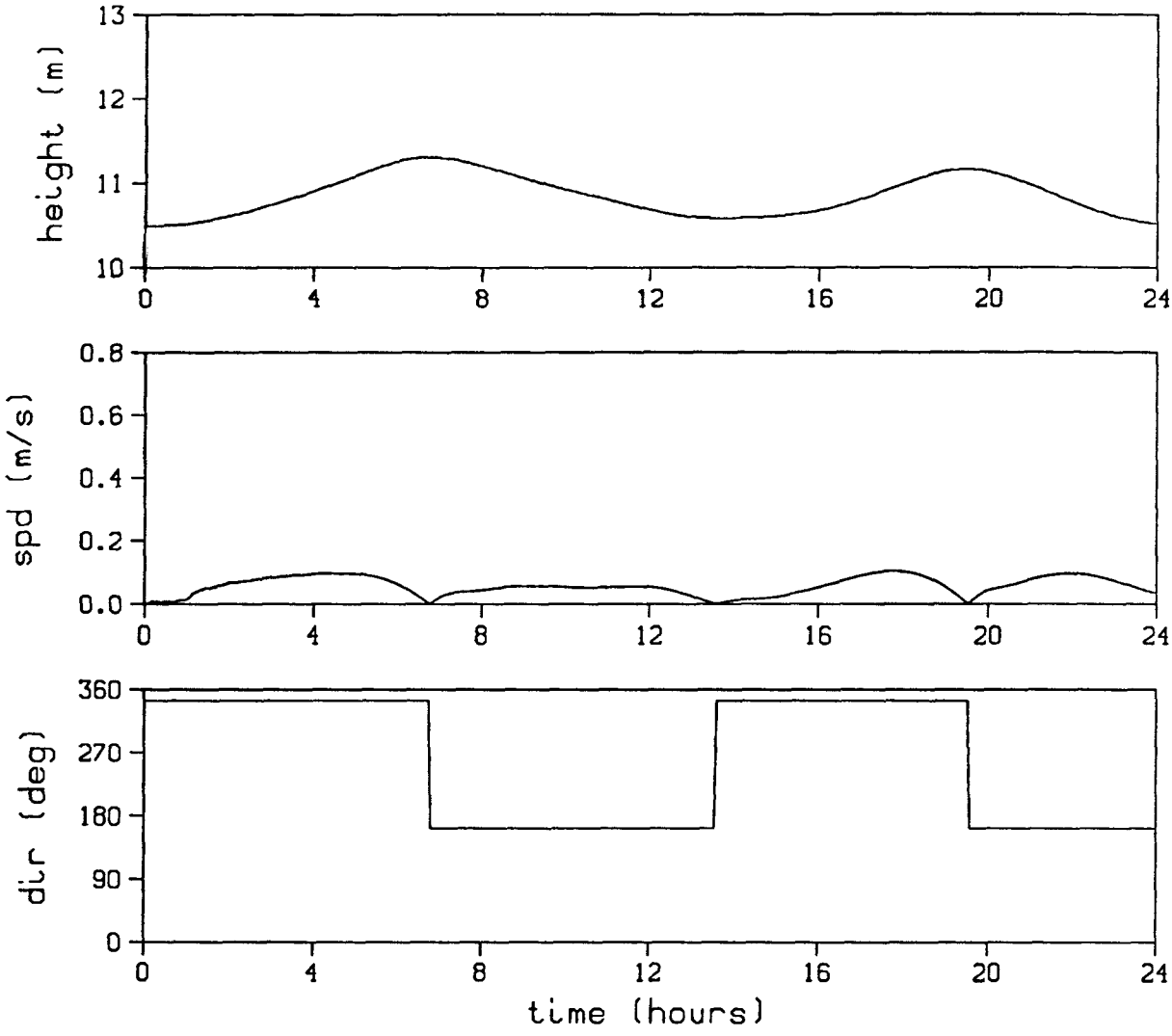

FIGURE E.155. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 9 FOR THE JULY 31, 1986 CALIBRATION CASE

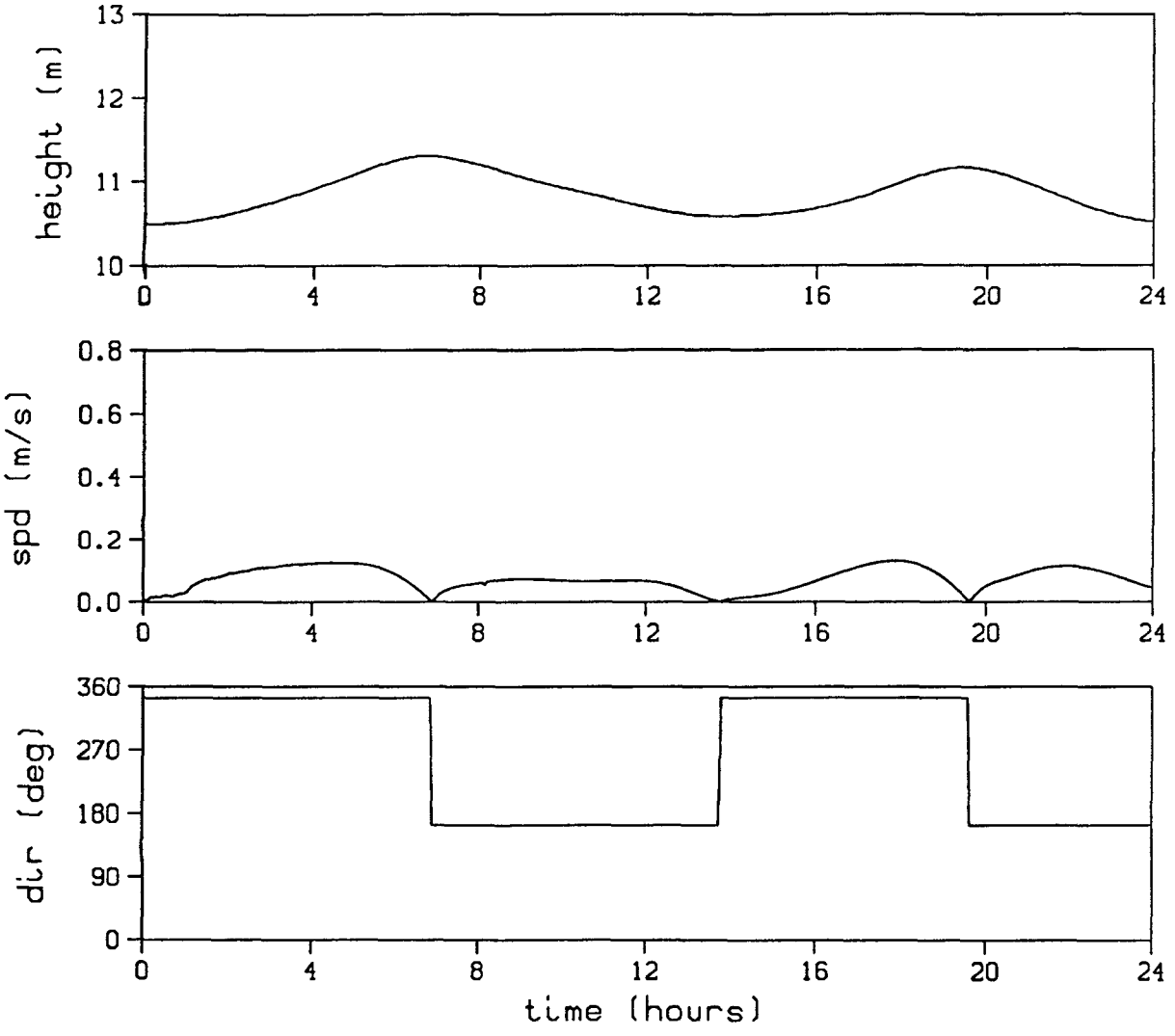

FIGURE E.156. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 10 FOR THE JULY 31, 1986 CALIBRATION CASE

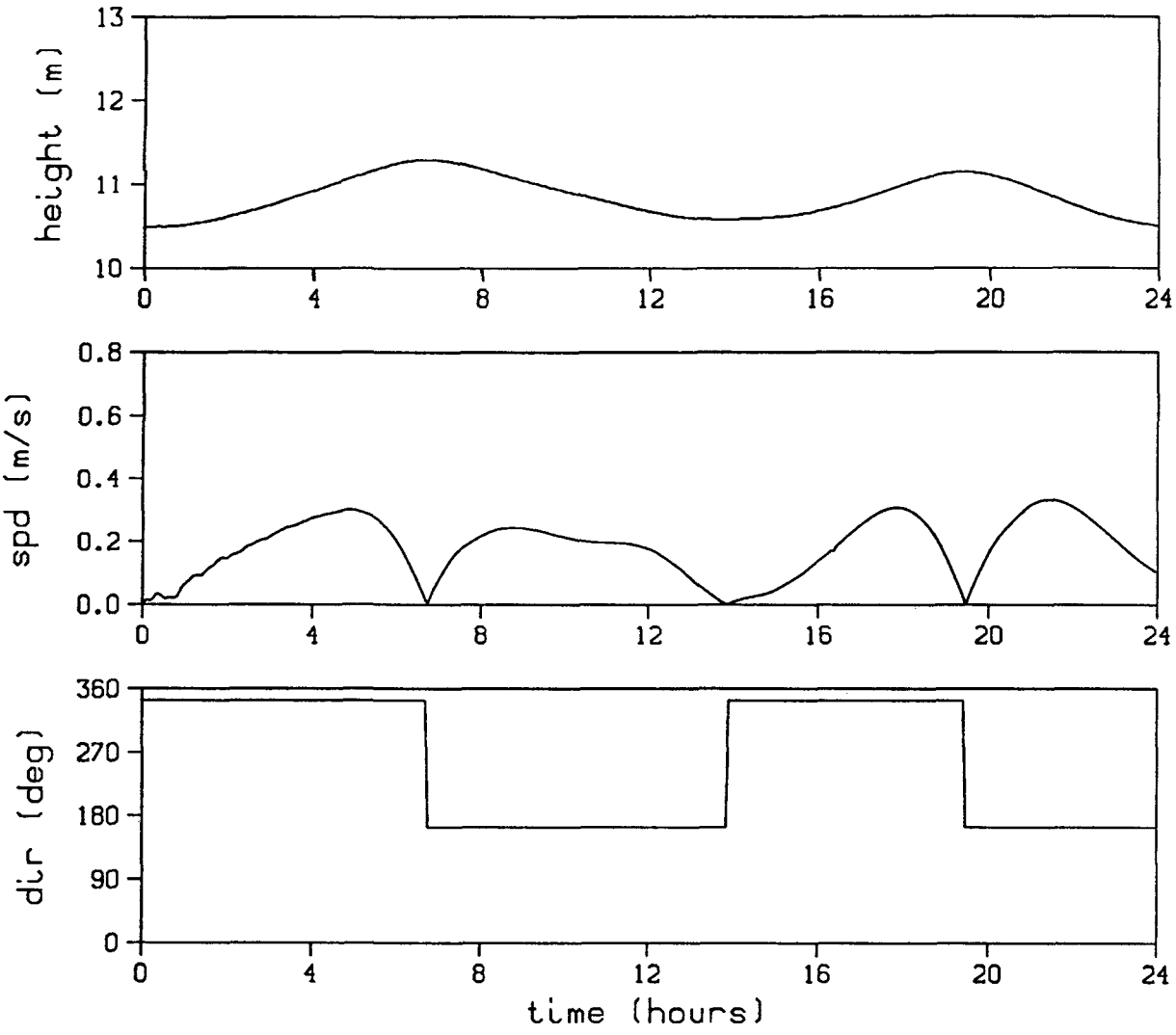

FIGURE E.157. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 11 FOR THE JULY 31, 1986 CALIBRATION CASE

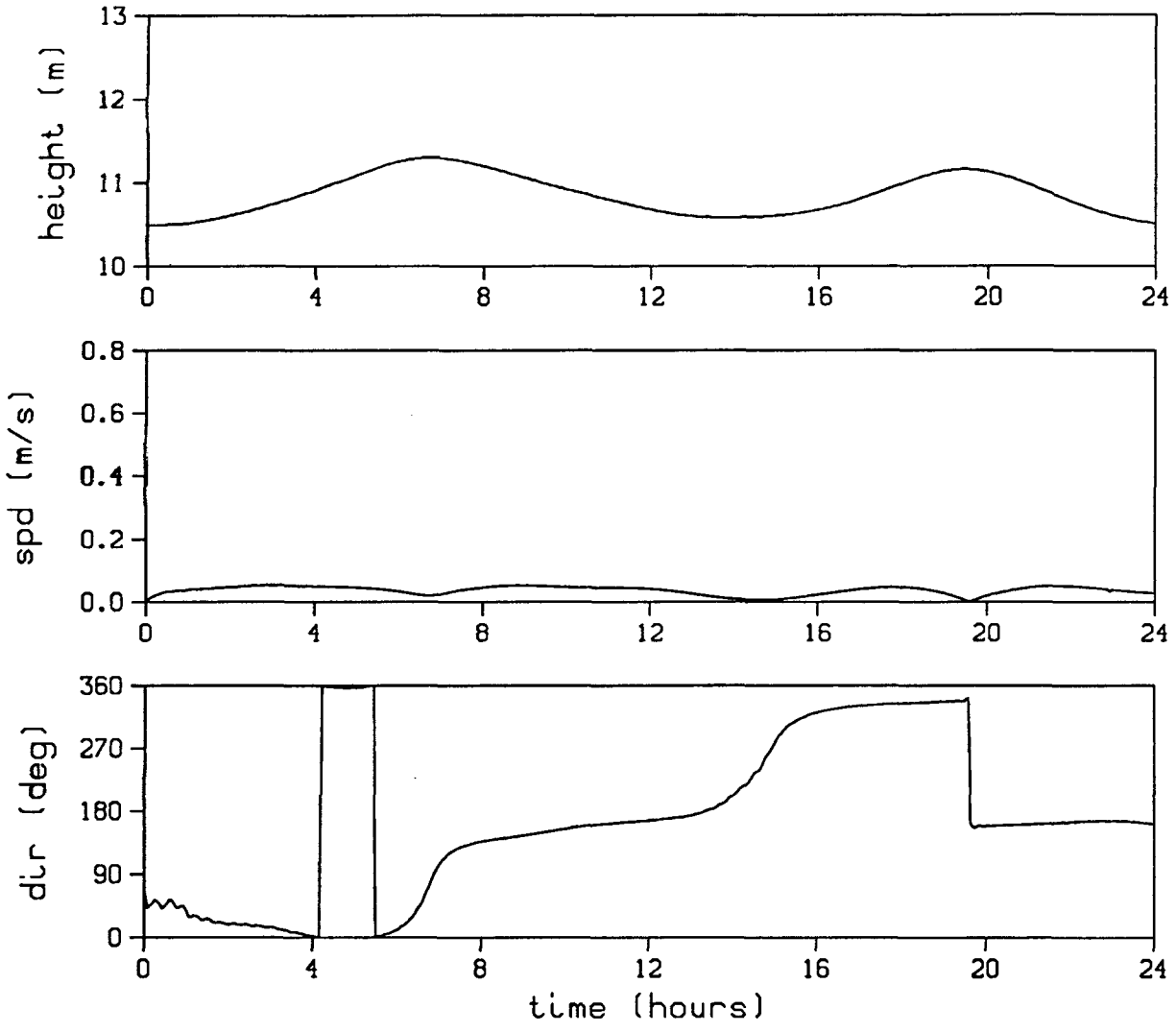

FIGURE E.158. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 12 FOR THE JULY 31, 1986 CALIBRATION CASE

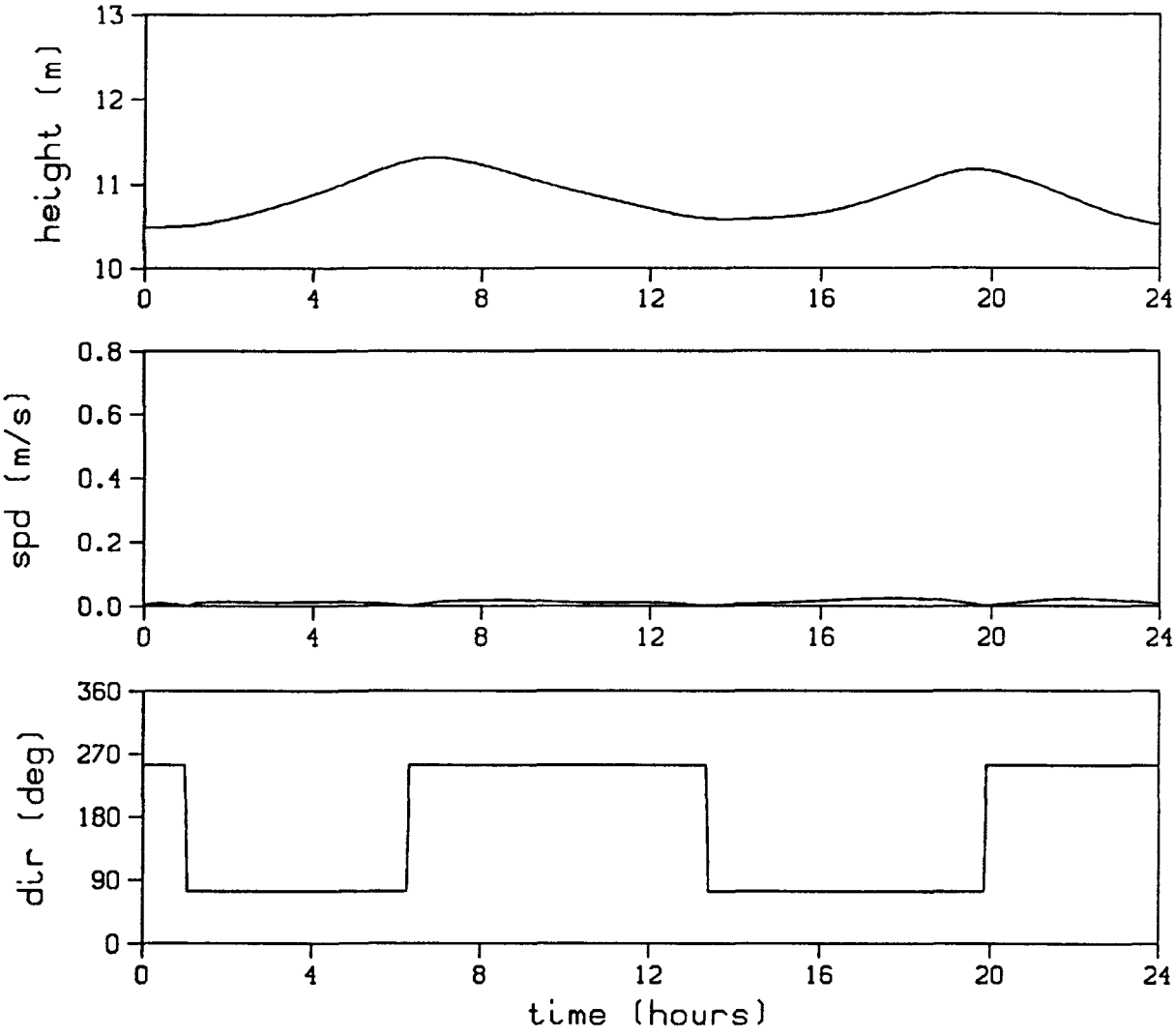

FIGURE E.159. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 13 FOR THE JULY 31, 1986 CALIBRATION CASE

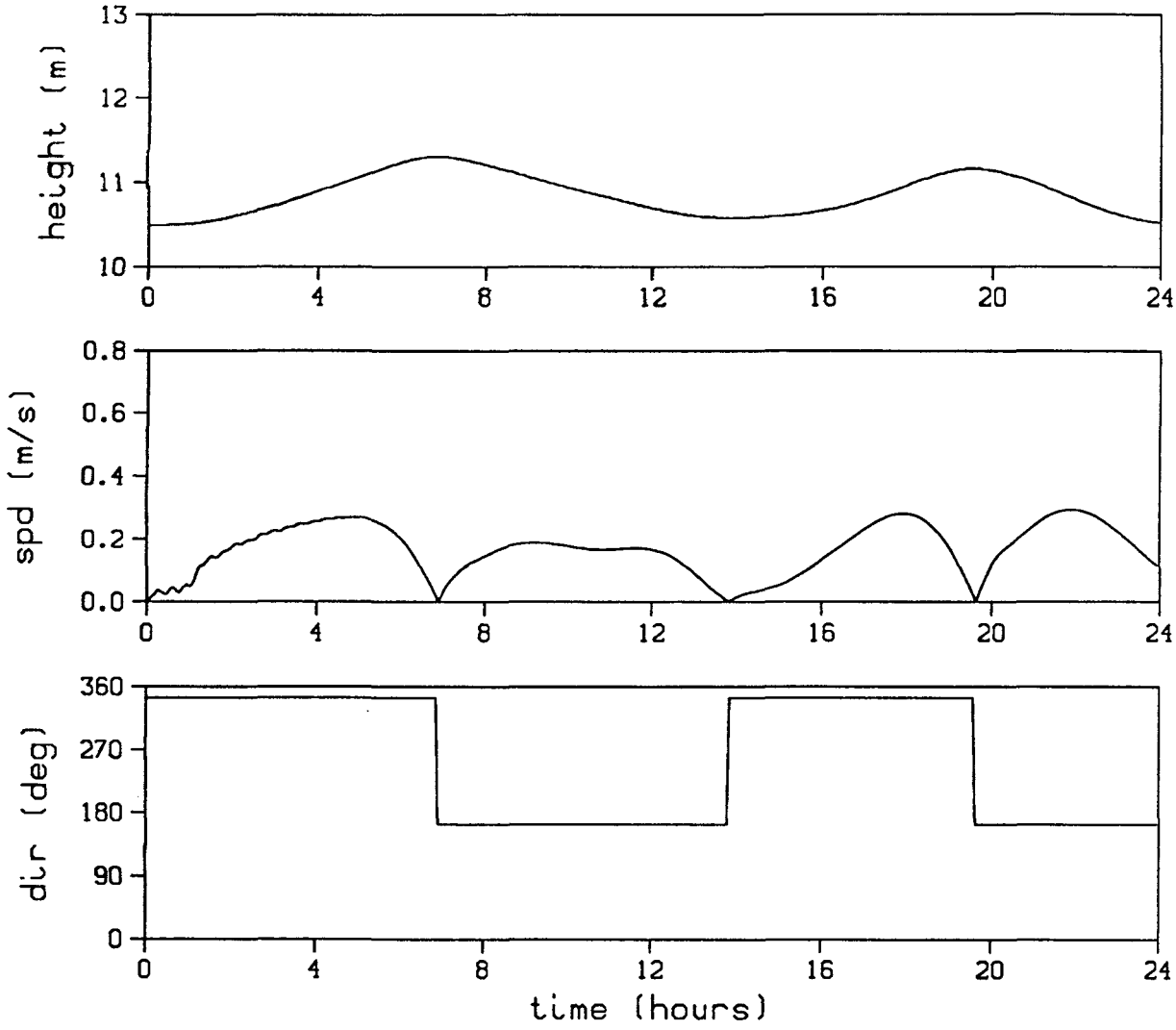

FIGURE E.161. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 15 FOR THE JULY 31, 1986 CALIBRATION CASE

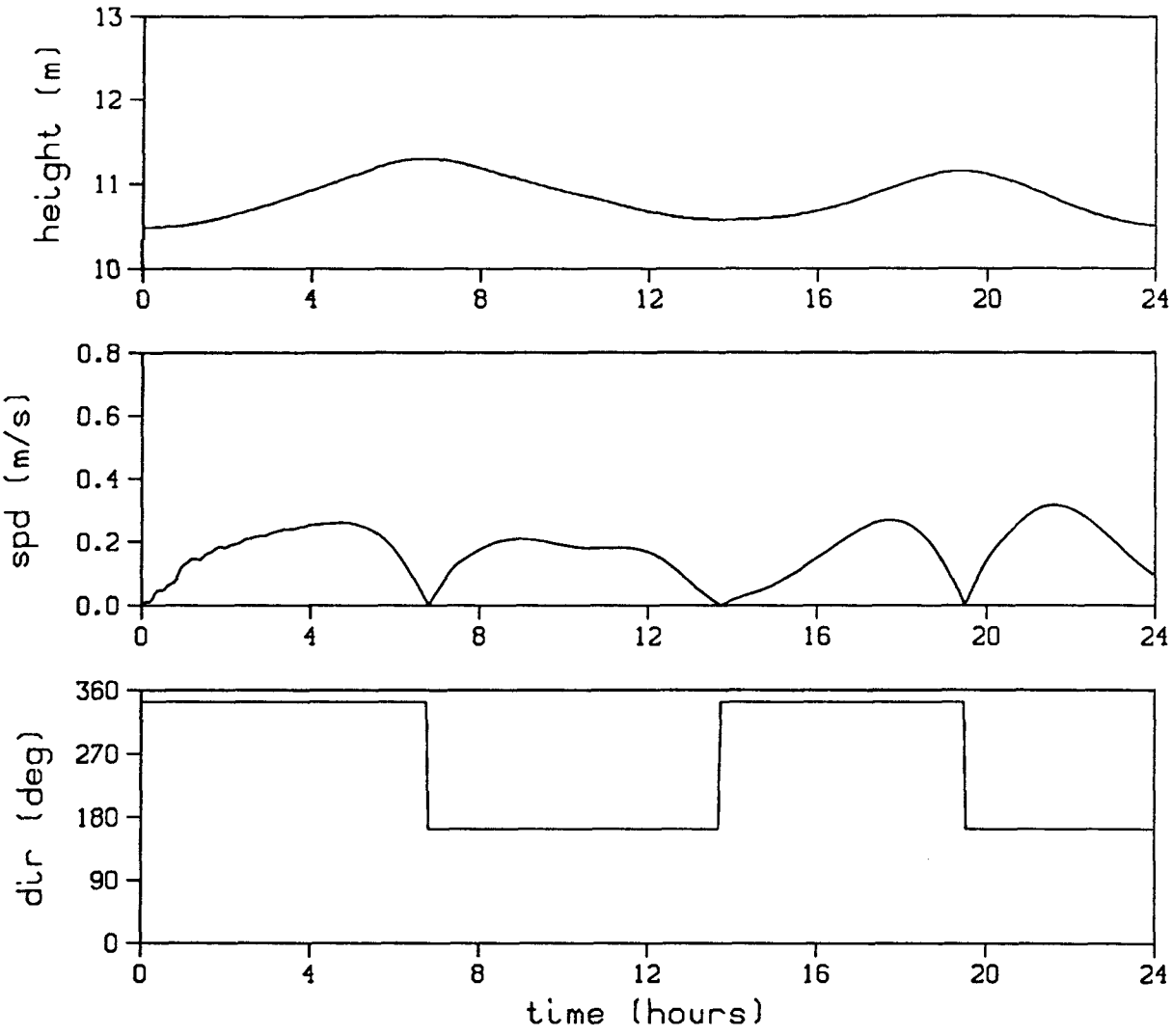

FIGURE E.162. COMPUTED WATER SURFACE HEIGHT, CURRENT SPEED, AND CURRENT DIRECTION AT TIME-SERIES LOCATION 16 FOR THE JULY 31, 1986 CALIBRATION CASE

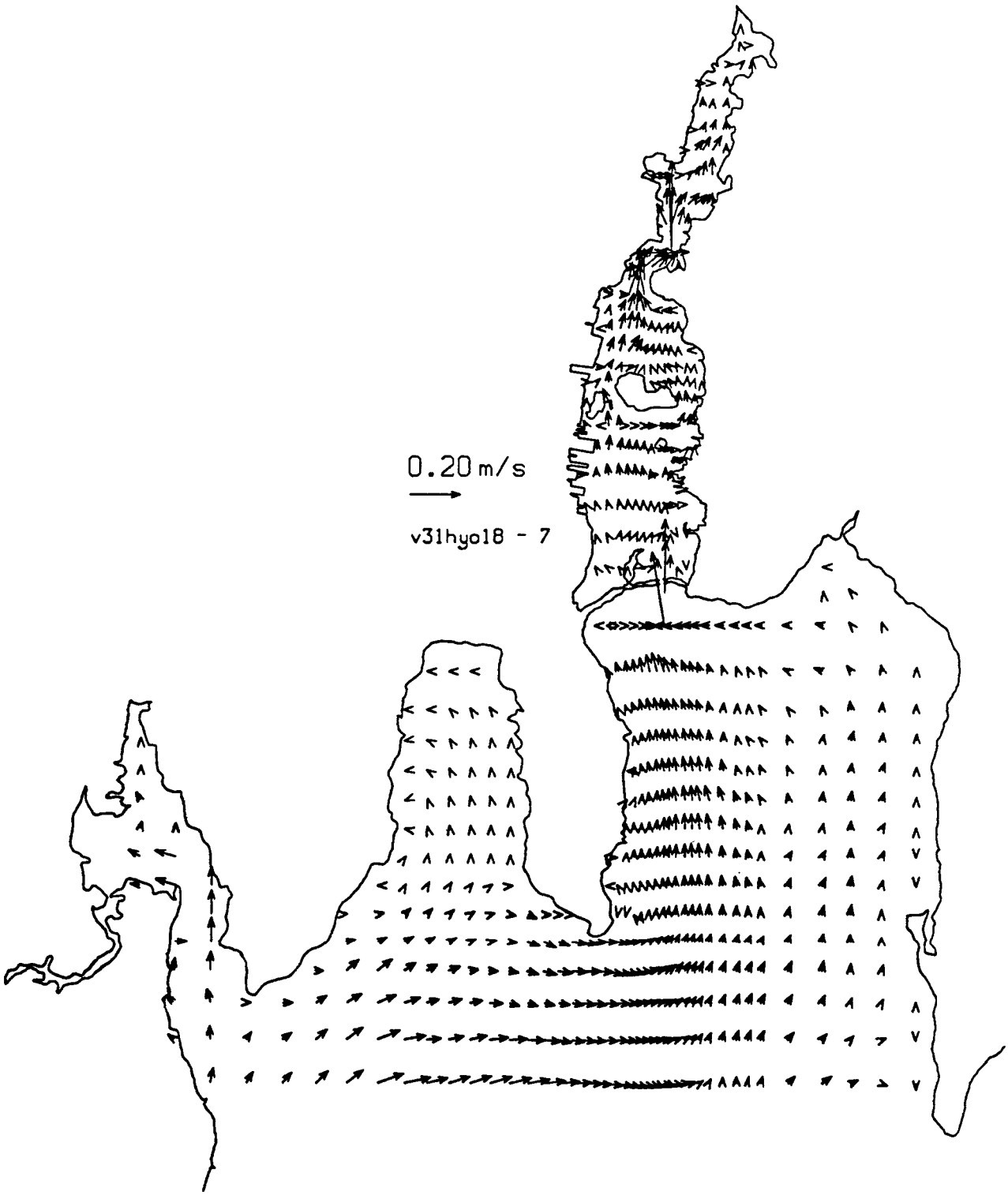

FIGURE E.163. VELOCITY VECTORS COMPUTED FOR THE JULY 31, 1986 CALIBRATION CASE. CONDITIONS 18 HOURS AFTER THE START OF THE SIMULATION IN GRID LAYER 7.

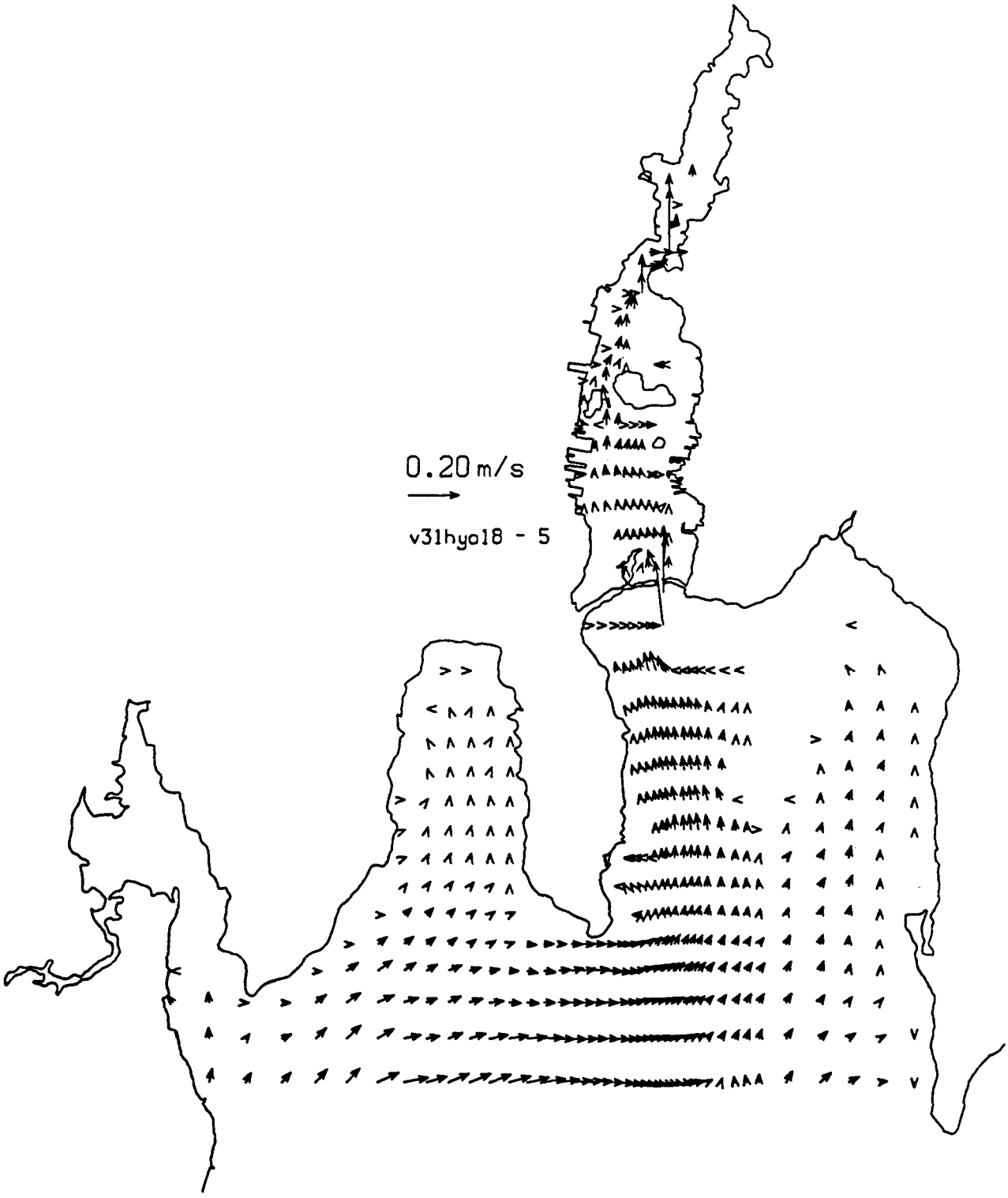

FIGURE E.164. VELOCITY VECTORS COMPUTED FOR THE JULY 31, 1986 CALIBRATION CASE. CONDITIONS 18 HOURS AFTER THE START OF THE SIMULATION IN GRID LAYER 5.

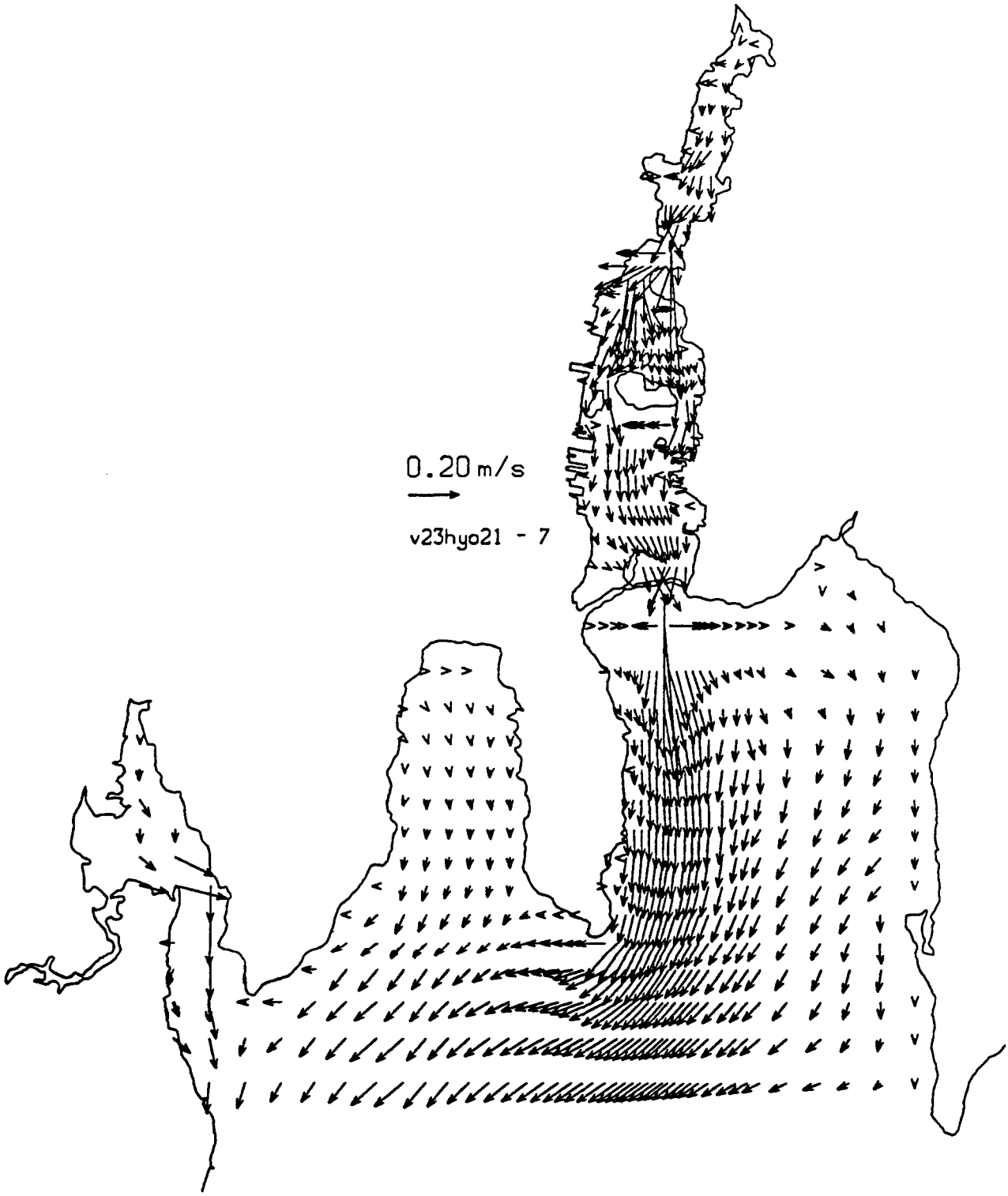

FIGURE E.165. VELOCITY VECTORS COMPUTED FOR THE JULY 23, 1986 CALIBRATION CASE. CONDITIONS 21 HOURS AFTER THE START OF THE SIMULATION IN GRID LAYER 7.

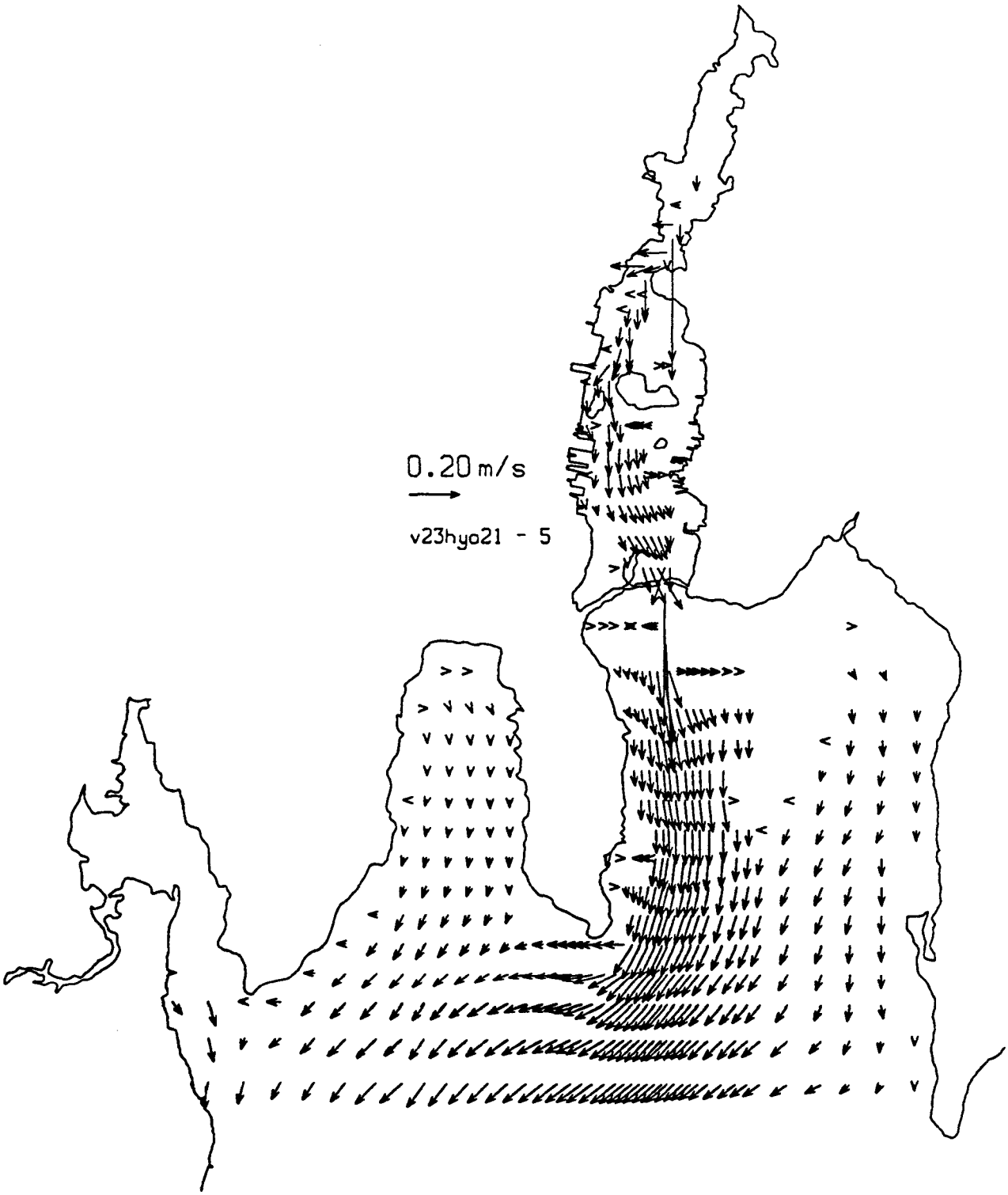

FIGURE E.166. VELOCITY VECTORS COMPUTED FOR THE JULY 23, 1986 CALIBRATION CASE. CONDITIONS 21 HOURS AFTER THE START OF THE SIMULATION IN GRID LAYER 5.

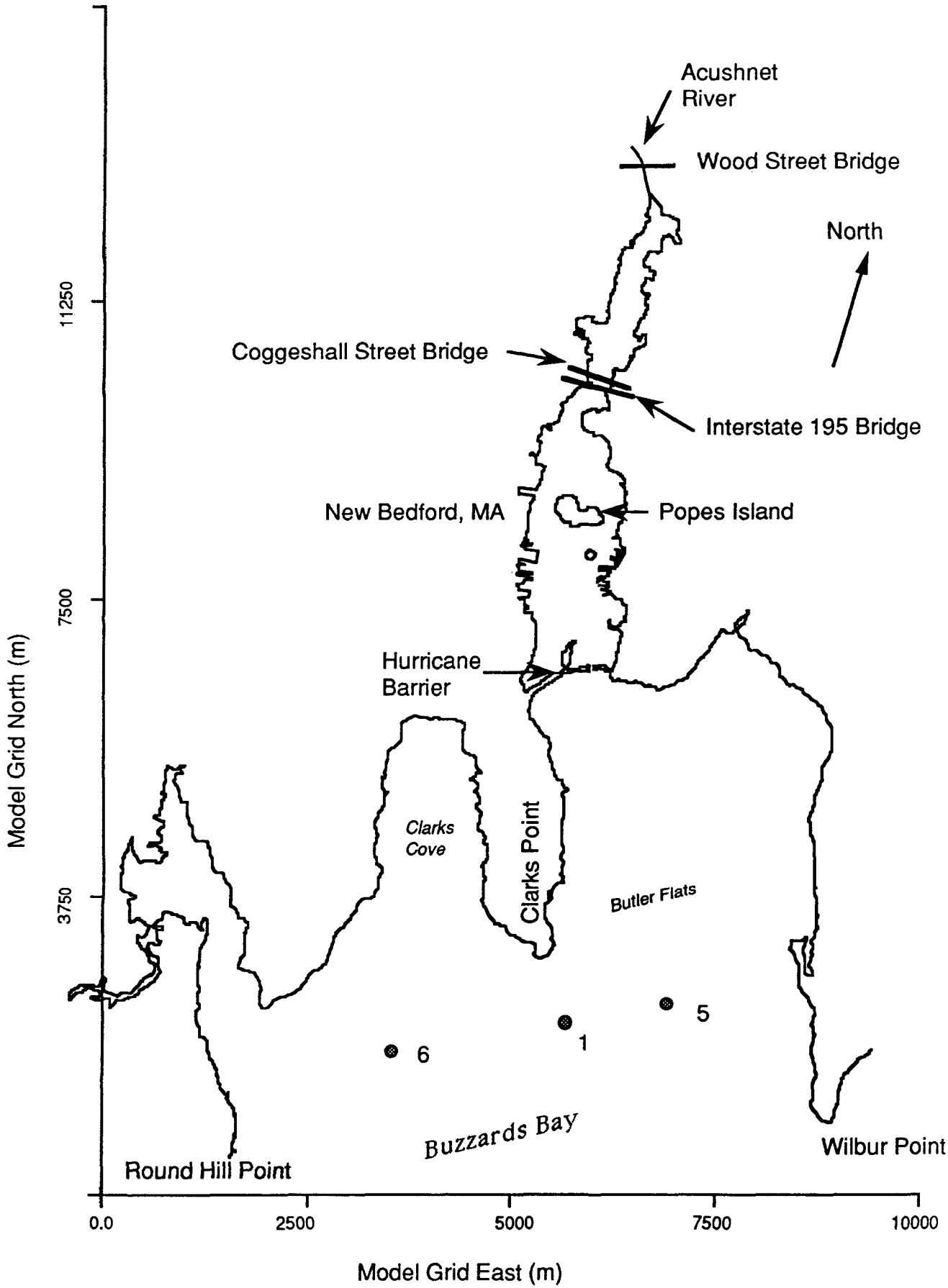

FIGURE E.167. APPROXIMATE LOCATION OF THE MEASUREMENT STATIONS OF CAMP, DRESSER, AND MCKEE (1983).

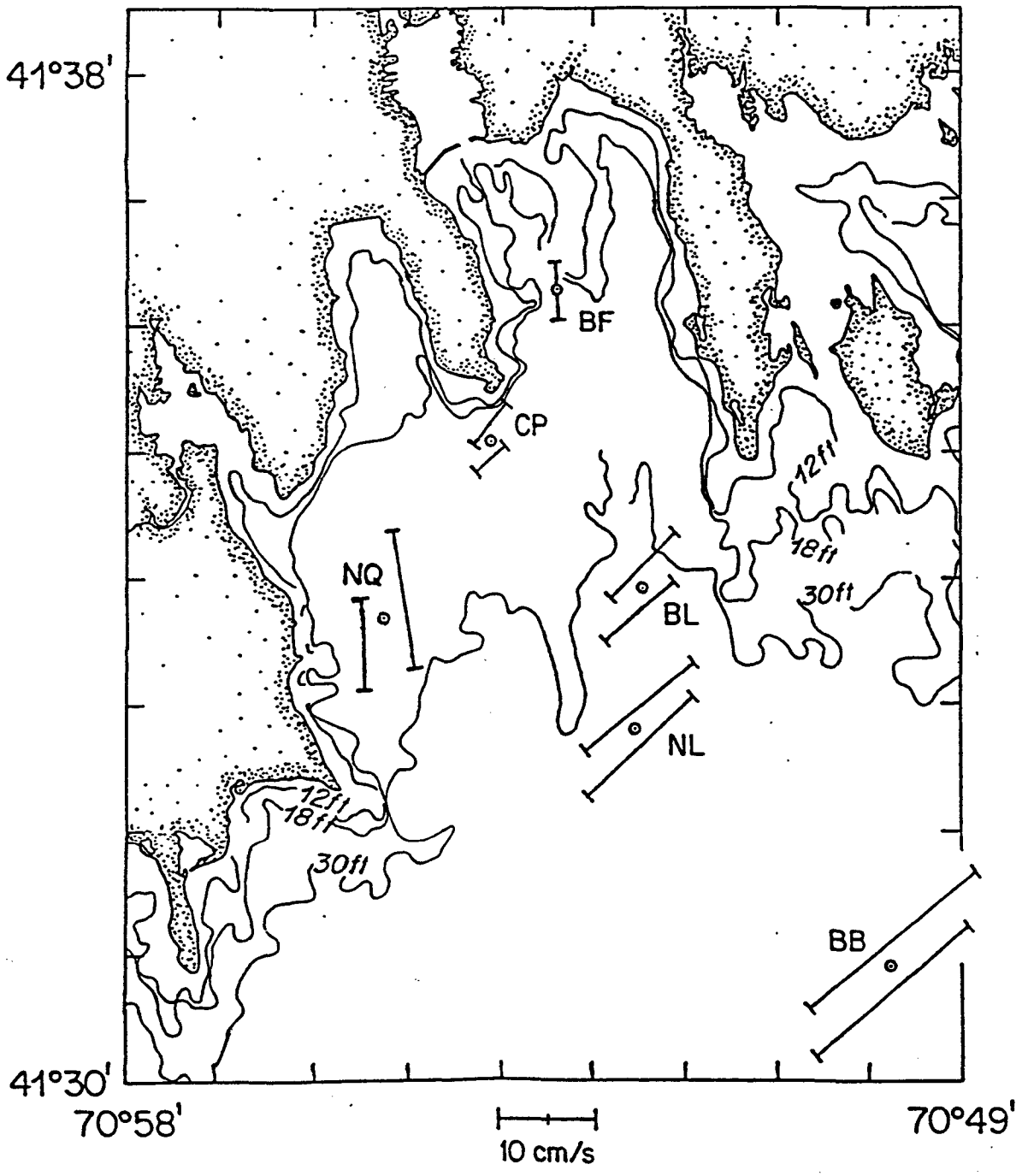

FIGURE E.168. M_2 MAJOR AXES BASED ON HARMONIC ANALYSES (AFTER GEYER AND DRAGOS, 1988)

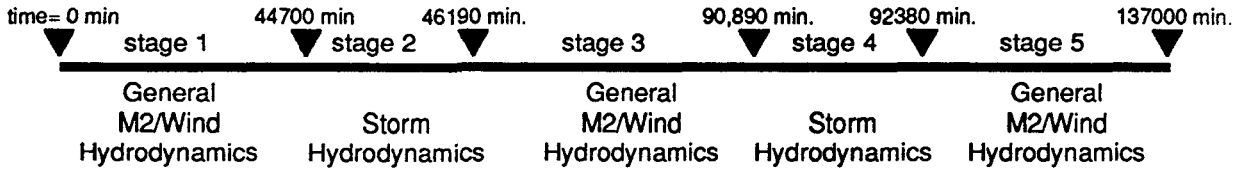

FIGURE E.169. SEQUENCE OF HYDRODYNAMIC SCENARIOS USED IN DECOUPLED TRANSPORT SIMULATIONS

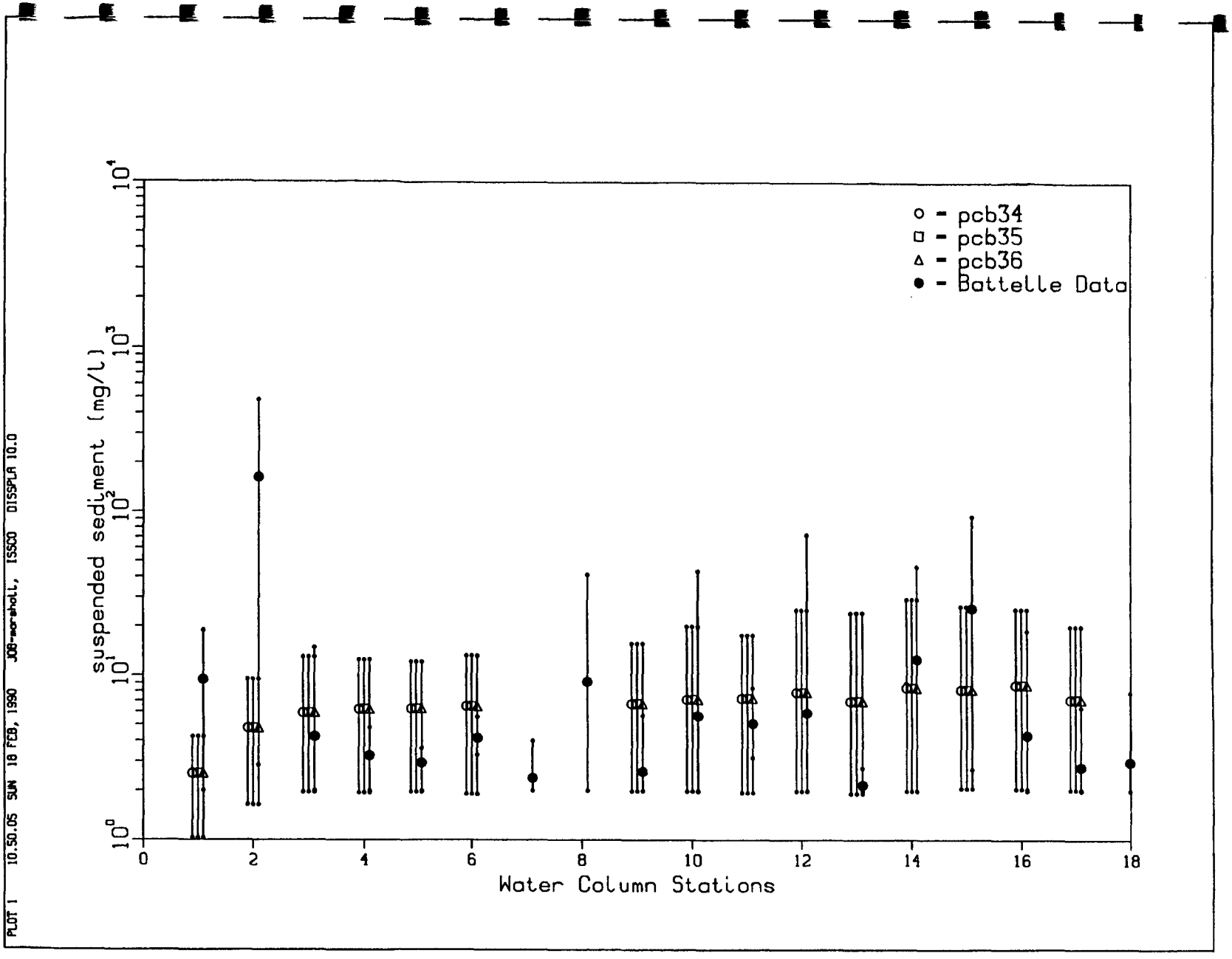

FIGURE E.170. COMPARISON OF COMPUTED AND MEASURED TOTAL SUSPENDED SEDIMENT CONCENTRATION. THE SYMBOLS CORRESPOND TO MEAN VALUES AND THE BAR ENDPOINTS TO HIGH AND LOW VALUES. STATION LOCATIONS ARE GIVEN IN FIGURE E.117 OF APPENDIX E.

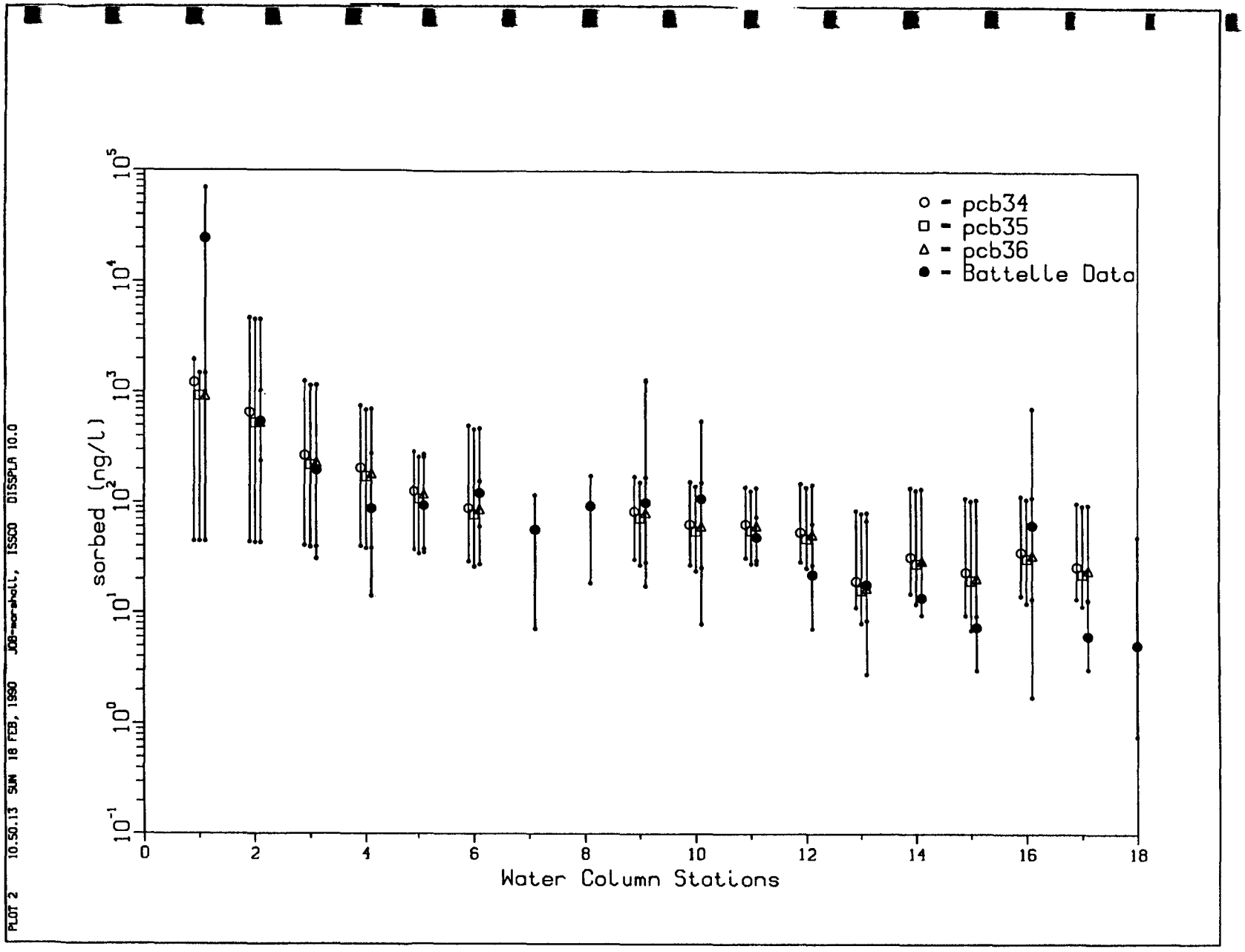

FIGURE E.171. COMPARISON OF COMPUTED AND MEASURED SEDIMENT-SORBED PCB CONCENTRATION. THE SYMBOLS CORRESPOND TO MEAN VALUES AND THE BAR ENDPOINTS TO HIGH AND LOW VALUES. STATION LOCATIONS ARE GIVEN IN FIGURE E.117 OF APPENDIX E.

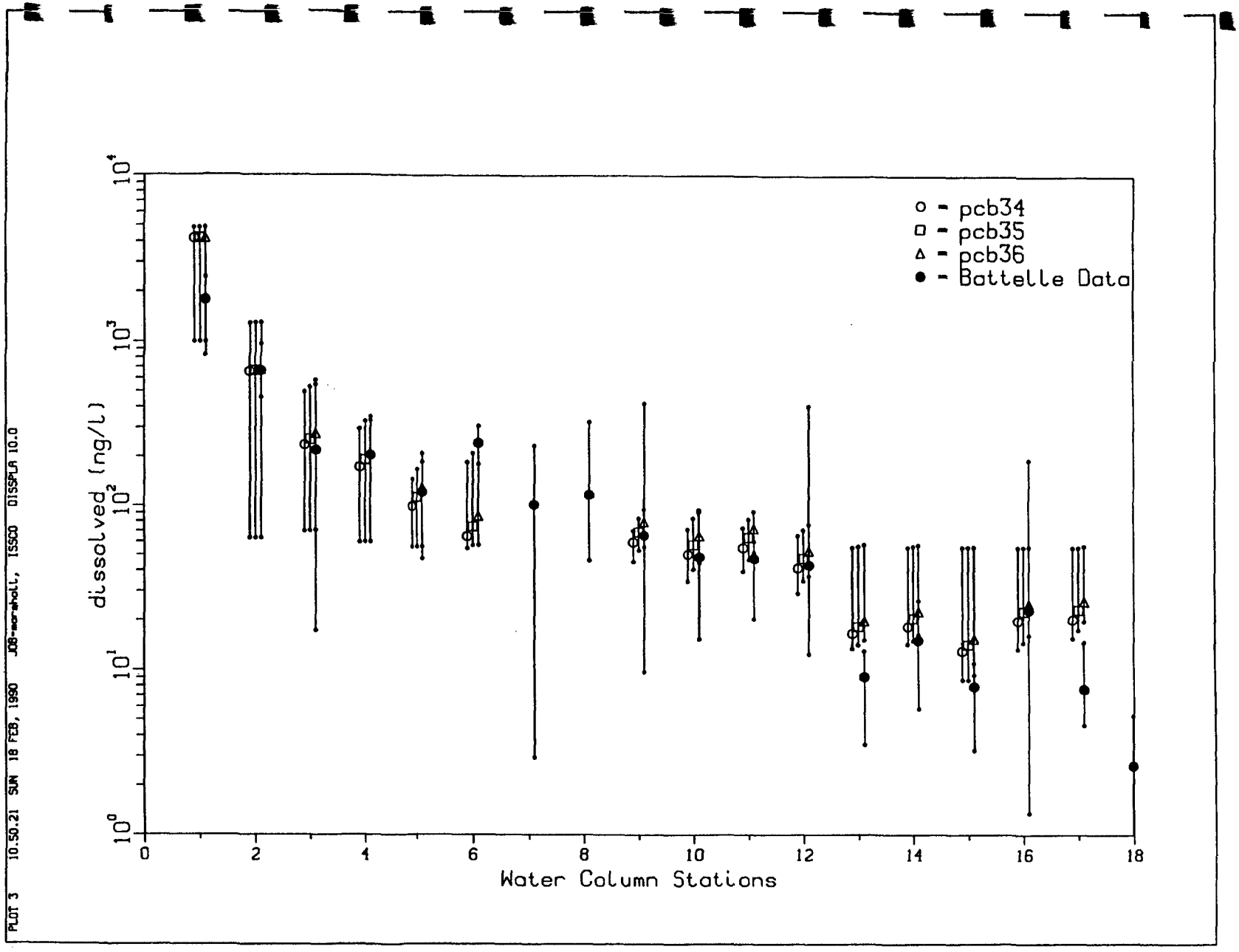

FIGURE E.172. COMPARISON OF COMPUTED AND MEASURED TOTAL DISSOLVED PCB CONCENTRATION. THE SYMBOLS CORRESPOND TO MEAN VALUES AND THE BAR ENDPOINTS TO HIGH AND LOW VALUES. STATION LOCATIONS ARE GIVEN IN FIGURE E.117 OF APPENDIX E.

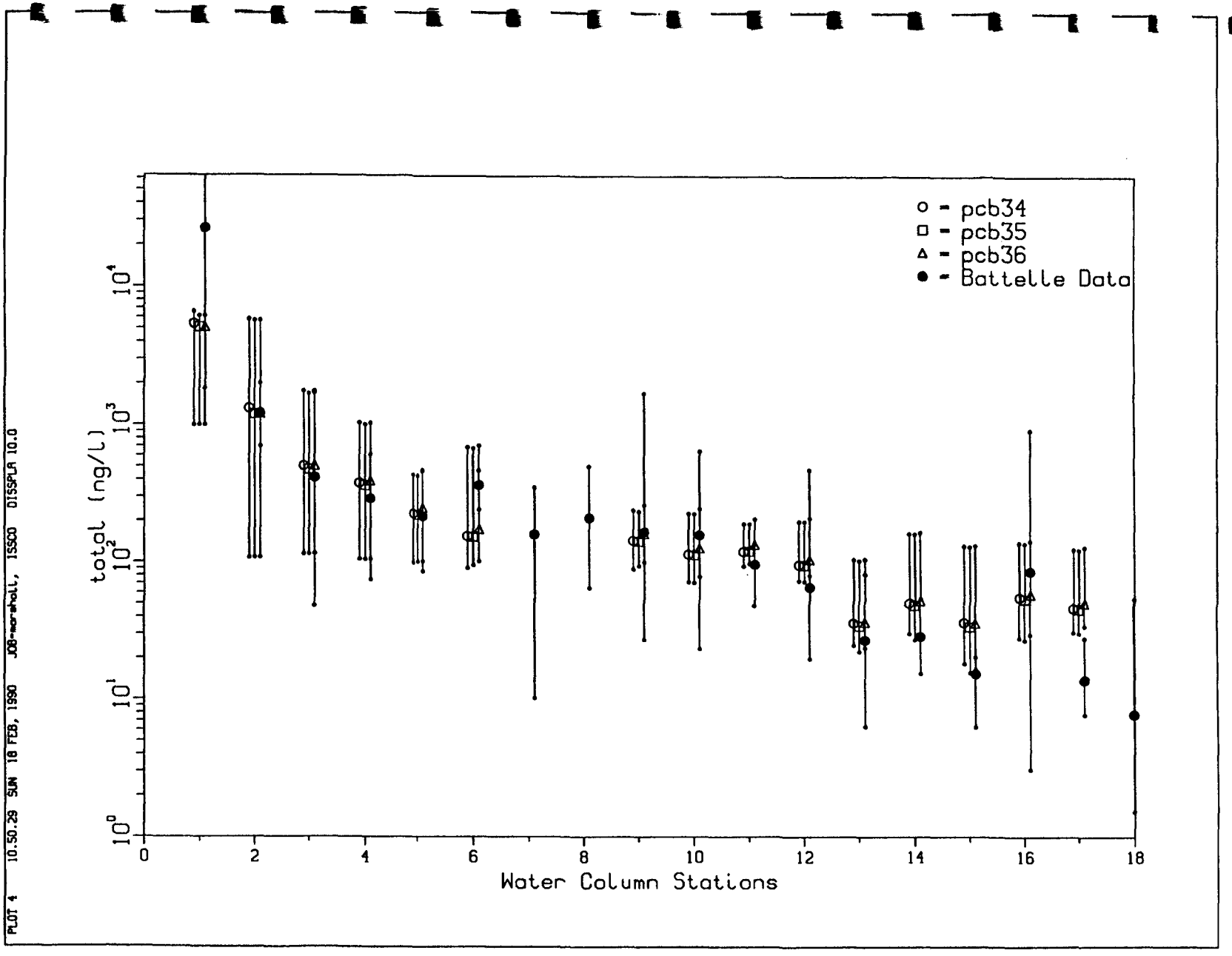

FIGURE E.173. COMPARISON OF COMPUTED AND MEASURED TOTAL PCB (DISSOLVED + SEDIMENT-SORBED CONCENTRATION. THE SYMBOLS CORRESPOND TO MEAN VALUES AND THE BAR ENDPOINTS TO HIGH AND LOW VALUES. STATION LOCATIONS ARE GIVEN IN FIGURE E.117 OF APPENDIX E.

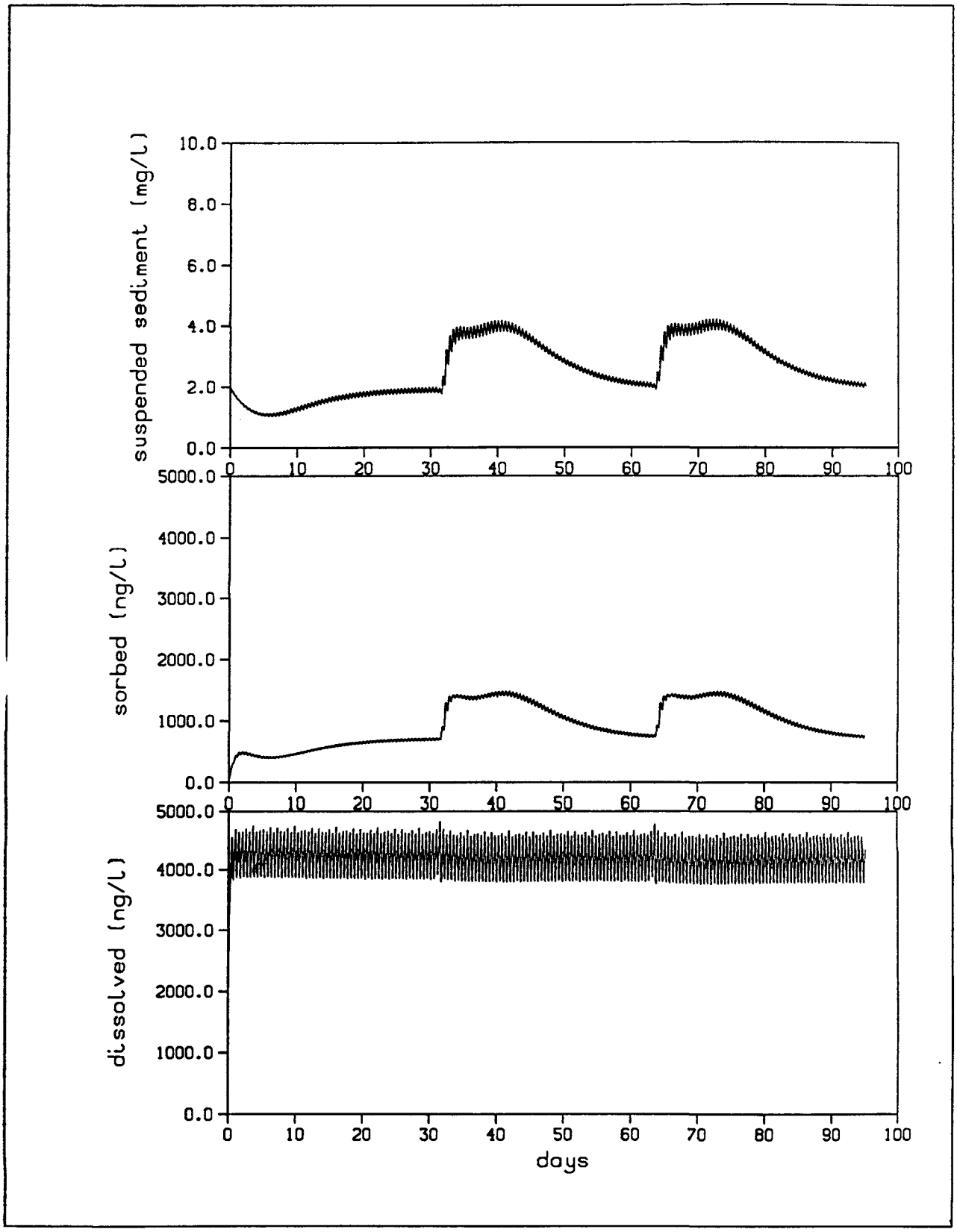

FIGURE E.174. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 1.

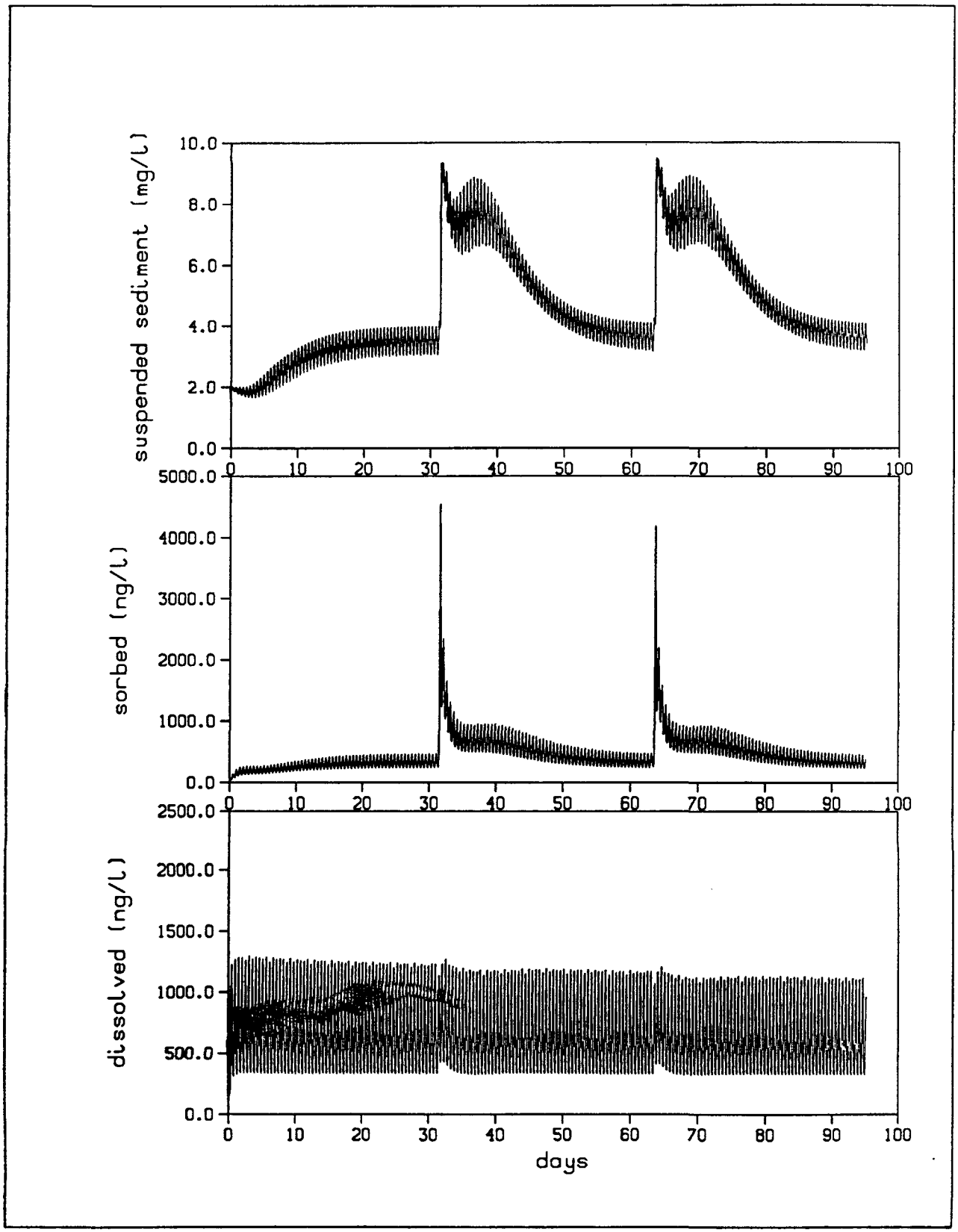

FIGURE E.175. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 2.

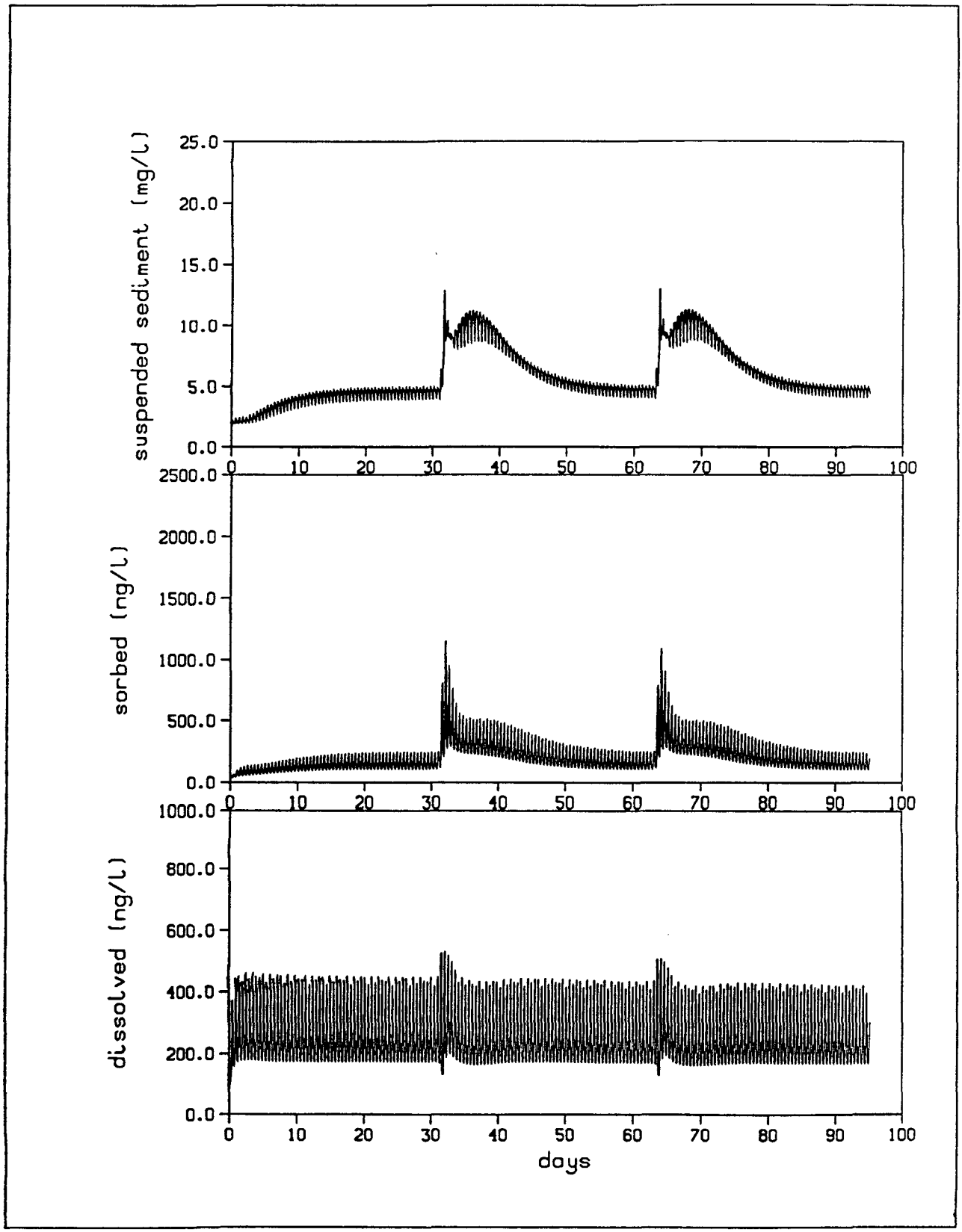

FIGURE E.176. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 3.

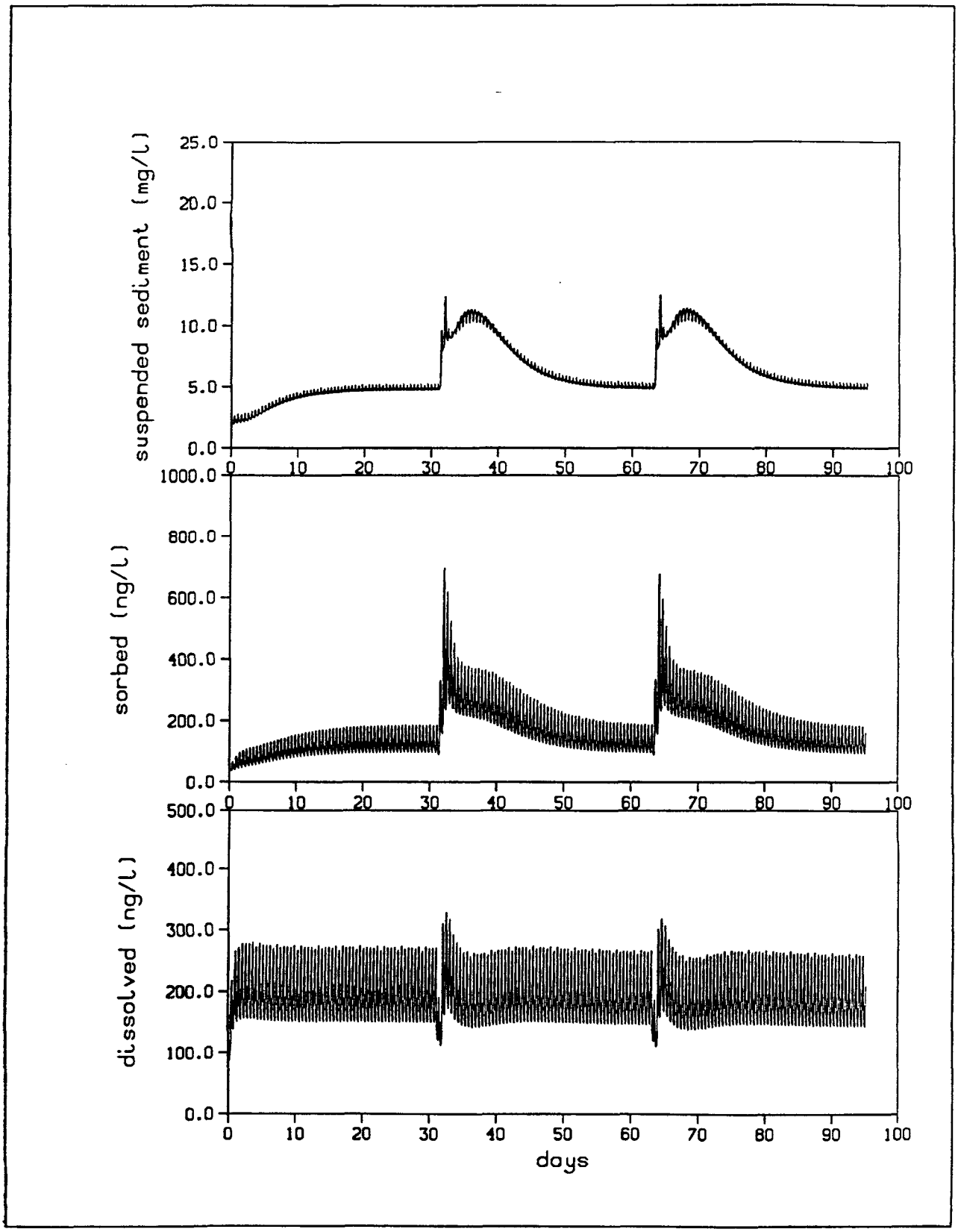

FIGURE E.177. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 4.

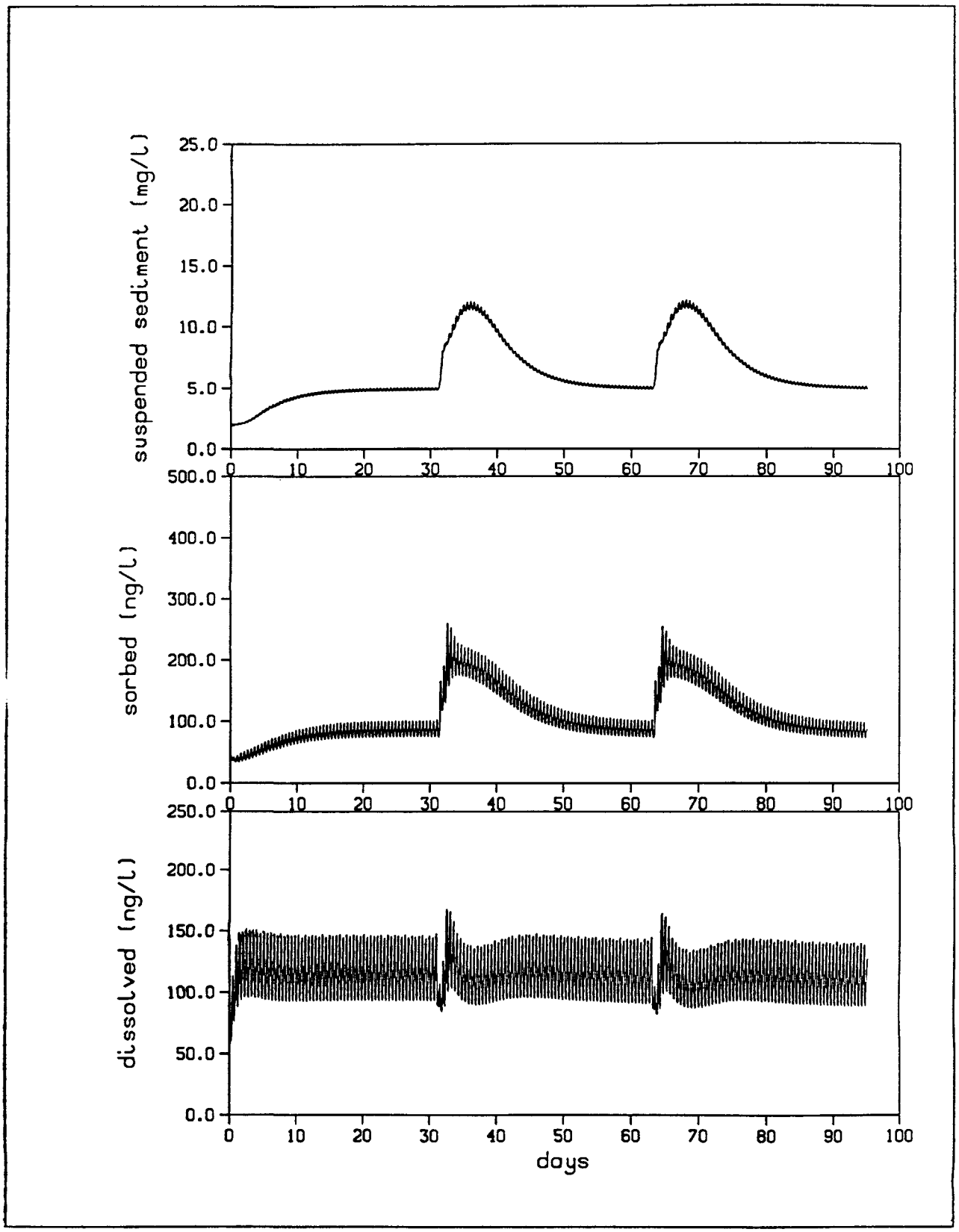

FIGURE E.178. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 5.

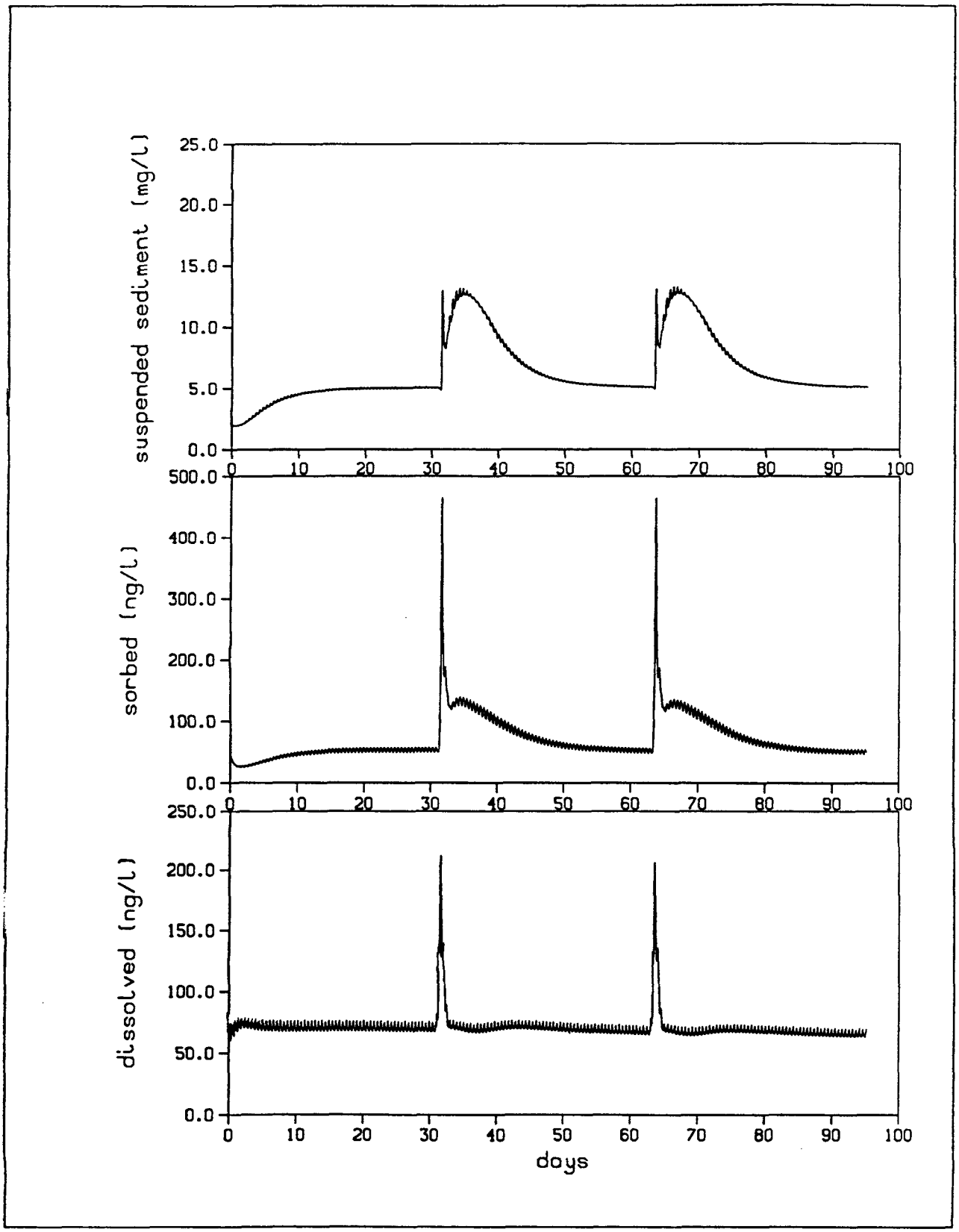

FIGURE E.179. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 6.

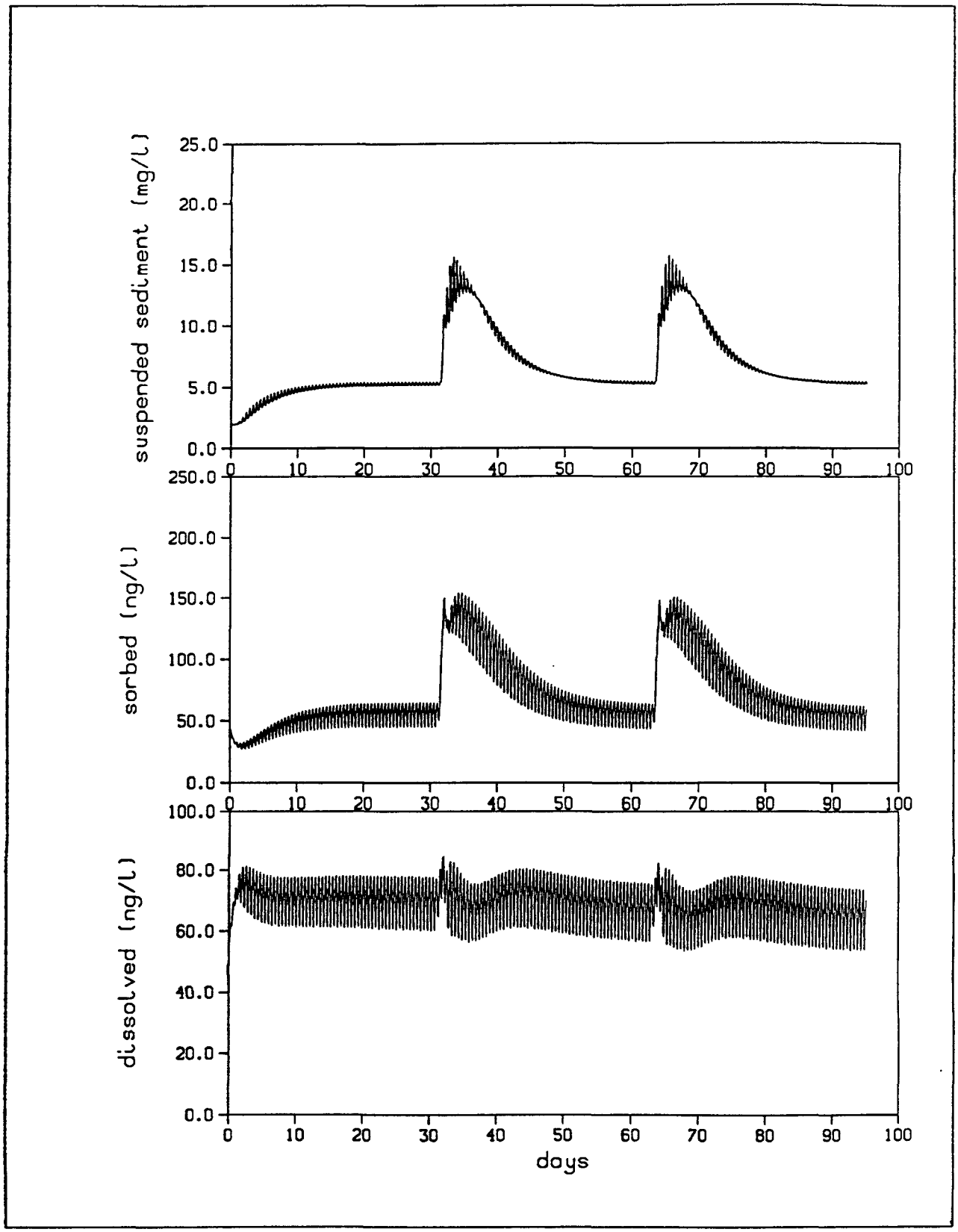

FIGURE E.180. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 9.

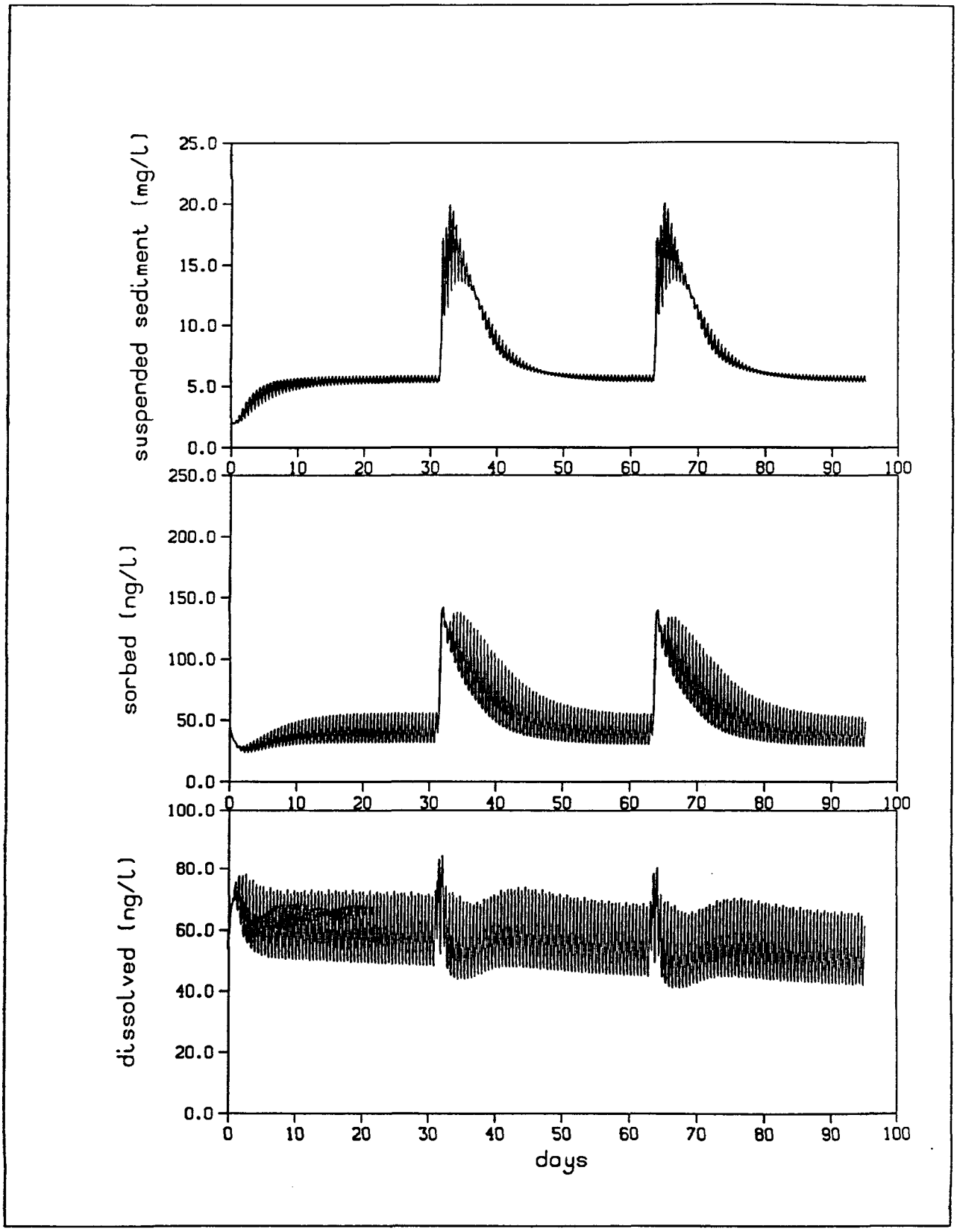

FIGURE E.181. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 10.

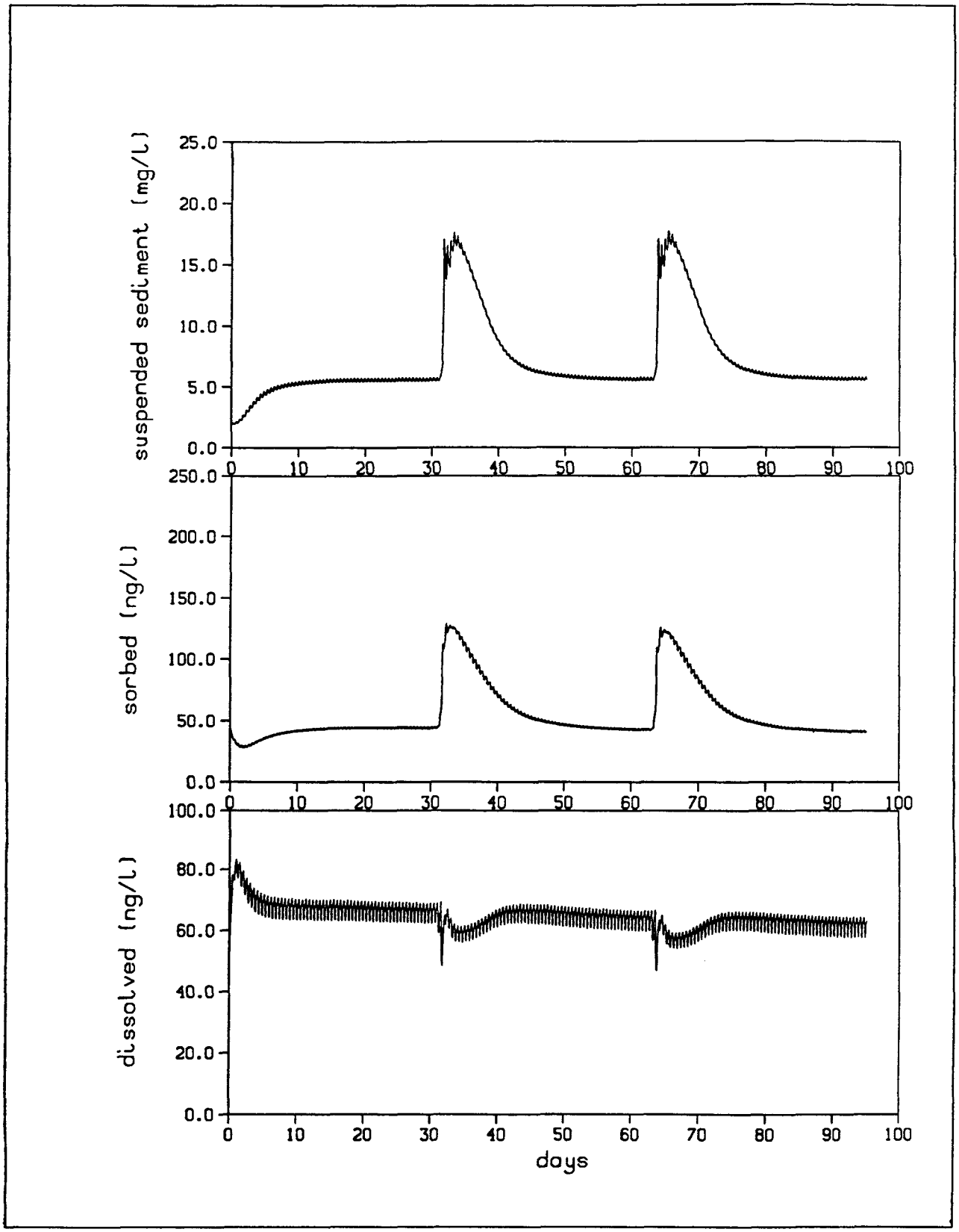

FIGURE E.182. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 11.

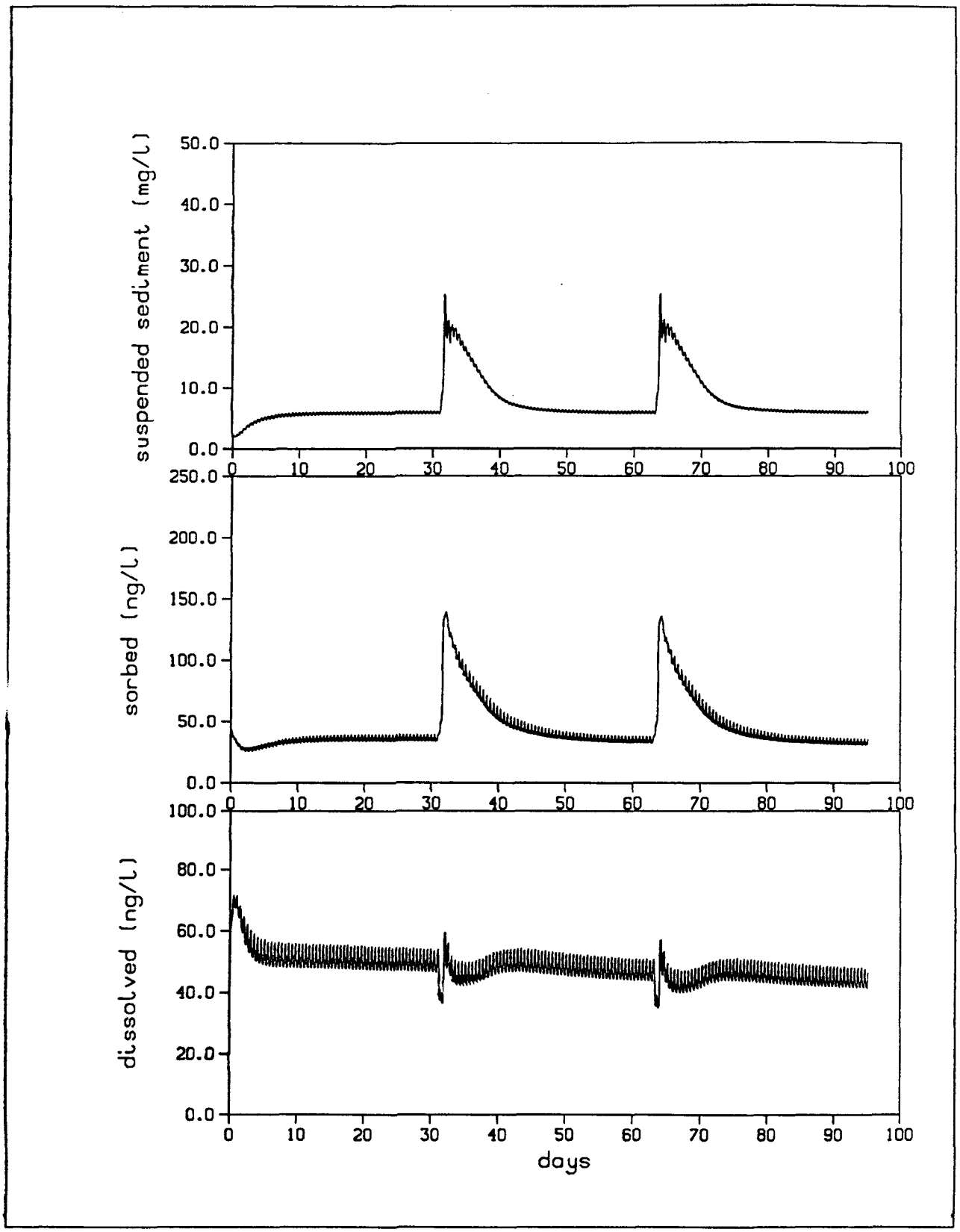

FIGURE E.183. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 12.

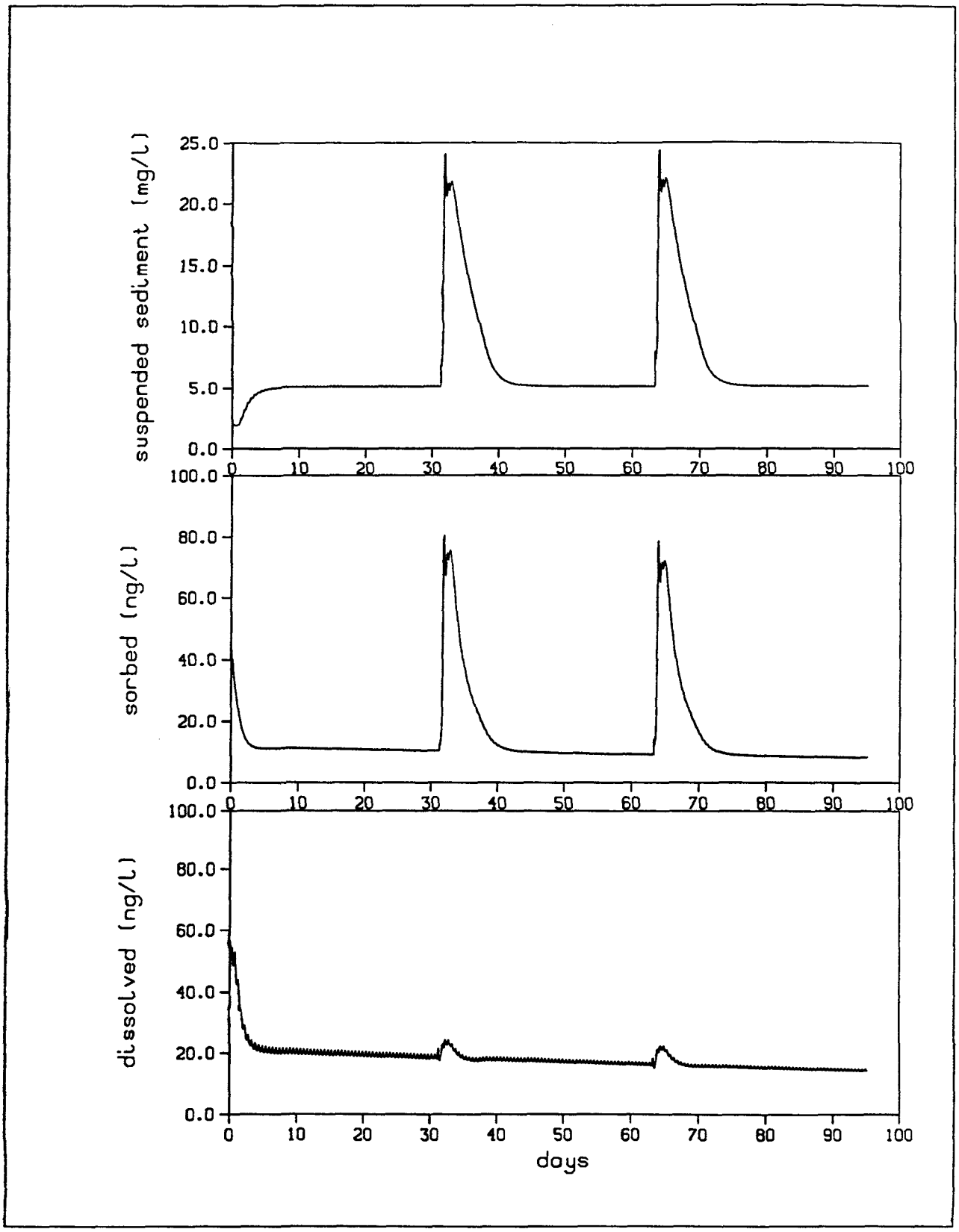

FIGURE E.184. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 13.

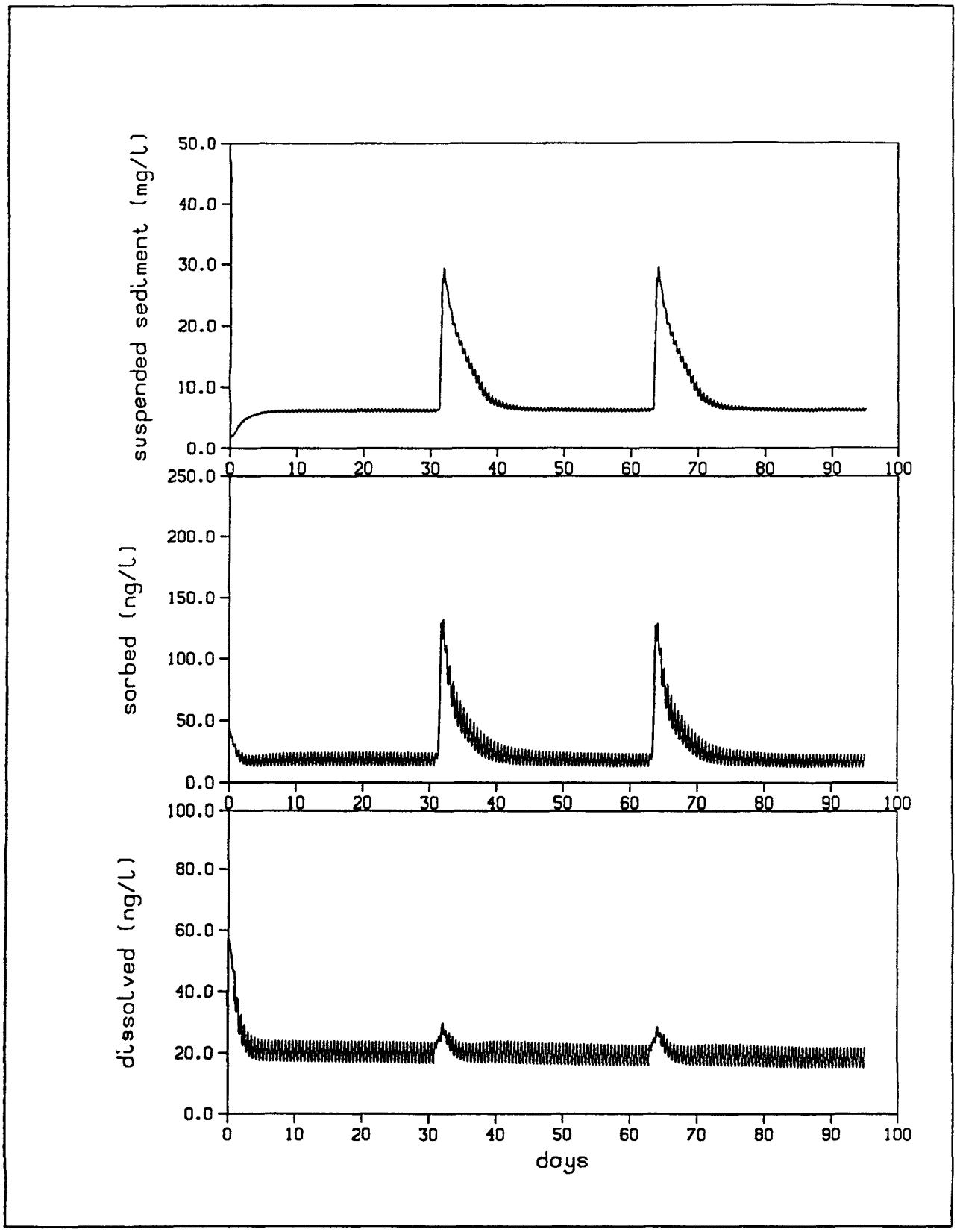

FIGURE E.185. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 14.

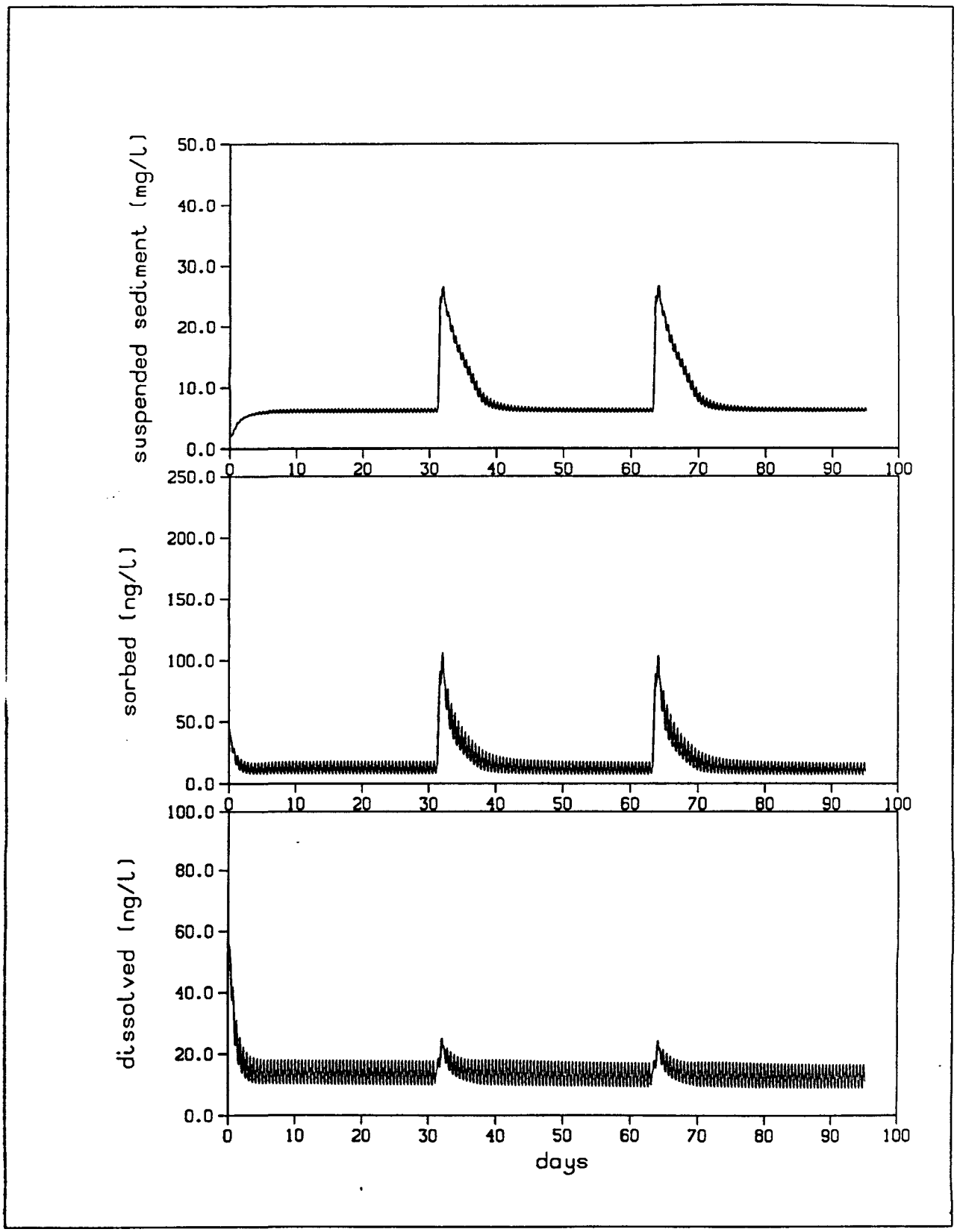

FIGURE E.186. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 15.

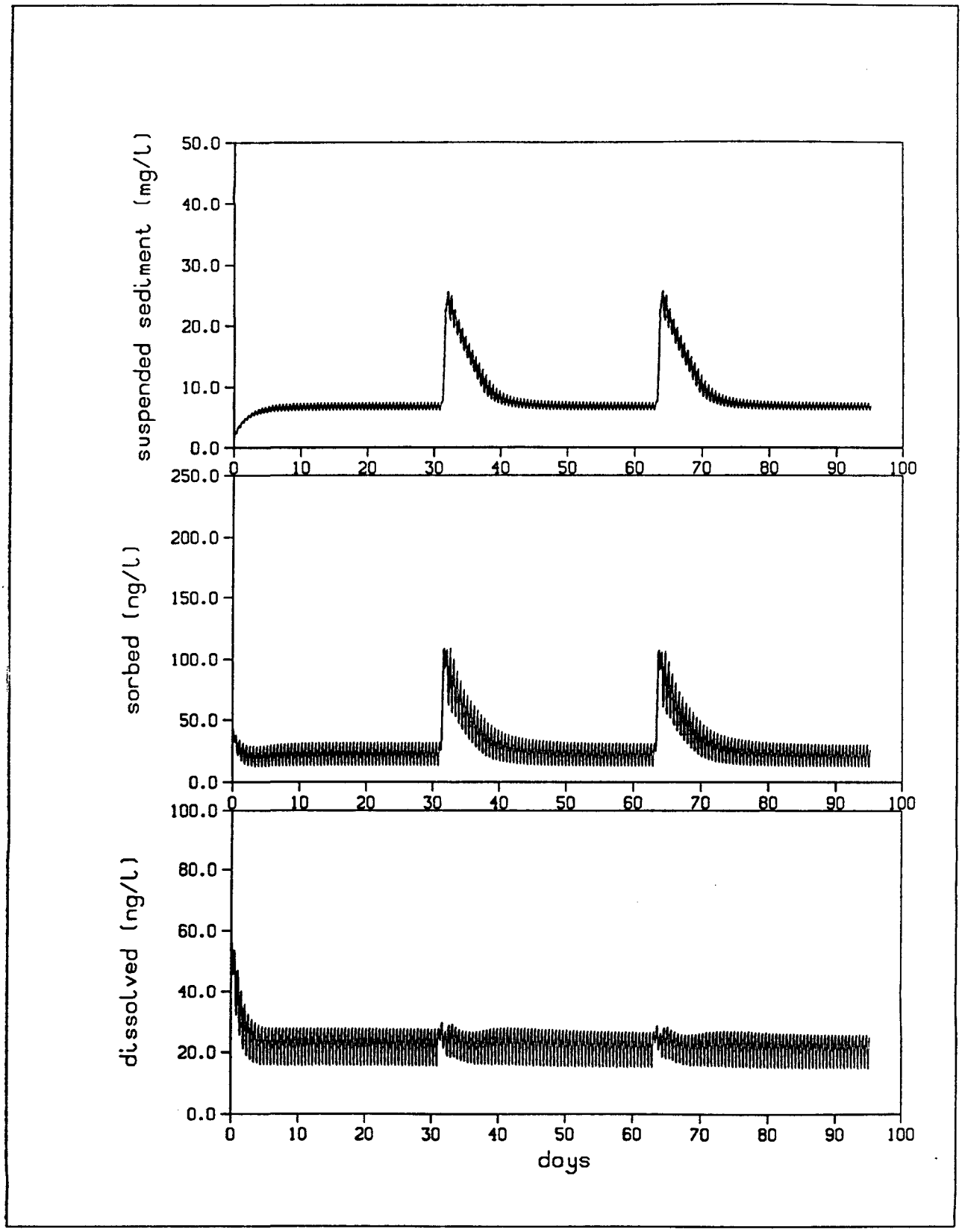

FIGURE E.187. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 16.

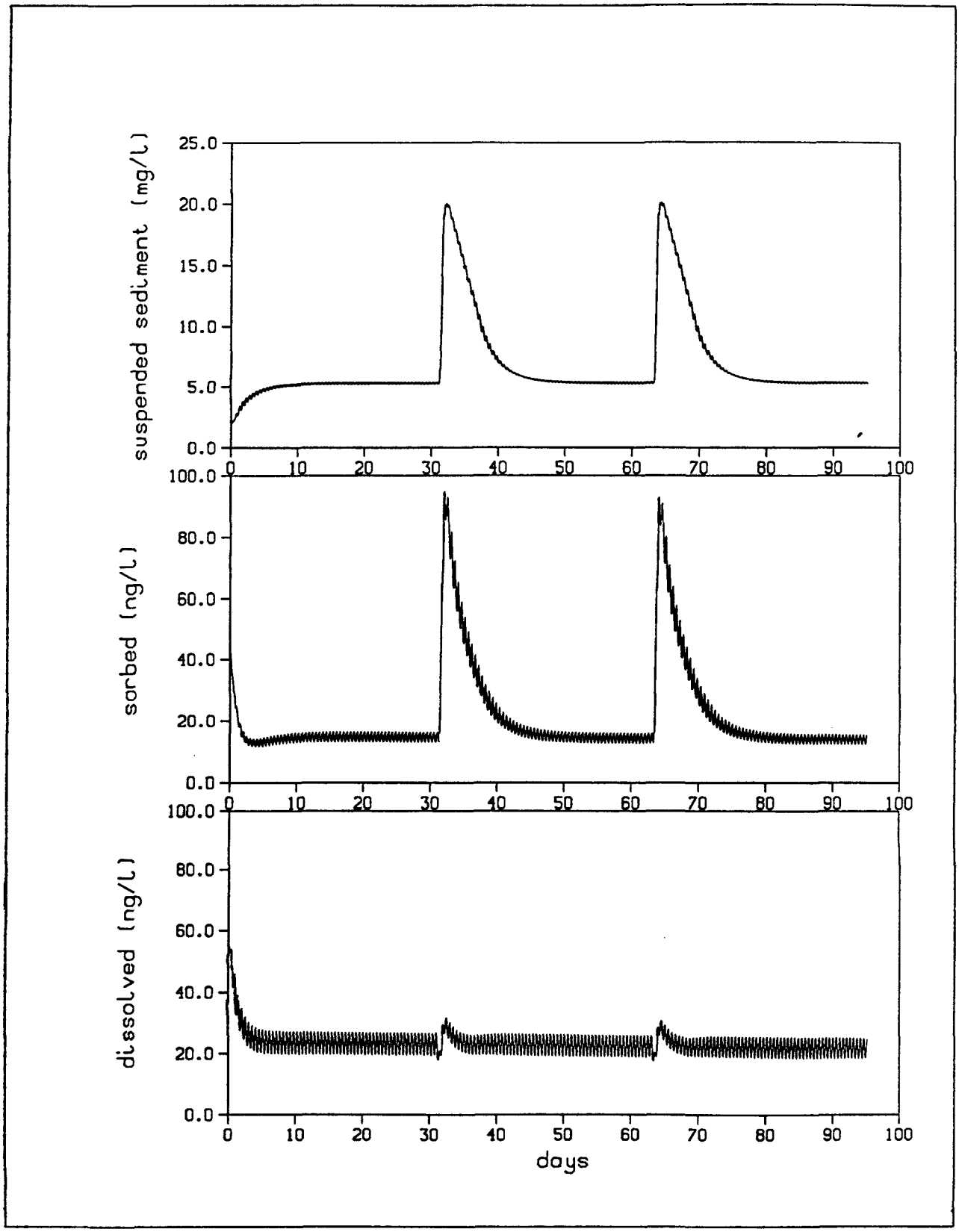

FIGURE E.188. SEDIMENT AND PCB CONCENTRATION TIME-SERIES COMPUTED USING THE CALIBRATED MODEL. BATTELLE OCEAN SCIENCES STATION 17.

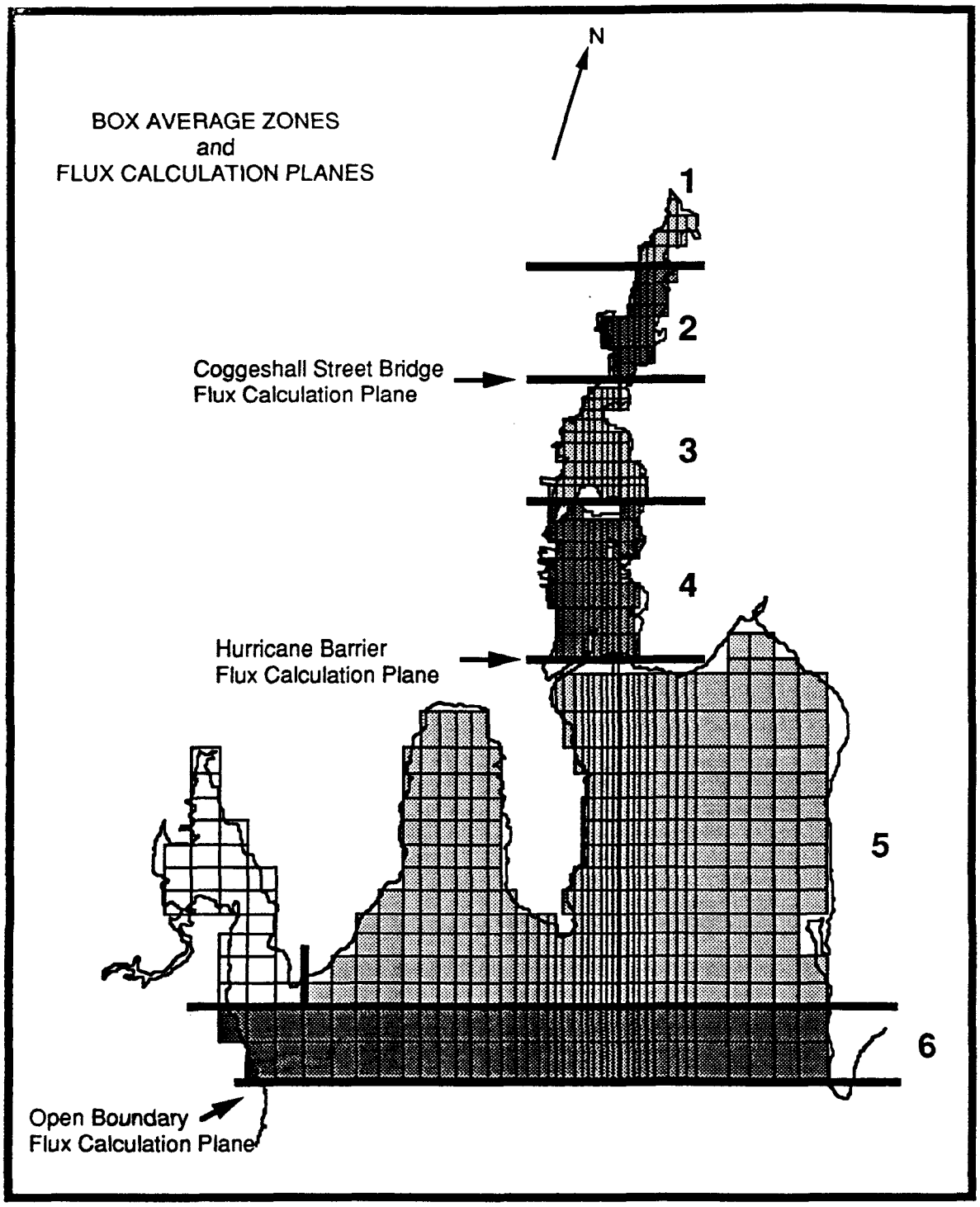

FIGURE E.189. BOX-AVERAGING ZONES AND FLUX CALCULATION PLANES

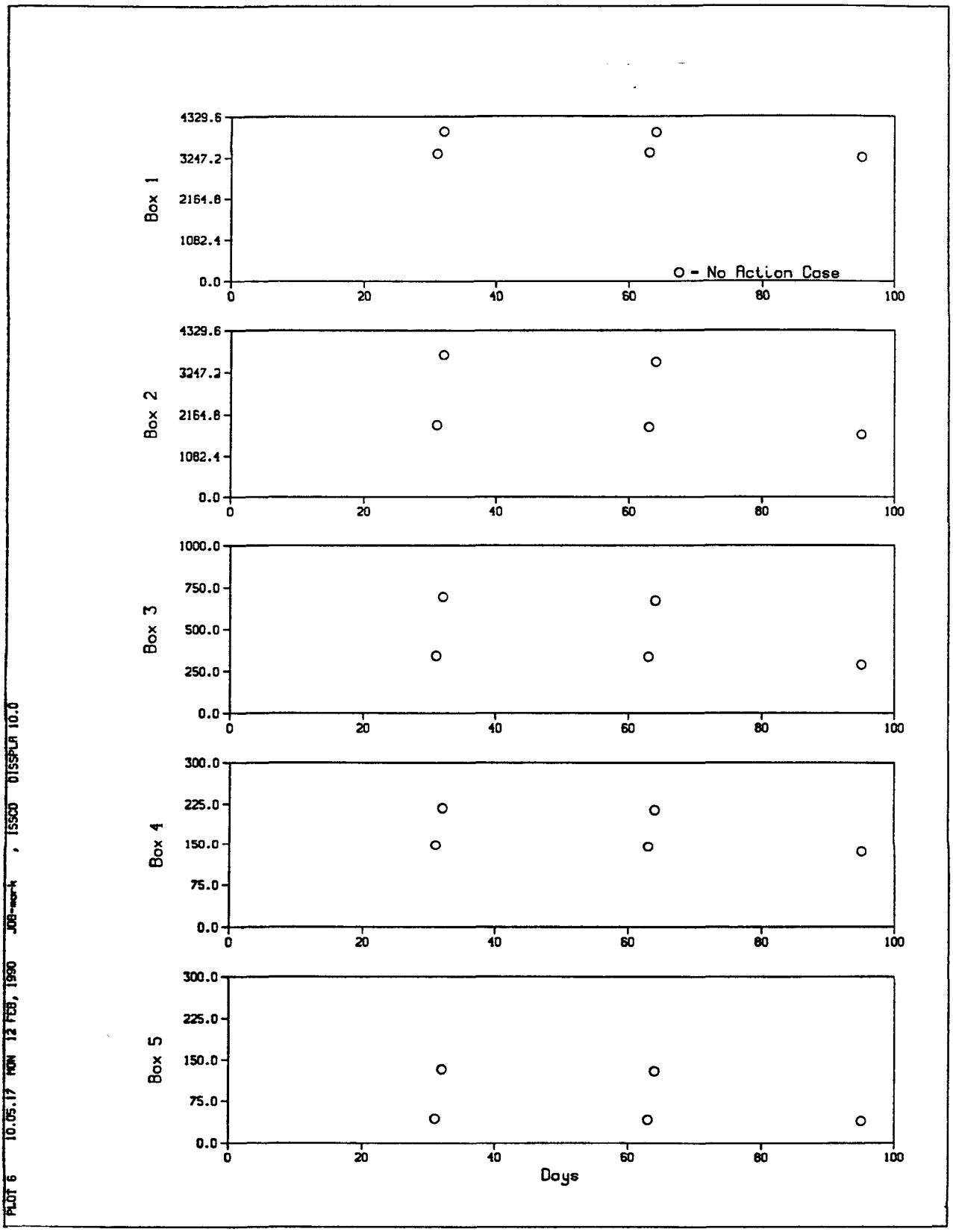

FIGURE E.190. BOX-AVERAGED MODEL RESULTS FOR THE CALIBRATED MODEL (NO ACTION CASE). TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN.

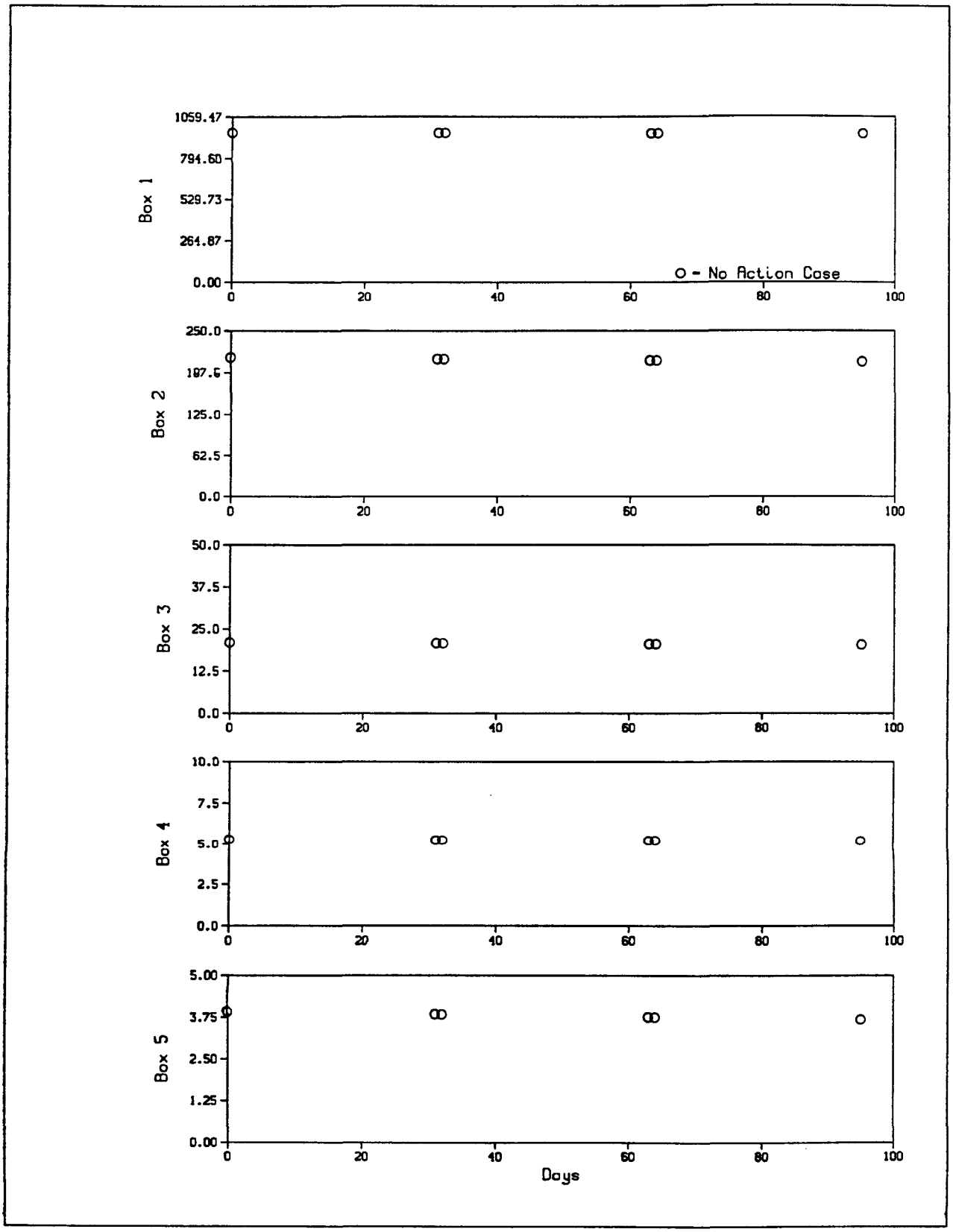

FIGURE E.191. BOX-AVERAGED MODEL RESULTS FOR THE CALIBRATED MODEL (NO ACTION CASE). TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER.

APPENDIX F

SEDIMENT/CONTAMINANT TRANSPORT MODEL
REMEDIAL ACTION SCENARIO RESULTS

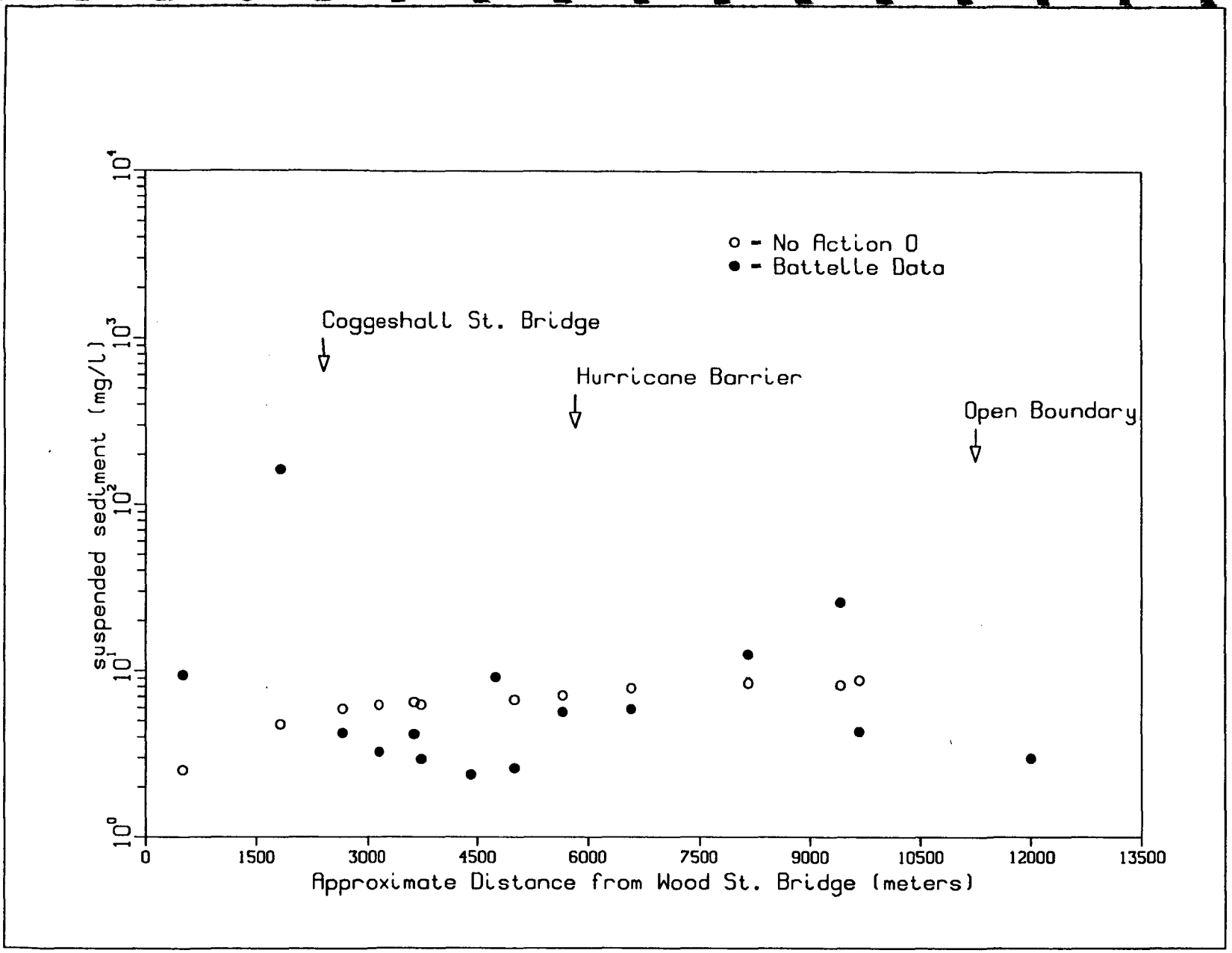

FIGURE F.1. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENTS FOR YEAR 0 OF THE NO-ACTION SCENARIO

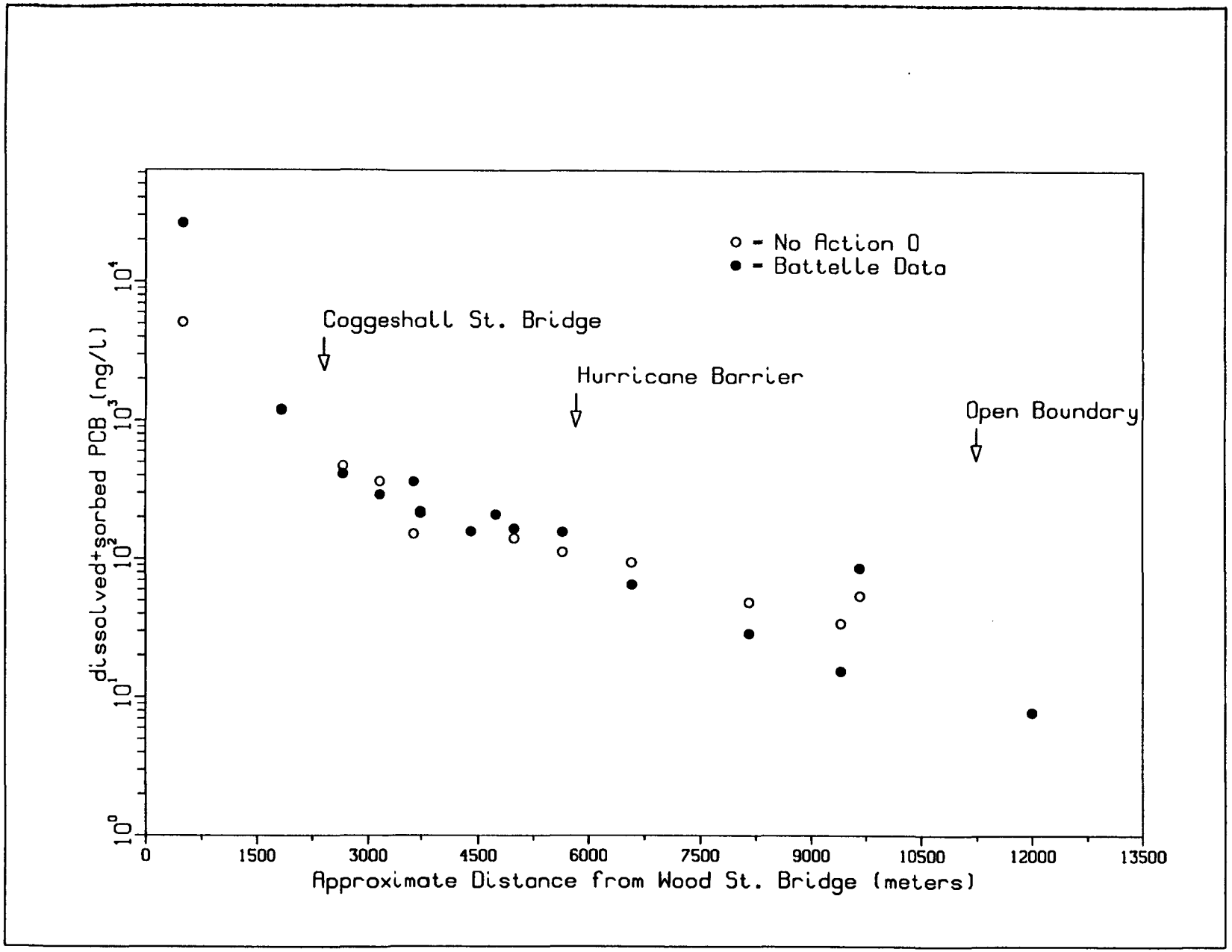

FIGURE F.2. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 0 OF THE NO-ACTION SCENARIO

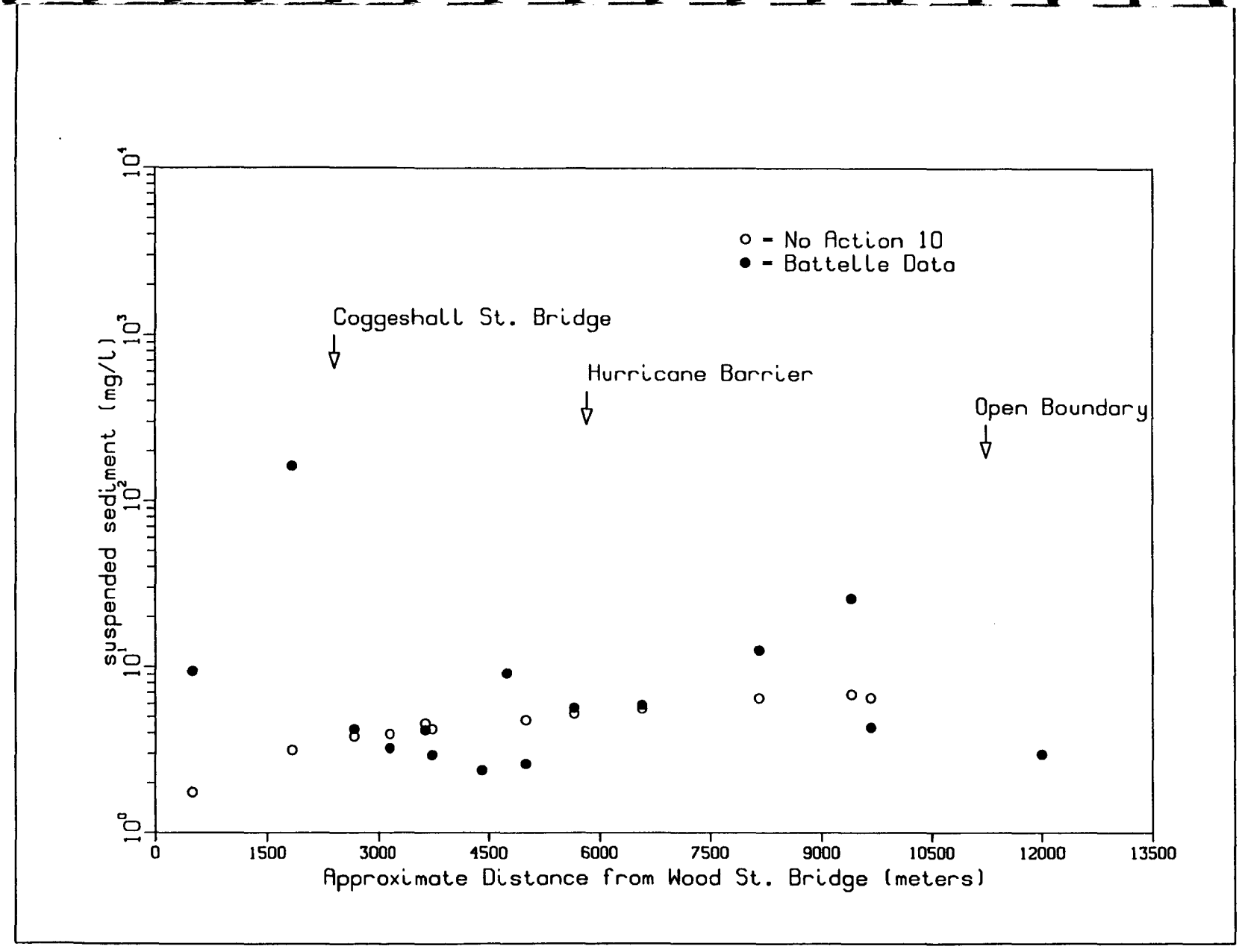

FIGURE F.3. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENTS FOR YEAR 10 OF THE NO-ACTION SCENARIO

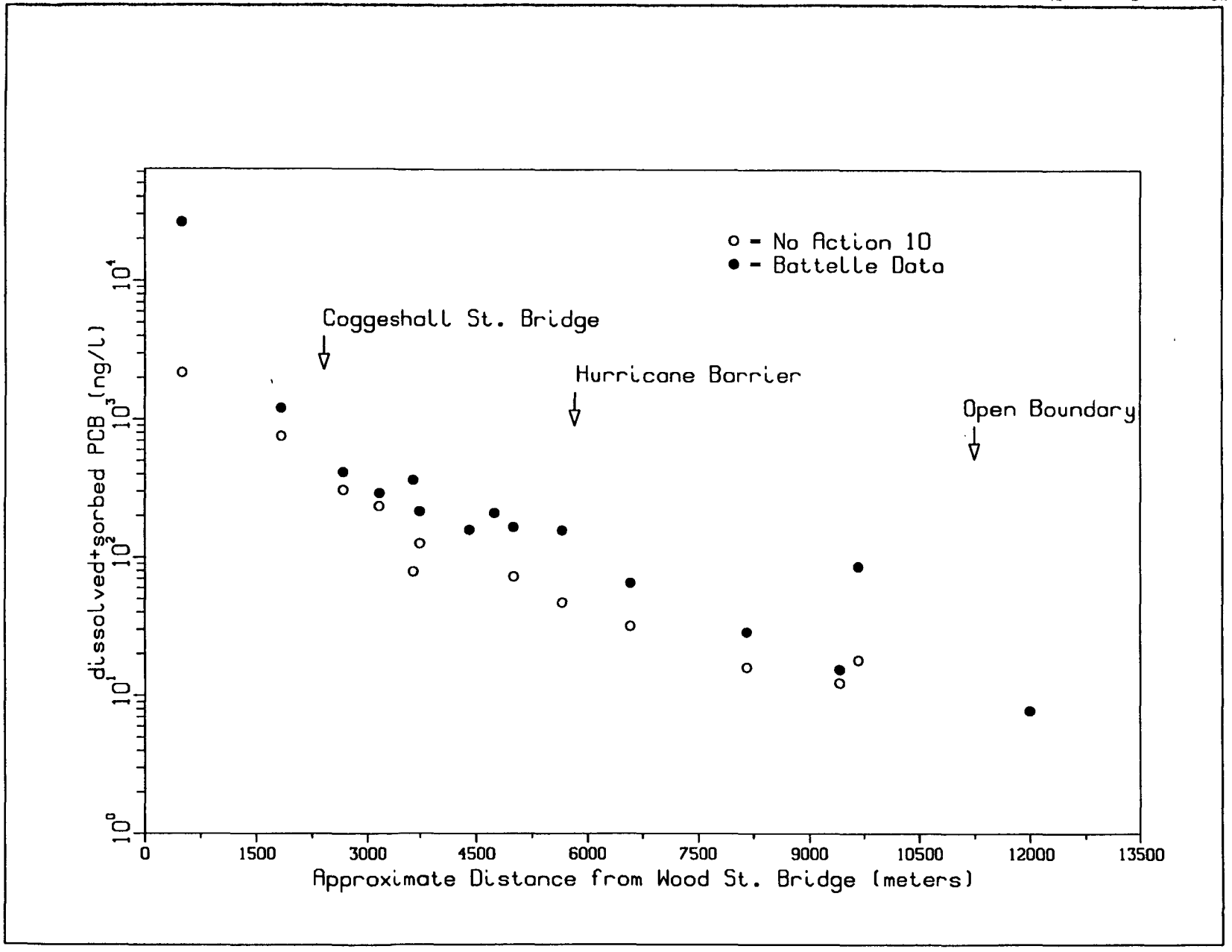

FIGURE F.4. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 10 OF THE NO-ACTION SCENARIO

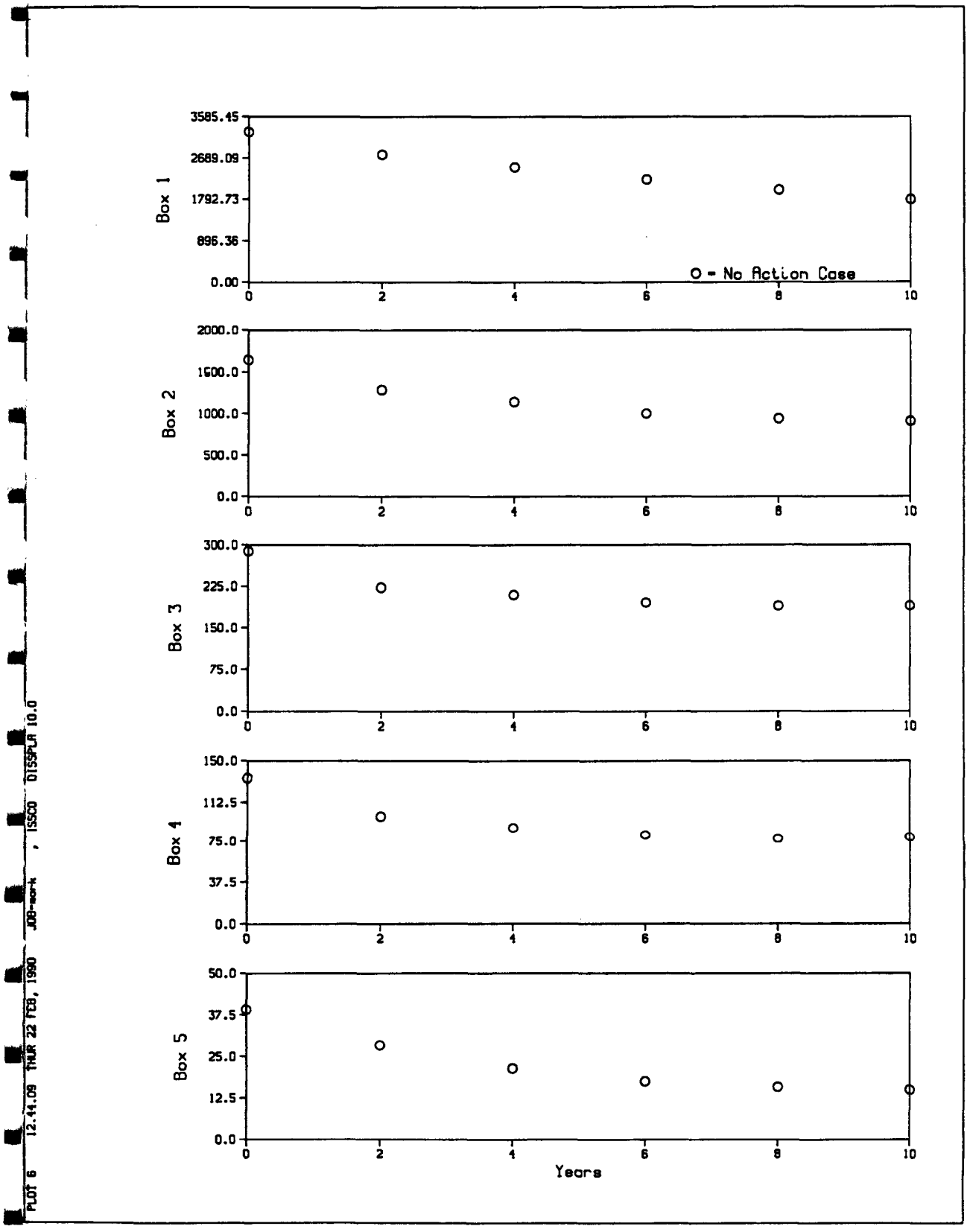

FIGURE F.5. BOX-AVERAGED MODEL RESULTS FOR THE NO-ACTION SCENARIO TOTAL PCB CONCENTRATION IN THE WATER COLUMN (ng/l)

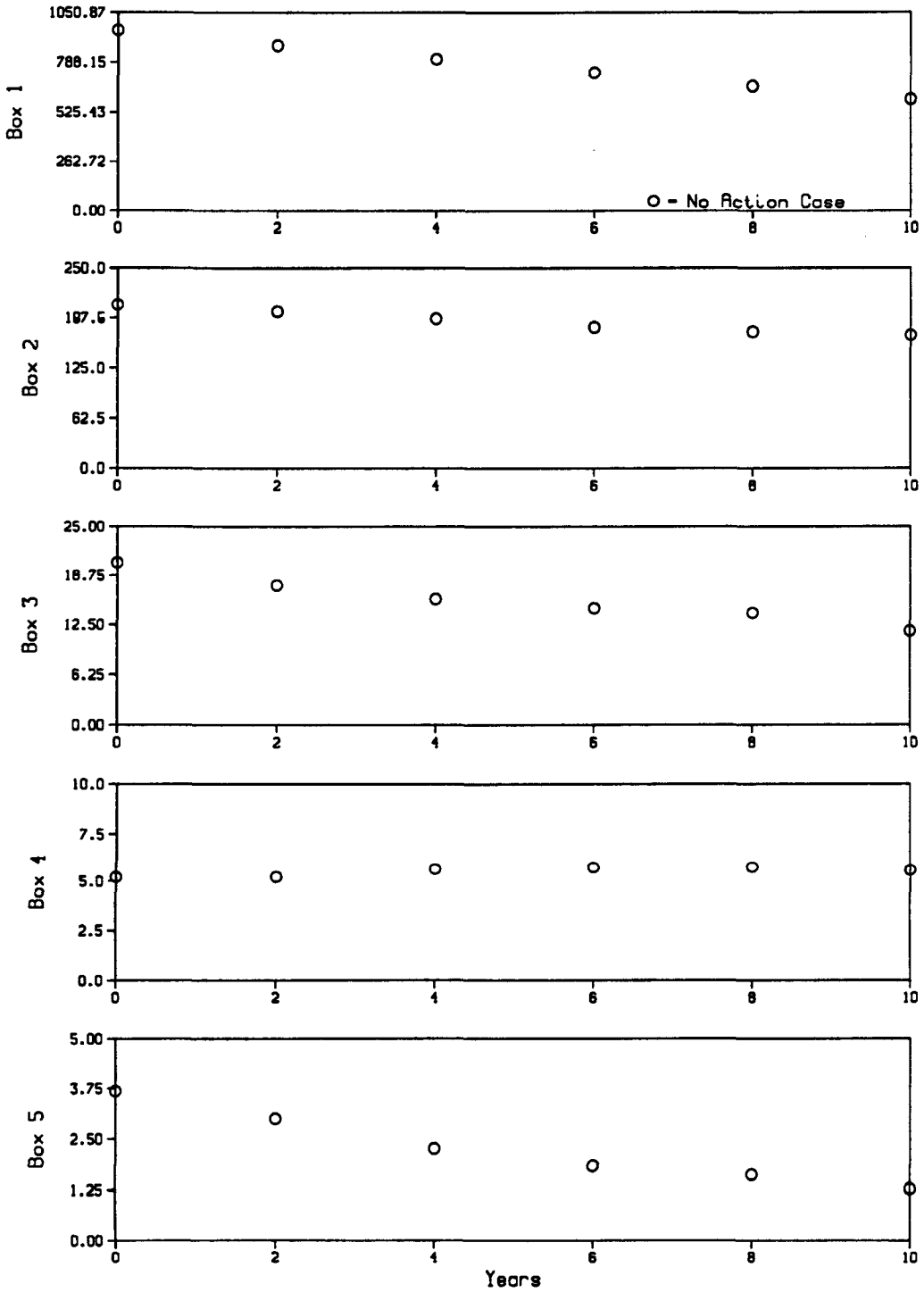

FIGURE F.6. BOX-AVERAGED MODEL RESULTS FOR THE NO-ACTION SCENARIO TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER

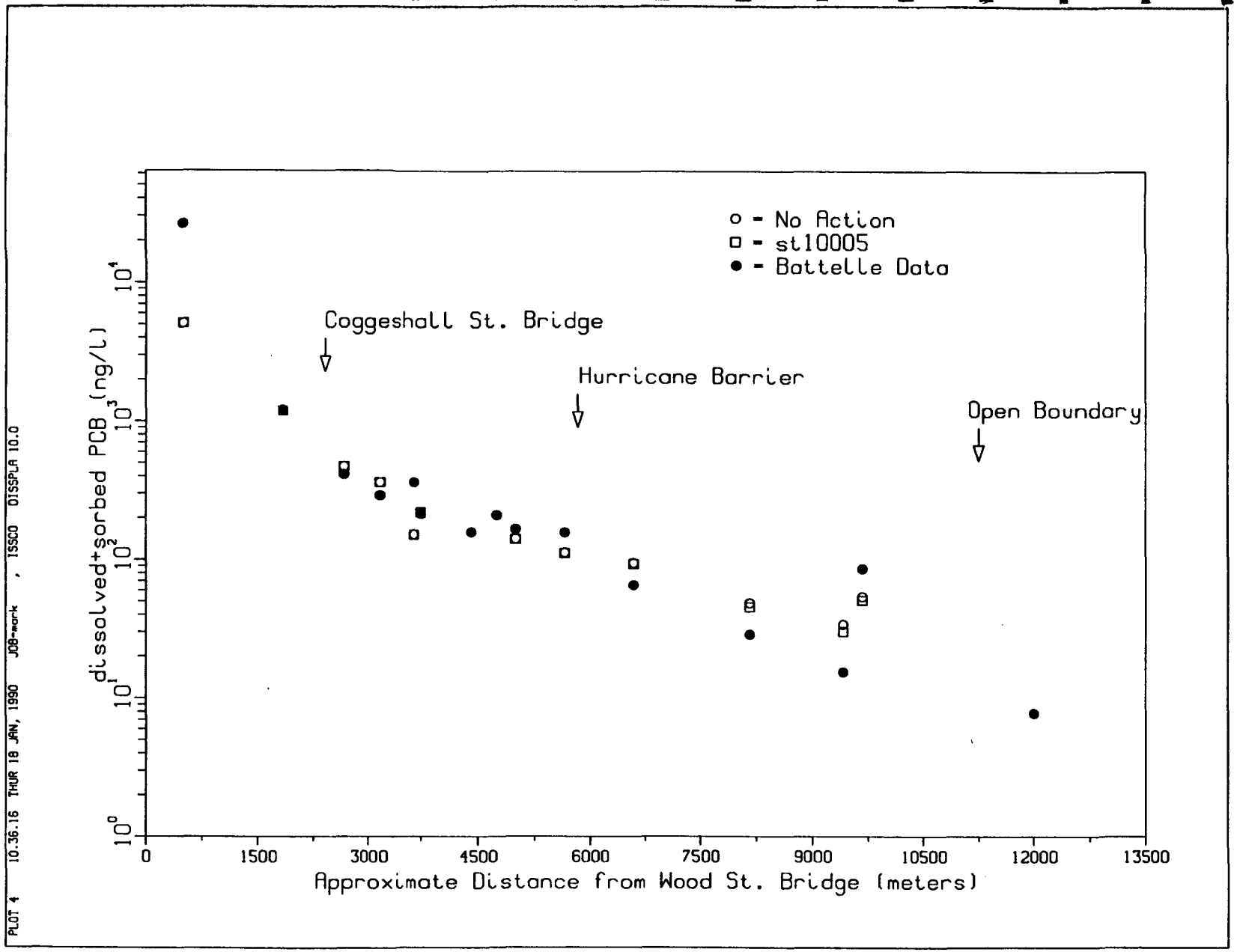

FIGURE F.7. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 0 OF THE 1 ng/l OPEN-BOUNDARY-CONDITION TEST. o = NO-ACTION SCENARIO, □ = OPEN-BOUNDARY CONDITION TEST, . = BATTELLE OCEAN SCIENCES DATA.

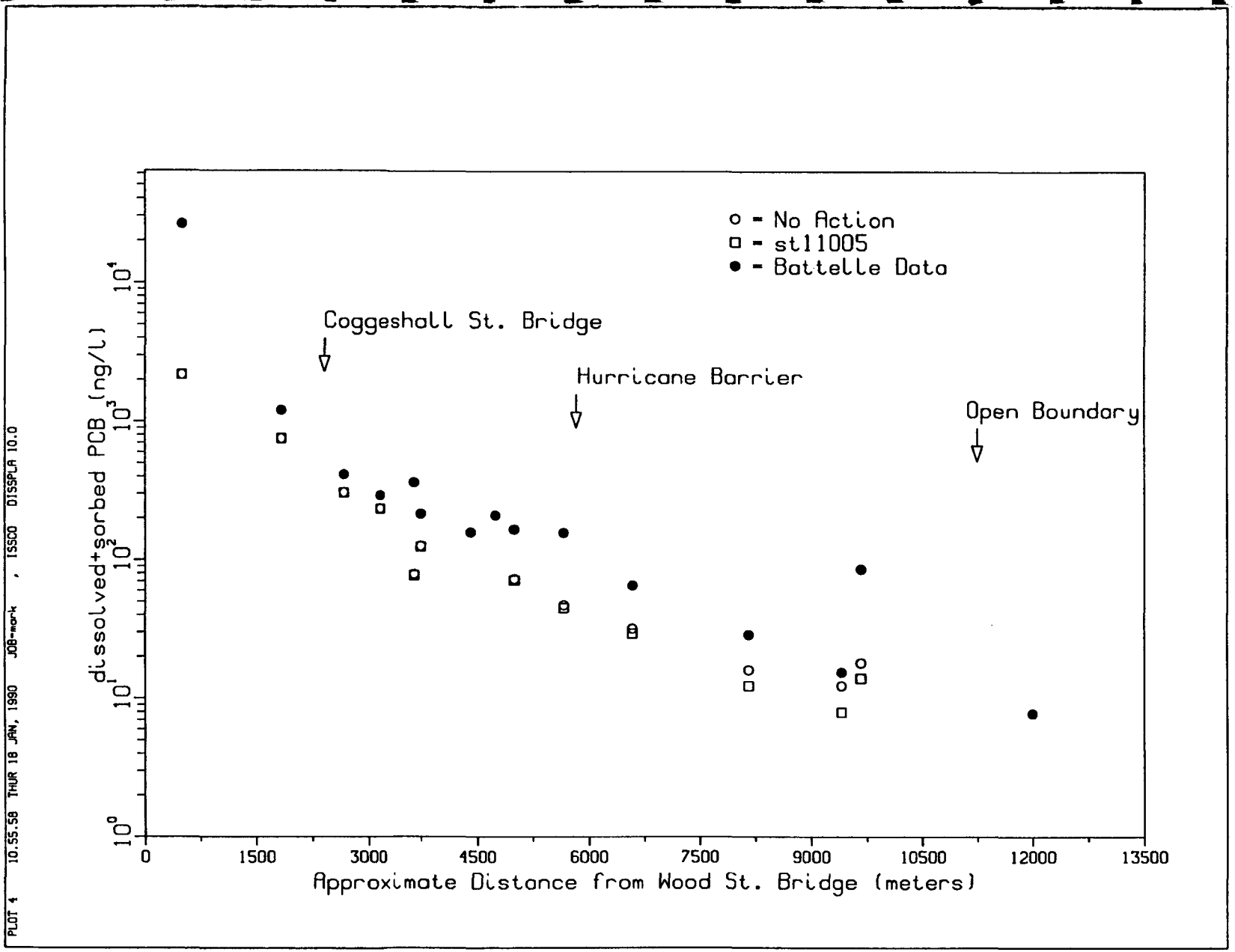

FIGURE F.8. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 10 OF THE 1 ng/l OPEN-BOUNDARY-CONDITION TEST. o = NO-ACTION SCENARIO, □ = OPEN-BOUNDARY-CONDITION TEST, . = BATTELLE OCEAN SCIENCES DATA.

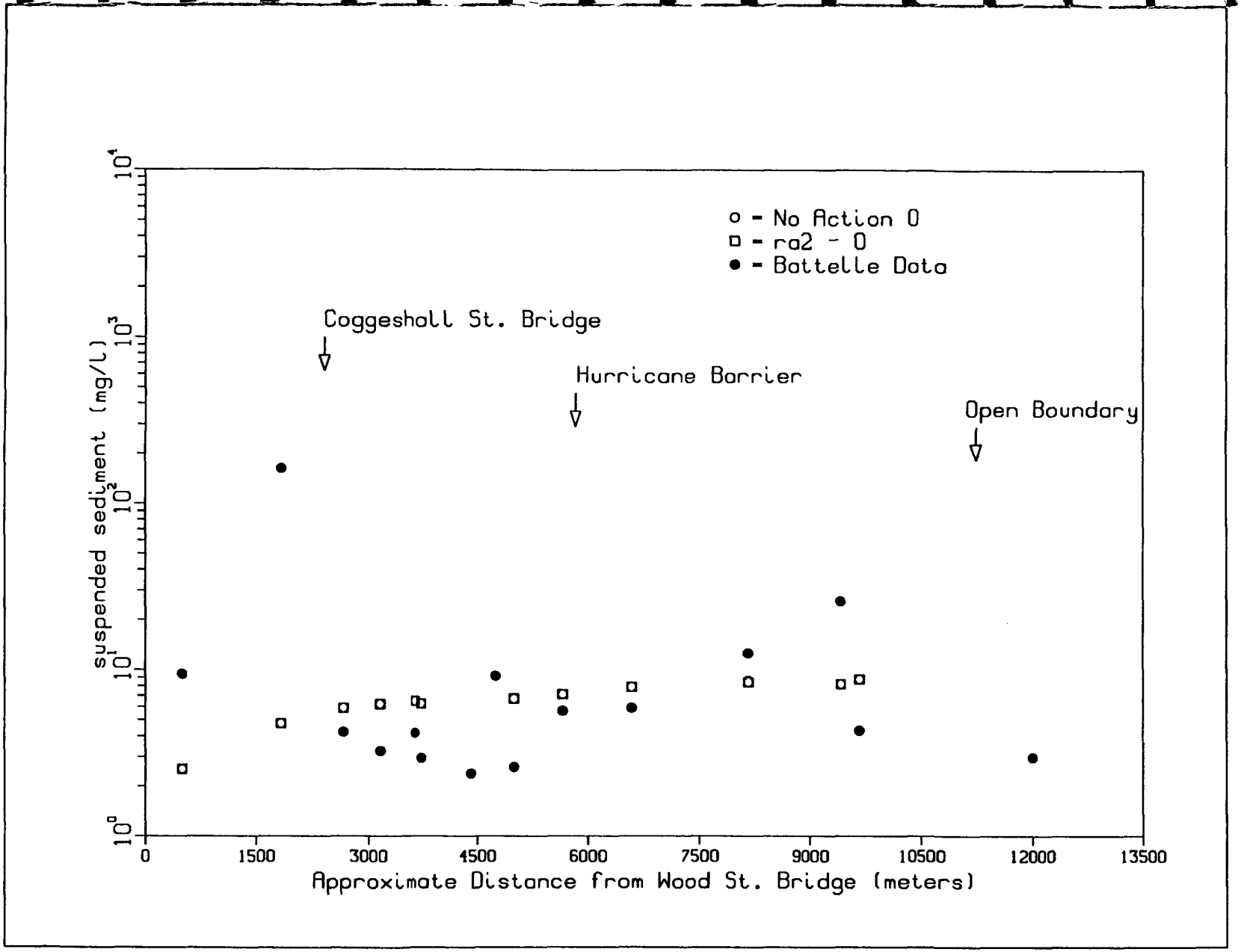

FIGURE F.9. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 0 OF THE 10-ppm UPPER-ESTUARY TEST. o = NO-ACTION SCENARIO, □ = 10 ppm UPPER-ESTUARY TEST, · = BATTELLE OCEAN SCIENCES DATA.

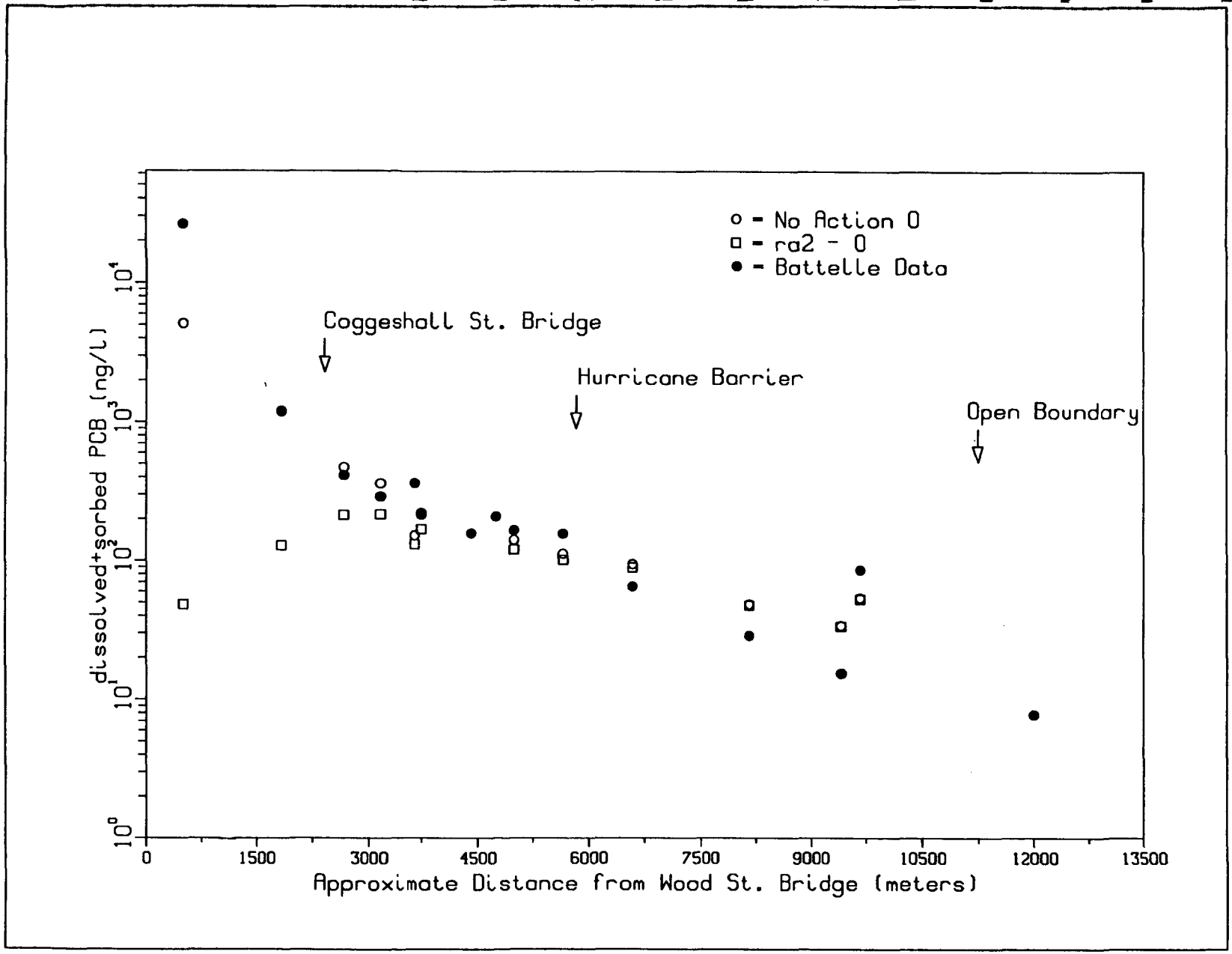

FIGURE F.10. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 0 OF THE 10-ppm UPPER-ESTUARY TEST. o = NO-ACTION SCENARIO, □ = 10-ppm UPPER-ESTUARY TEST, . = BATTELLE OCEAN SCIENCES DATA.

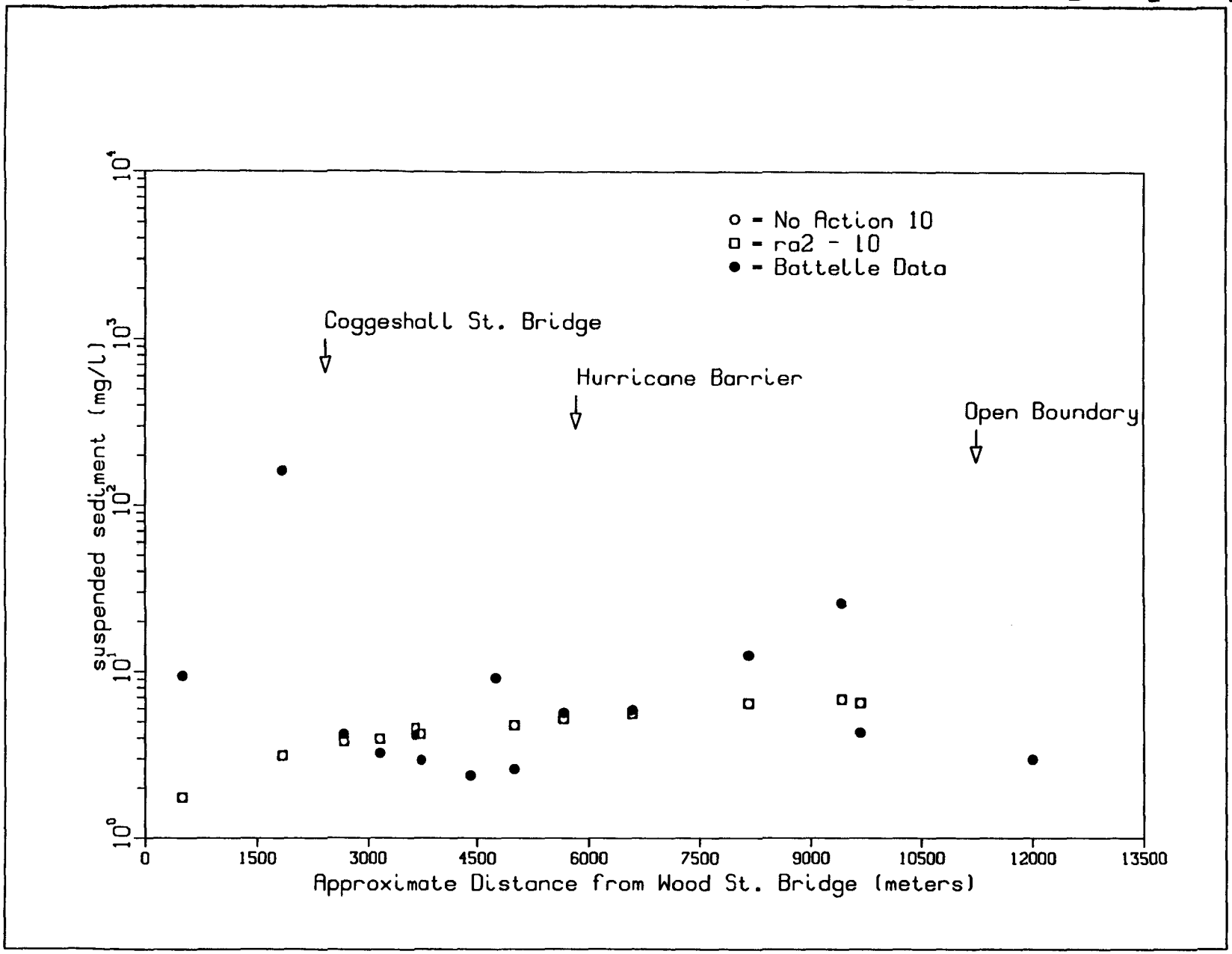

FIGURE F.11. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 10 OF THE 10 ppm UPPER-ESTUARY TEST. o = NO-ACTION SCENARIO, o = 10 ppm UPPER-ESTUARY TEST, · = BATTELLE OCEAN SCIENCES DATA.

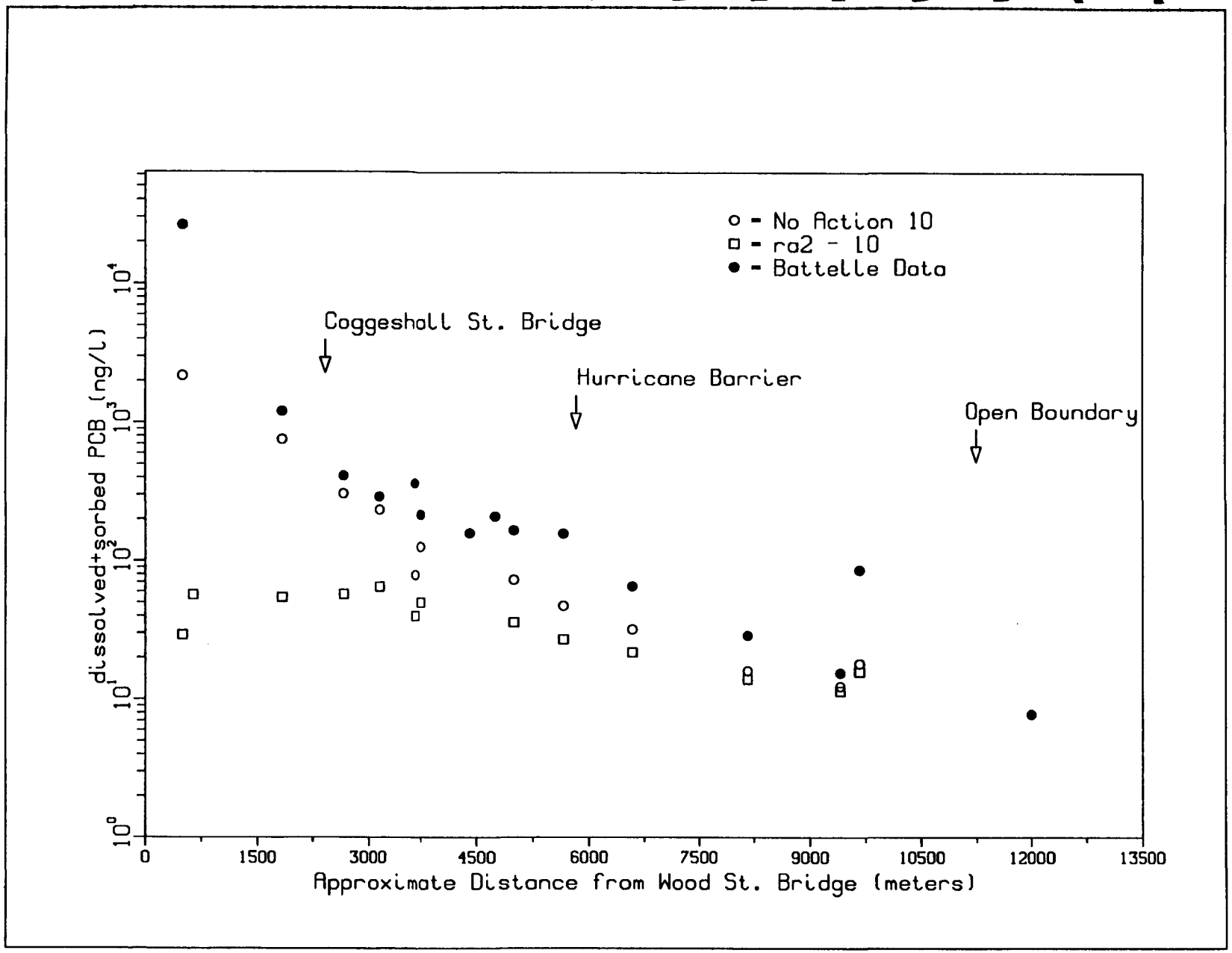

FIGURE F.12. AVERAGE CONCENTRATION OF TOTAL PCBS IN THE WATER COLUMN FOR YEAR 10 OF THE 10-ppm UPPER-ESTUARY TEST. o = NO-ACTION SCENARIO, □ = 10-ppm UPPER-ESTUARY TEST, . = BATTELLE OCEAN SCIENCES DATA.

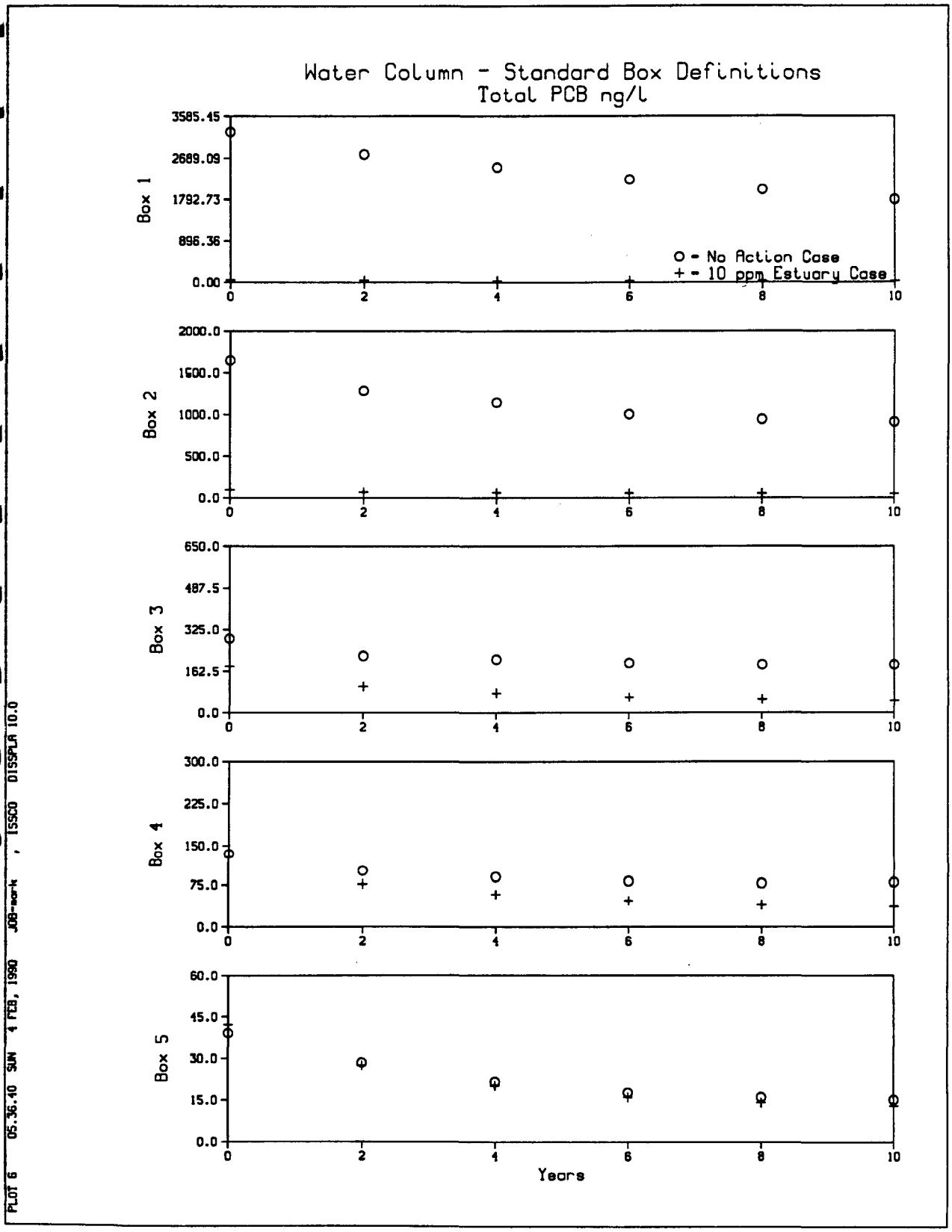

FIGURE F.13. BOX-AVERAGED MODEL RESULTS FOR THE 10-ppm UPPER-ESTUARY TEST. TOTAL PCB CONCENTRATION (ng/l) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = 10-ppm UPPER-ESTUARY TEST.

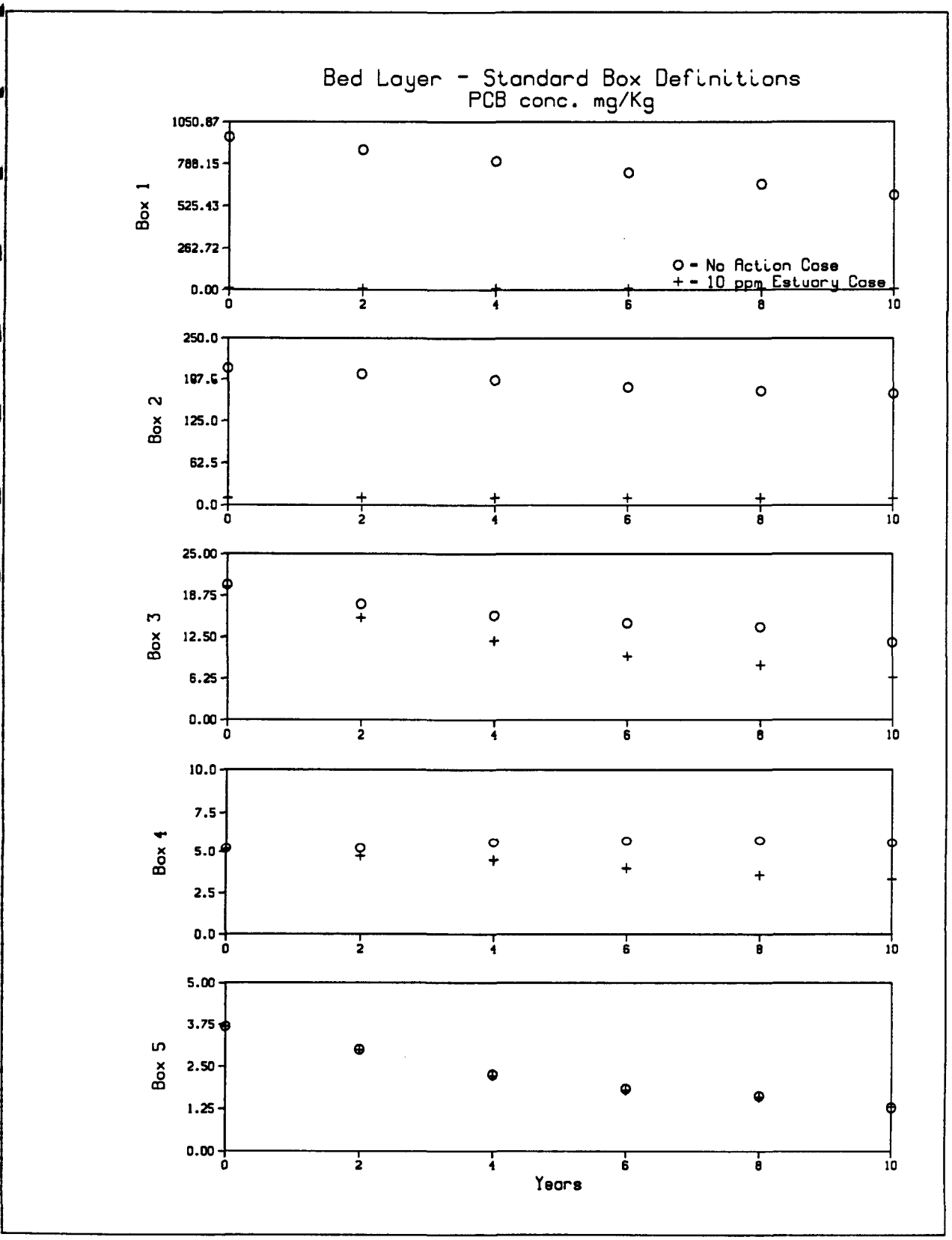

FIGURE F.14. BOX-AVERAGED MODEL RESULTS FOR THE 10-ppm UPPER-ESTUARY TEST. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = 10-ppm UPPER-ESTUARY TEST.

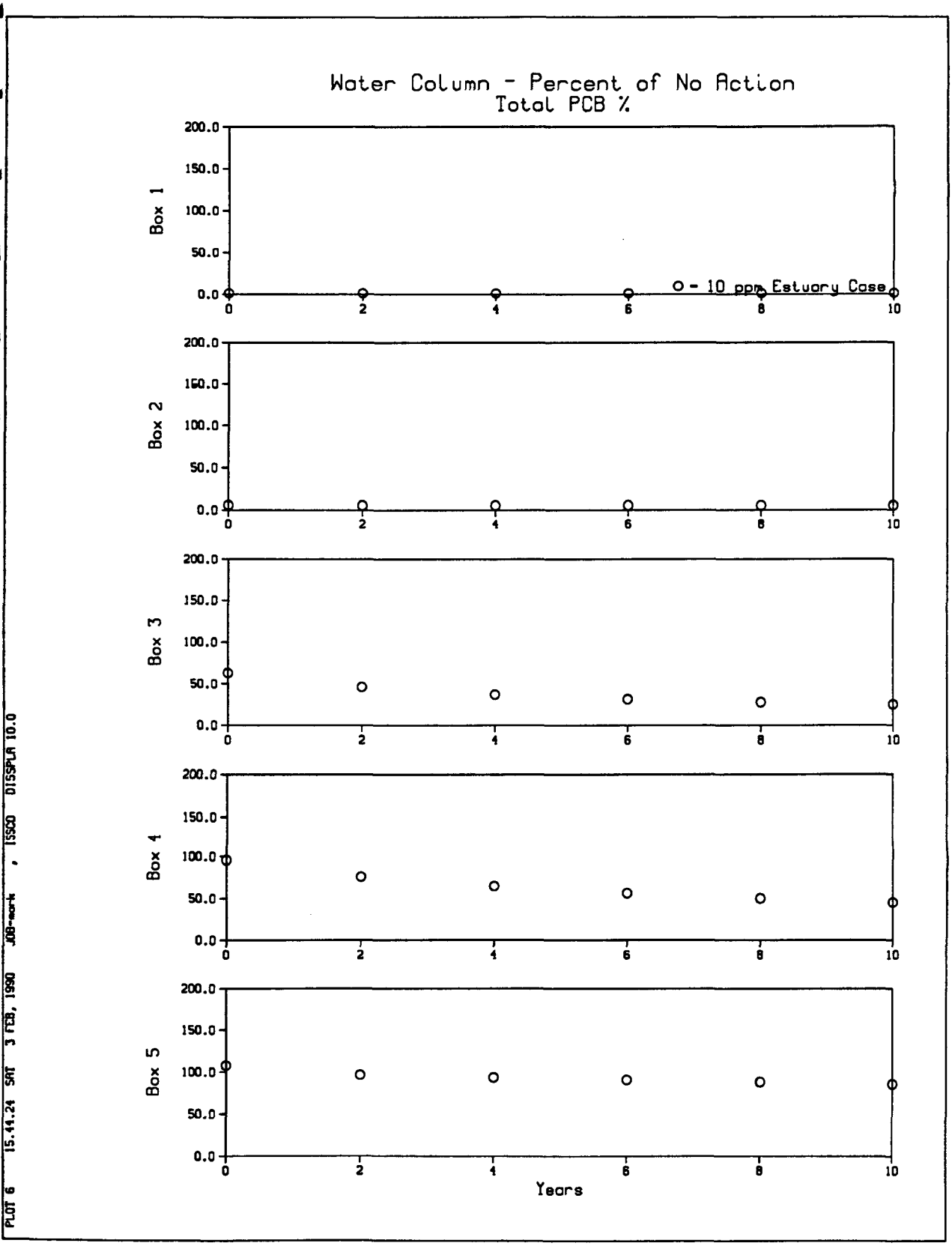

FIGURE F.15. BOX-AVERAGED MODEL RESULTS FOR THE 10-ppm UPPER-ESTUARY TEST EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

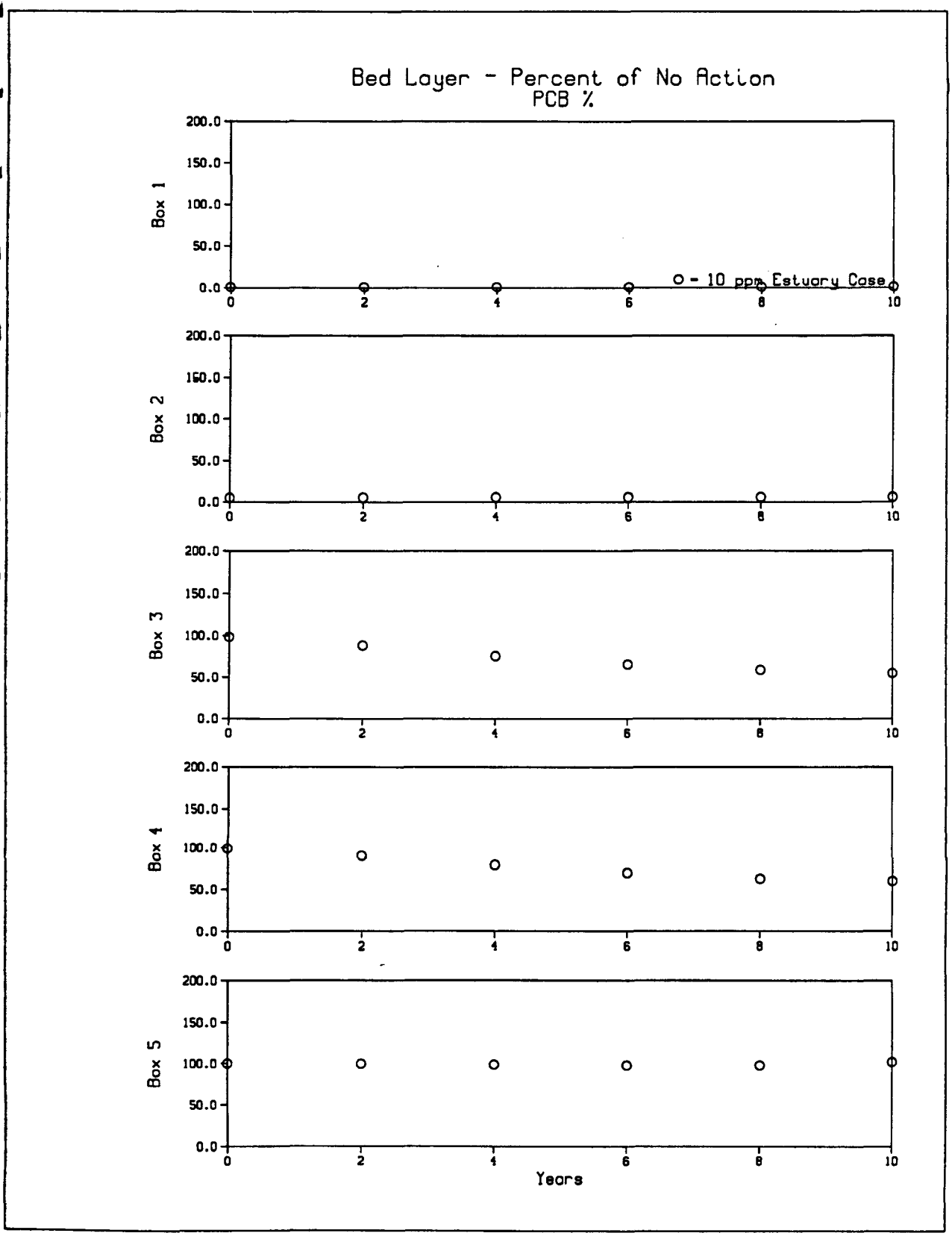

FIGURE F.16. BOX-AVERAGED MODEL RESULTS FOR THE 10-ppm UPPER-ESTUARY TEST EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

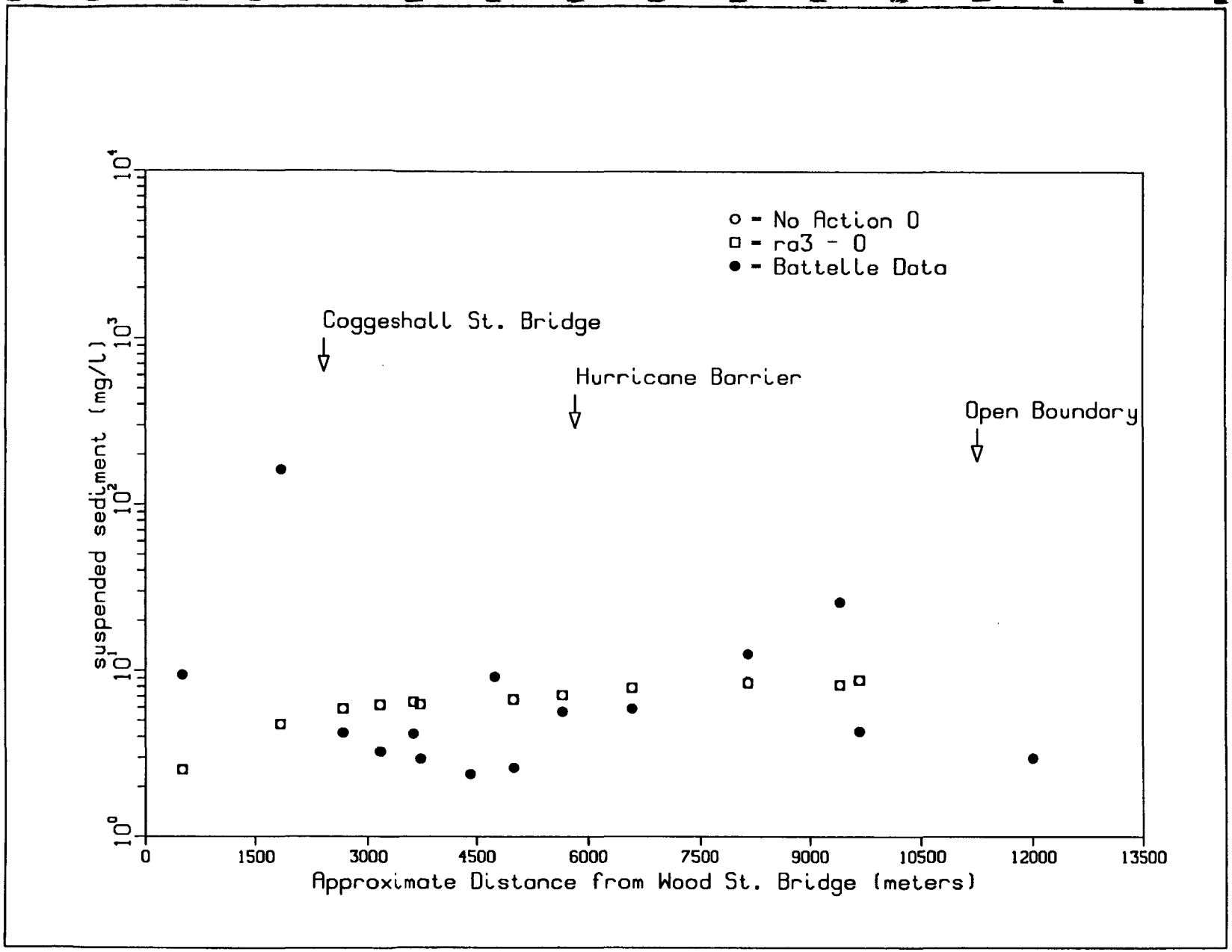

FIGURE F.17. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 0 OF THE HOT-SPOT SCENARIO. o = NO-ACTION SCENARIO, □ = HOT-SPOT SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

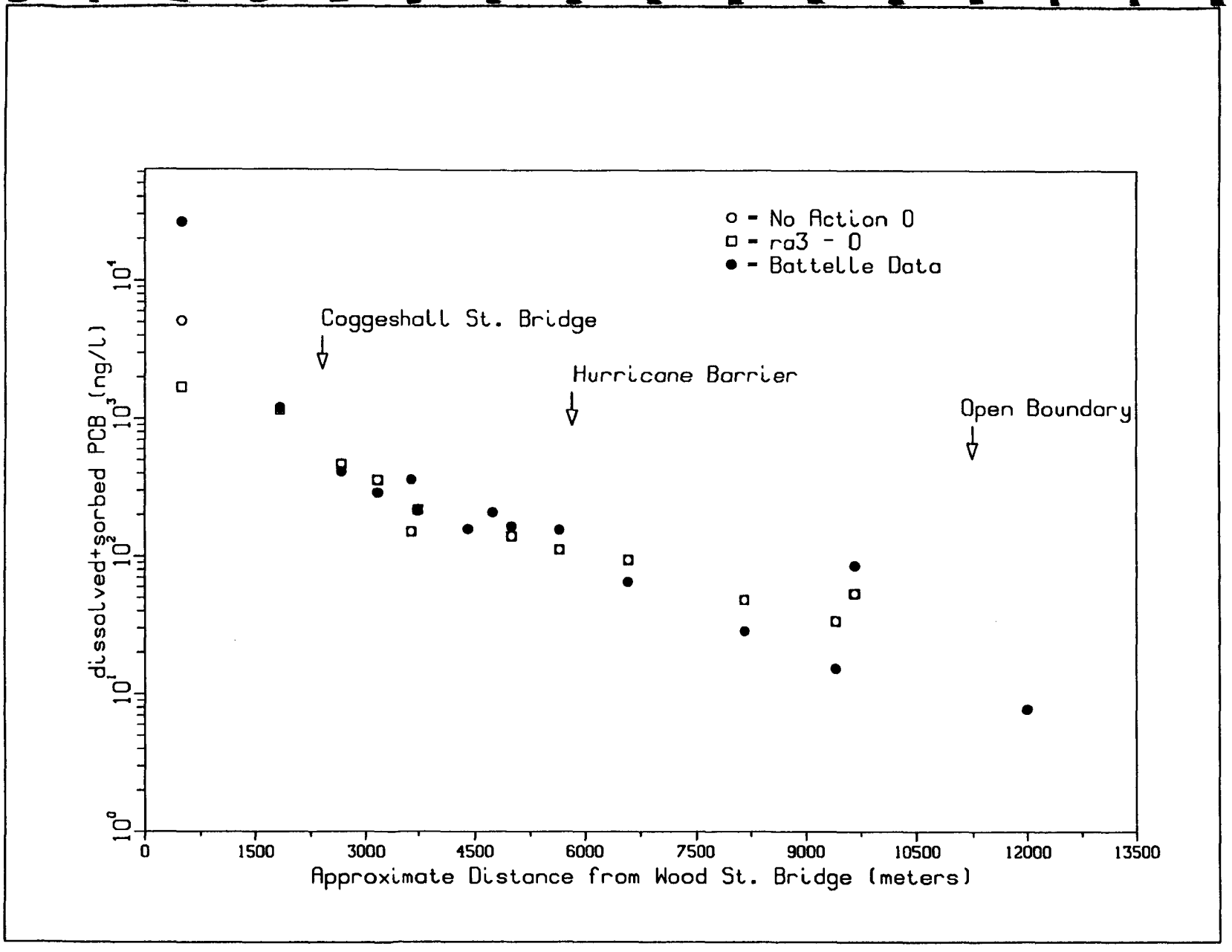

FIGURE F.18. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE HOT-SPOT SCENARIO. o = NO-ACTION SCENARIO, □ = HOT-SPOT SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

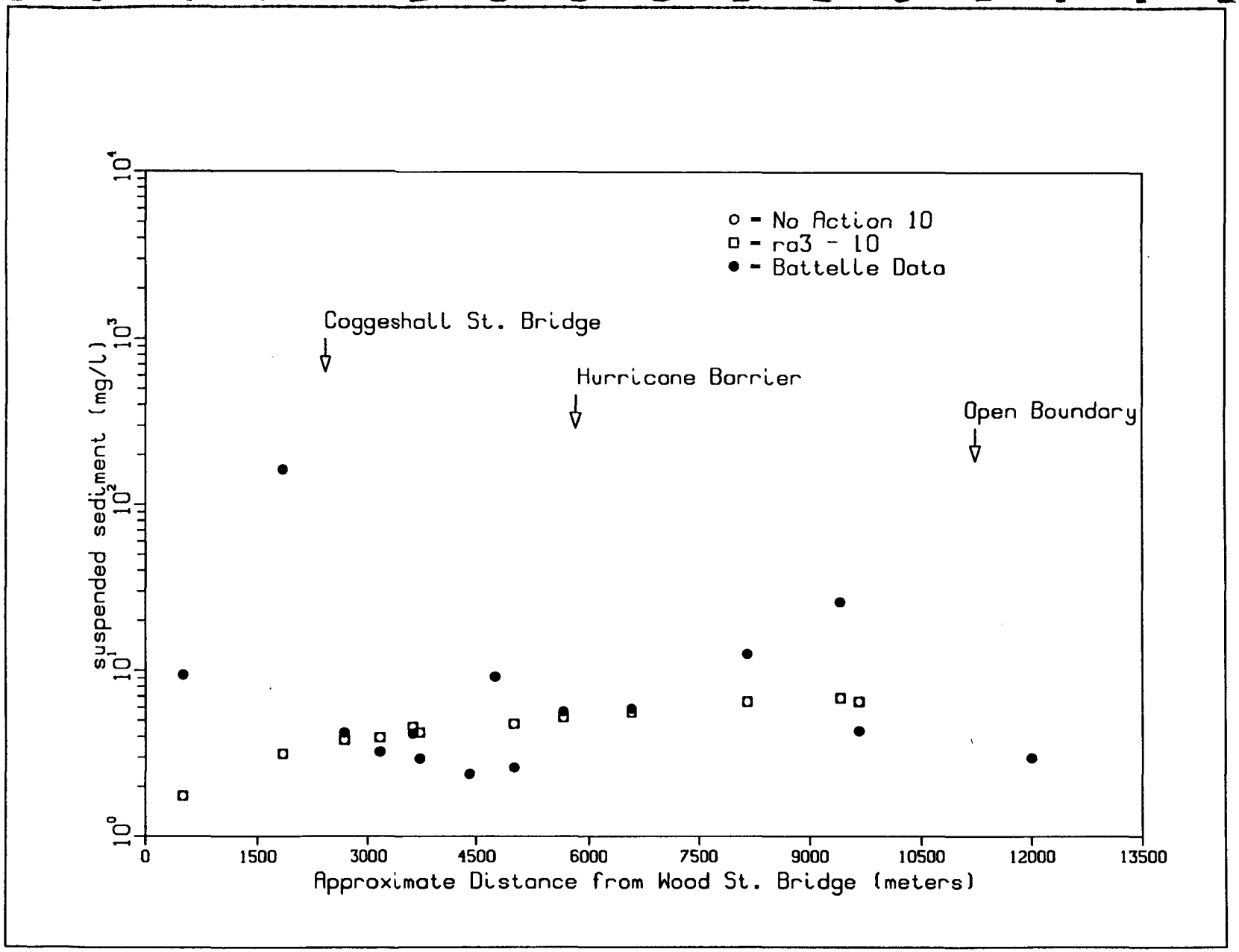

FIGURE F.19. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 10 OF THE HOT-SPOT SCENARIO. o = NO-ACTION SCENARIO, □ = HOT-SPOT SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

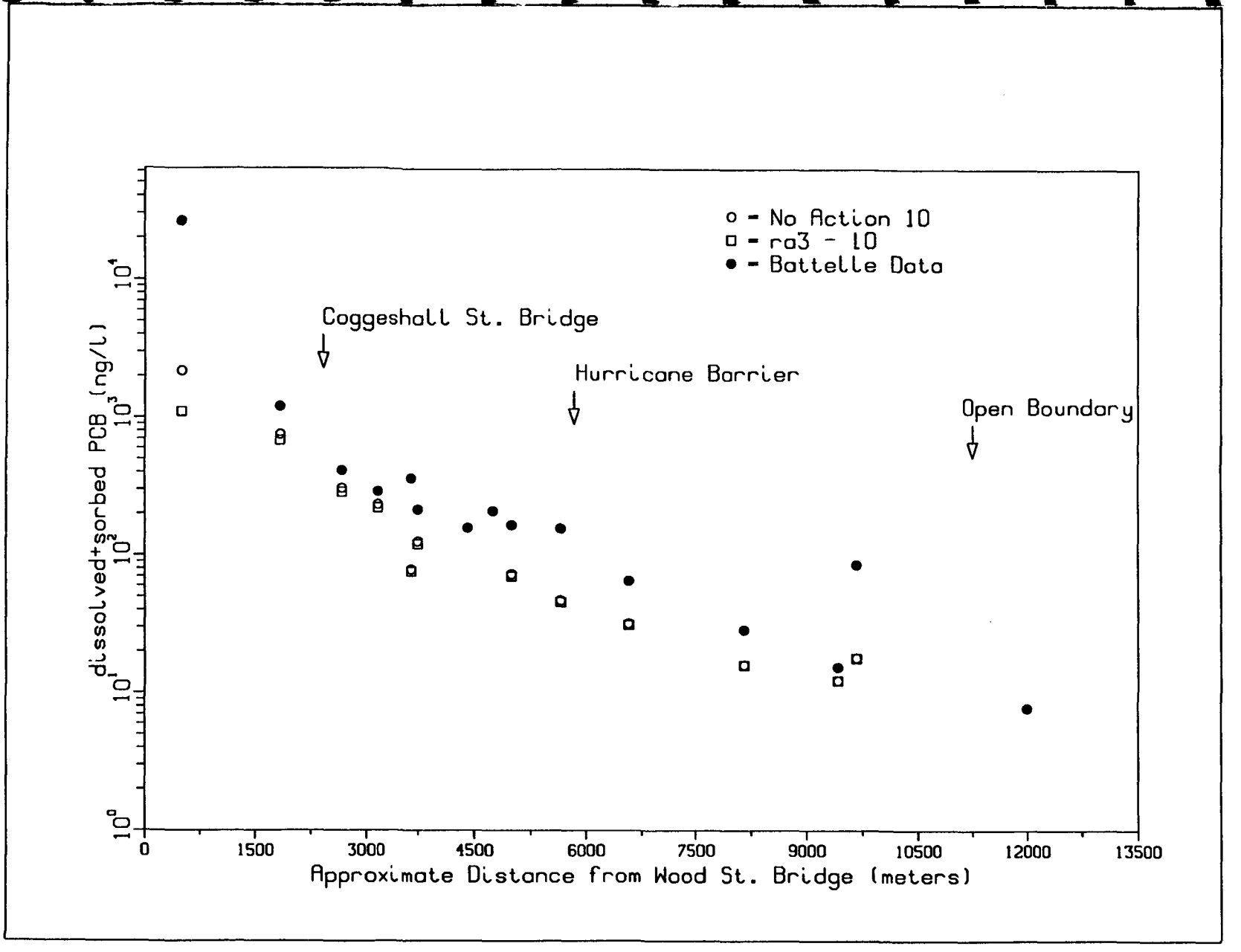

FIGURE F.20. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE HOT-SPOT SCENARIO. o = NO-ACTION SCENARIO, □ = HOT-SPOT SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

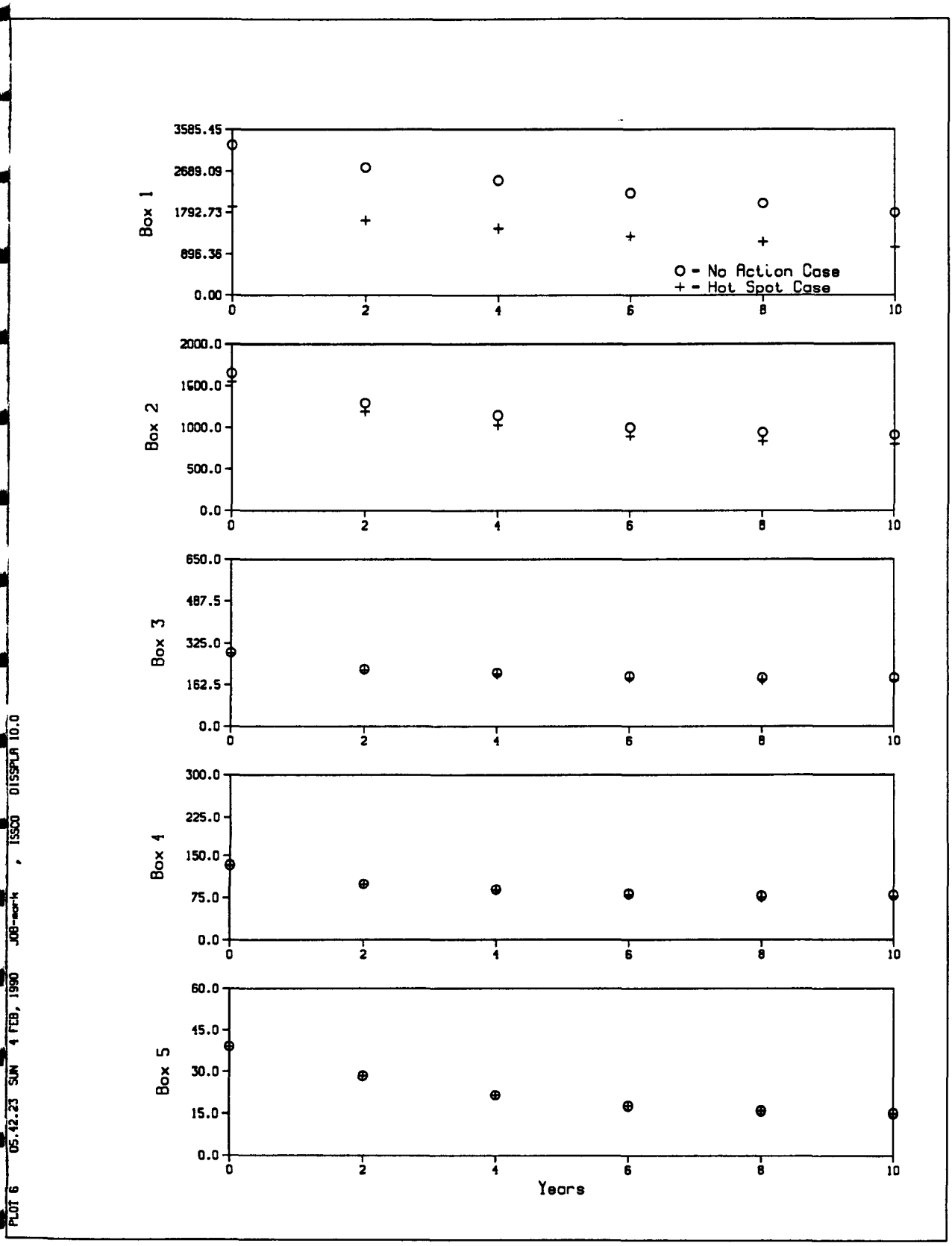

FIGURE F.21. BOX-AVERAGED MODEL RESULTS FOR THE HOT-SPOT SCENARIO. TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = HOT-SPOT SCENARIO.

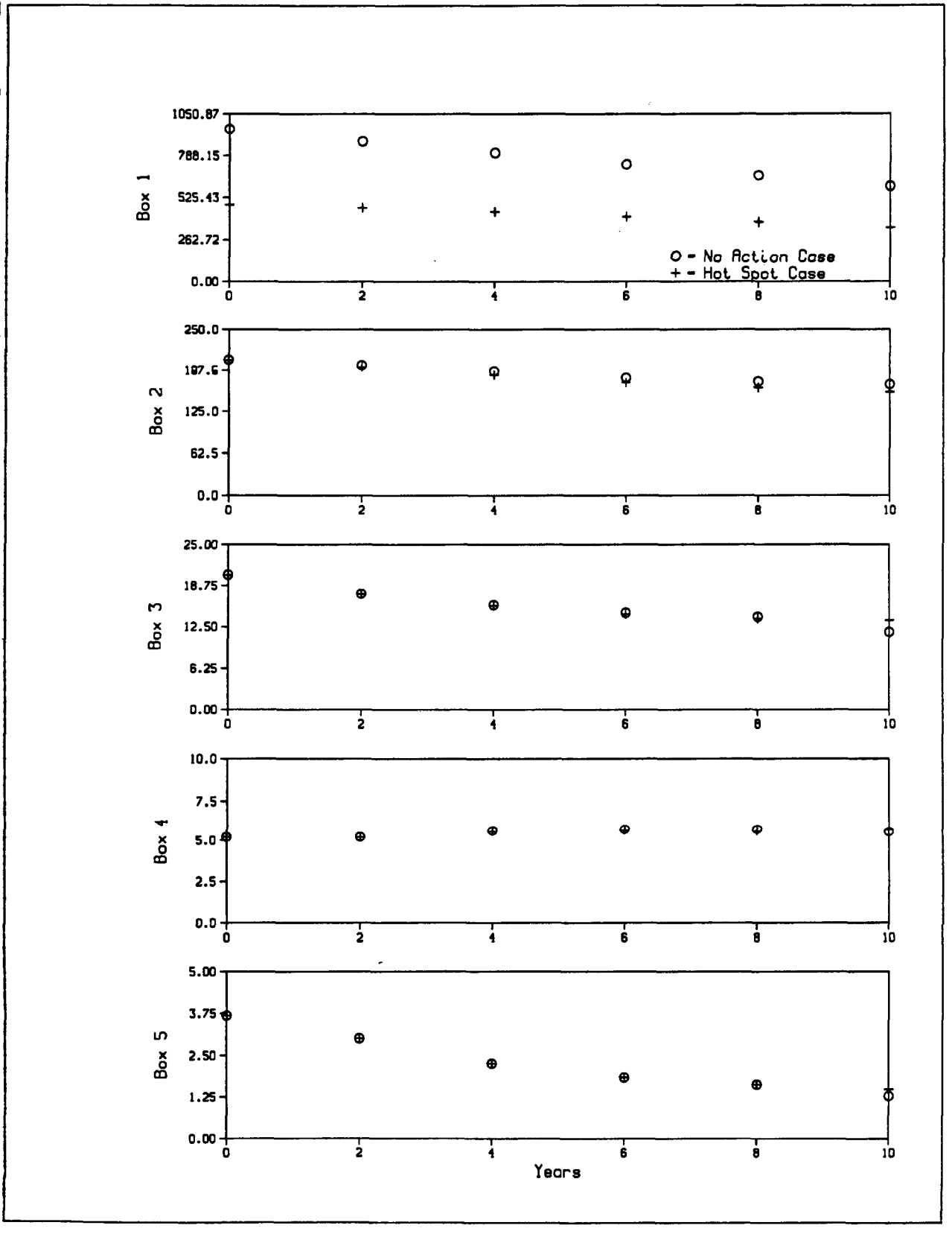

FIGURE F.22. BOX-AVERAGED MODEL RESULTS FOR THE HOT-SPOT SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = HOT-SPOT SCENARIO.

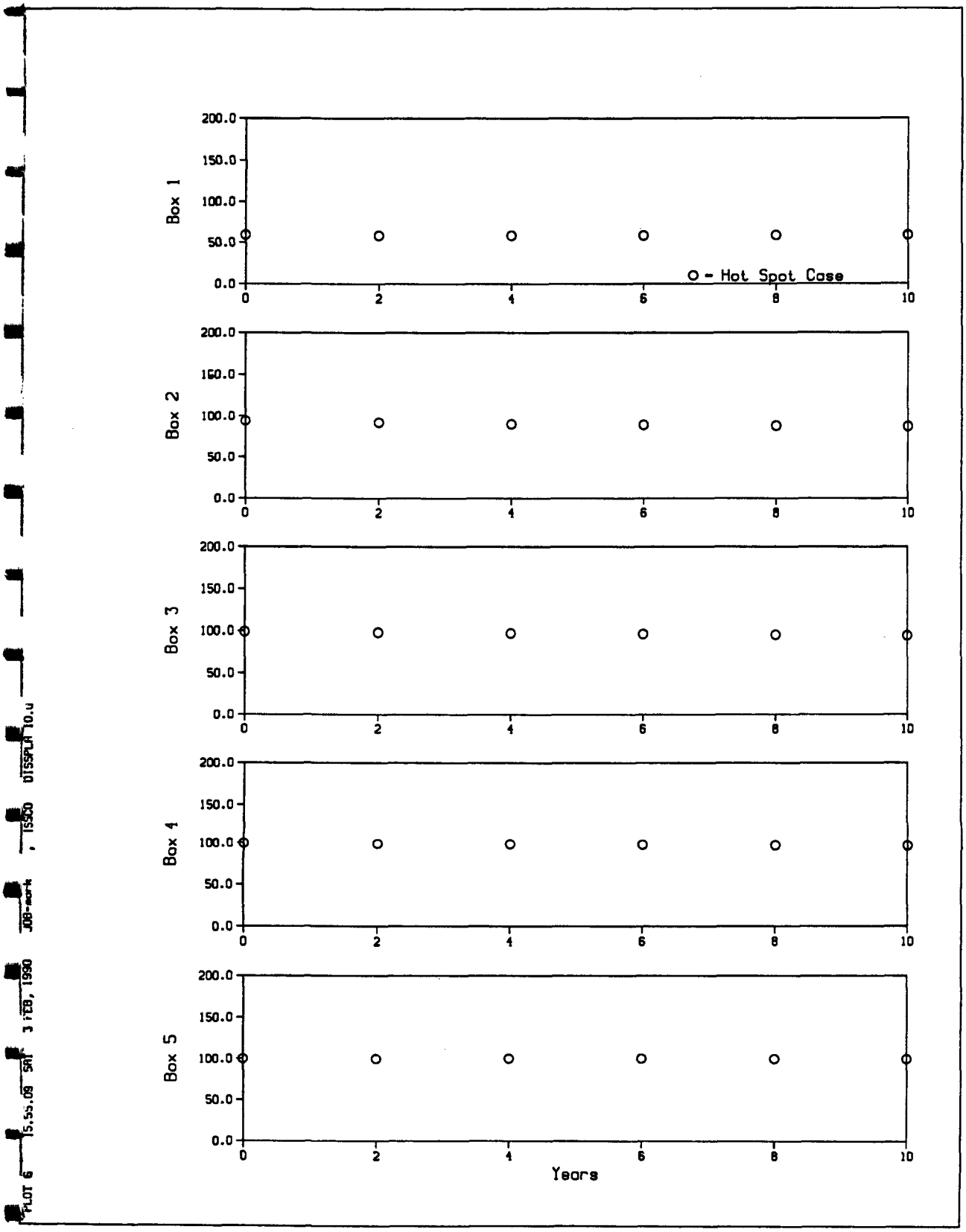

FIGURE F.23. BOX-AVERAGED MODEL RESULTS FOR THE HOT-SPOT SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

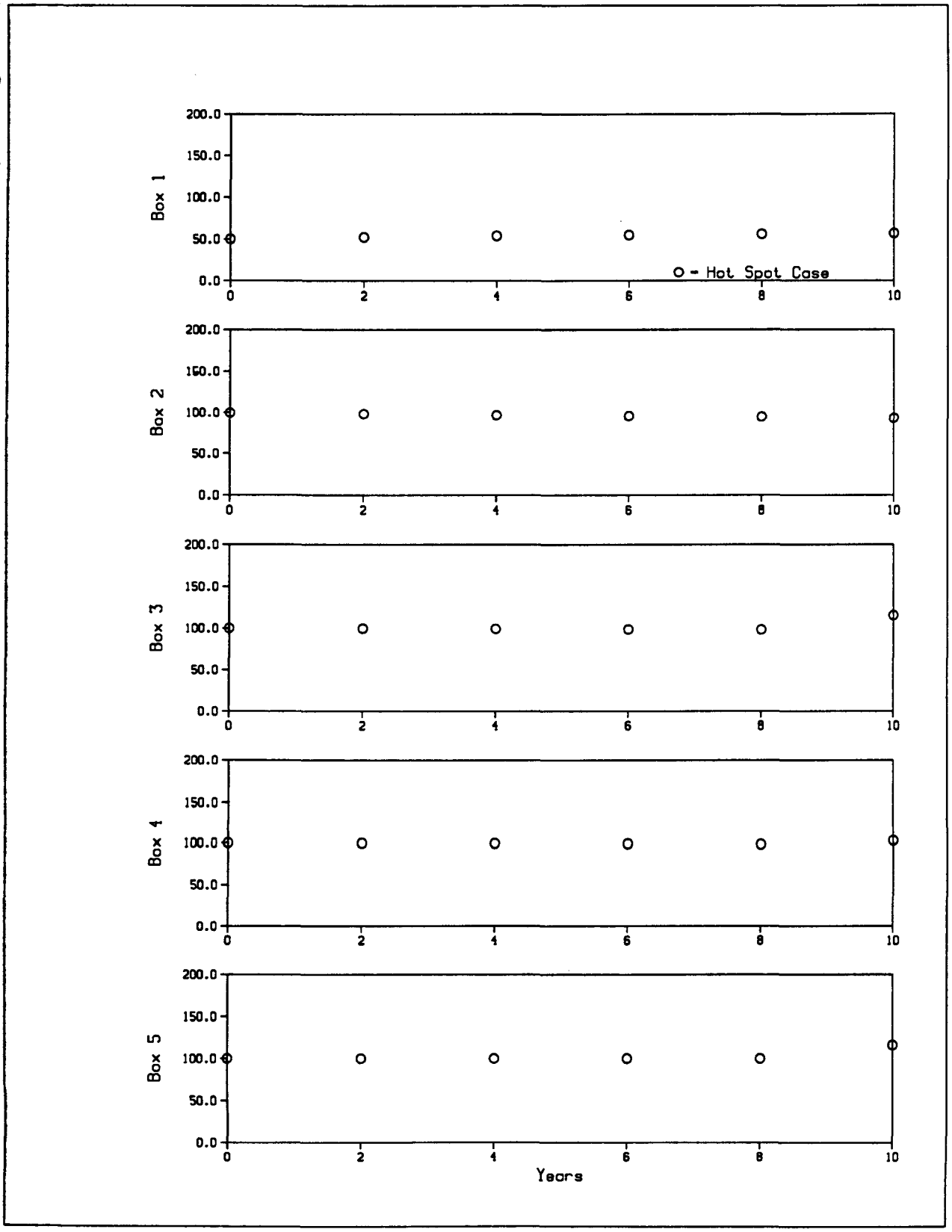

FIGURE F.24. BOX-AVERAGED MODEL RESULTS FOR THE HOT-SPOT SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

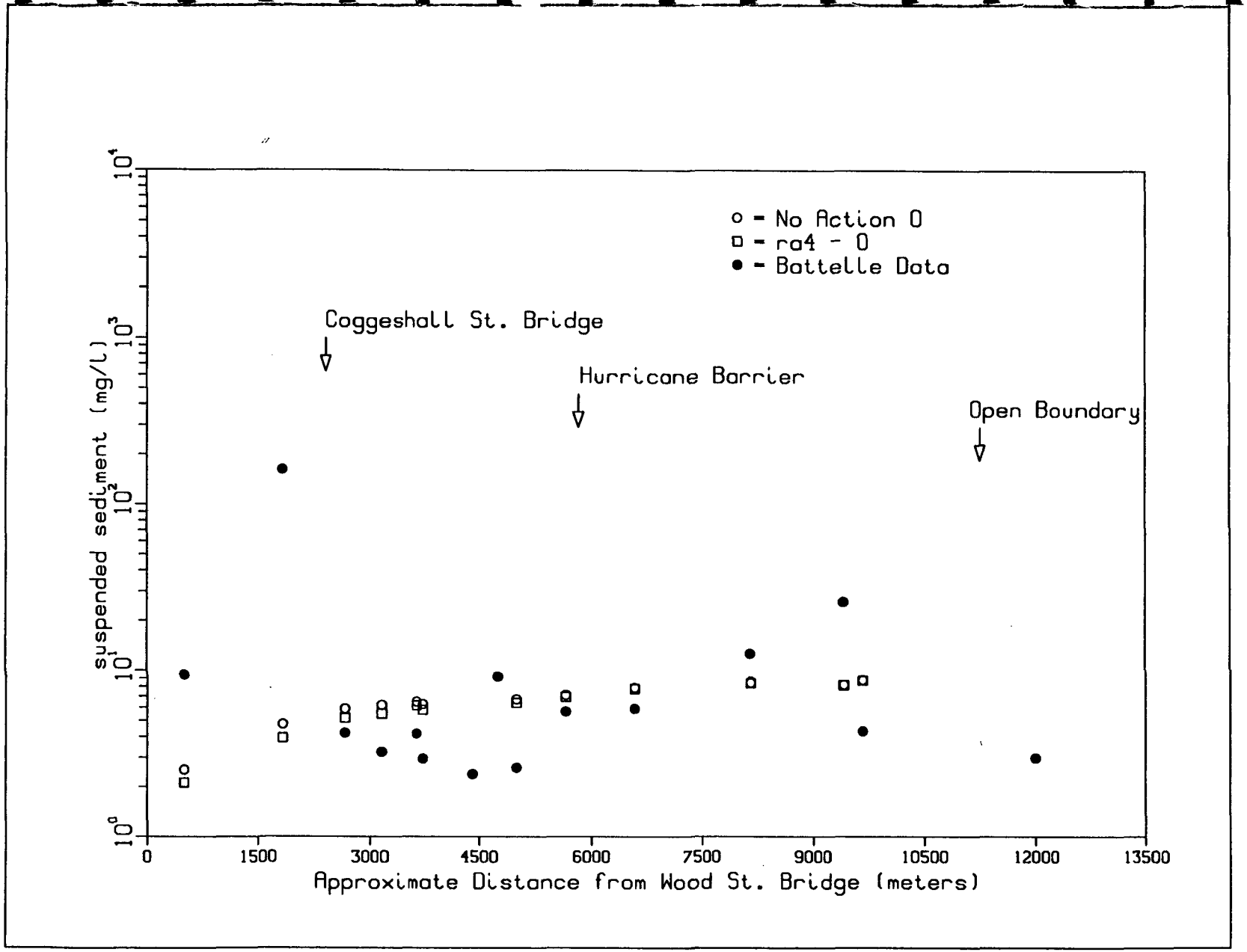

FIGURE F.25. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 0 OF THE UPPER-ESTUARY SCENARIO. o = NO-ACTION SCENARIO, □ = UPPER-ESTUARY SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

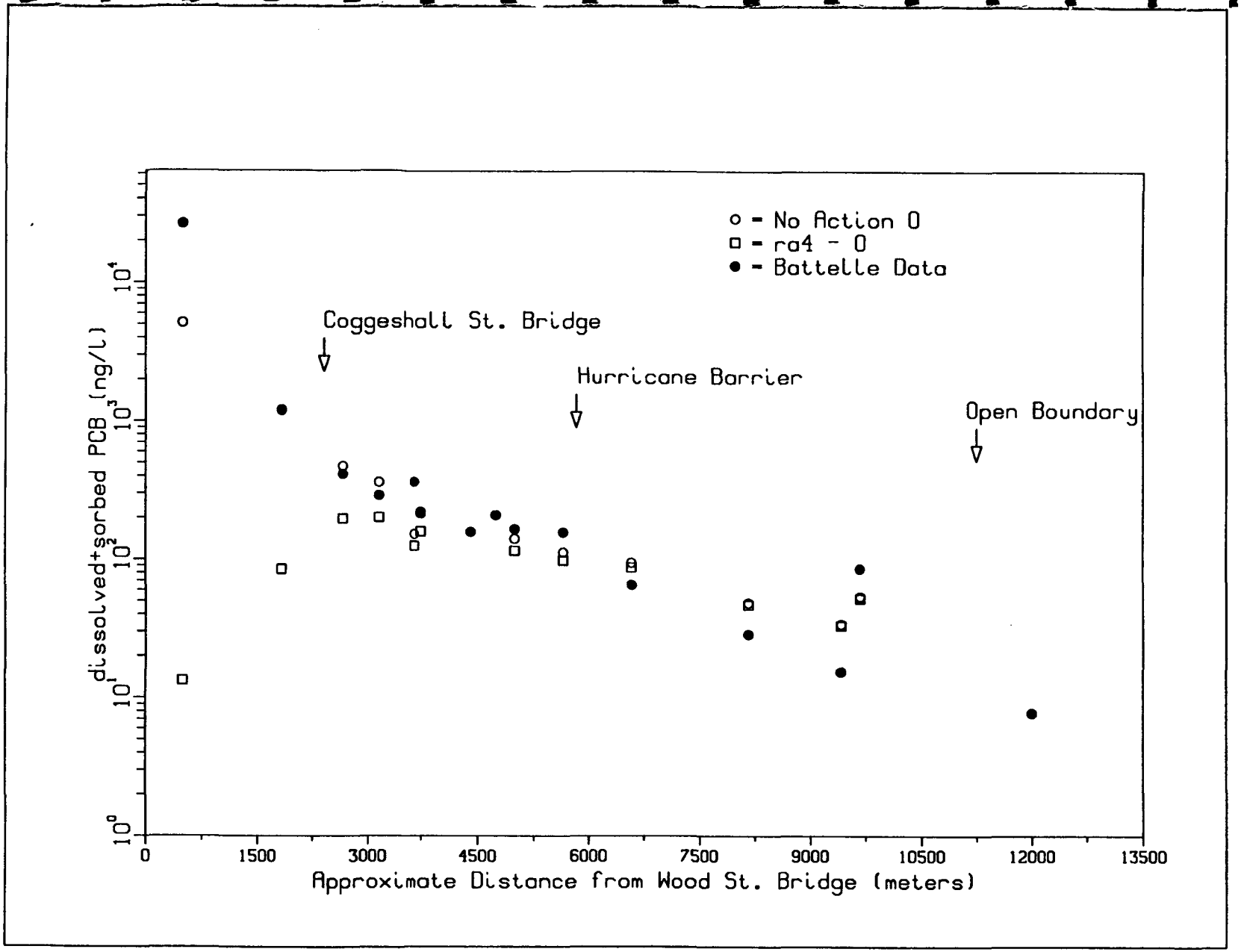

FIGURE F.26. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE UPPER-ESTUARY SCENARIO. o = NO-ACTION SCENARIO, □ = UPPER-ESTUARY SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

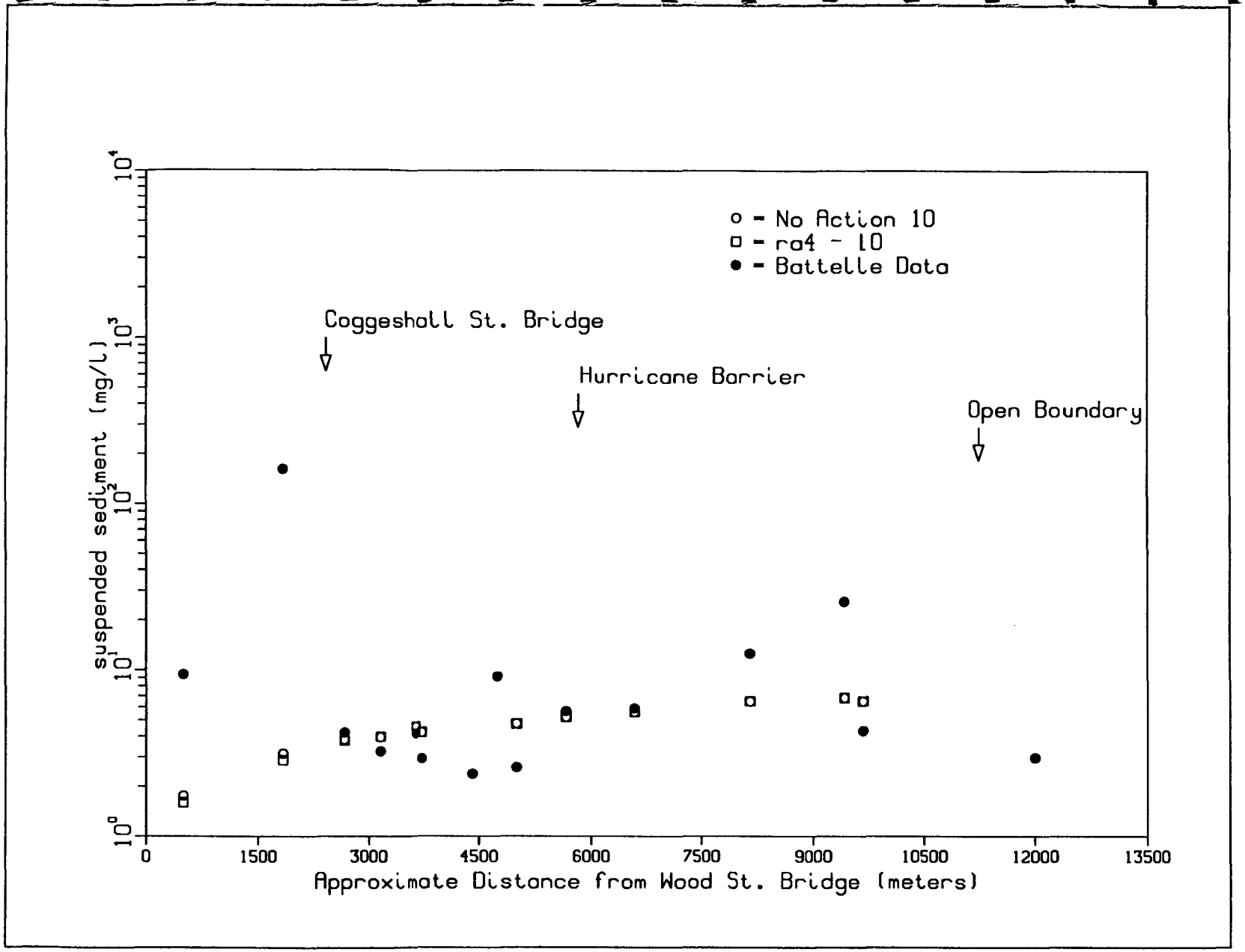

FIGURE F.27. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 10 OF THE UPPER-ESTUARY SCENARIO. o = NO-ACTION SCENARIO, □ = UPPER-ESTUARY SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

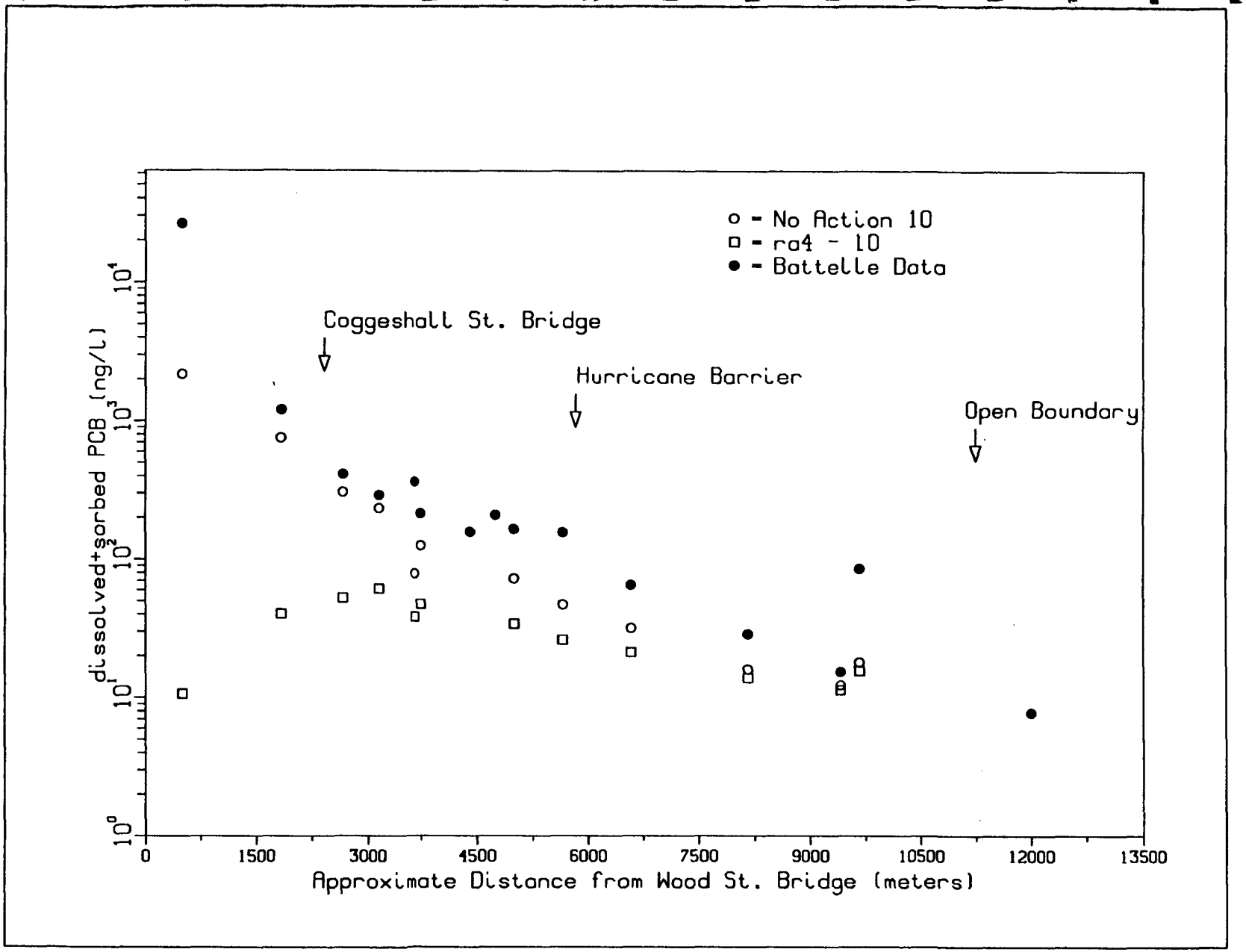

FIGURE F.28. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE UPPER-ESTUARY SCENARIO. o = NO-ACTION SCENARIO, □ = UPPER-ESTUARY SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

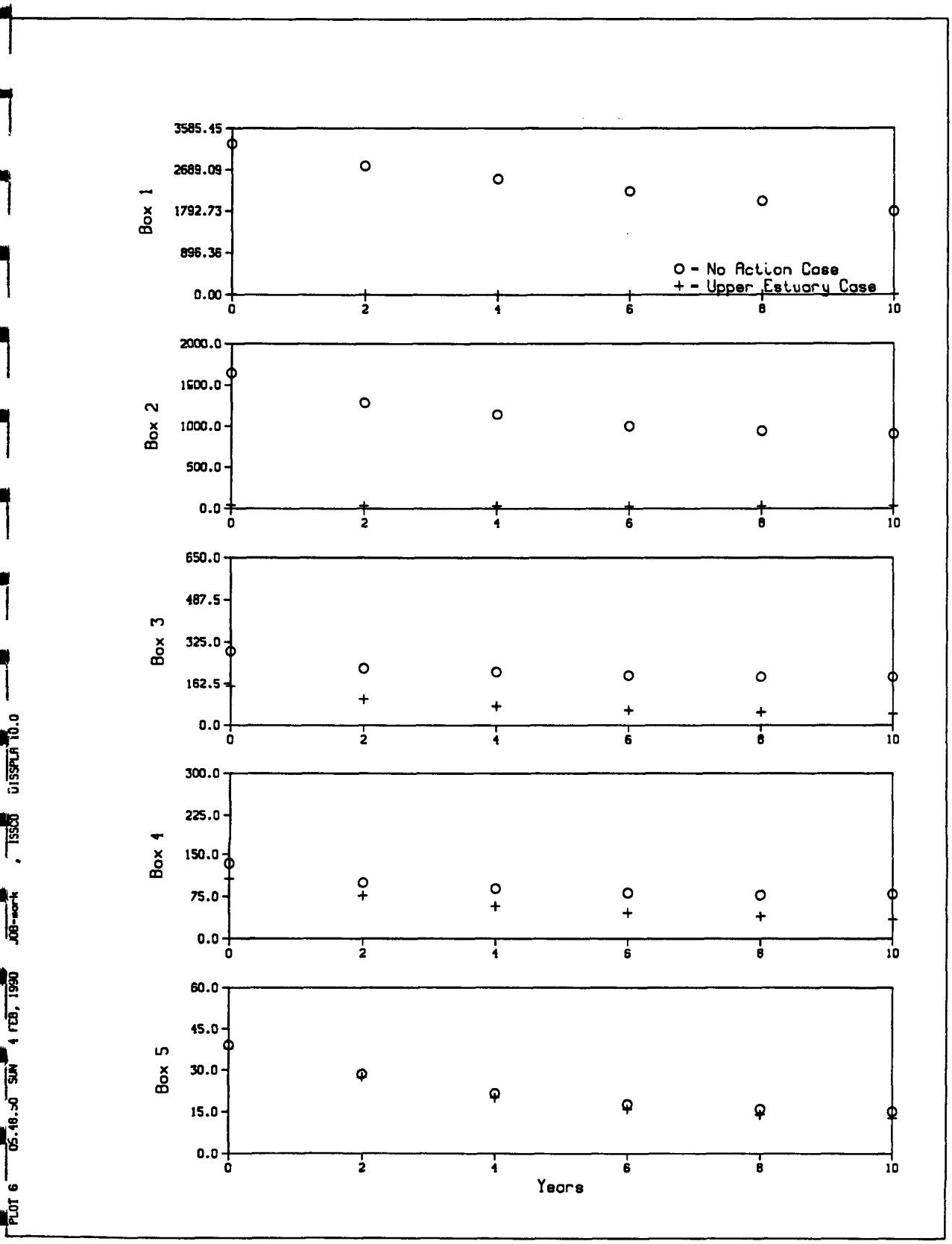

FIGURE F.29. BOX-AVERAGED MODEL RESULTS FOR THE UPPER-ESTUARY SCENARIO. TOTAL PCB CONCENTRATION (ng/l) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = UPPER-ESTUARY SCENARIO.

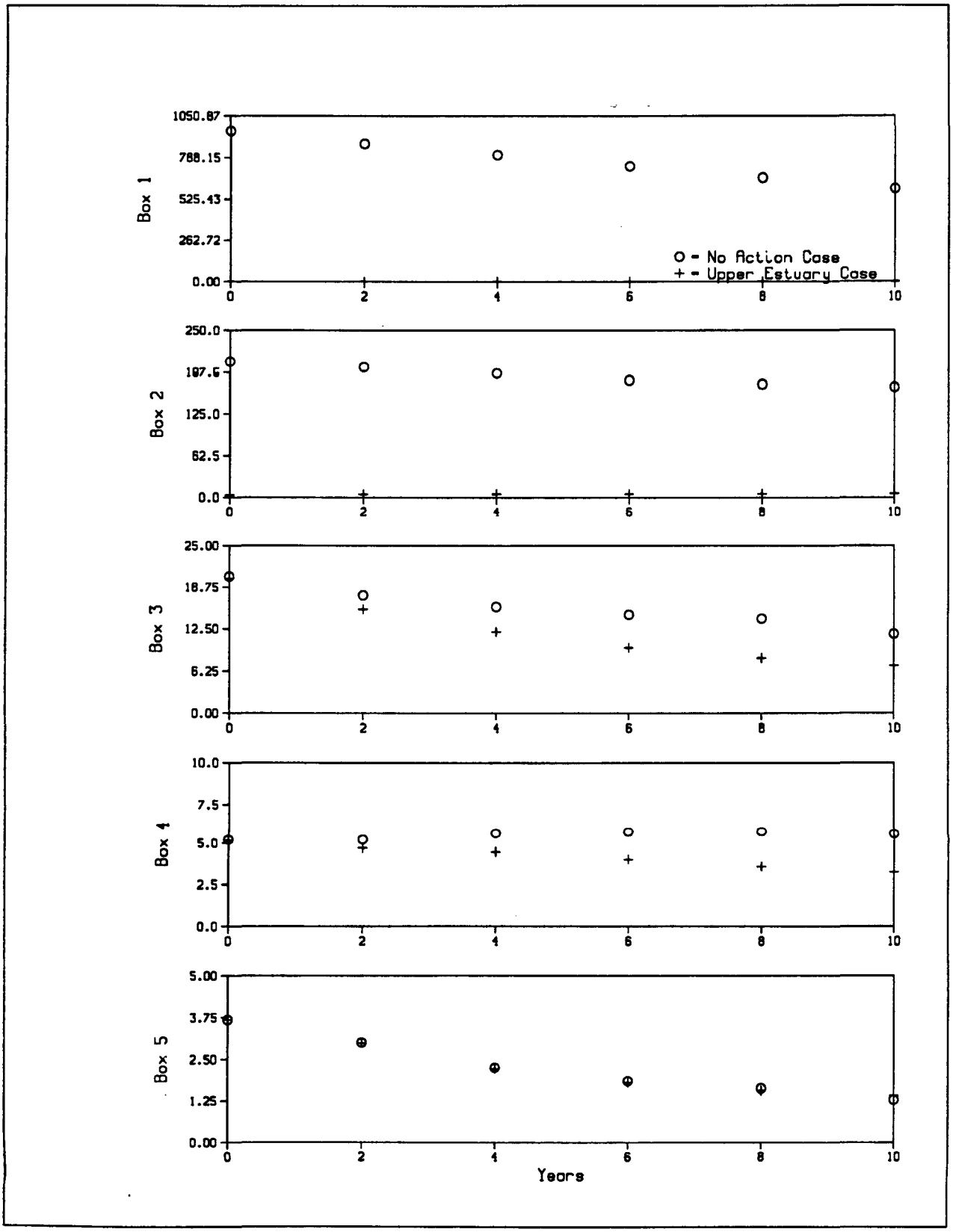

FIGURE F.30. BOX-AVERAGED MODEL RESULTS FOR THE UPPER-ESTUARY SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = UPPER-ESTUARY SCENARIO.

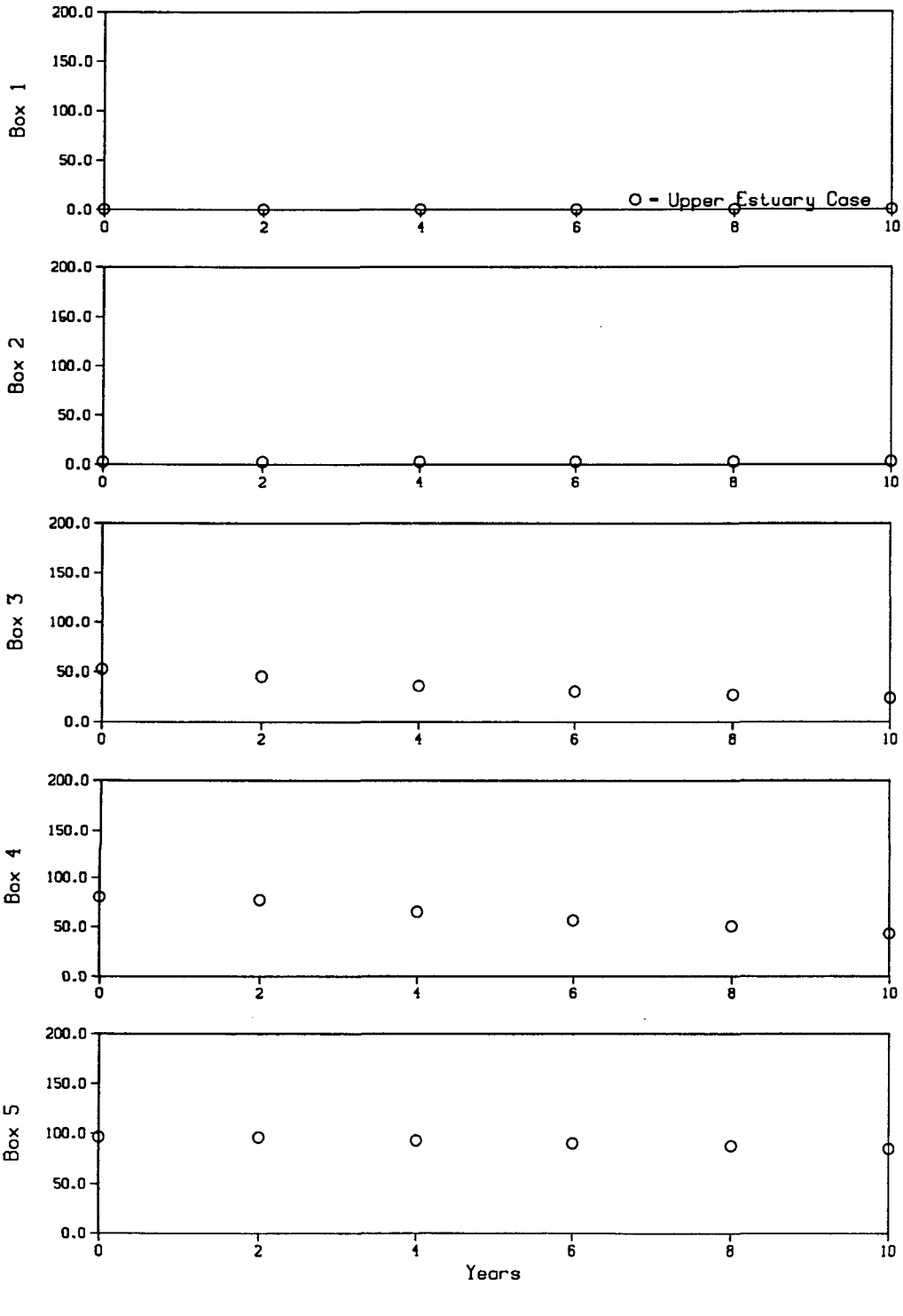

FIGURE F.31. BOX-AVERAGED MODEL RESULTS FOR THE UPPER-ESTUARY SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

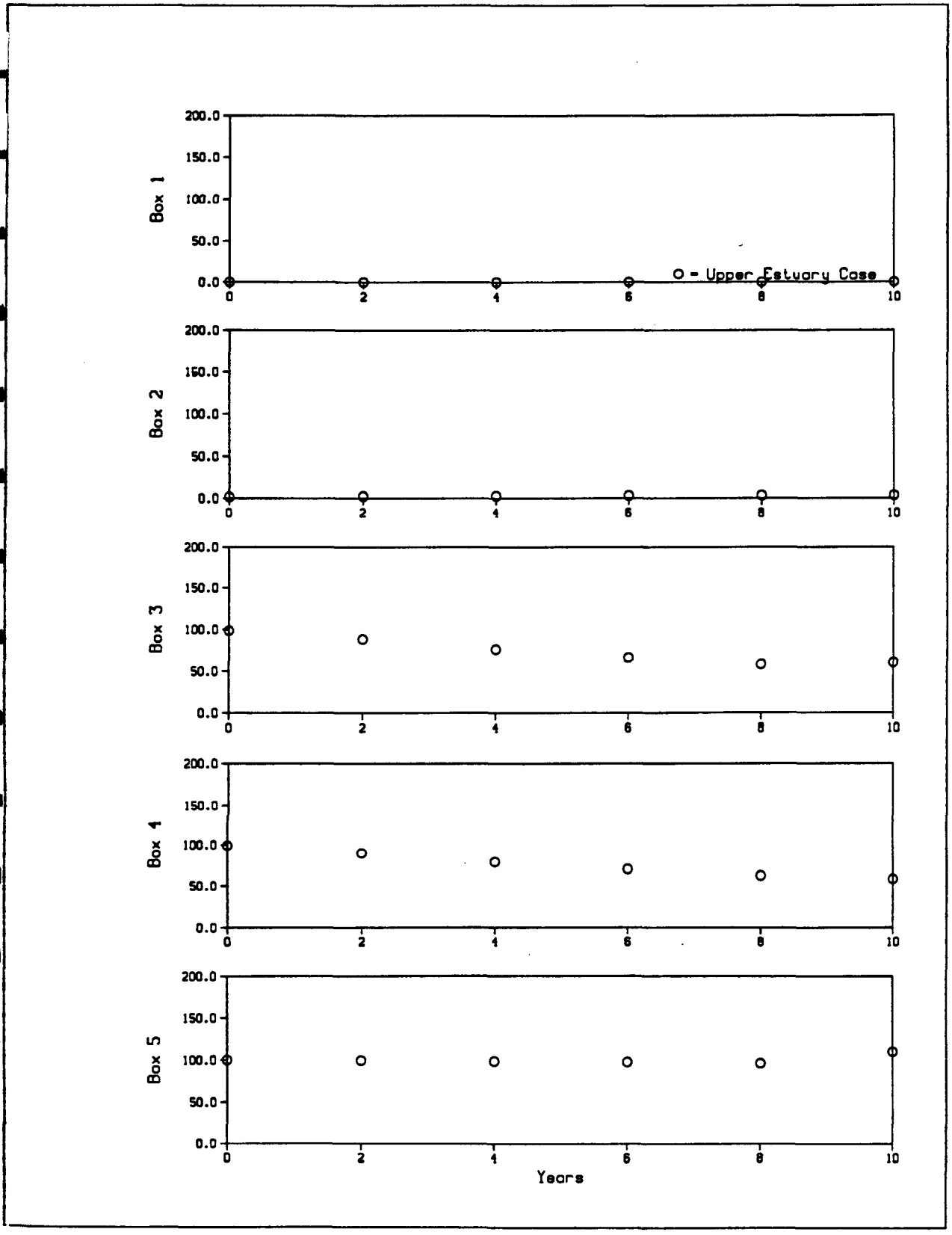

FIGURE F.32. BOX-AVERAGED MODEL RESULTS FOR THE UPPER-ESTUARY SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

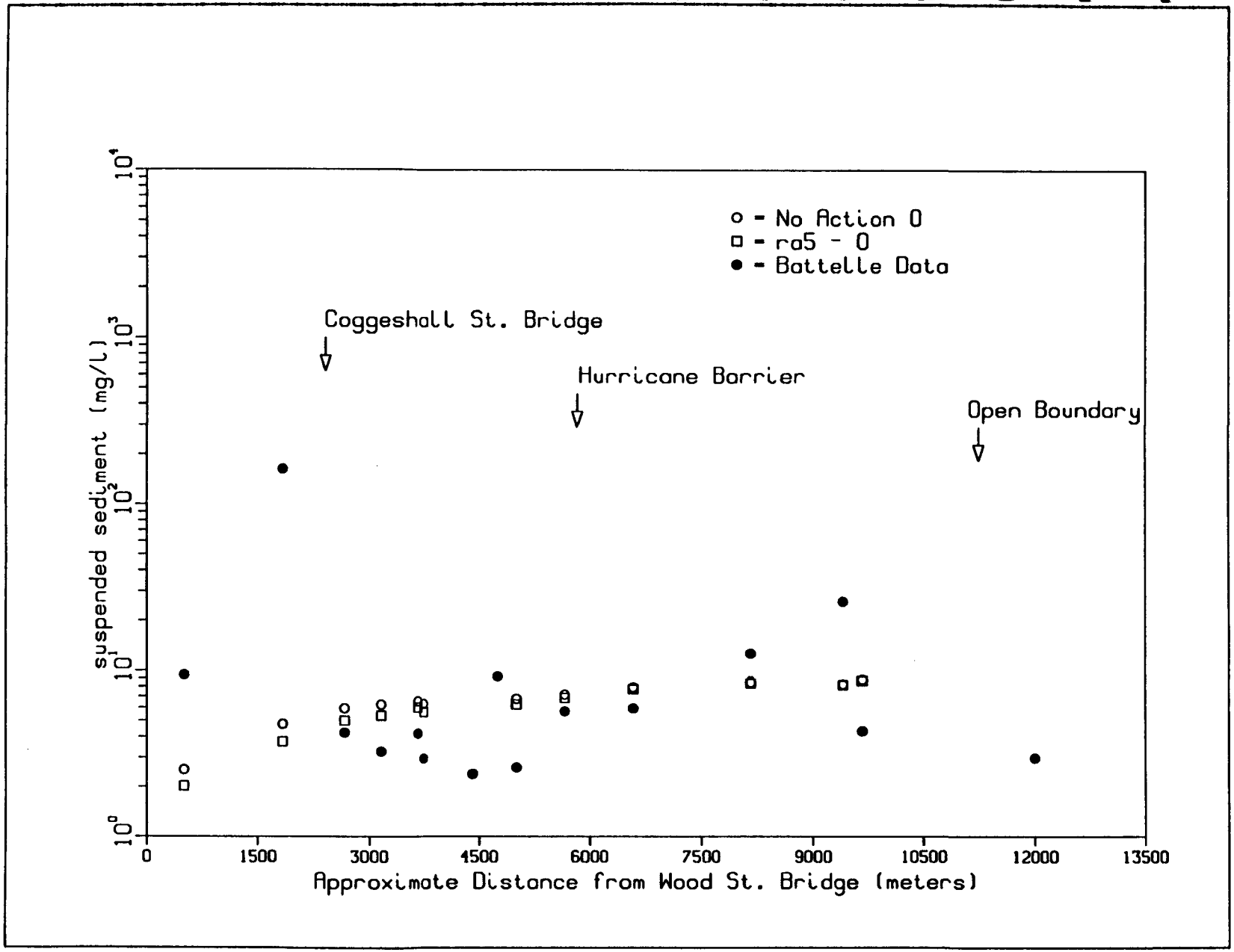

FIGURE F.33. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 0 OF THE LOWER-HARBOR SCENARIO. o = NO-ACTION SCENARIO, □ = LOWER-HARBOR SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

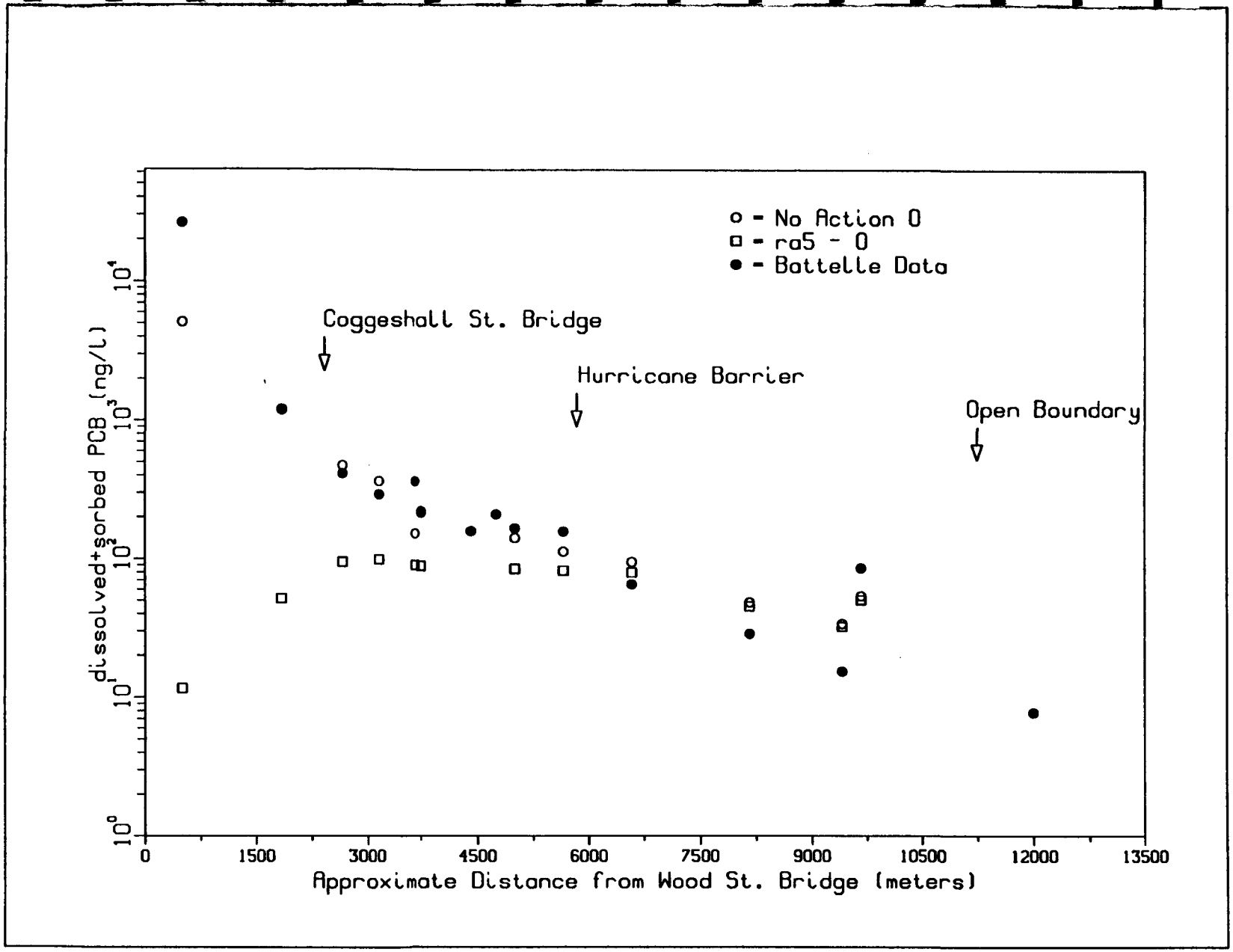

FIGURE F.34. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE LOWER-HARBOR SCENARIO. o = NO-ACTION SCENARIO, □ = LOWER-HARBOR SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

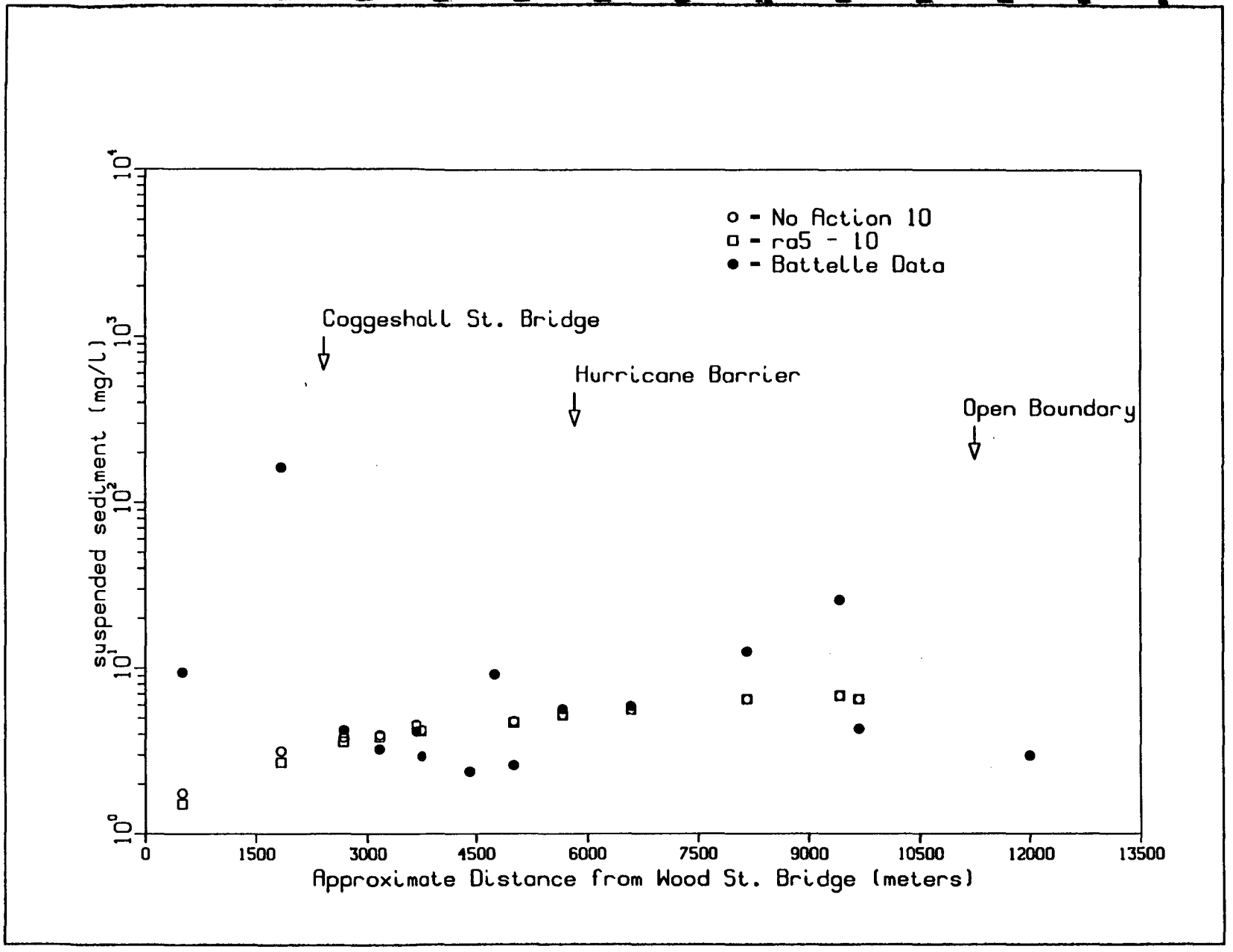

FIGURE F.35. AVERAGE CONCENTRATION OF SUSPENDED SEDIMENT IN THE WATER COLUMN FOR YEAR 10 OF THE LOWER-HARBOR SCENARIO. o = NO-ACTION SCENARIO, □ = LOWER-HARBOR SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

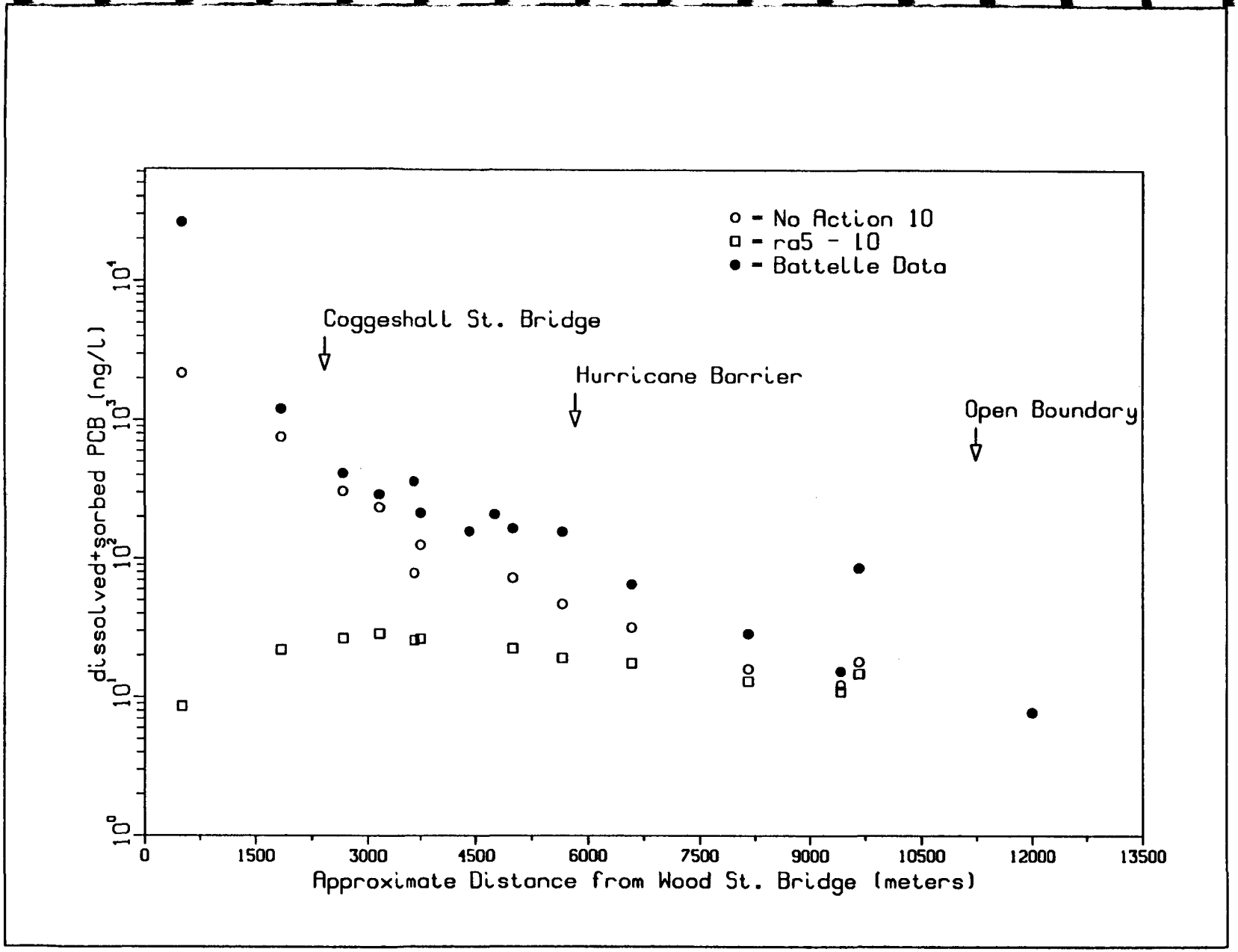

FIGURE F.36. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE LOWER-HARBOR SCENARIO. o = NO-ACTION SCENARIO, □ = LOWER-HARBOR SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

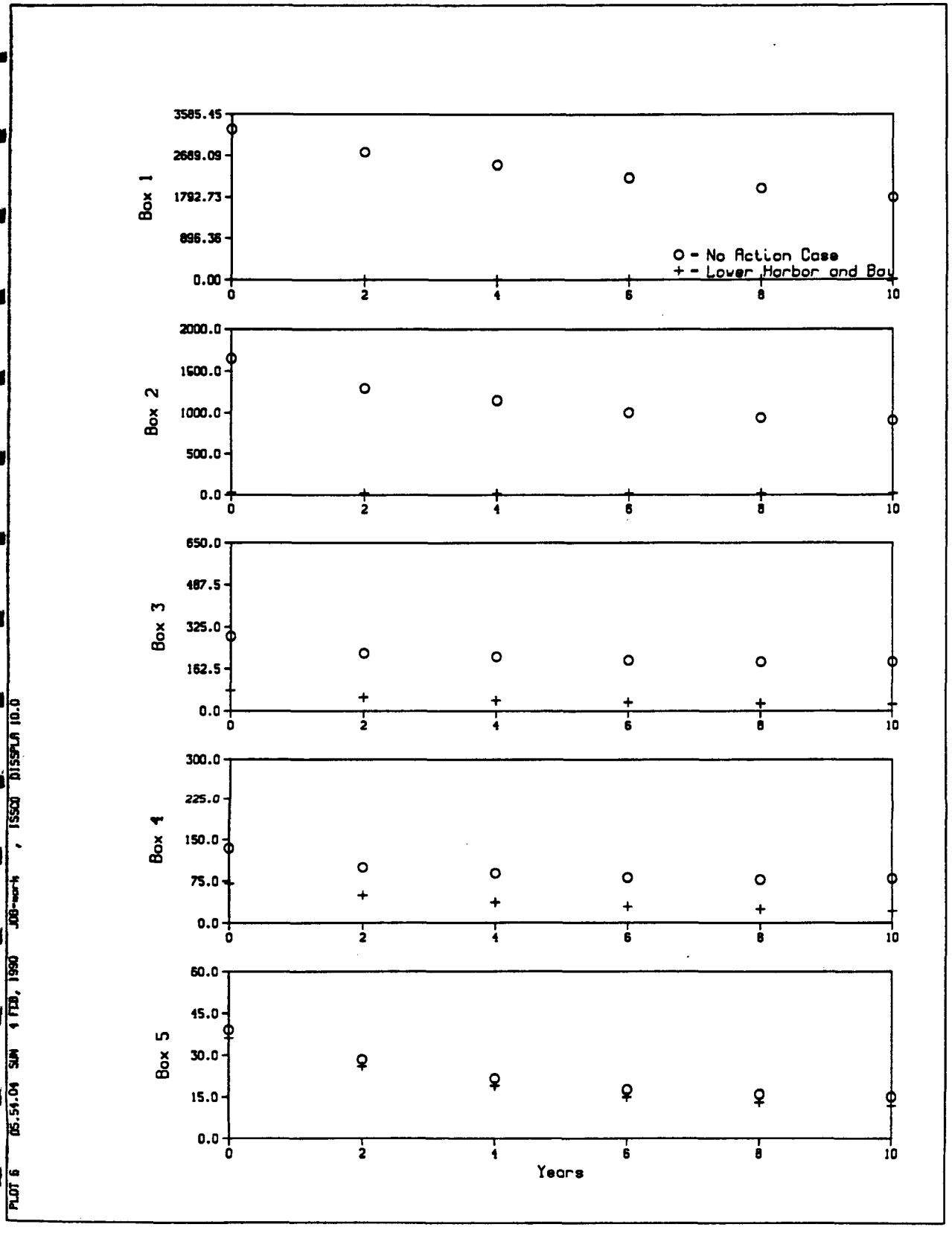

FIGURE F.37. BOX-AVERAGED MODEL RESULTS FOR THE LOWER-HARBOR SCENARIO. TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = LOWER-HARBOR SCENARIO.

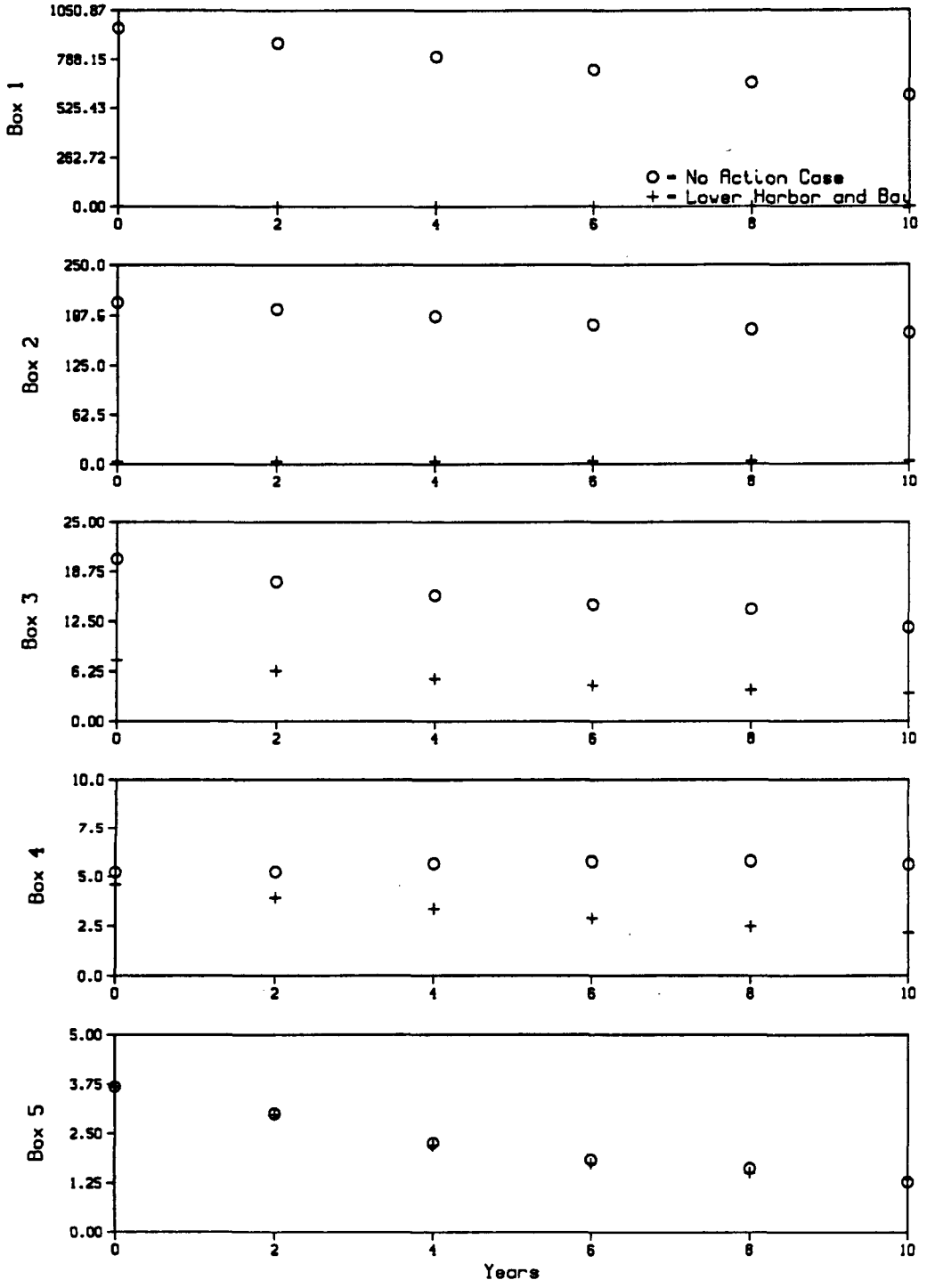

FIGURE F.38. BOX-AVERAGED MODEL RESULTS FOR THE LOWER-HARBOR SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = LOWER HARBOR SCENARIO.

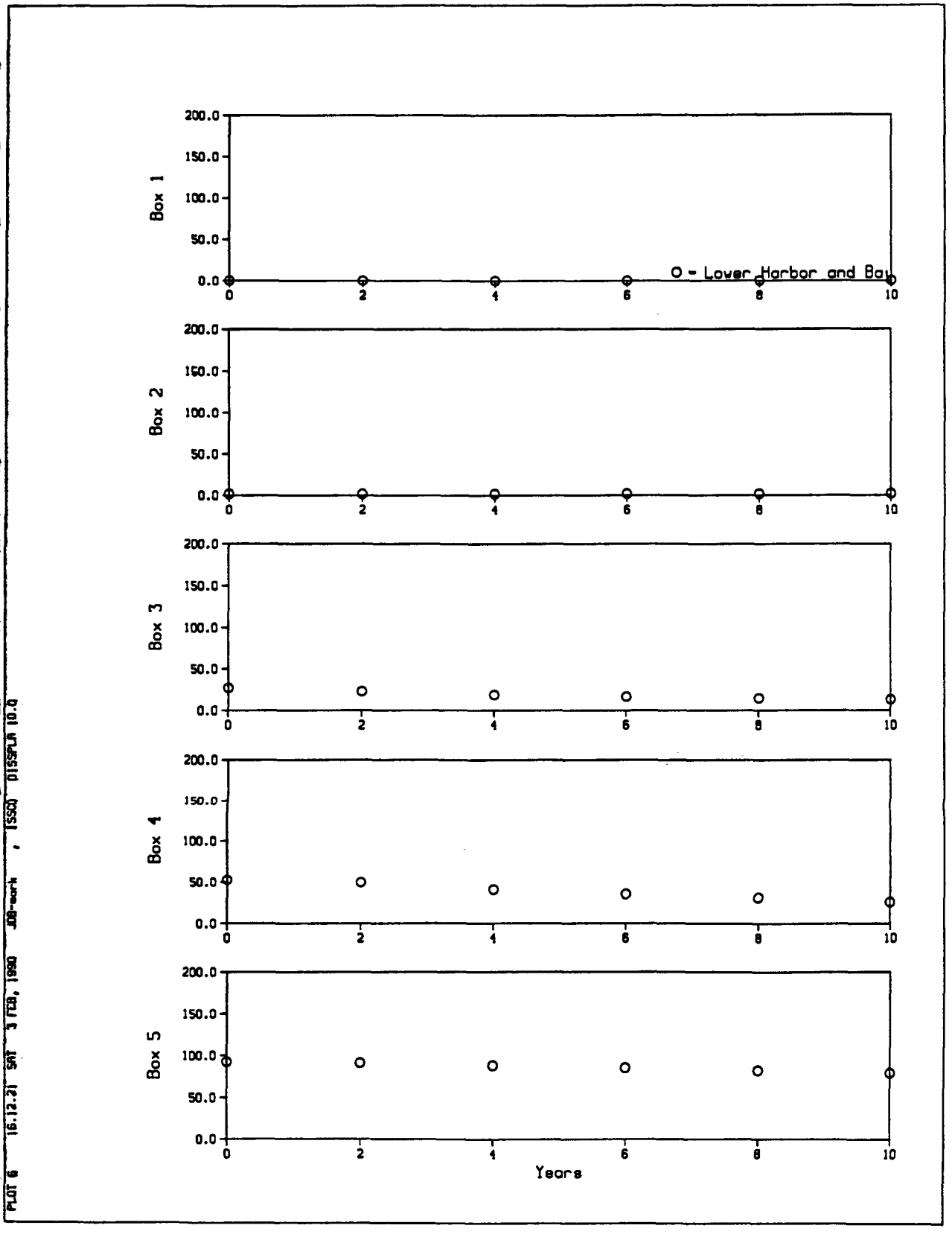

FIGURE F.39. BOX-AVERAGED MODEL RESULTS FOR THE LOWER HARBOR SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

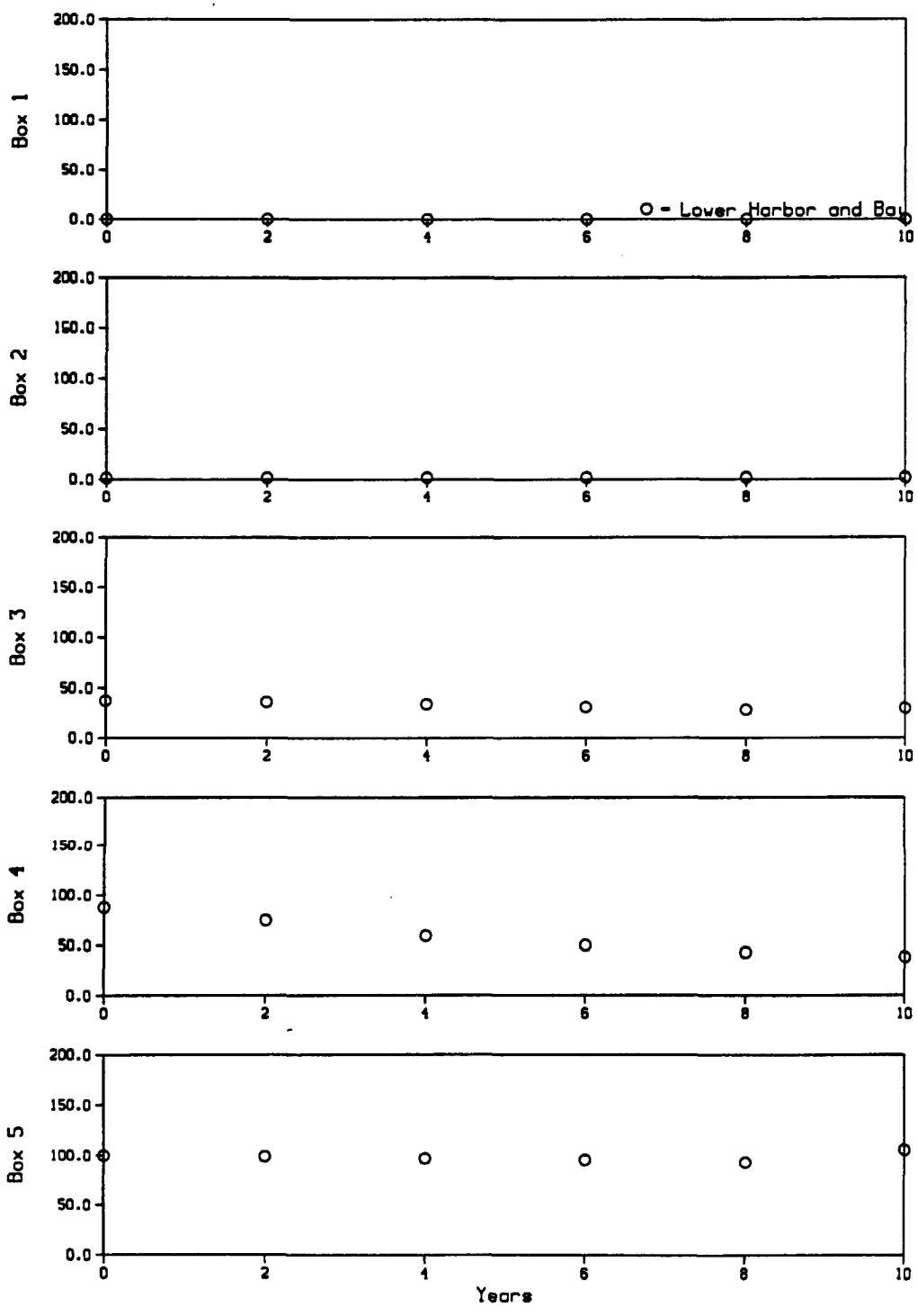

FIGURE F.40. BOX-AVERAGED MODEL RESULTS FOR THE LOWER-HARBOR SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

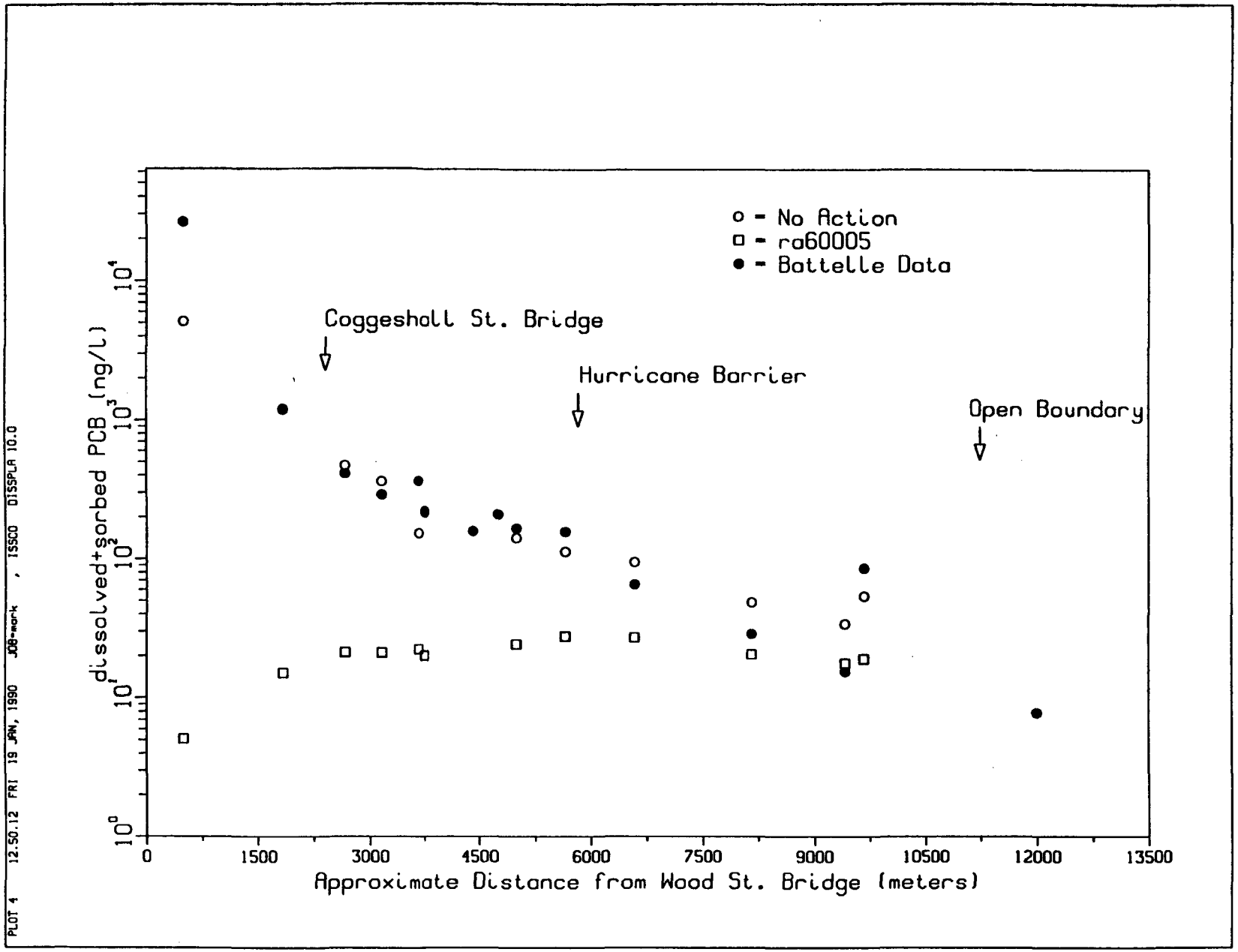

FIGURE F.41. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE 1-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 1-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

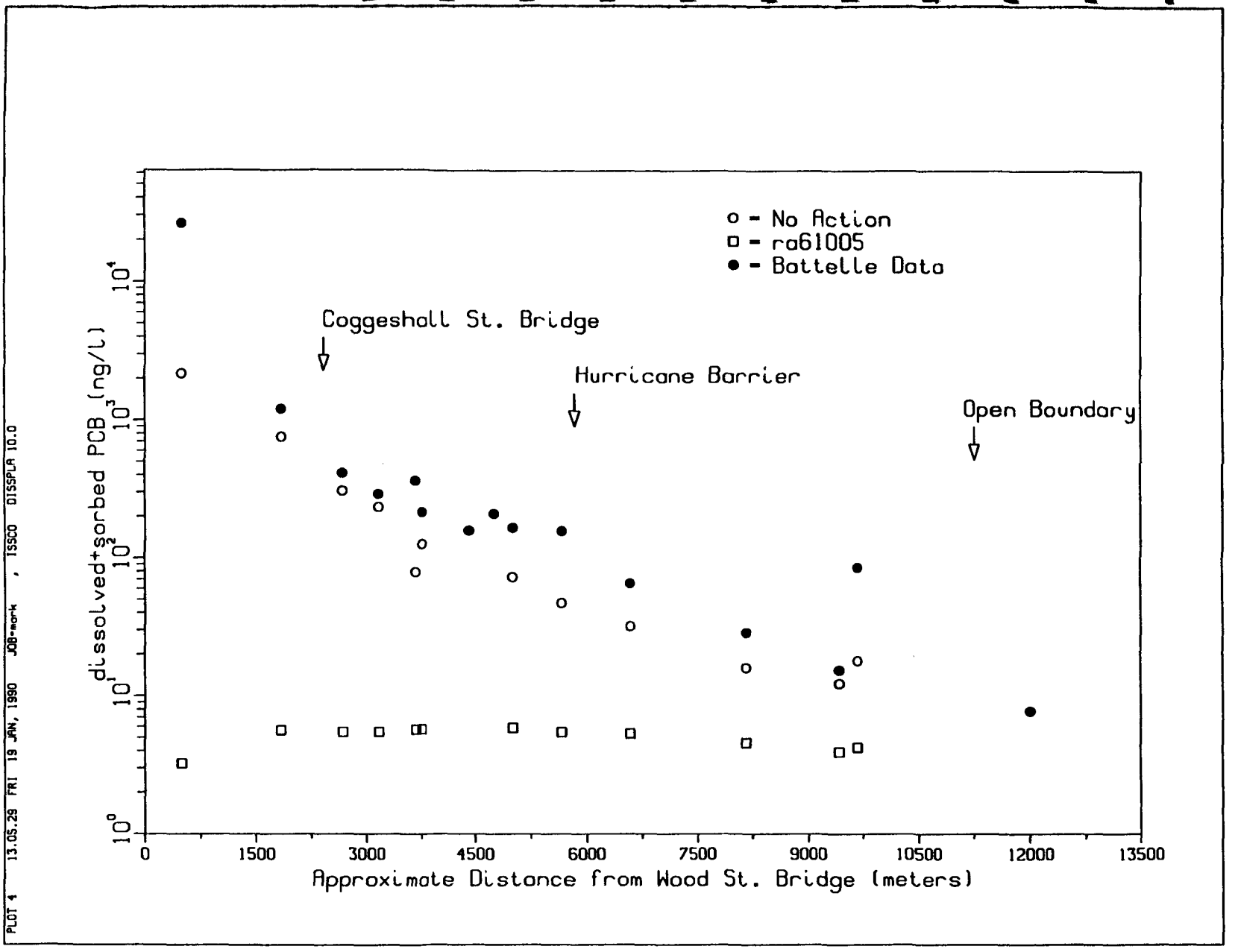

FIGURE F.42. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE 1-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 1-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

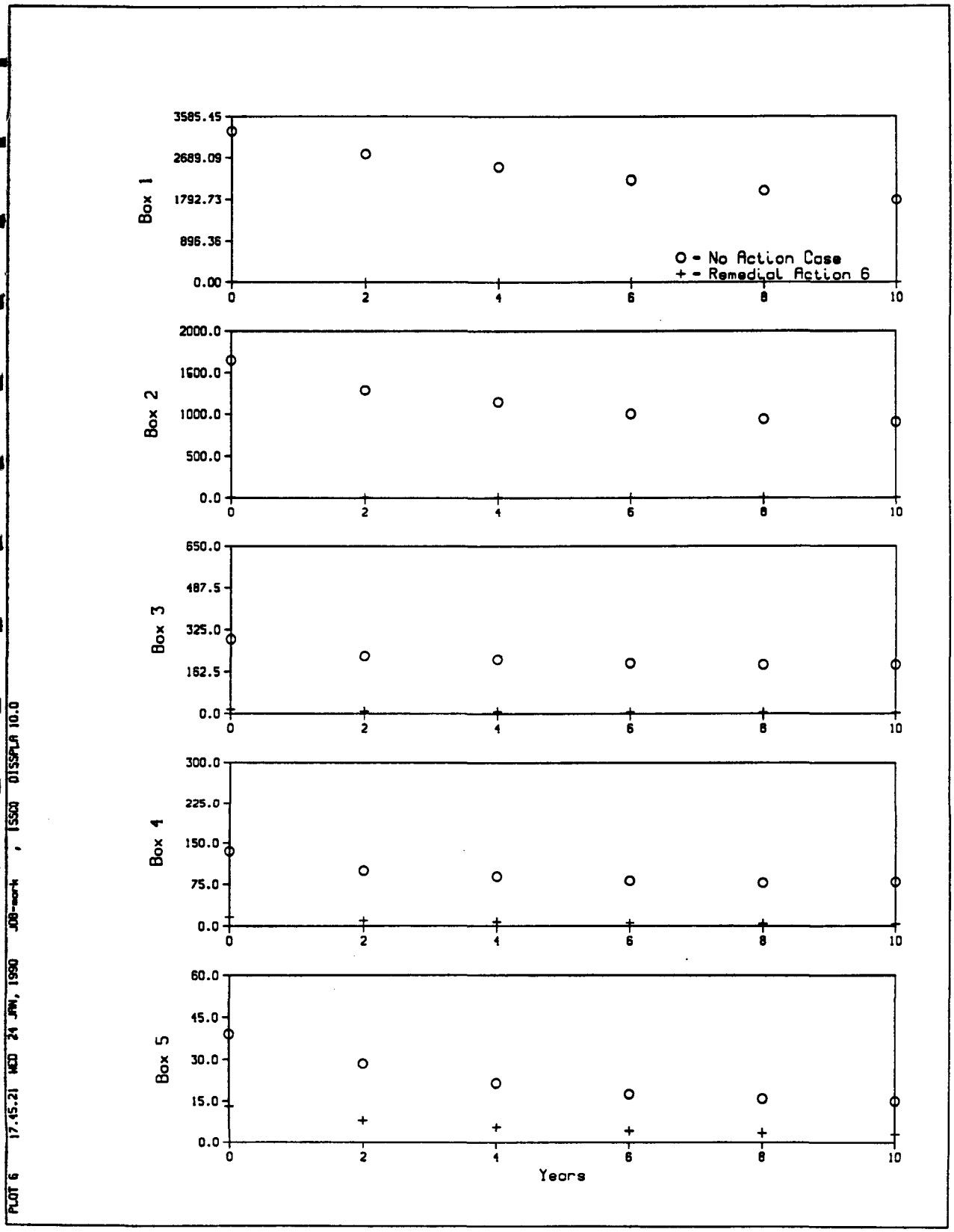

FIGURE F.43. BOX-AVERAGED MODEL RESULTS FOR THE 1-ppm SCENARIO. TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = 1-ppm SCENARIO.

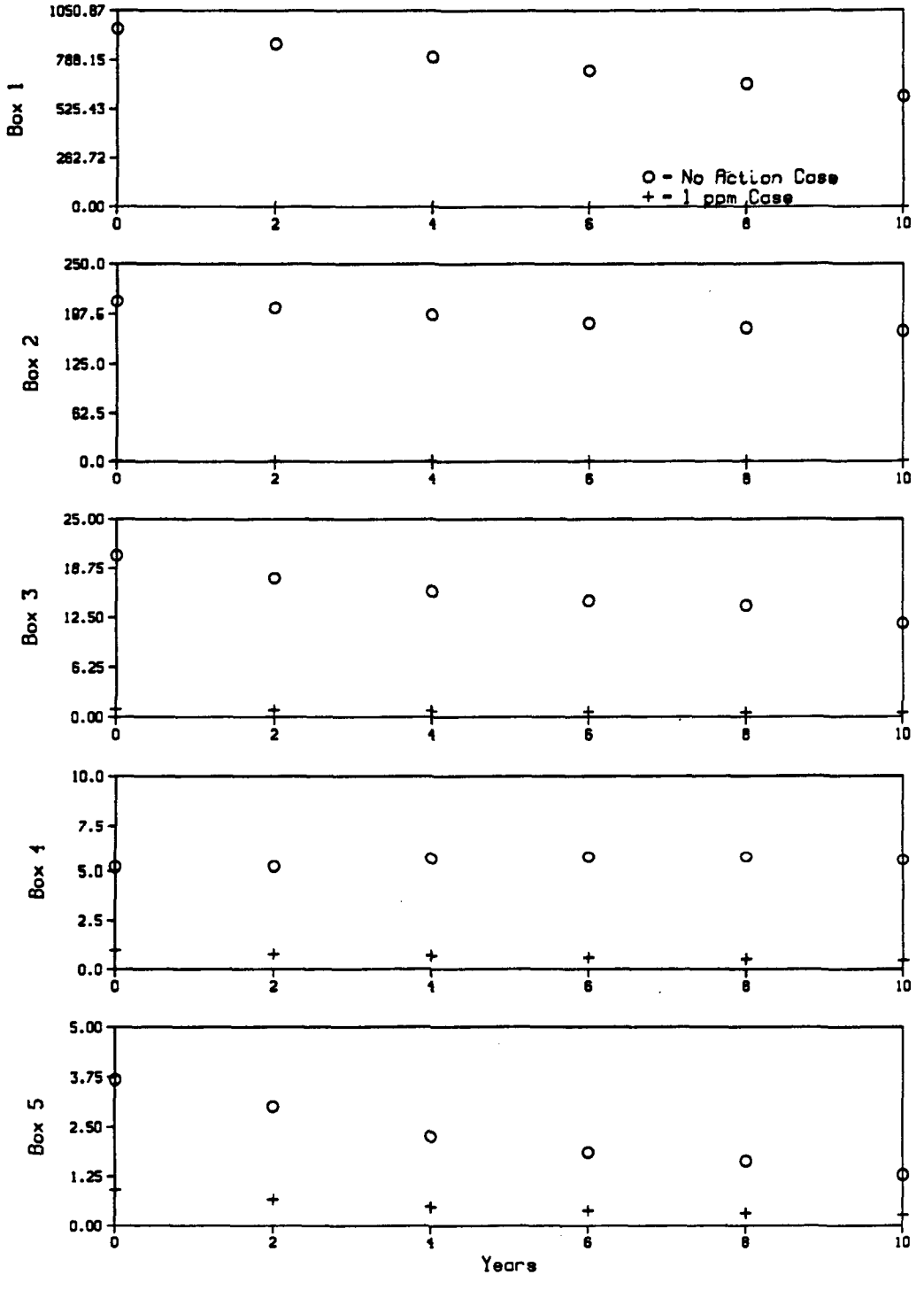

FIGURE F.44. BOX-AVERAGED MODEL RESULTS FOR THE 1-ppm SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = 1-ppm SCENARIO.

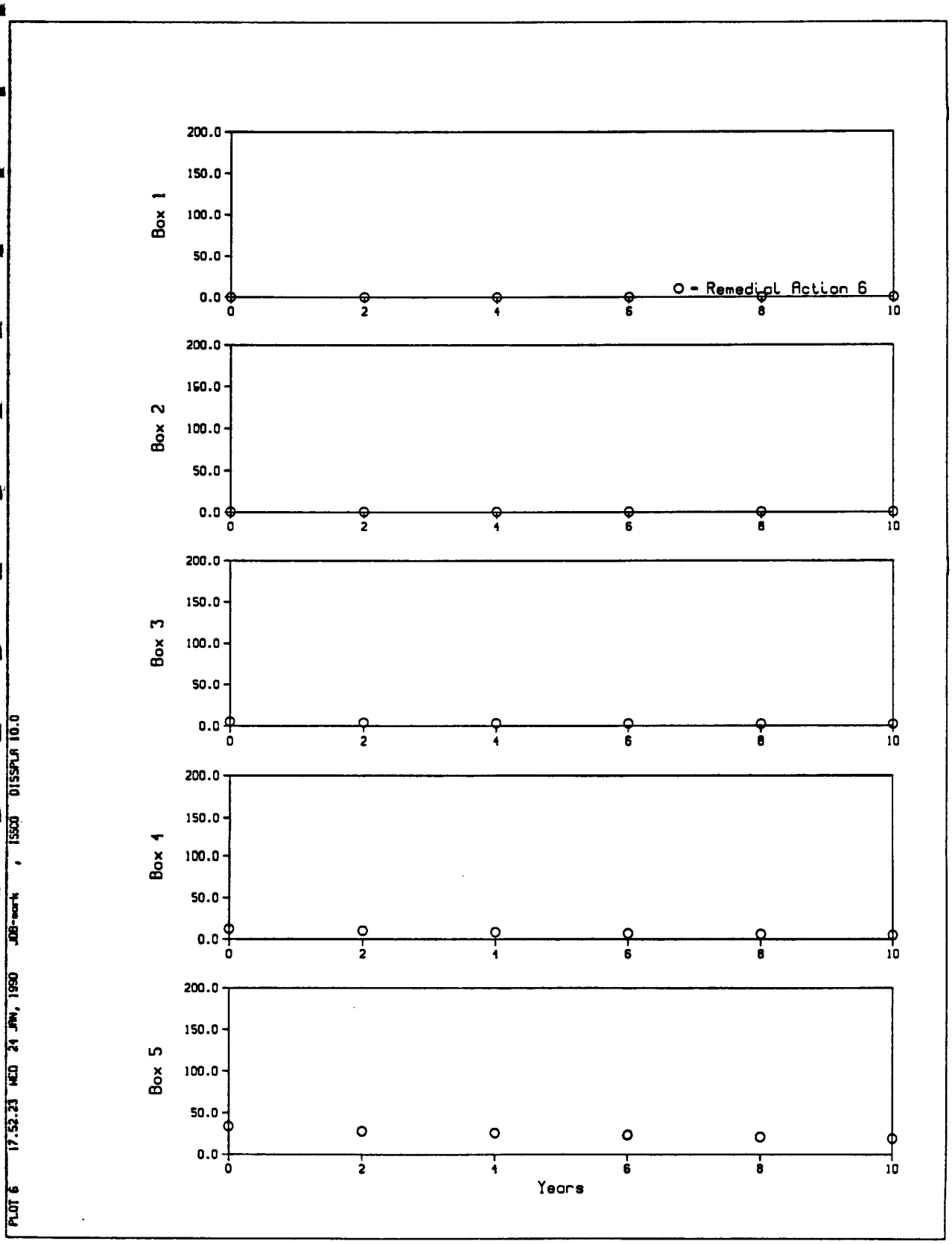

FIGURE F.45. BOX-AVERAGED MODEL RESULTS FOR THE 1-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

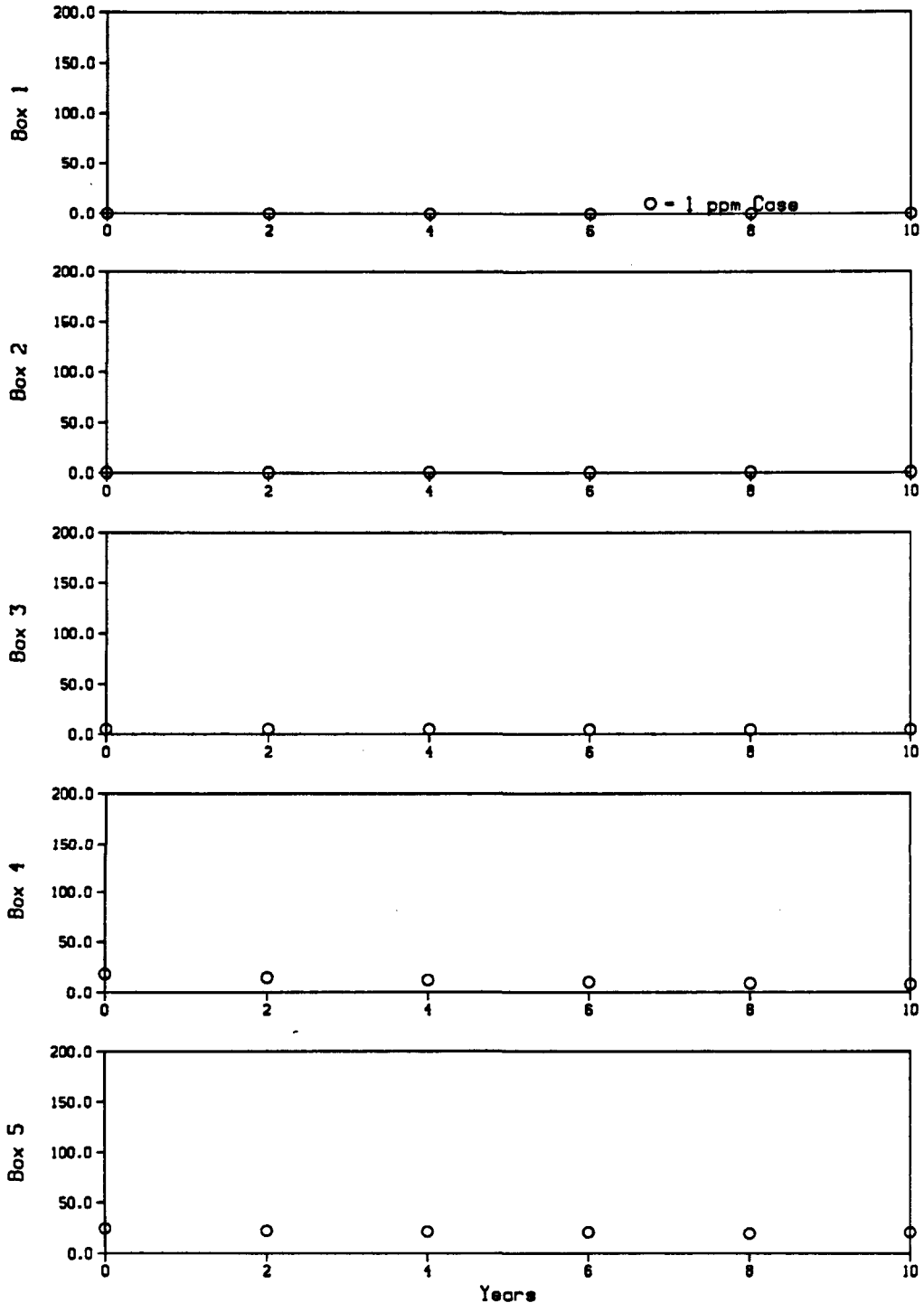

FIGURE F.46. BOX-AVERAGED MODEL RESULTS FOR THE 1-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

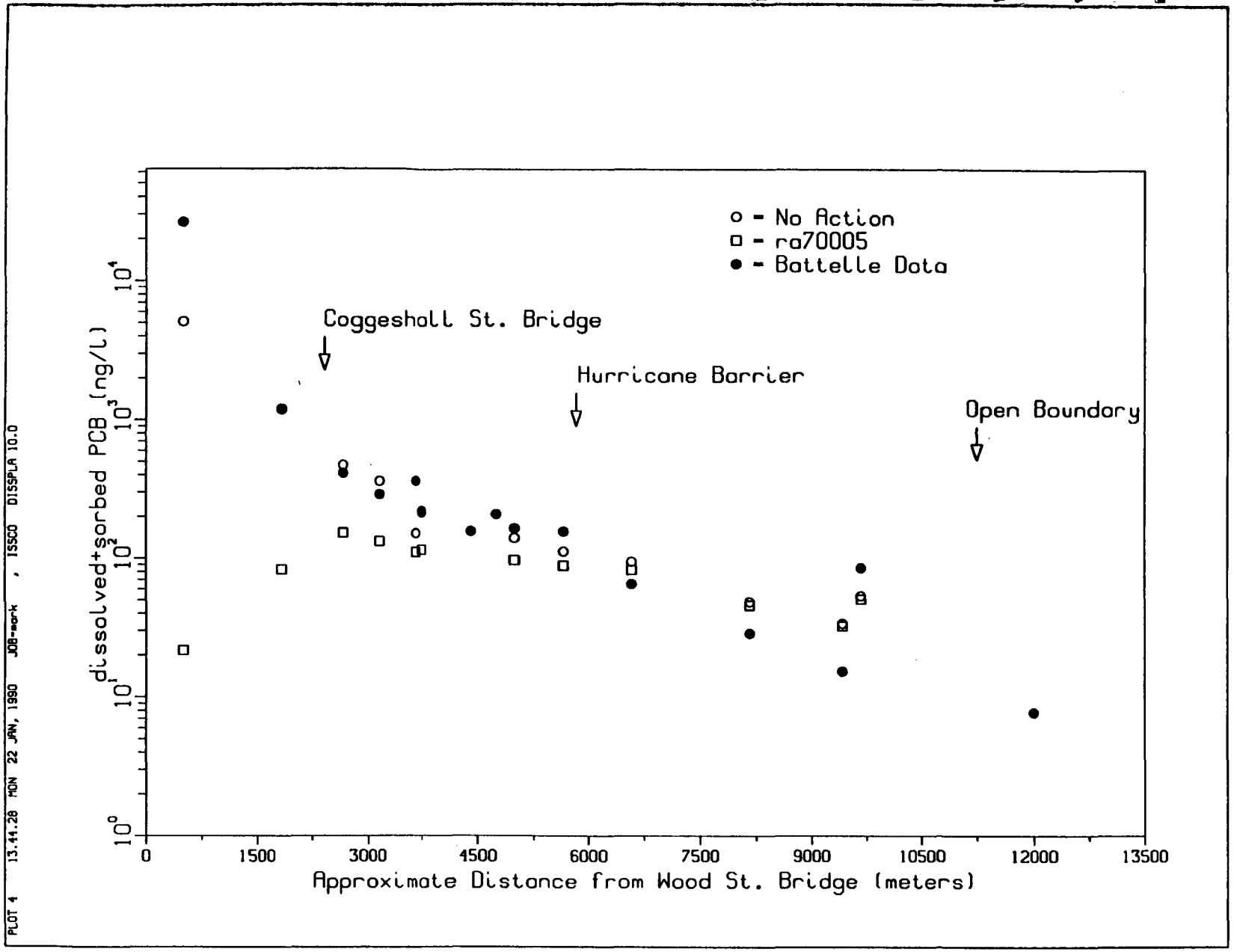

FIGURE F.47. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE 50-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 50-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

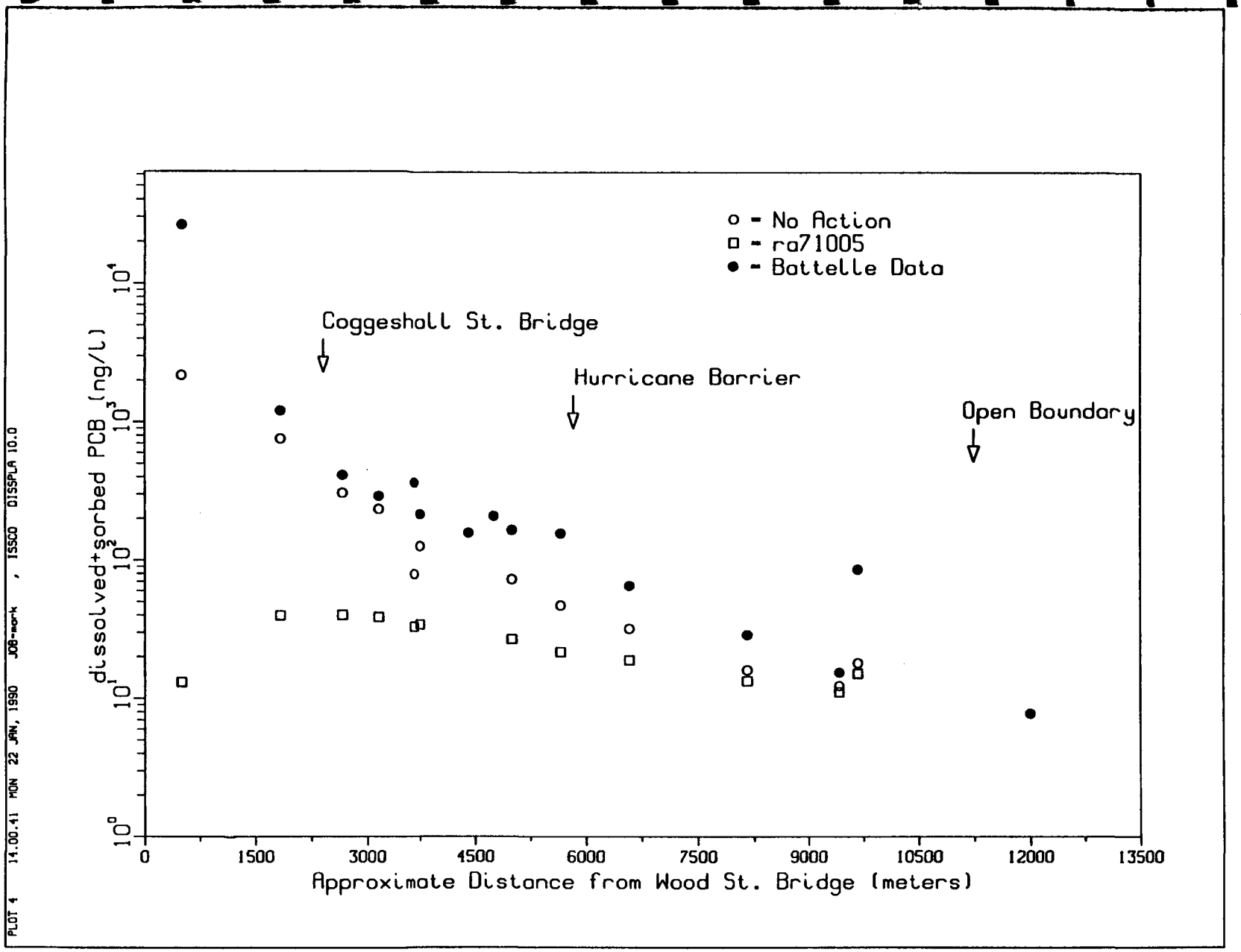

FIGURE F.48. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE 50-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 50-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

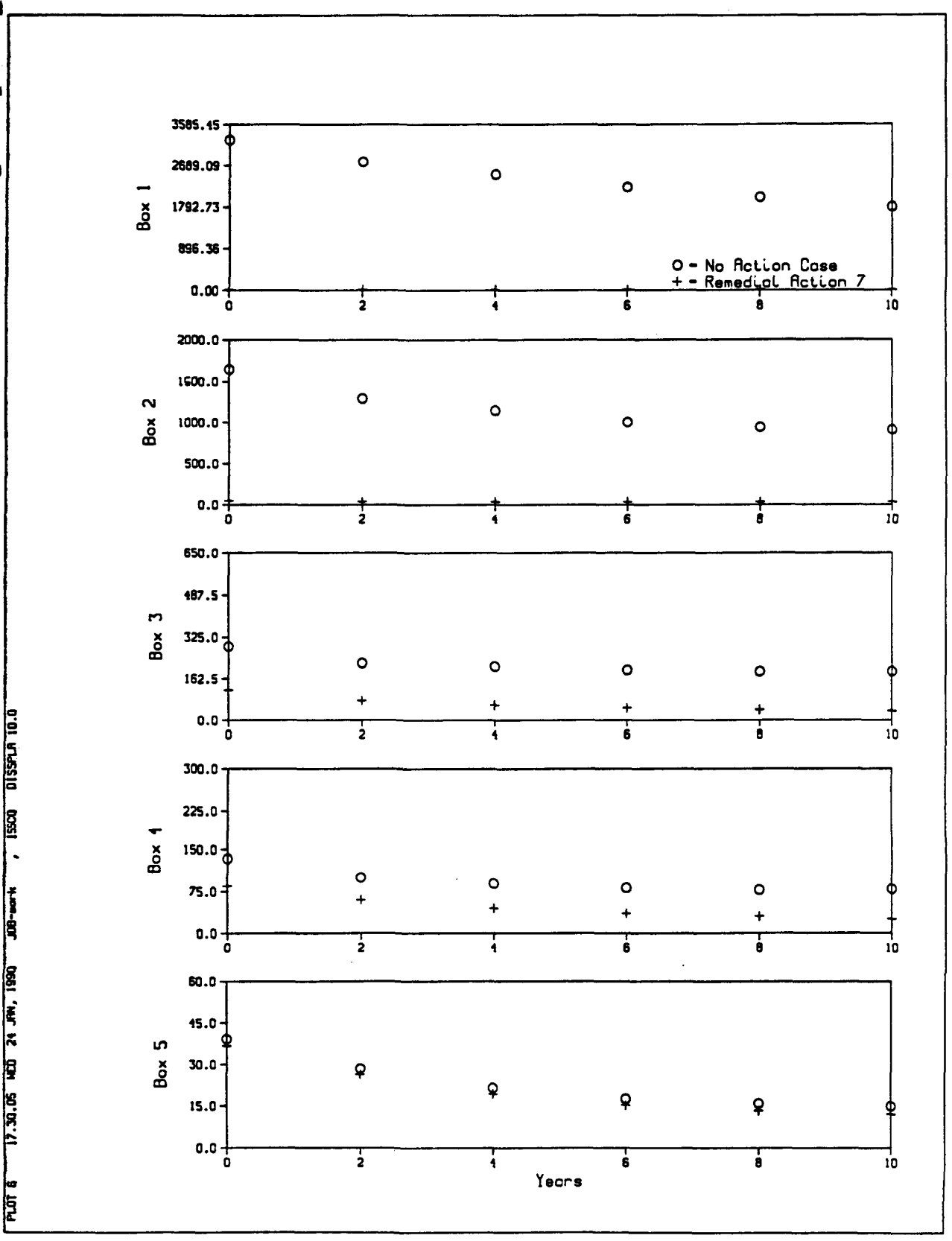

FIGURE F.49. BOX-AVERAGED MODEL RESULTS FOR THE 50-ppm SCENARIO. TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = 50-ppm SCENARIO.

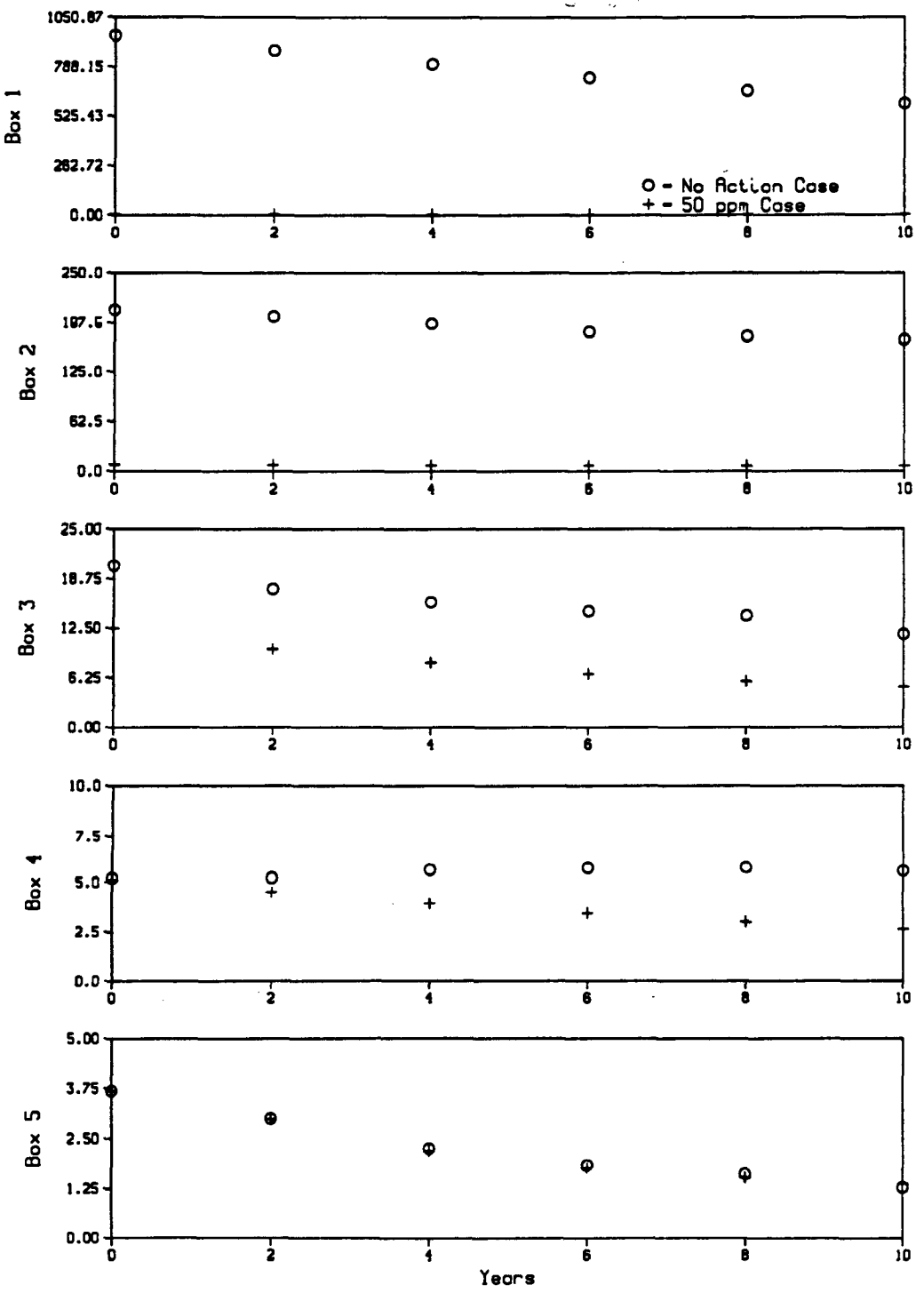

FIGURE F.50. BOX-AVERAGED MODEL RESULTS FOR THE 50-ppm SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = 50-ppm SCENARIO.

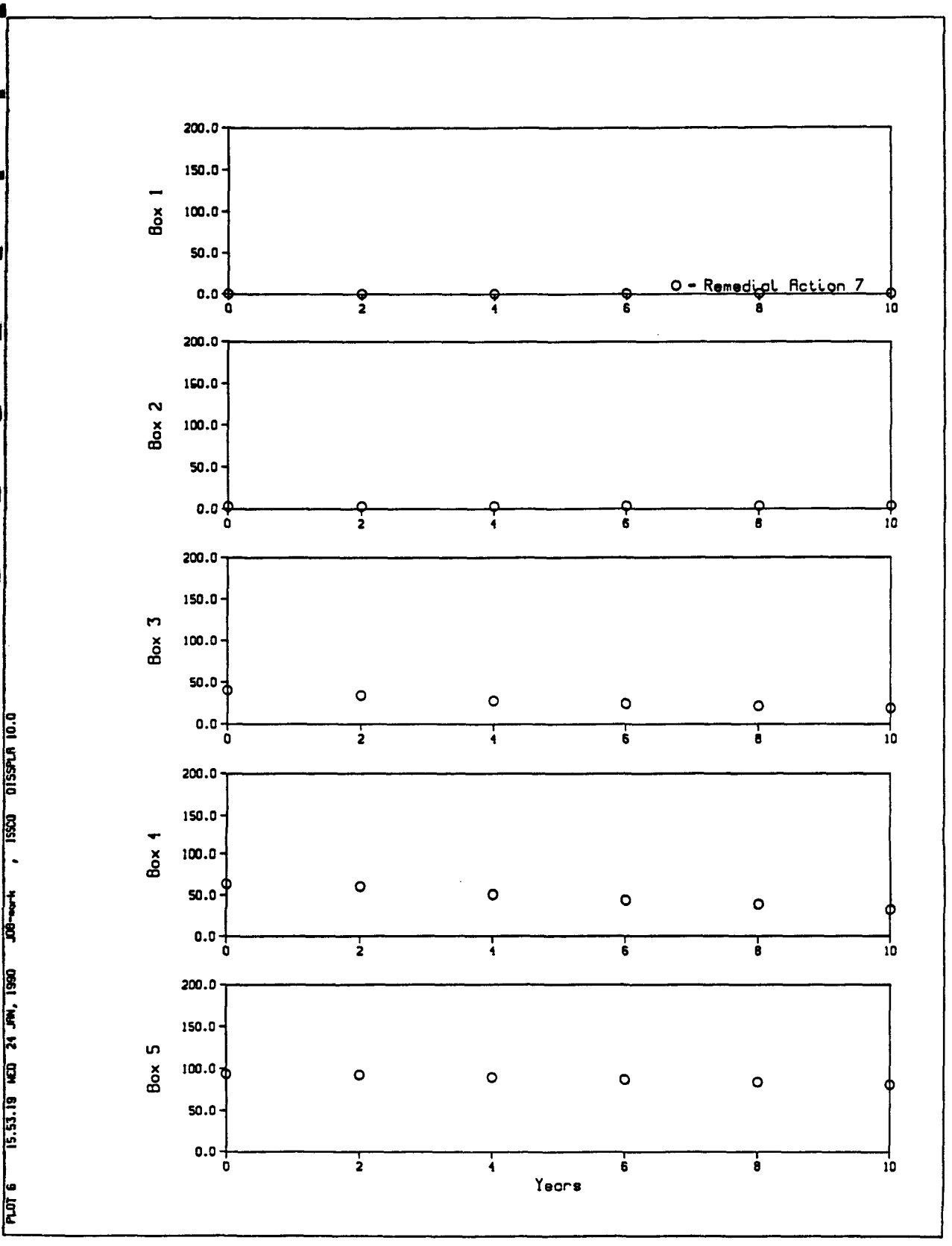

FIGURE F.51. BOX-AVERAGED MODEL RESULTS FOR THE 50-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

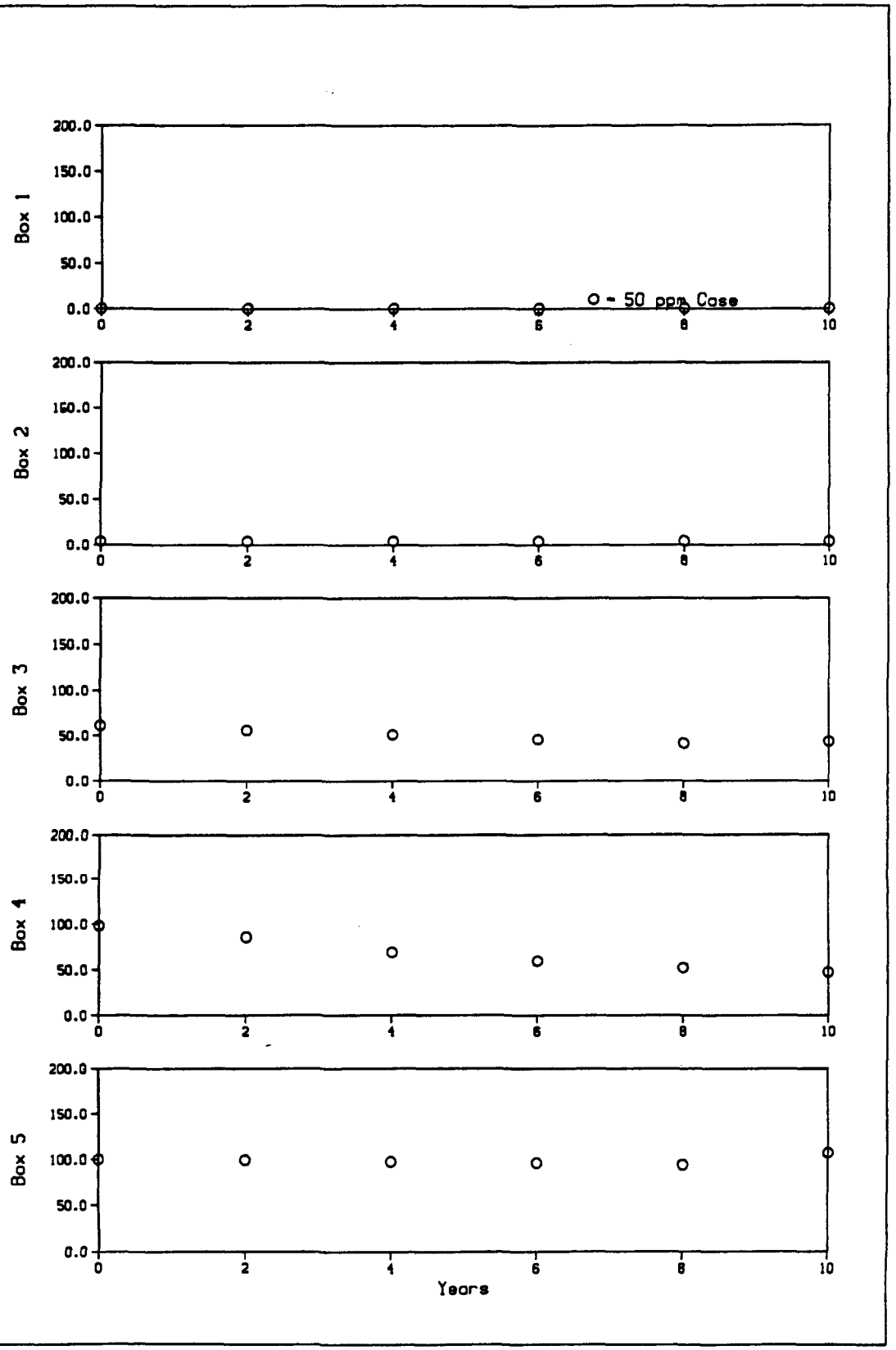

FIGURE F.52. BOX-AVERAGED MODEL RESULTS FOR THE 50-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.

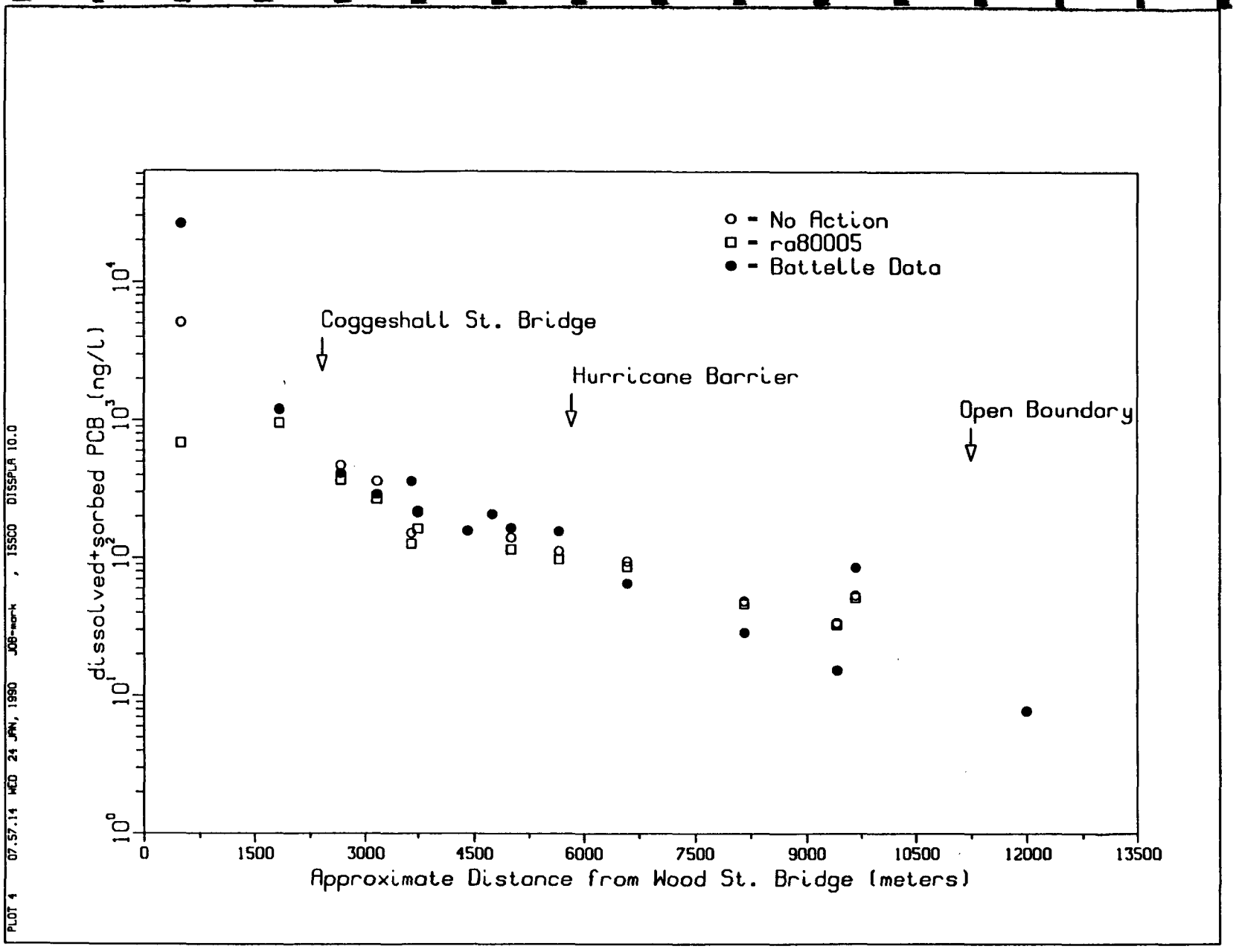

FIGURE F.53. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 0 OF THE 500-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 500-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

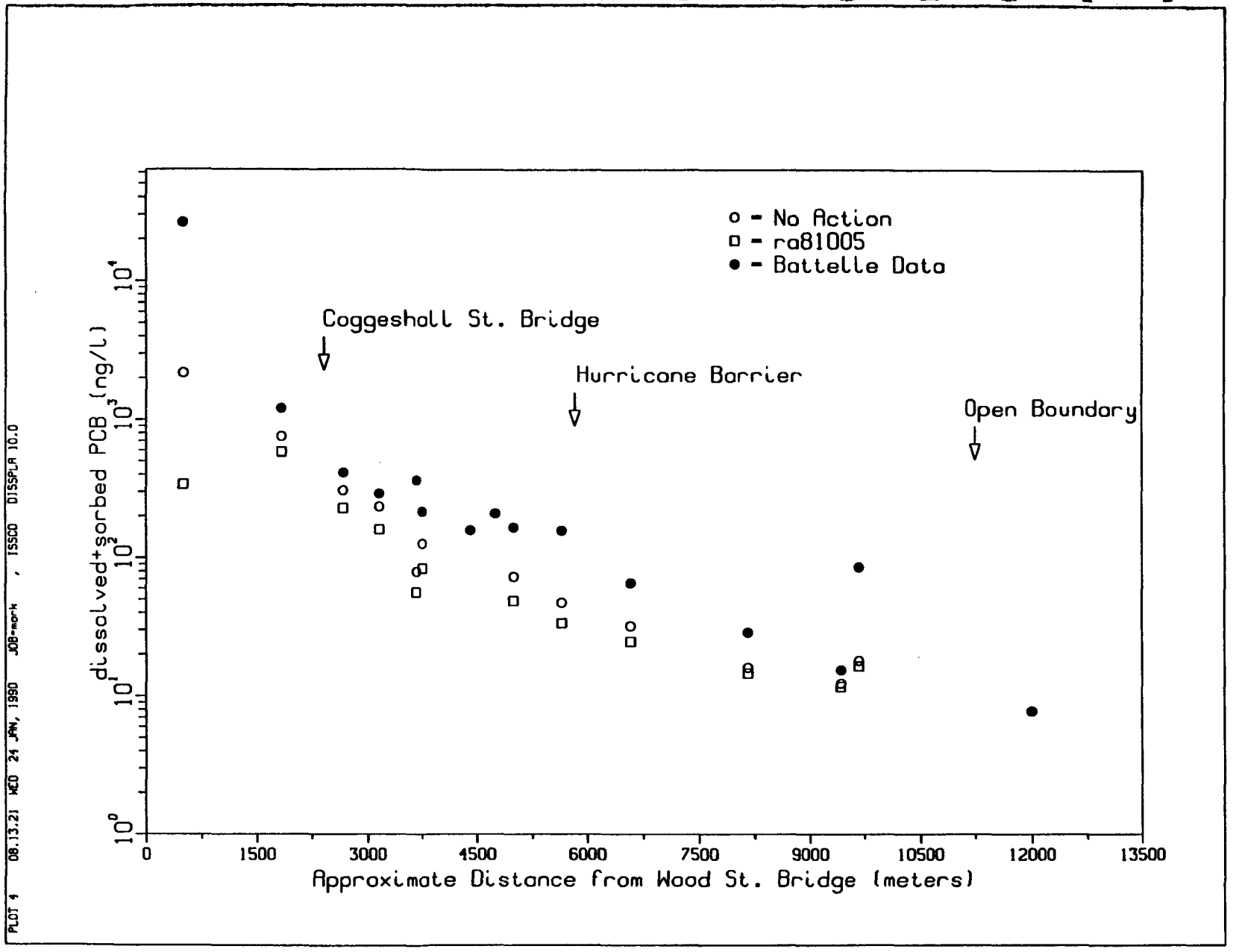

FIGURE F.54. AVERAGE CONCENTRATION OF TOTAL PCBs IN THE WATER COLUMN FOR YEAR 10 OF THE 500-ppm SCENARIO. o = NO-ACTION SCENARIO, □ = 500-ppm SCENARIO, • = BATTELLE OCEAN SCIENCES DATA.

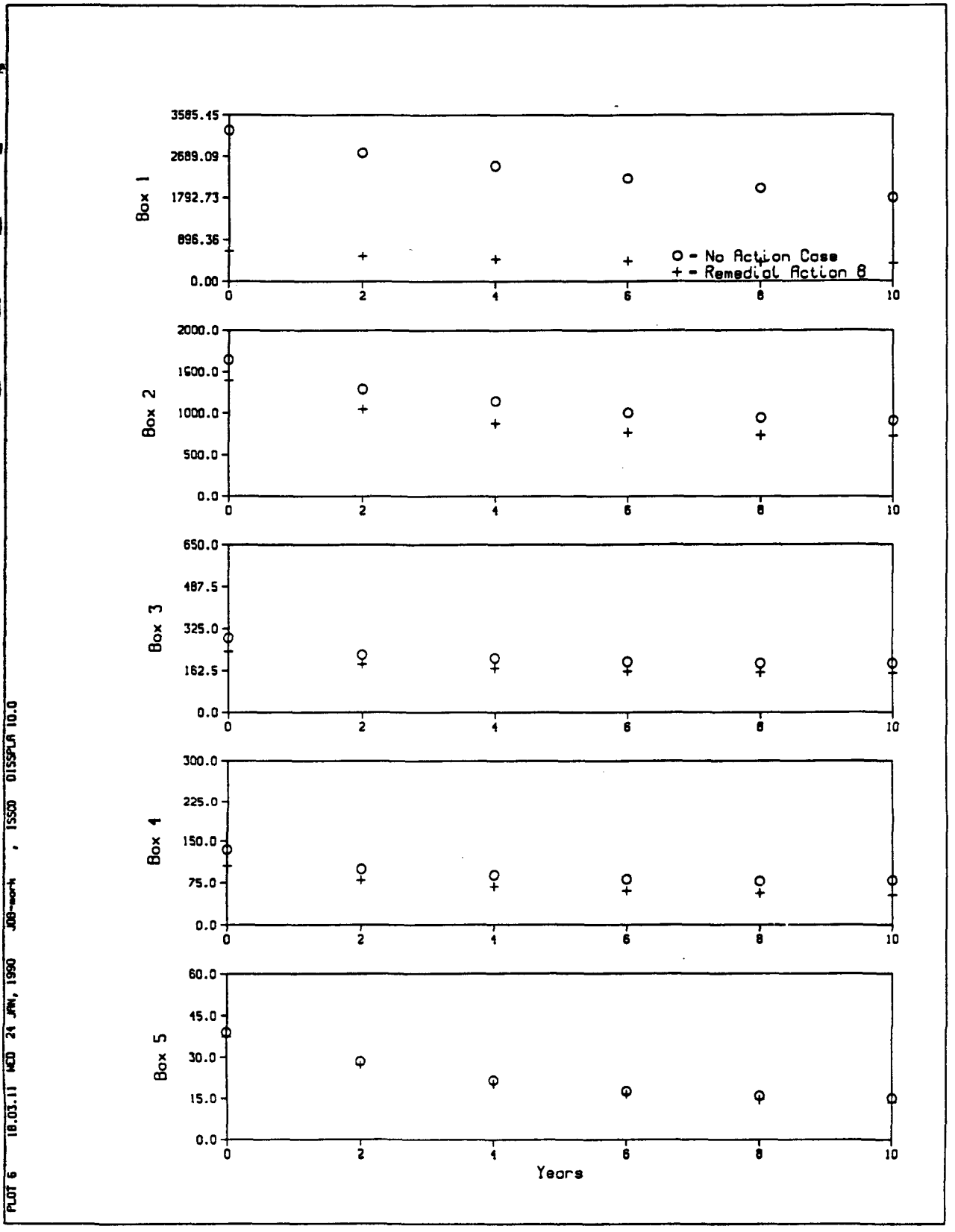

FIGURE F.55. BOX-AVERAGED MODEL RESULTS FOR THE 500-ppm SCENARIO. TOTAL PCB CONCENTRATION (ng/L) IN THE WATER COLUMN. o = NO-ACTION SCENARIO, + = 500-ppm SCENARIO.

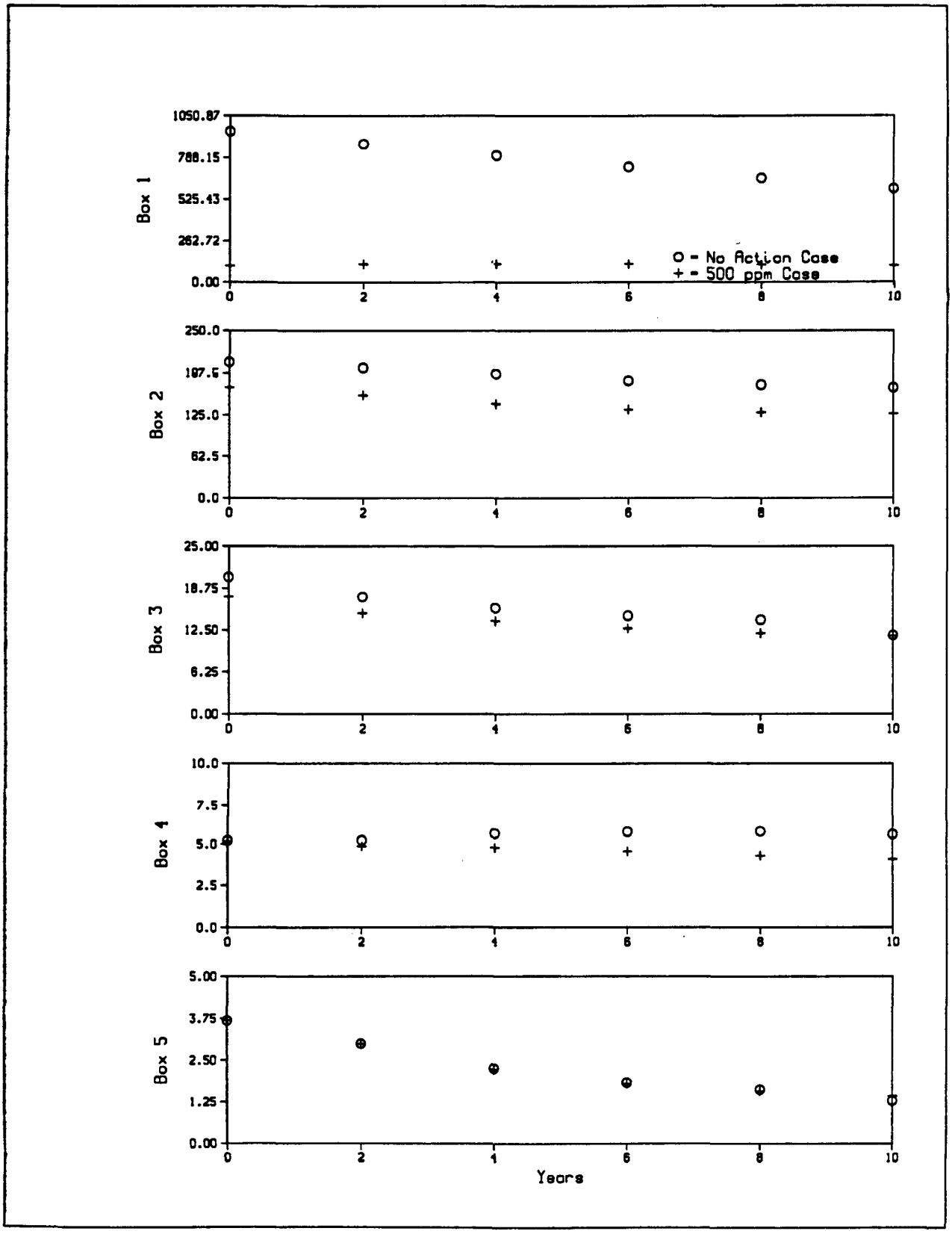

FIGURE F.56. BOX-AVERAGED MODEL RESULTS FOR THE 500-ppm SCENARIO. TOTAL PCB CONCENTRATION (mg/kg) IN THE BED SEDIMENT LAYER. o = NO-ACTION SCENARIO, + = 500-ppm SCENARIO.

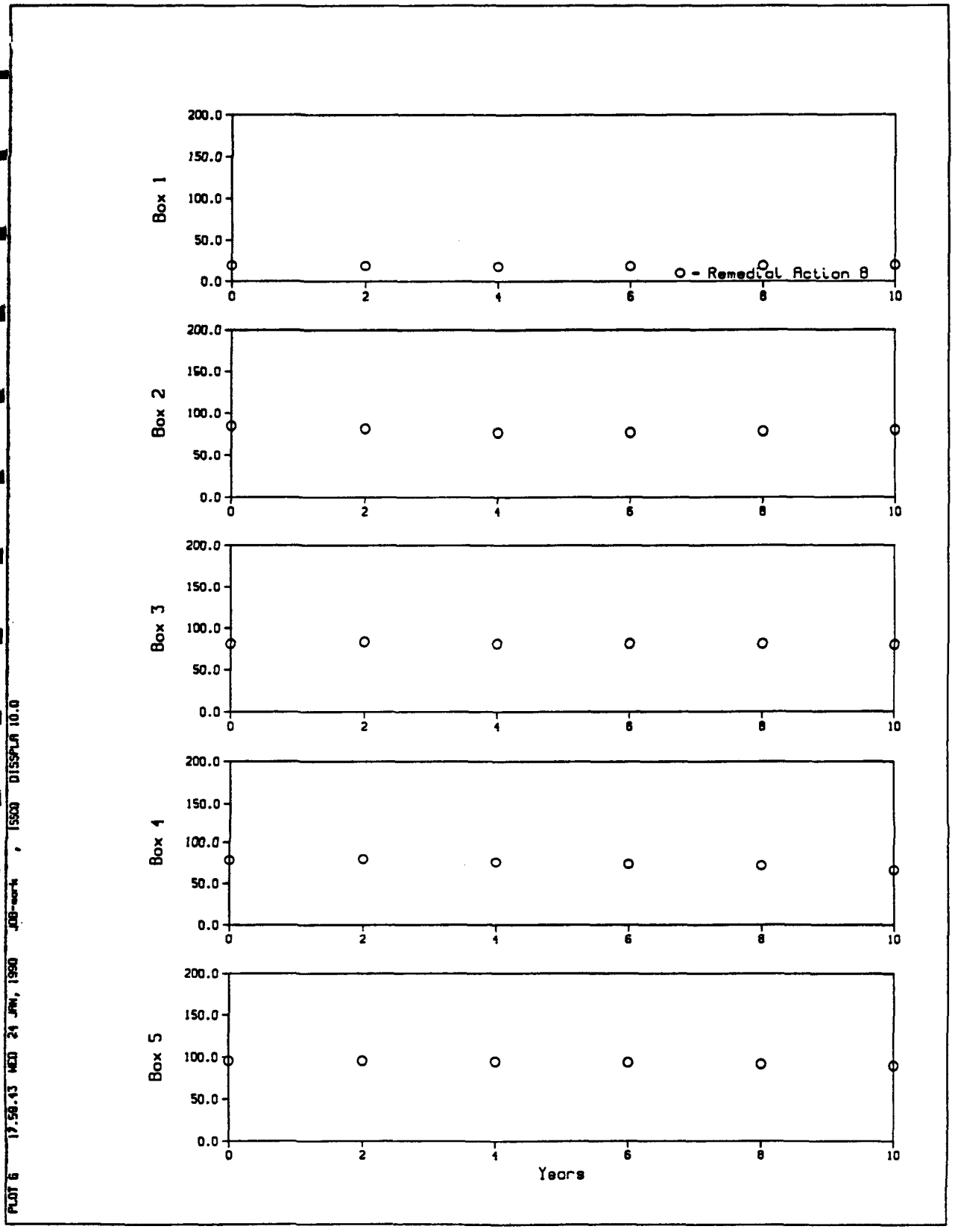

FIGURE F.57. BOX-AVERAGED MODEL RESULTS FOR THE 500-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE WATER COLUMN.

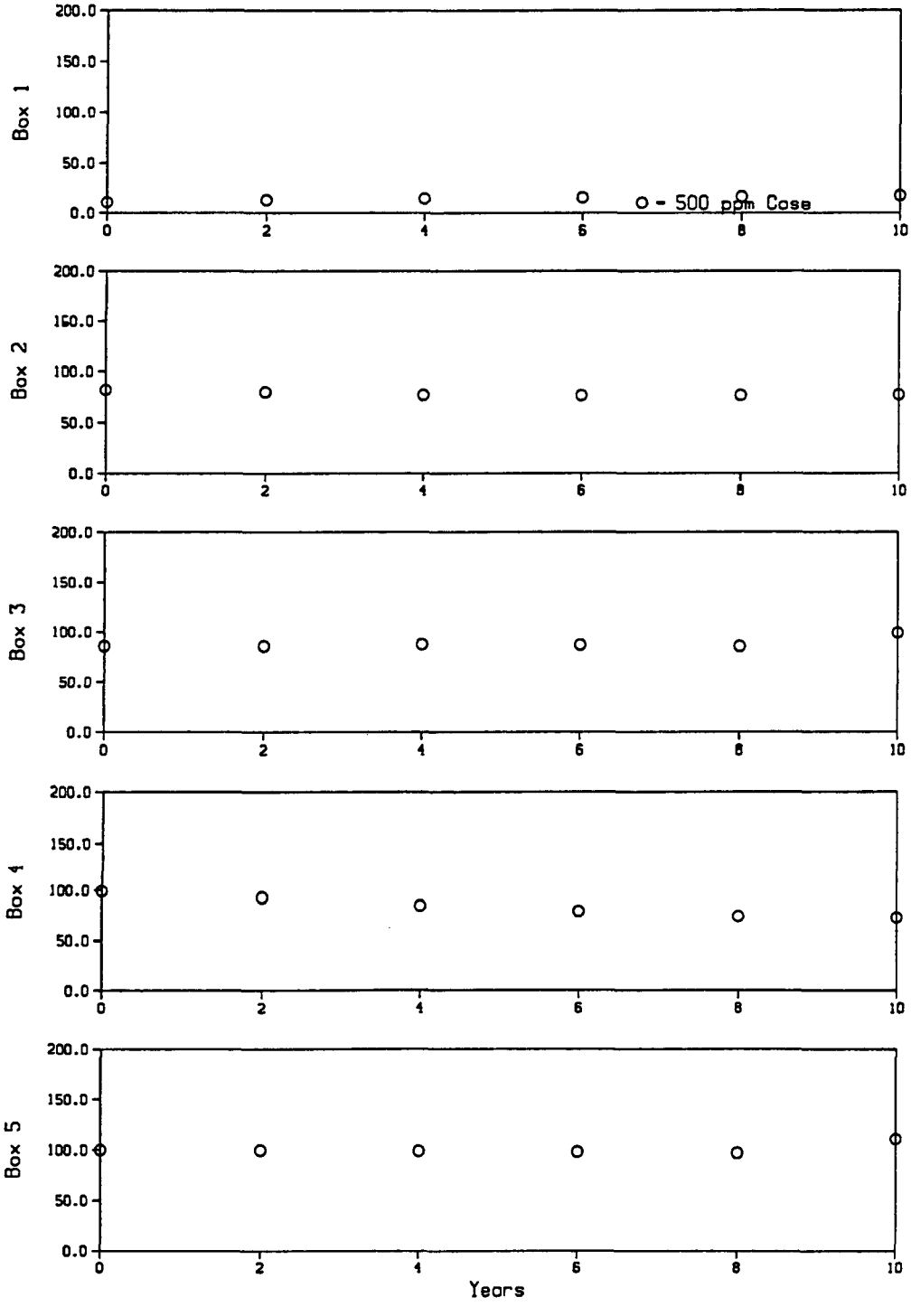

FIGURE F.58. BOX-AVERAGED MODEL RESULTS FOR THE 500-ppm SCENARIO EXPRESSED AS A PERCENTAGE OF THE NO-ACTION SCENARIO RESULTS. TOTAL PCB IN THE BED SEDIMENT LAYER.