Appendix E: Model Differences between T13B6 and T02A

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Introduction

This appendix presents results from the comparison of the "exactly equivalent" TCSAM2013 model T13B6 and the TCSAM model T02A. Ideally, these results should be identical, but given finite numerical accuracy and the numerical minimization process used in fitting the models, this expectation is unrealistic. The following plots demonstrate the differences between the two models, for all quantities examined, are extremely small and indicate the models are, indeed, "exactly equivalent."

Population processes

Natural mortality

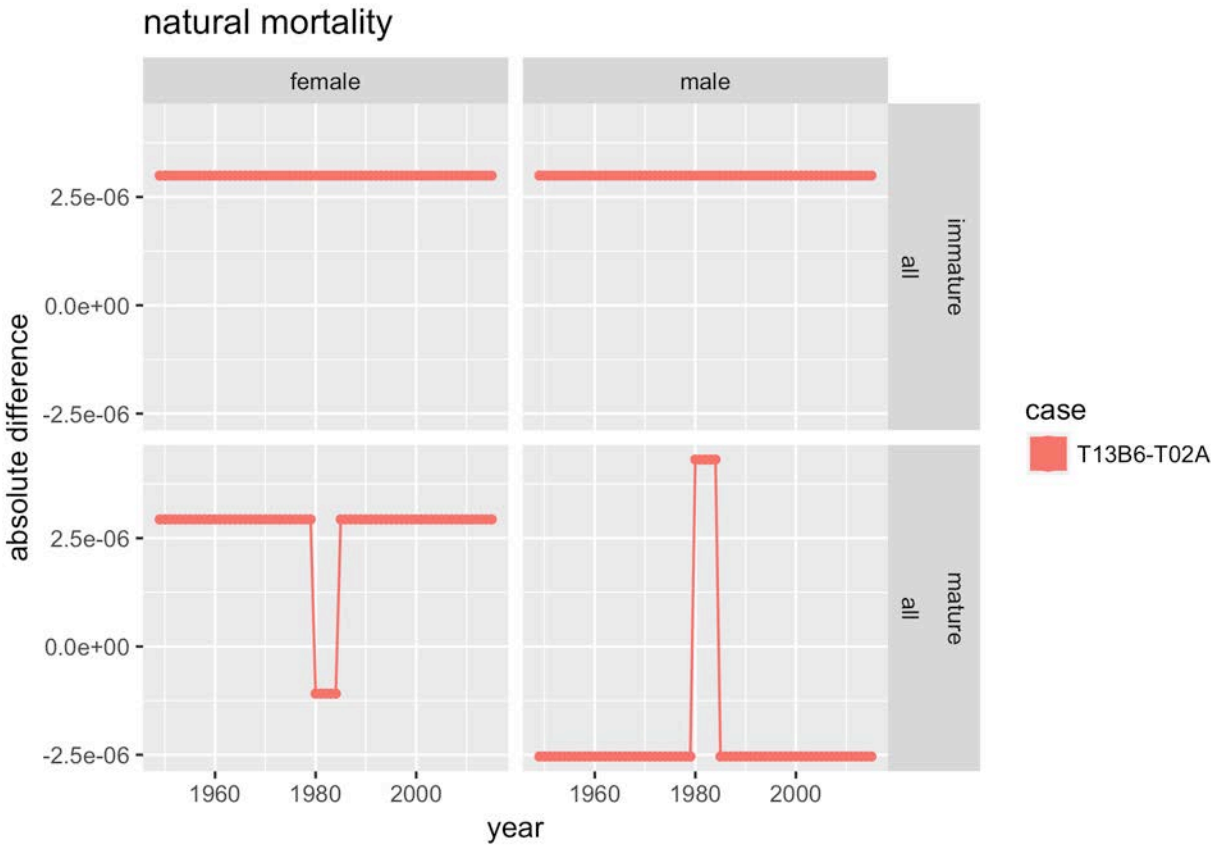

Figure 1. Differences for natural mortality.

Probability of terminal molt

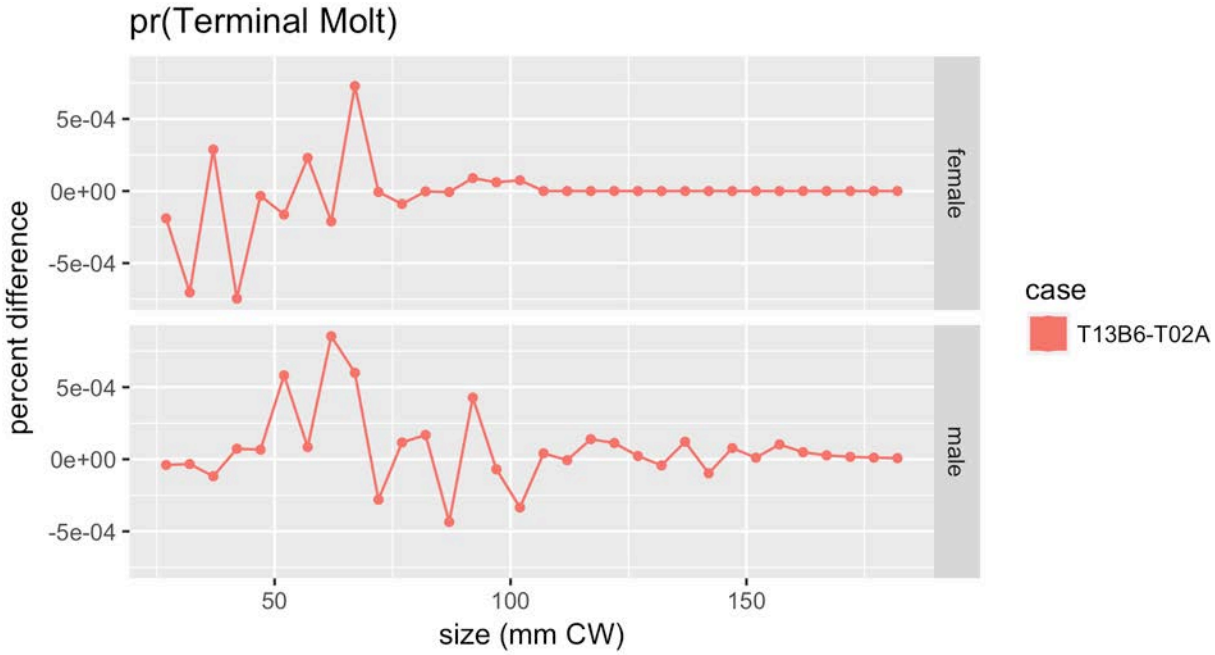

Figure 2. Differences for pr(Terminal Molt).

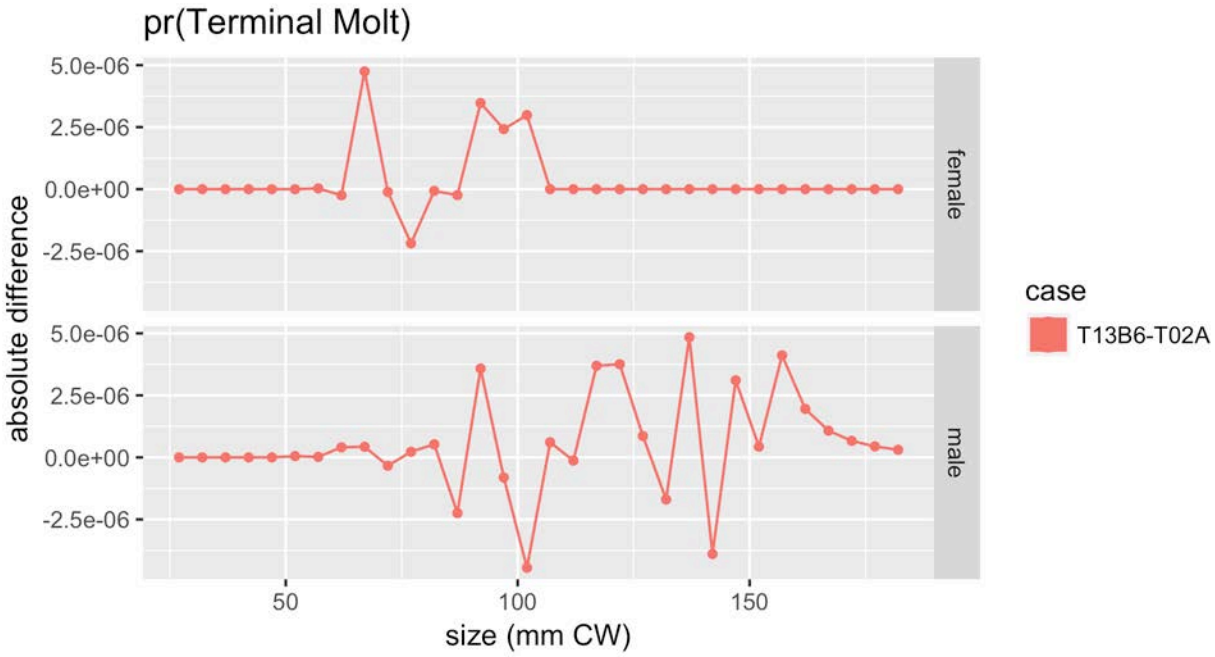

Figure 3. Differences for pr(Terminal Molt).

Mean growth

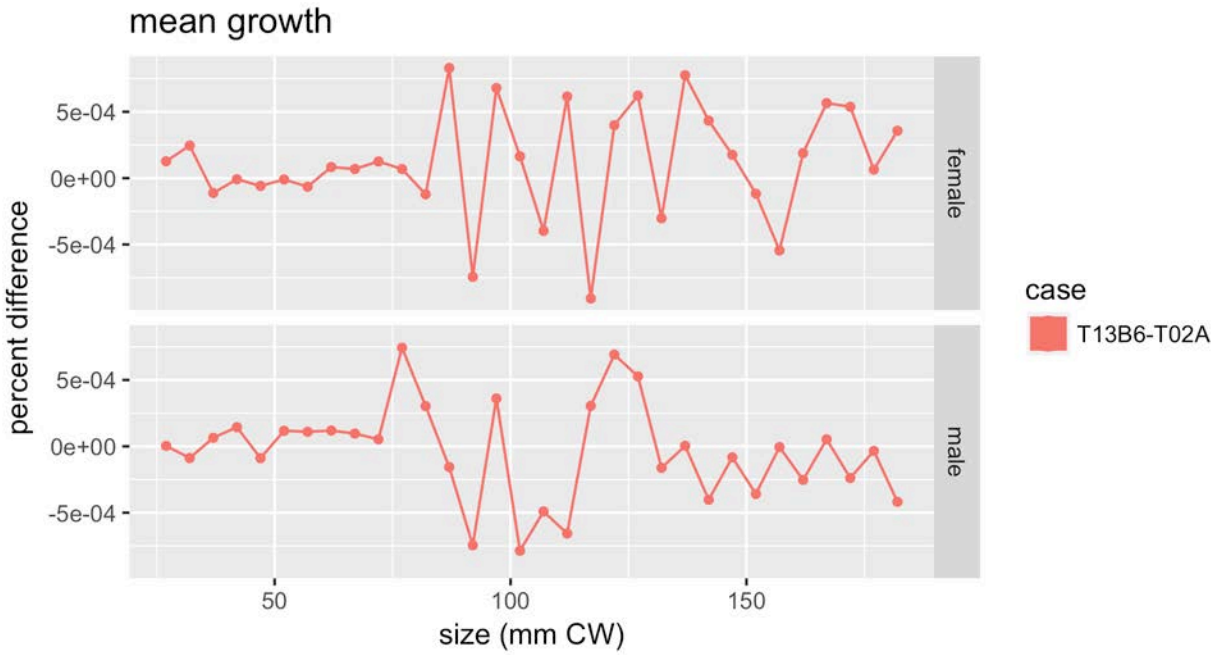

Figure 4. Differences for mean growth.

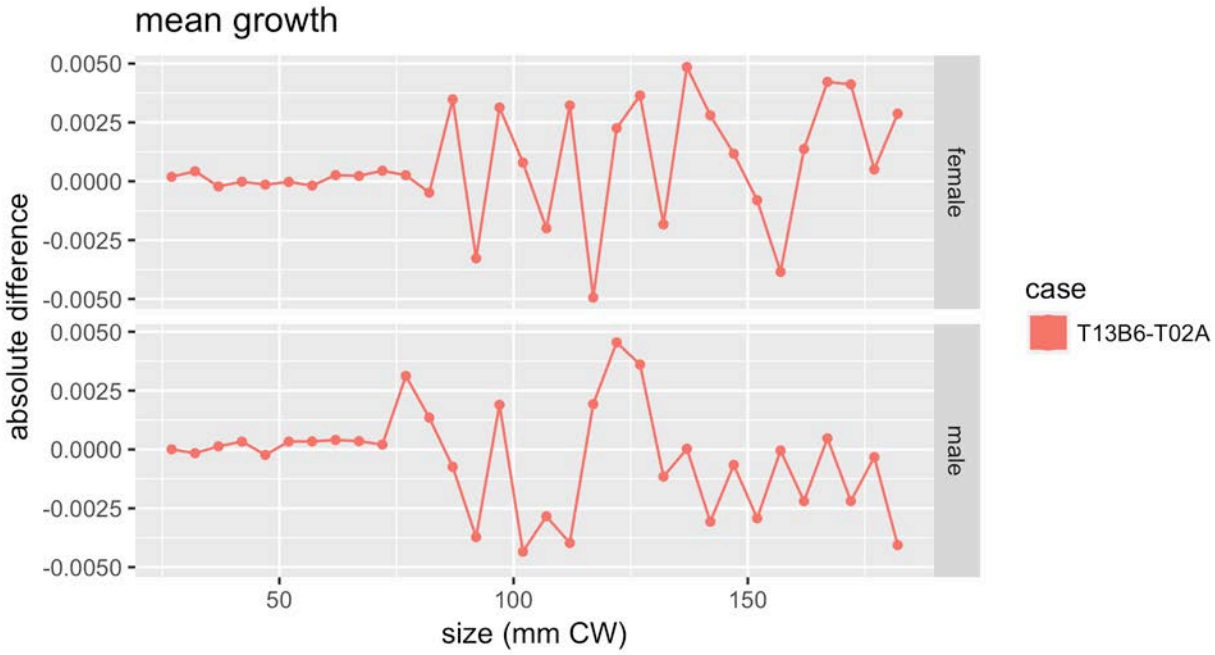

Figure 5. Differences for mean growth.

Growth matrices
plotting growth matrix for female plotting growth matrix for male

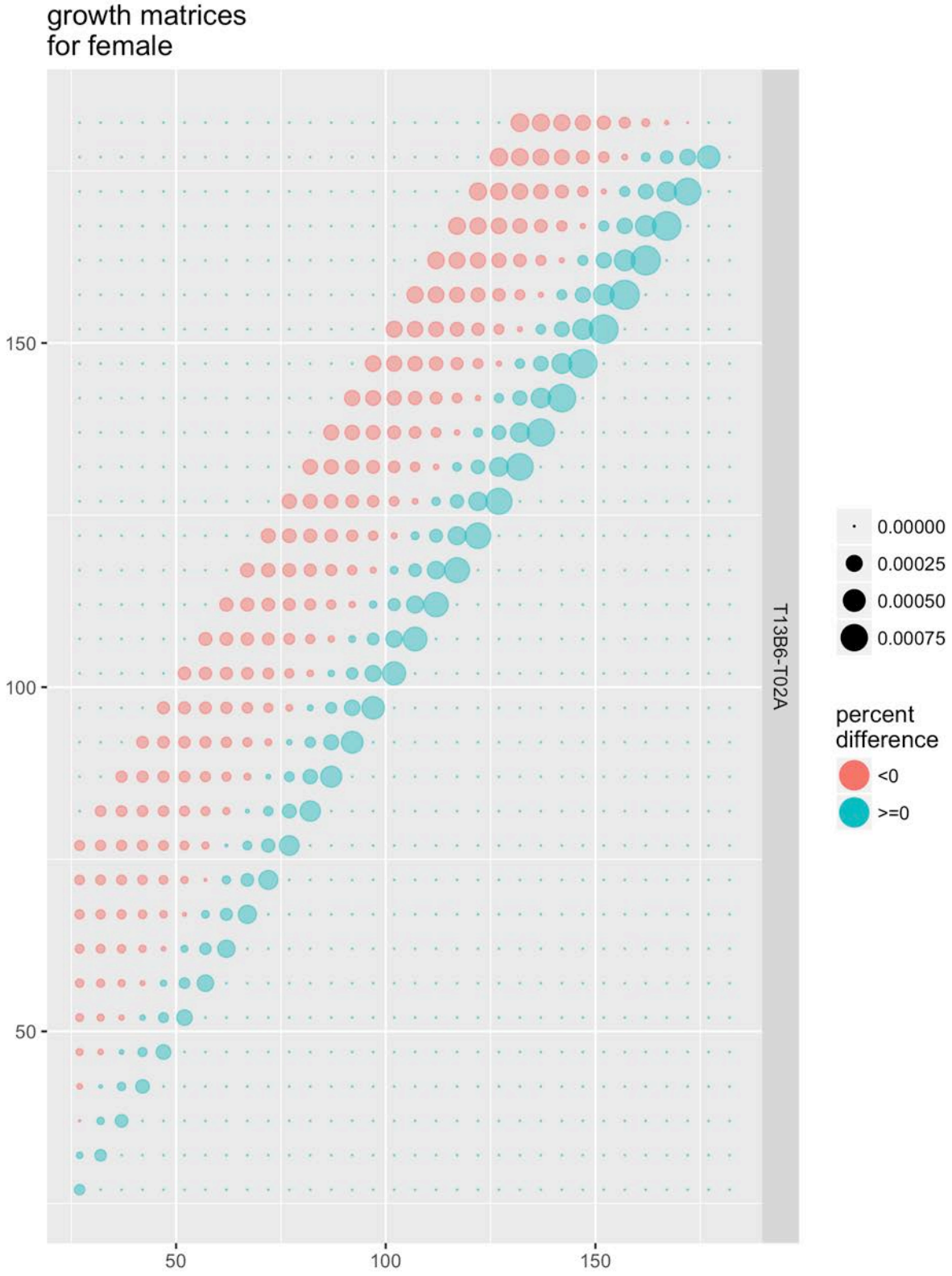

Figure 6. Growth matrix differences for female.

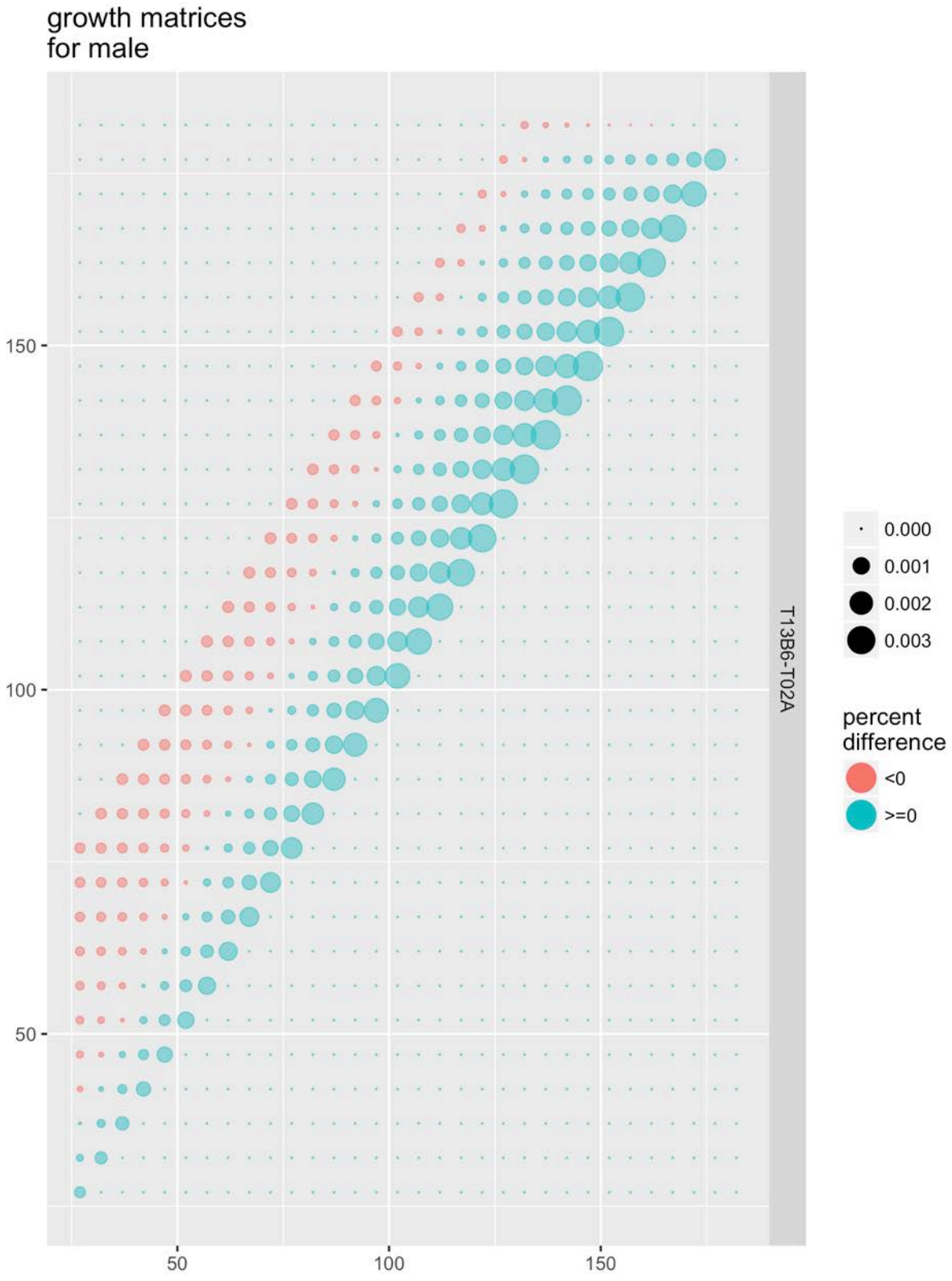

Figure 7. Growth matrix differences for male.

plotting growth matrix for female plotting growth matrix for male

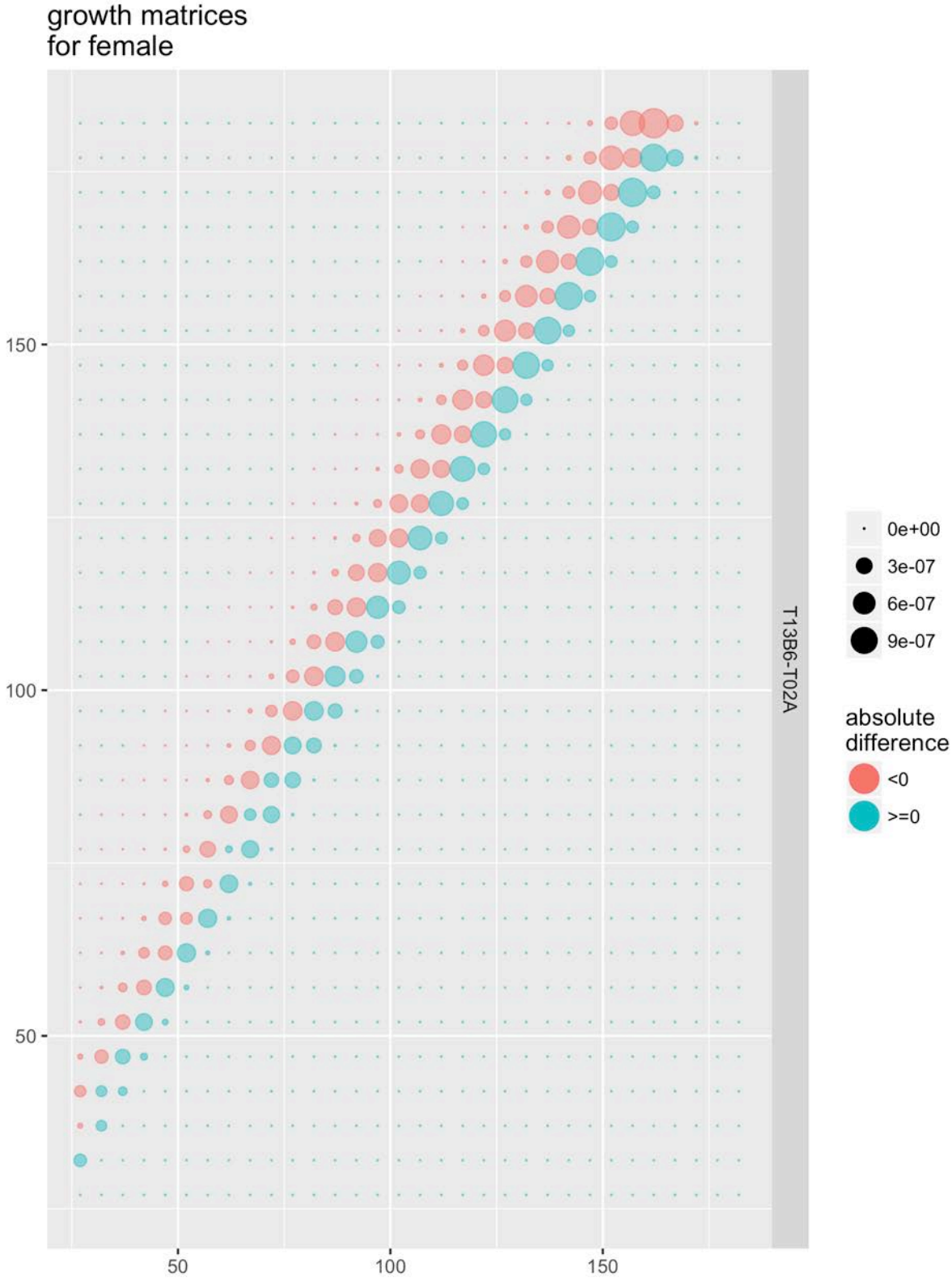

Figure 8. Growth matrix differences for female.

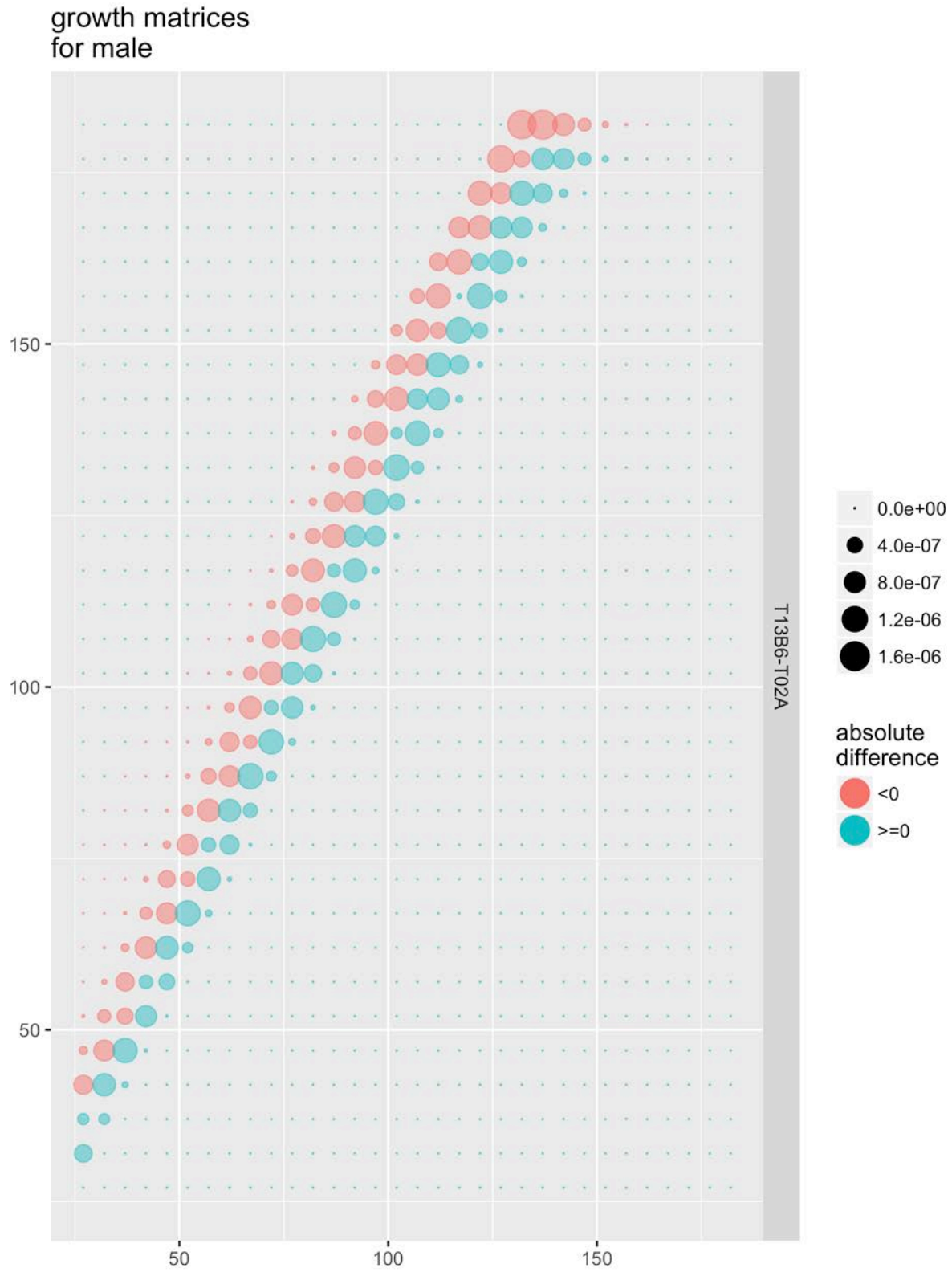

Figure 9. Growth matrix differences for male.

Size distribution for recruits

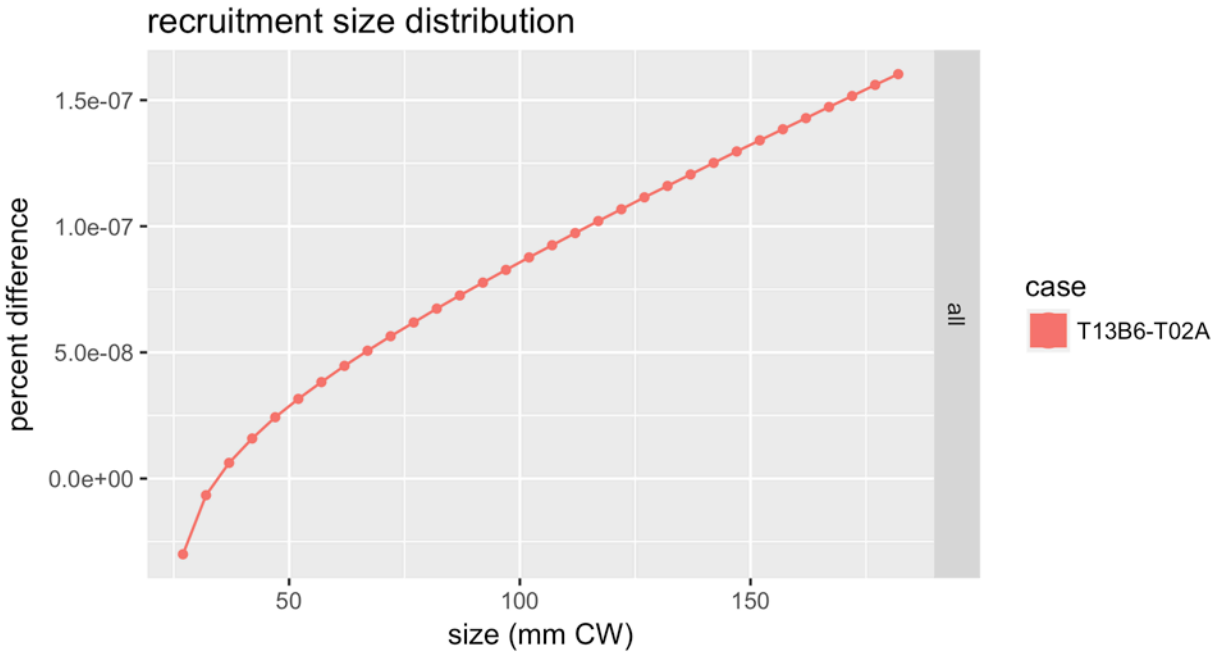

Figure 10. Differences for recruitment size distribution.

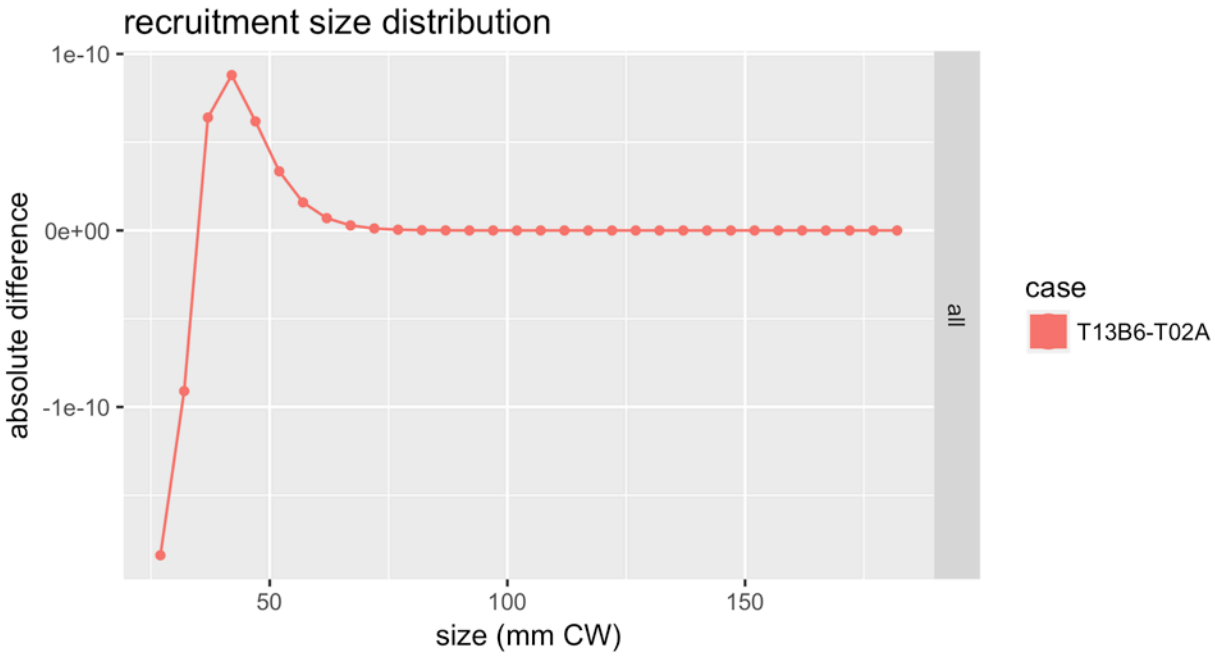

Figure 11. Differences for recruitment size distribution.

Population results

Recruitment

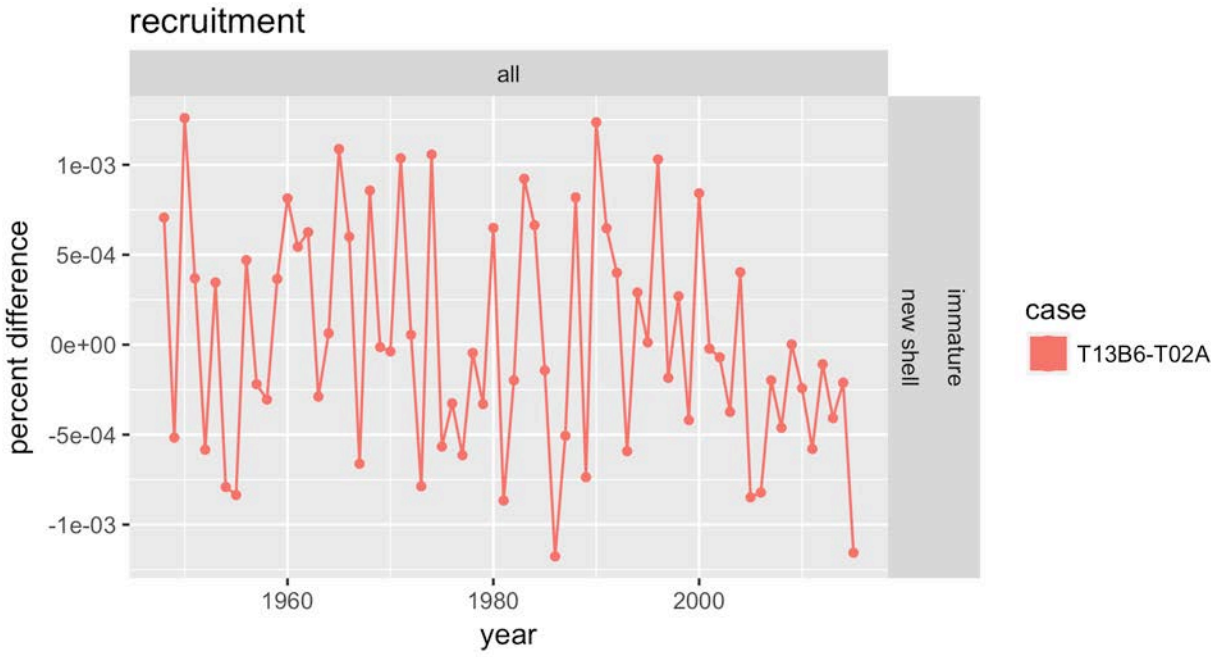

Figure 12. Differences for recruitment.

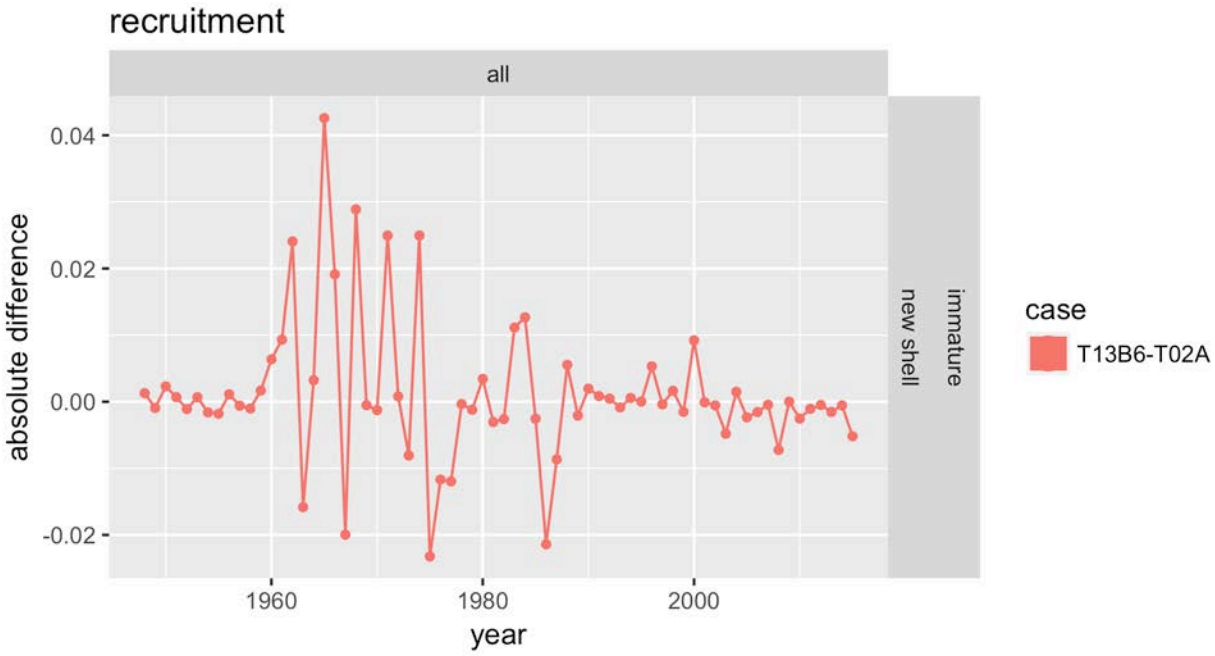

Figure 13. Differences for recruitment.

Population abundance

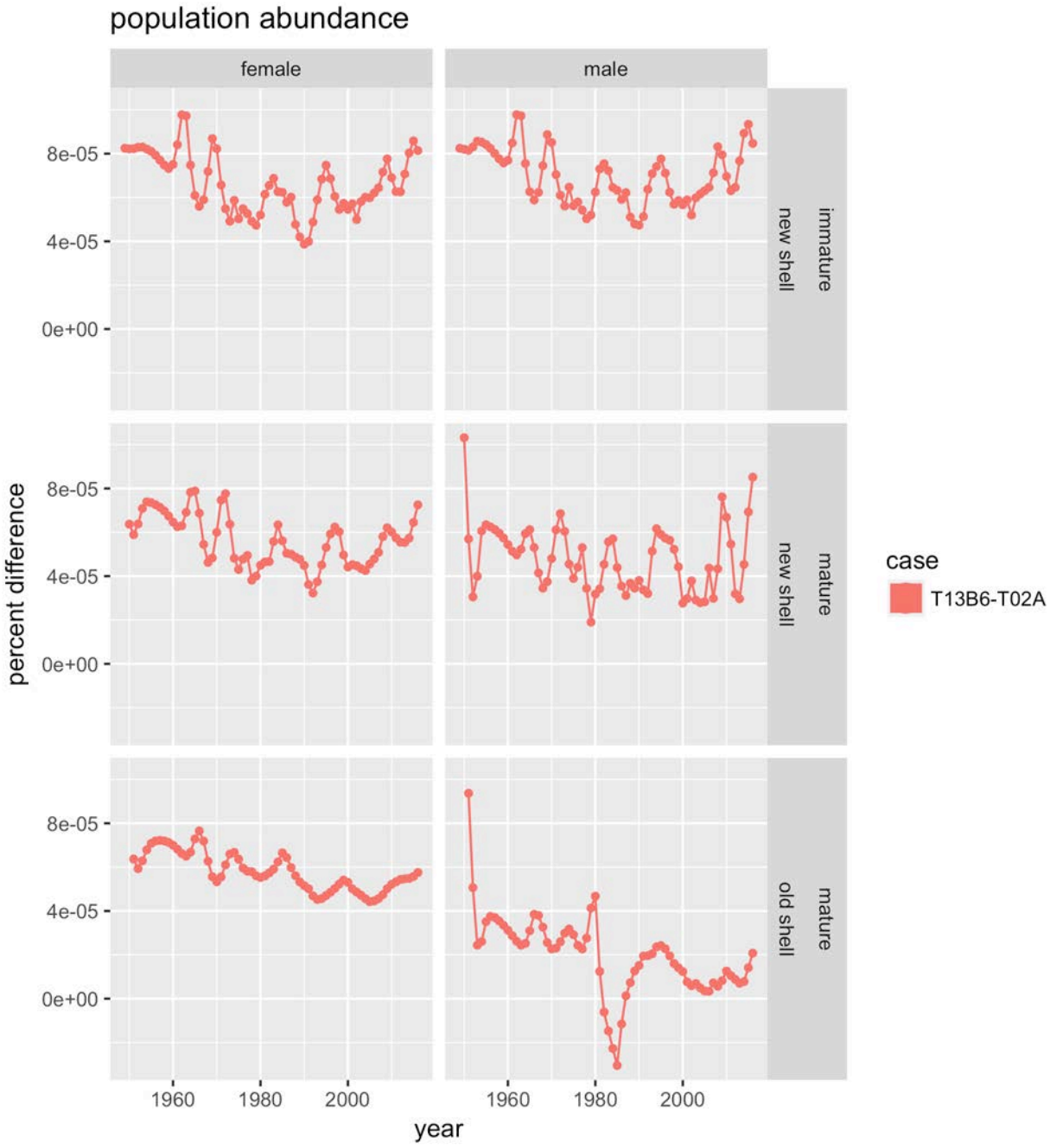

Figure 14. Differences for population abundance.

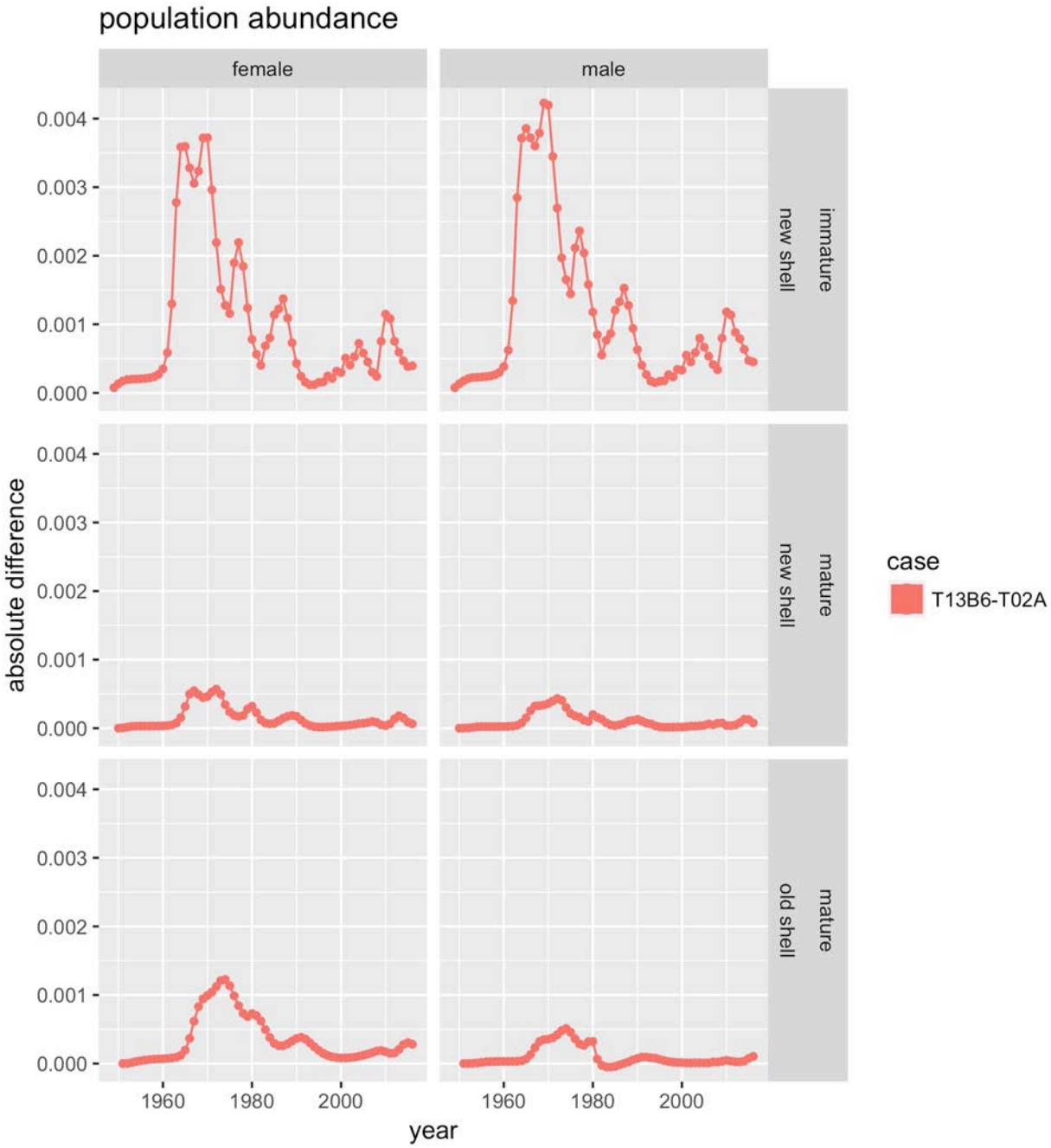

Figure 15. Differences for population abundance.

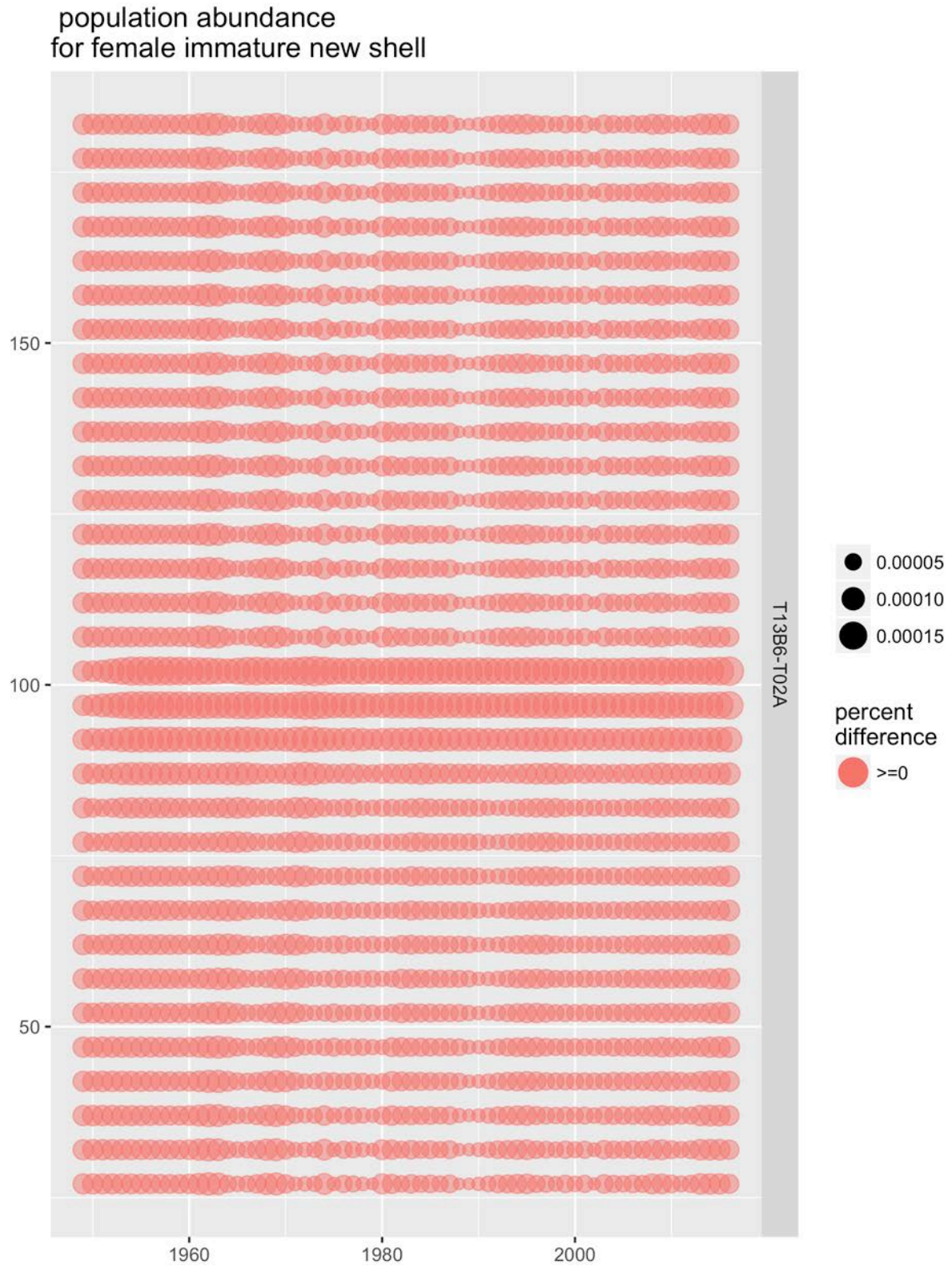

Figure 16. Differences for population abundance for female immature new shell.

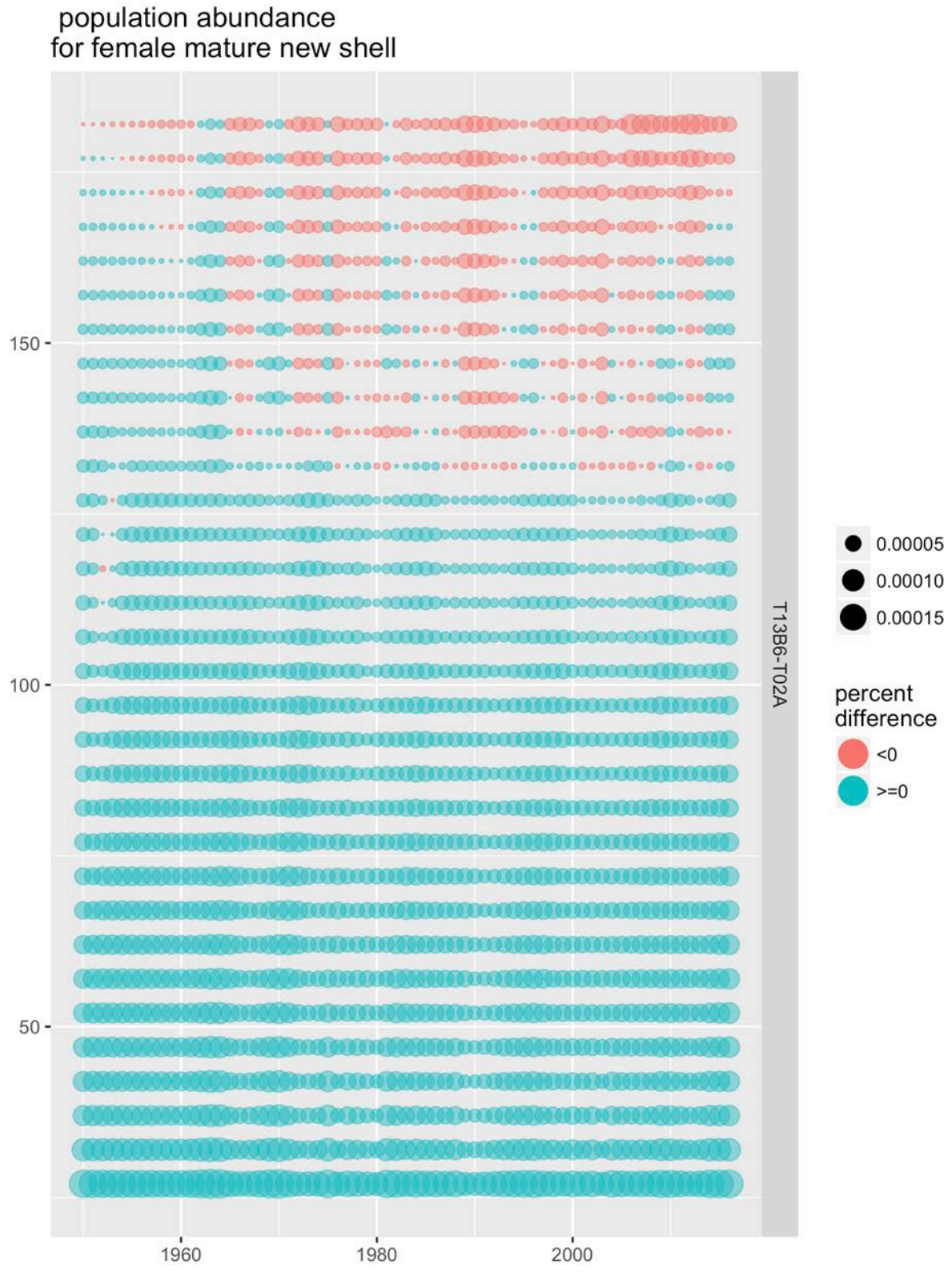

Figure 17. Differences for population abundance for female mature new shell.

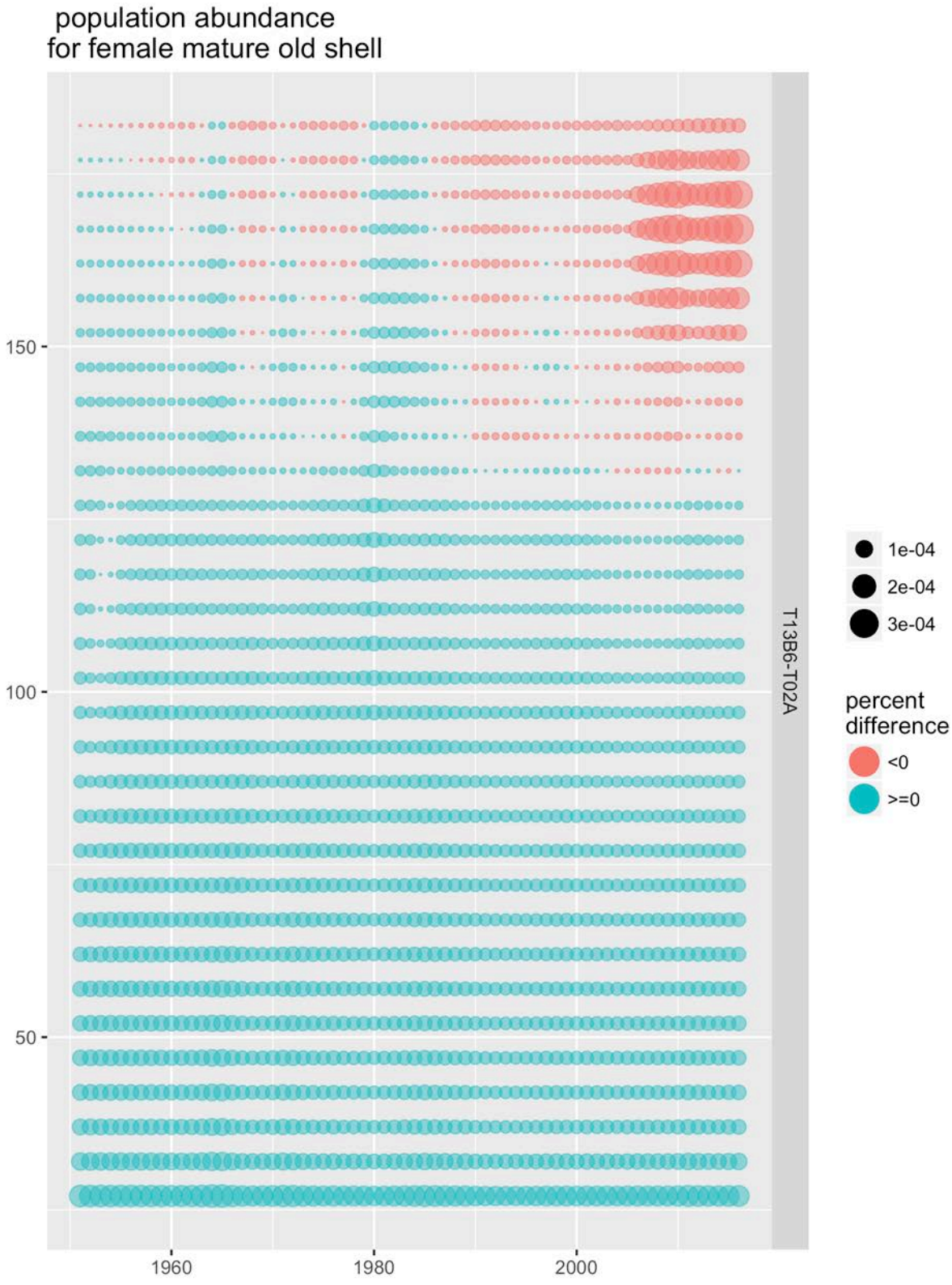

Figure 18. Differences for population abundance for female mature old shell.

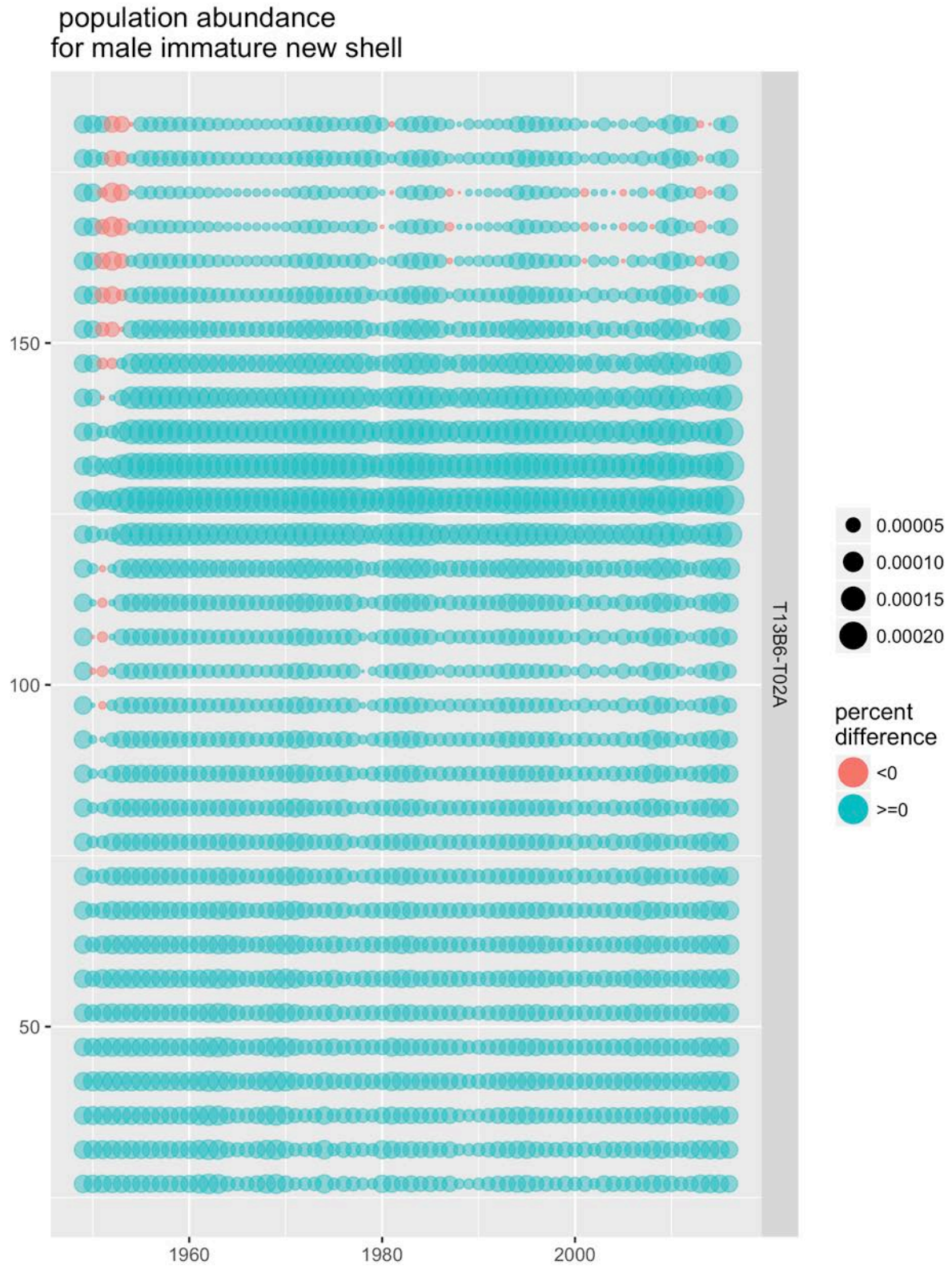

Figure 19. Differences for population abundance for male immature new shell.

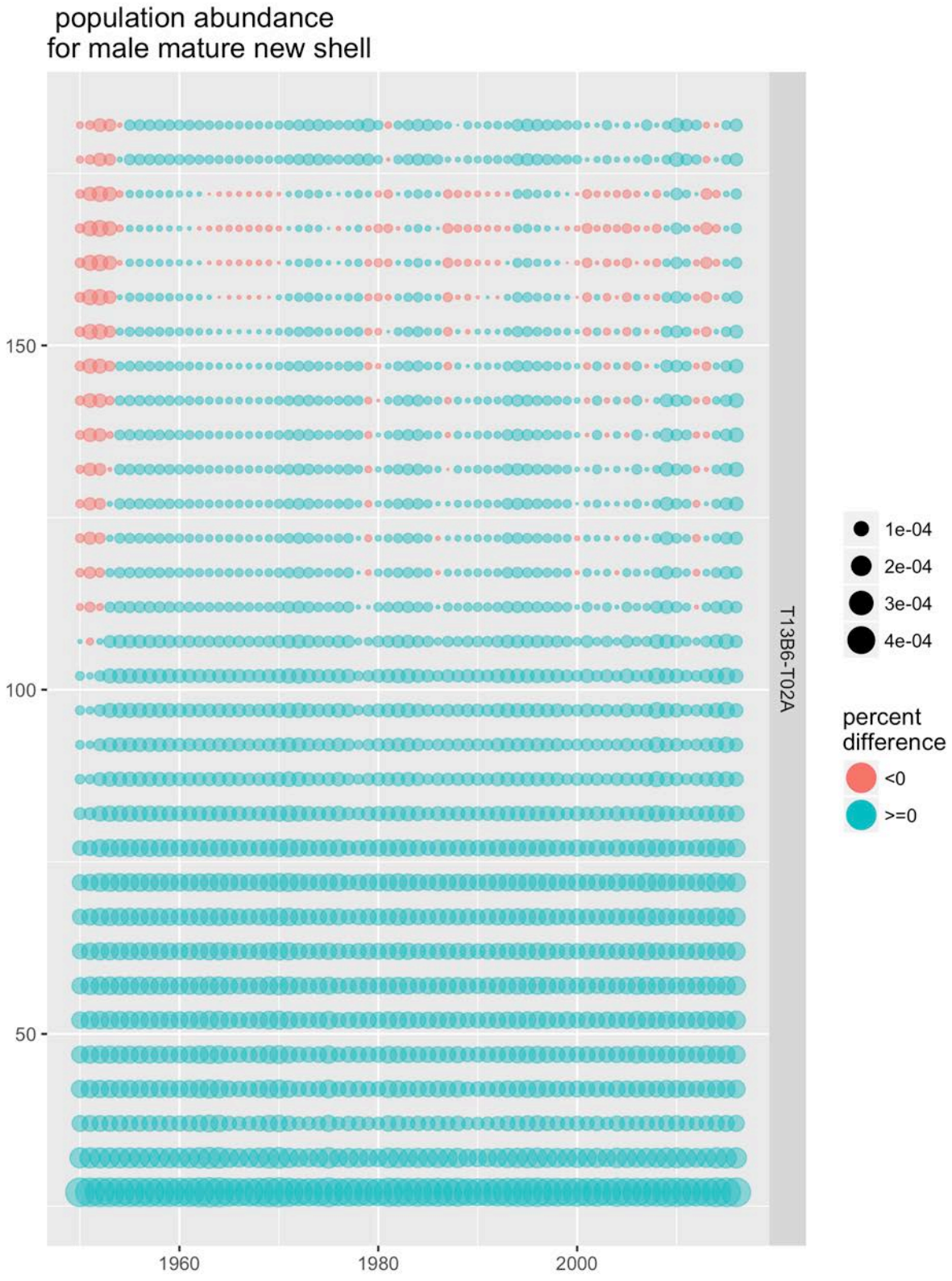

Figure 20. Differences for population abundance for male mature new shell.

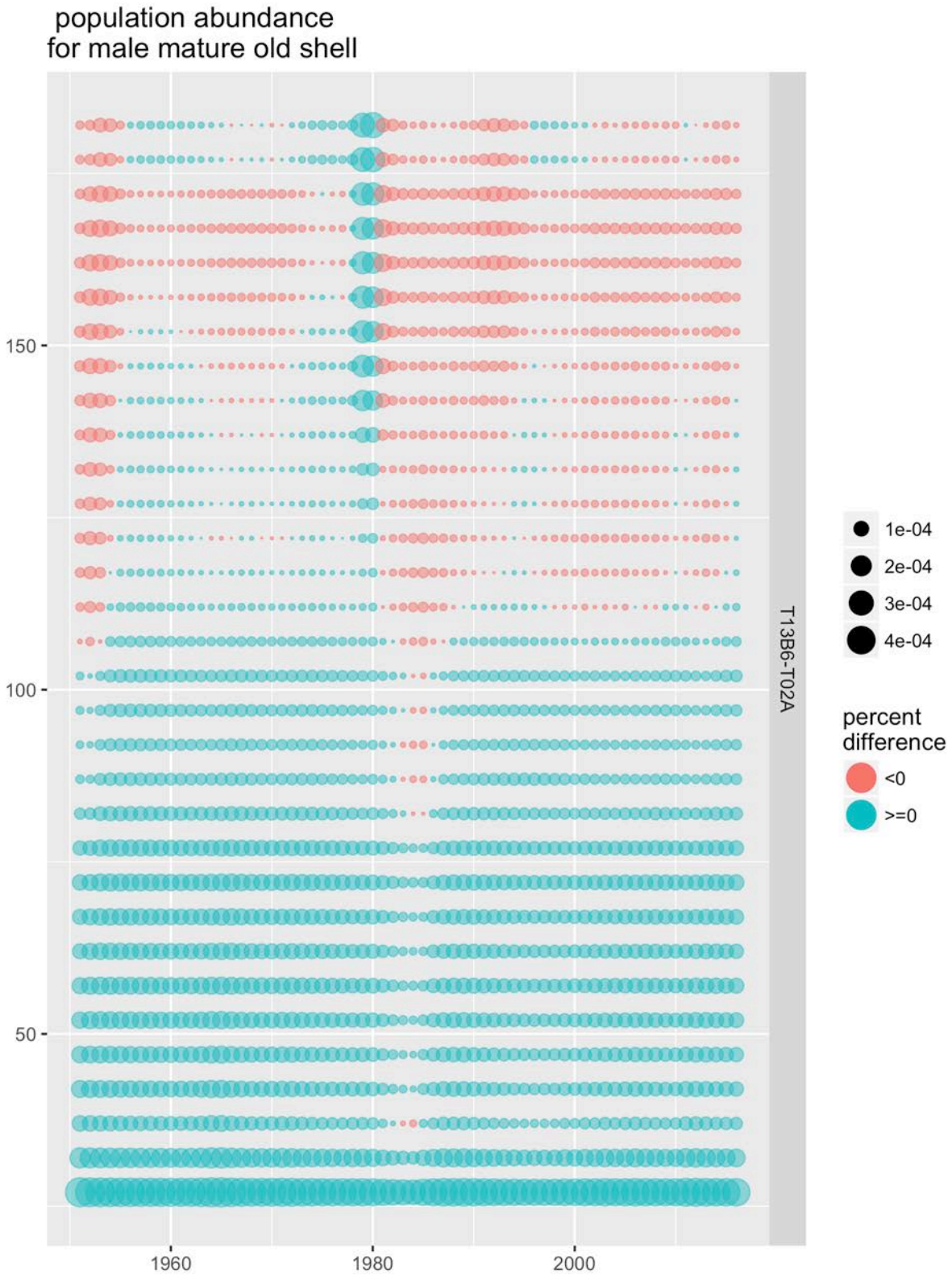

Figure 21. Differences for population abundance for male mature old shell.

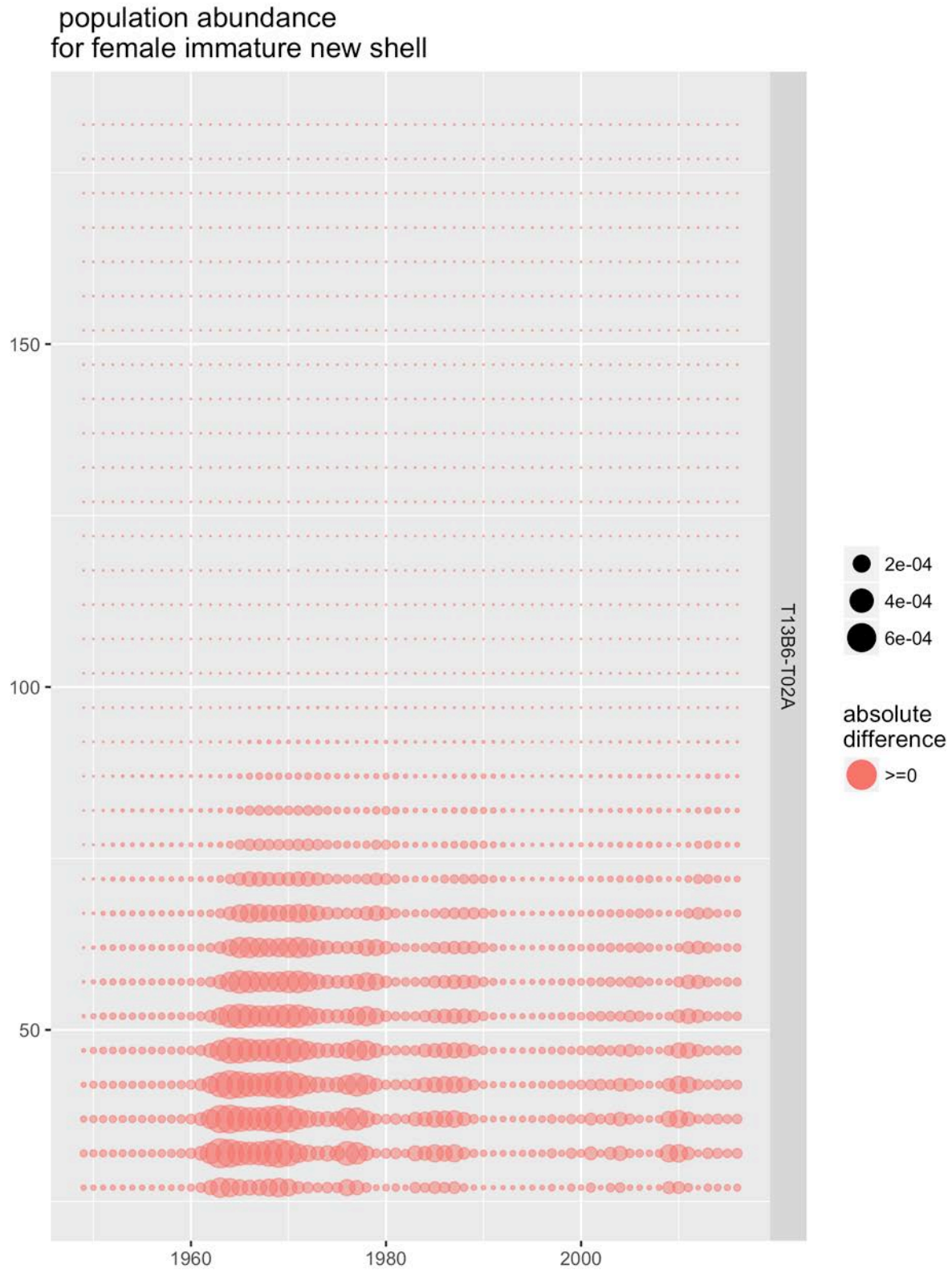

Figure 22. Differences for population abundance for female immature new shell.

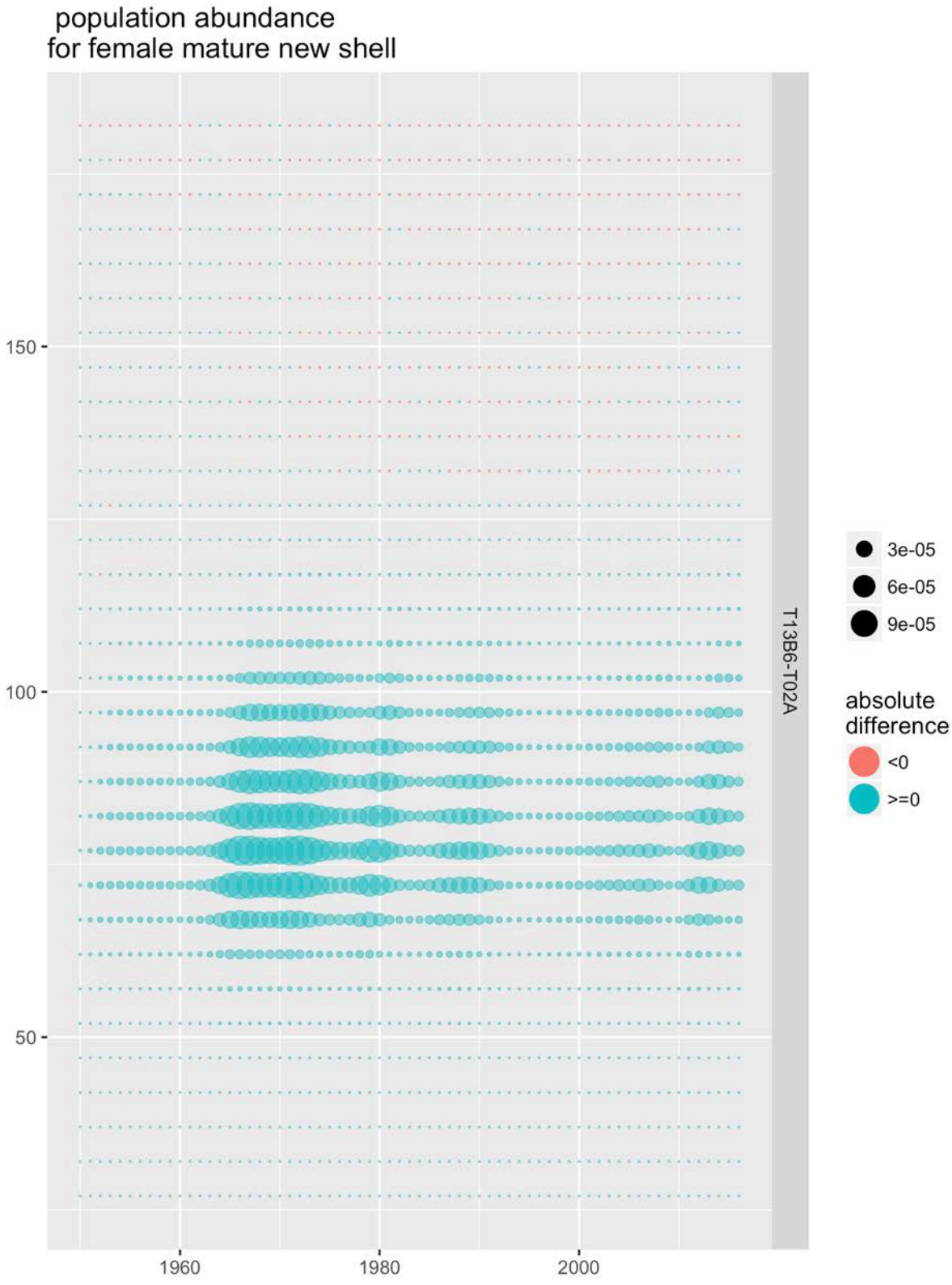

Figure 23. Differences for population abundance for female mature new shell.

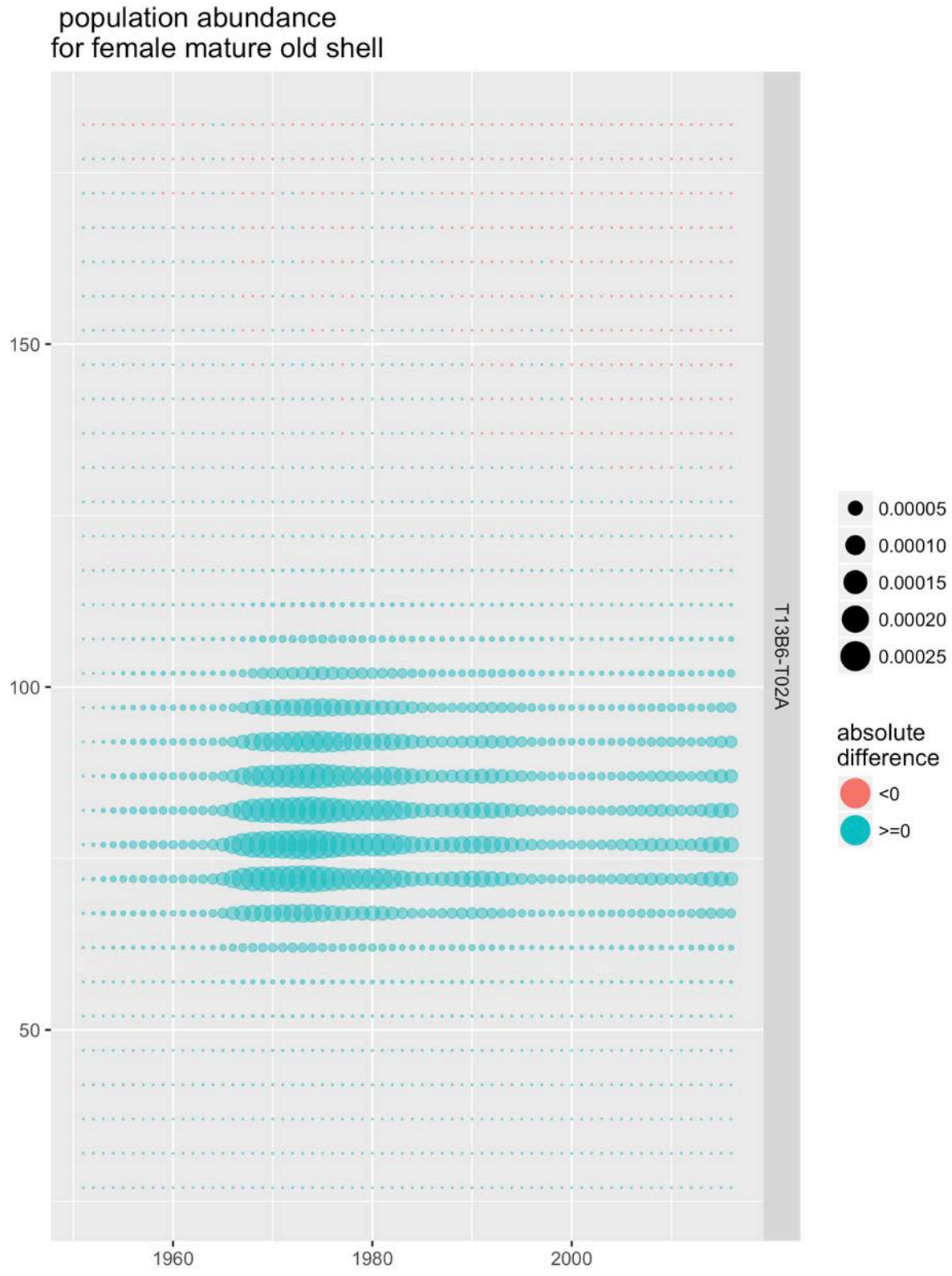

Figure 24. Differences for population abundance for female mature old shell.

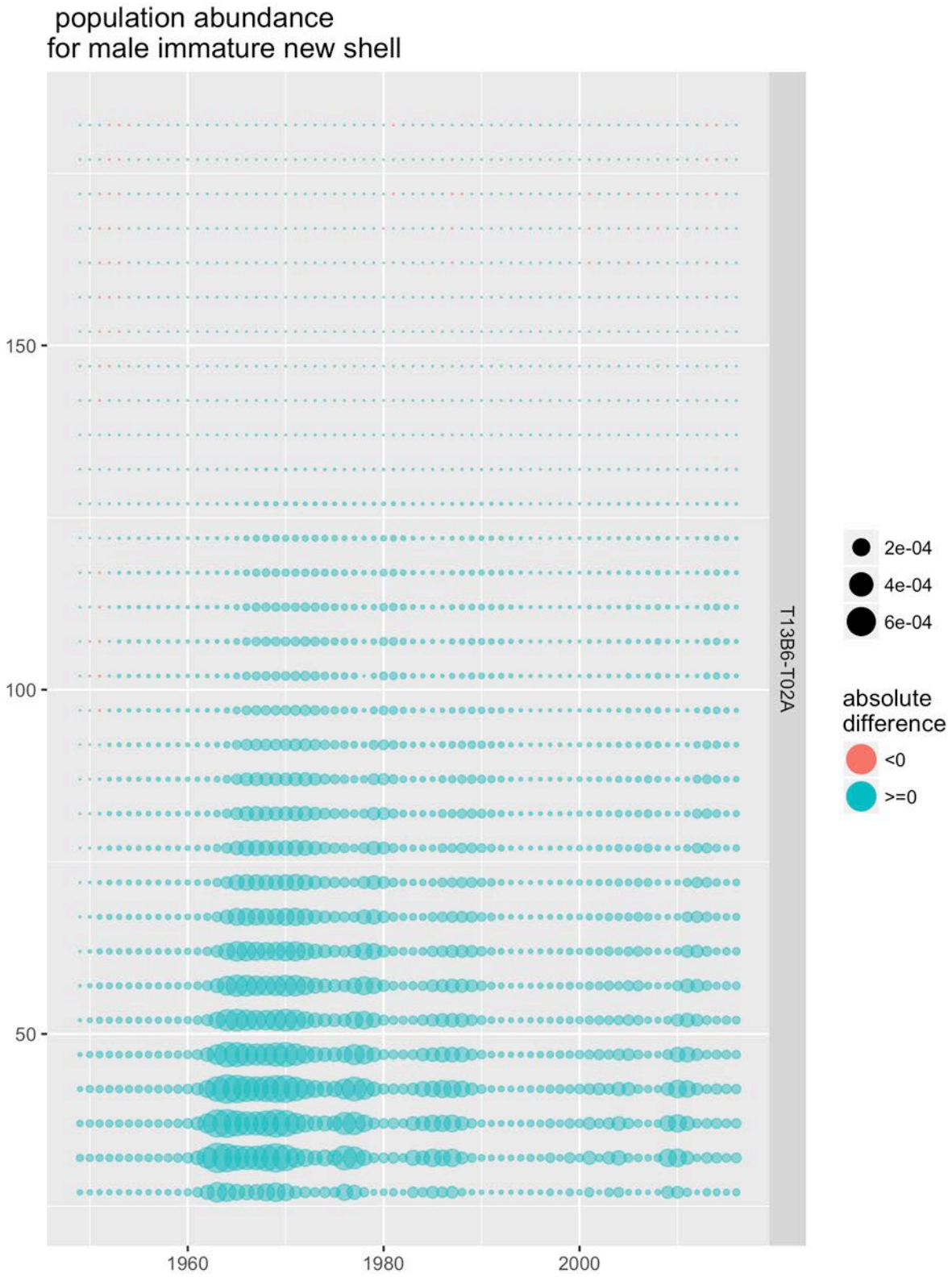

Figure 25. Differences for population abundance for male immature new shell.

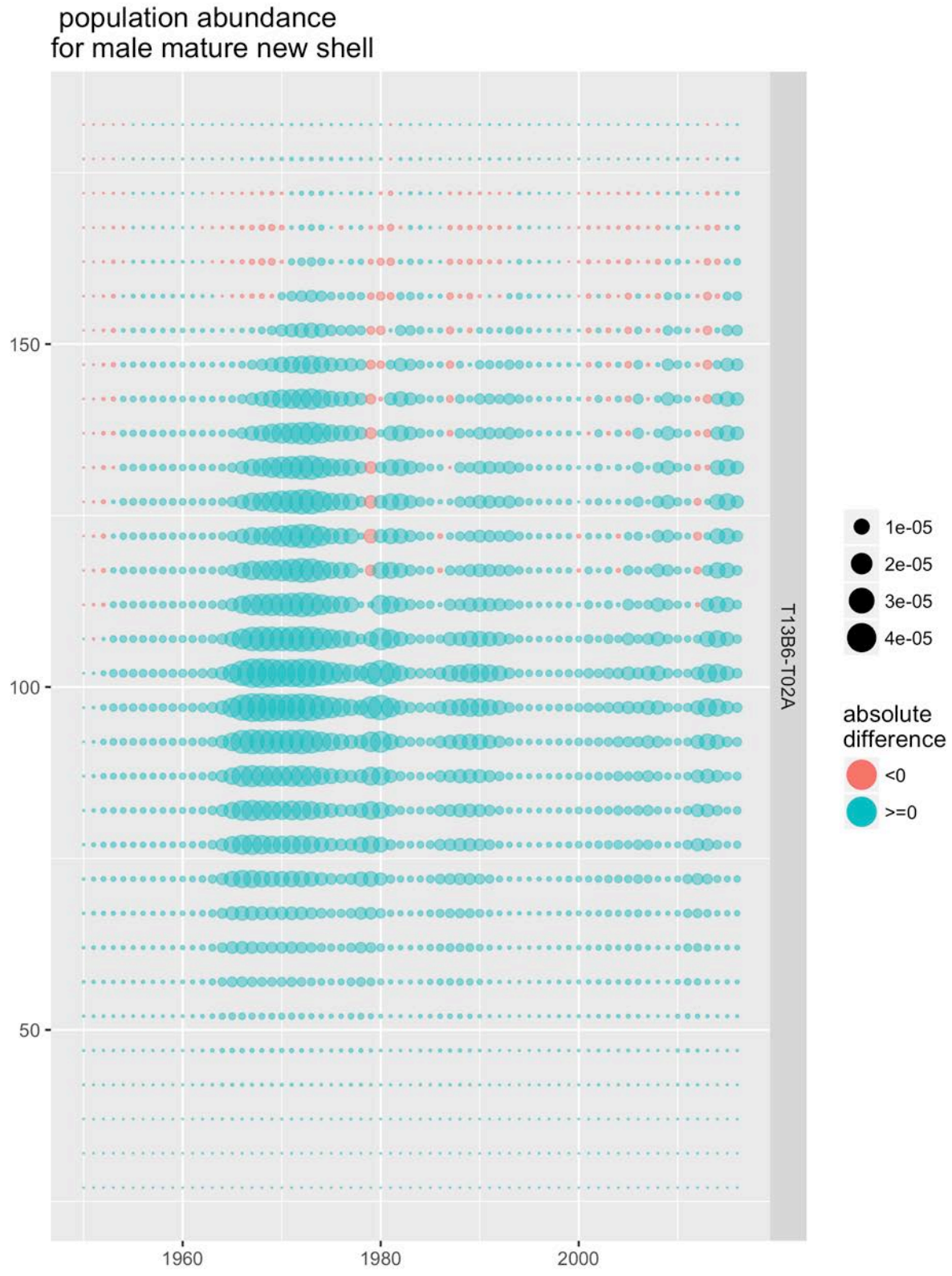

Figure 26. Differences for population abundance for male mature new shell.

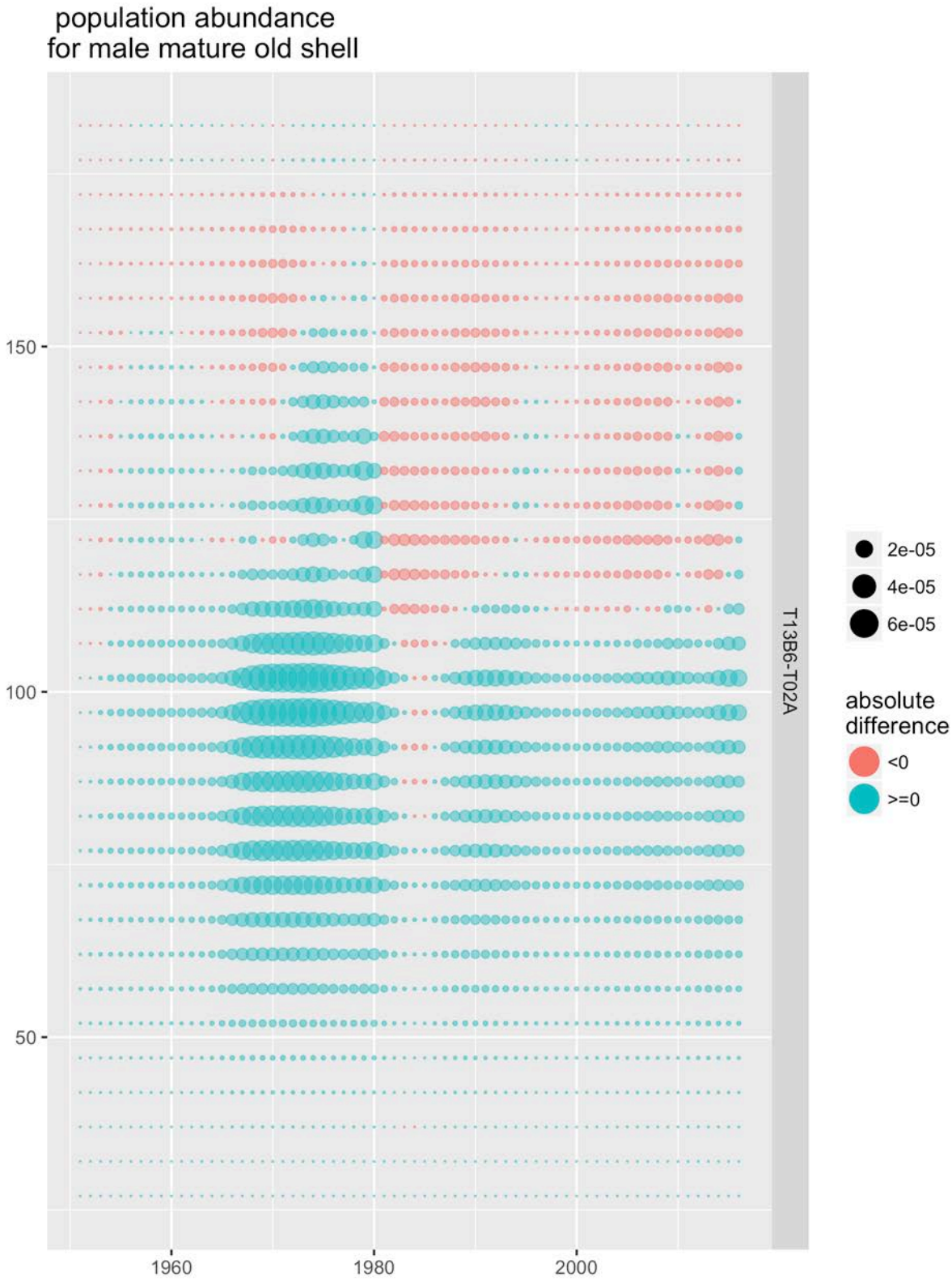

Figure 27. Differences for population abundance for male mature old shell.

Biomass

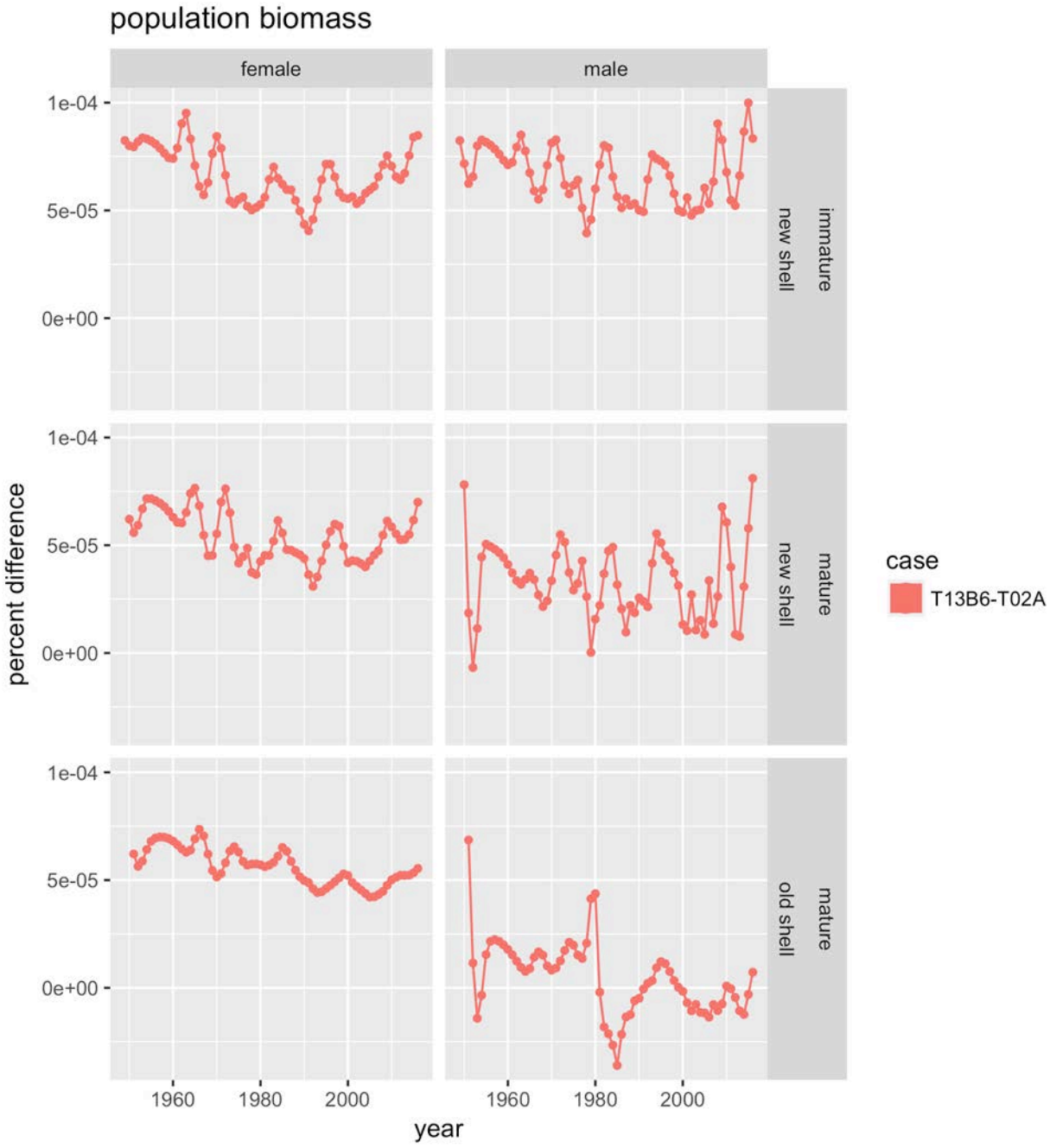

Figure 28. Differences for population biomass.

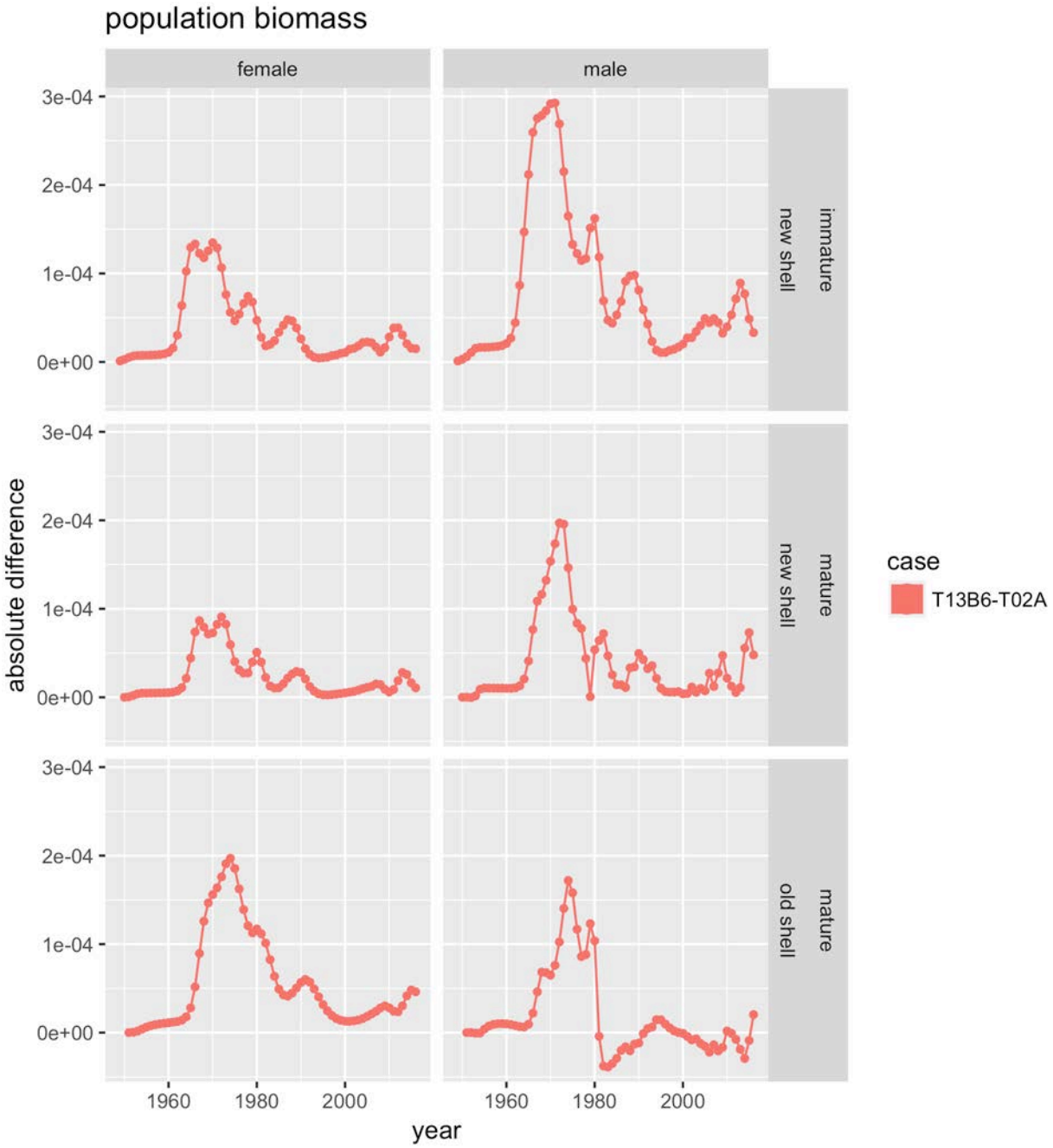

Figure 29. Differences for population biomass.

Surveys

Survey catchability

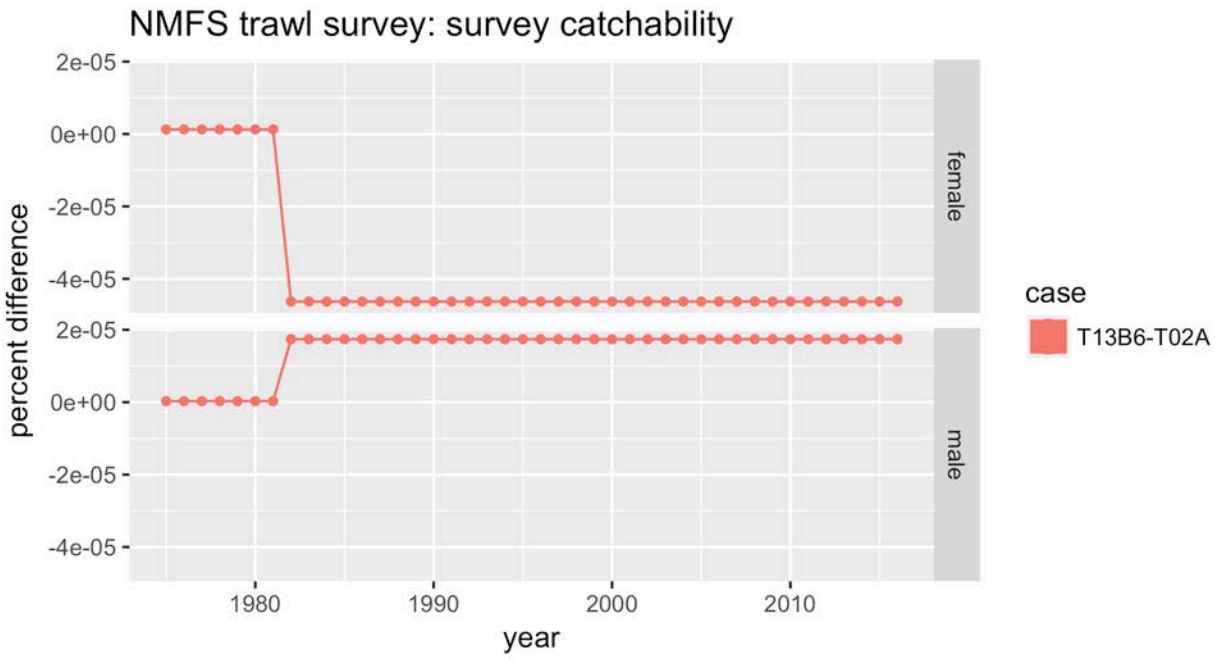

Figure 30. Differences for NMFS trawl survey: survey catchability.

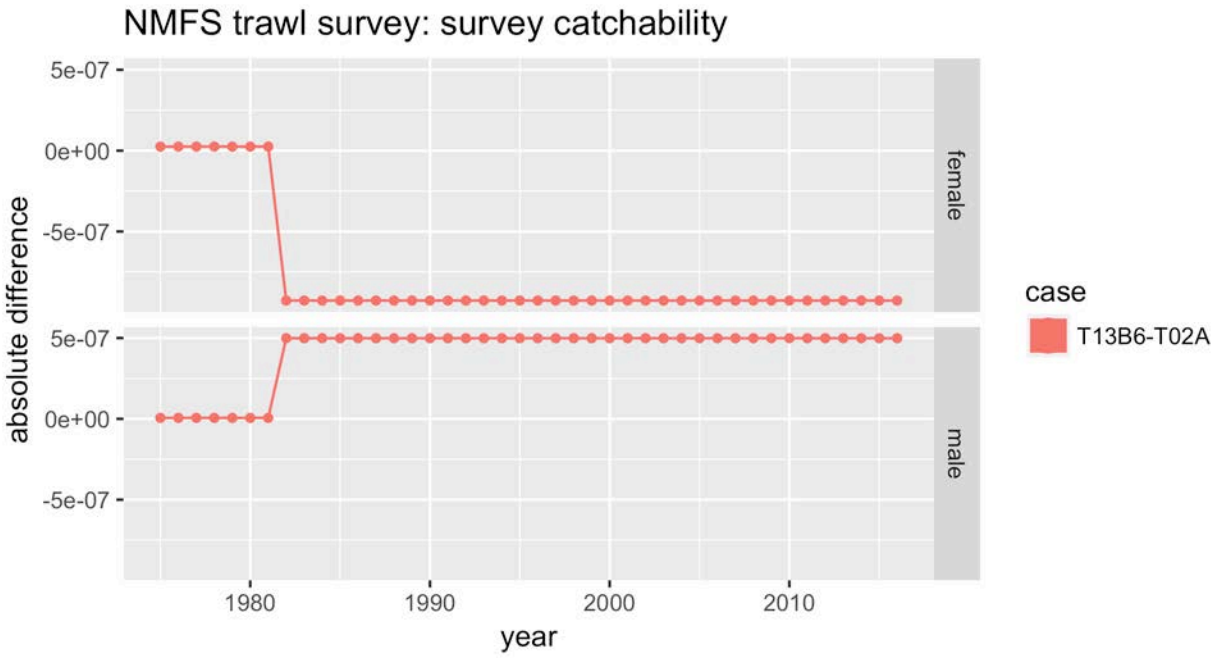

Figure 31. Differences for NMFS trawl survey: survey catchability.

Survey selectivity functions

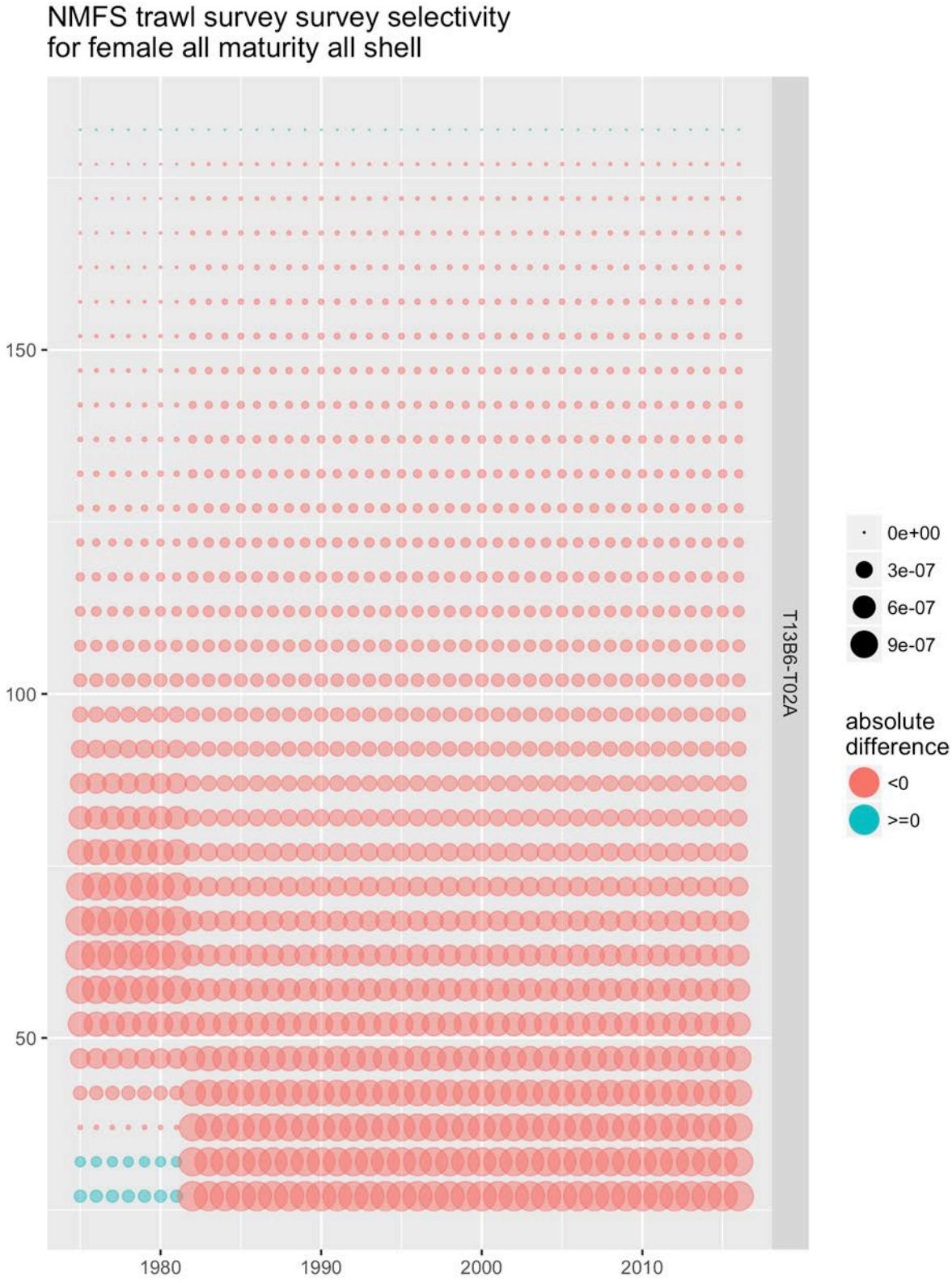

Figure 32. Differences for NMFS trawl survey survey selectivity for female all maturity all shell.

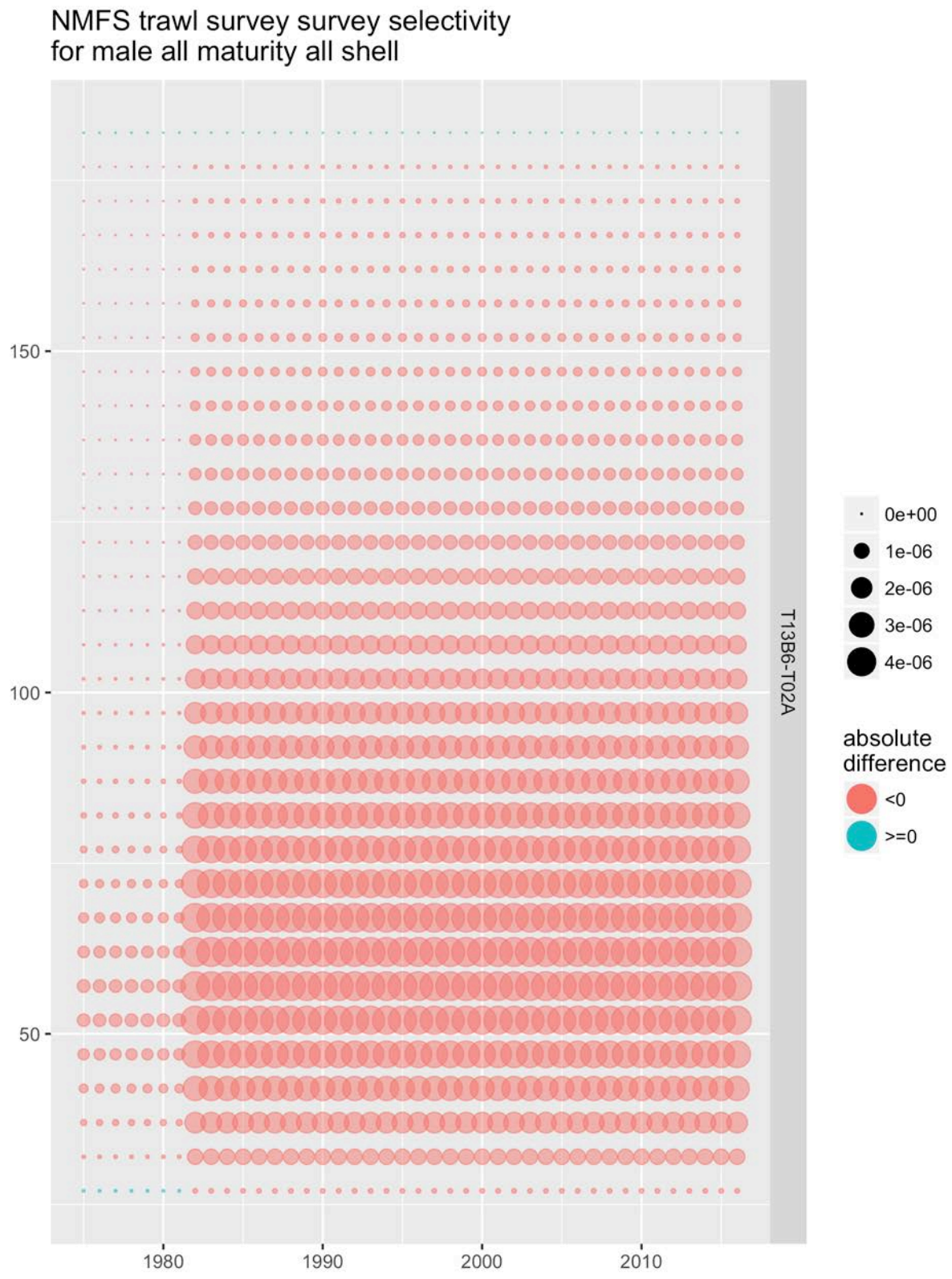

Figure 33. Differences for NMFS trawl survey survey selectivity for male all maturity all shell.

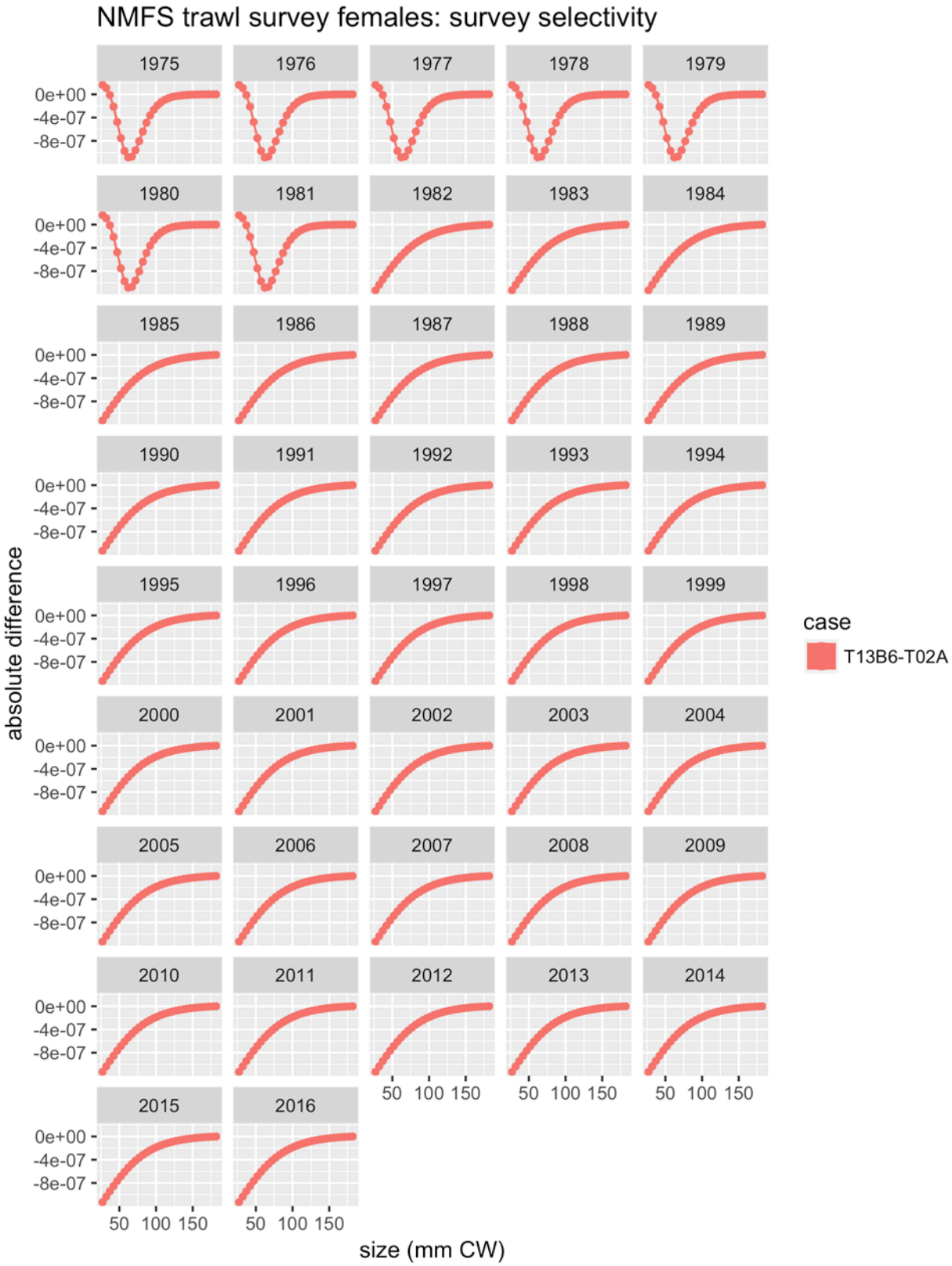

Figure 34. Differences for NMFS trawl survey females: survey selectivity.

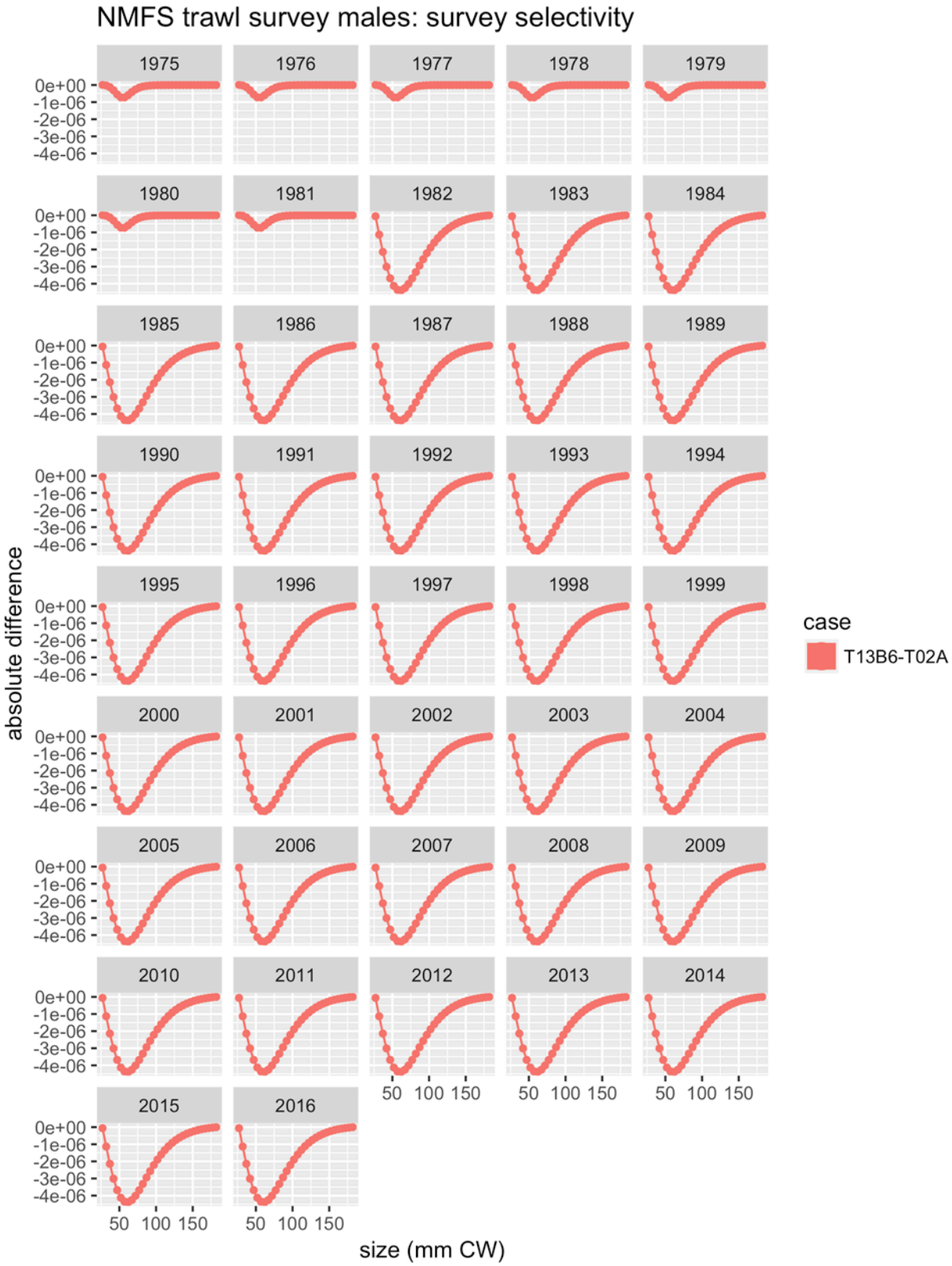

Figure 35. Differences for NMFS trawl survey males: survey selectivity.

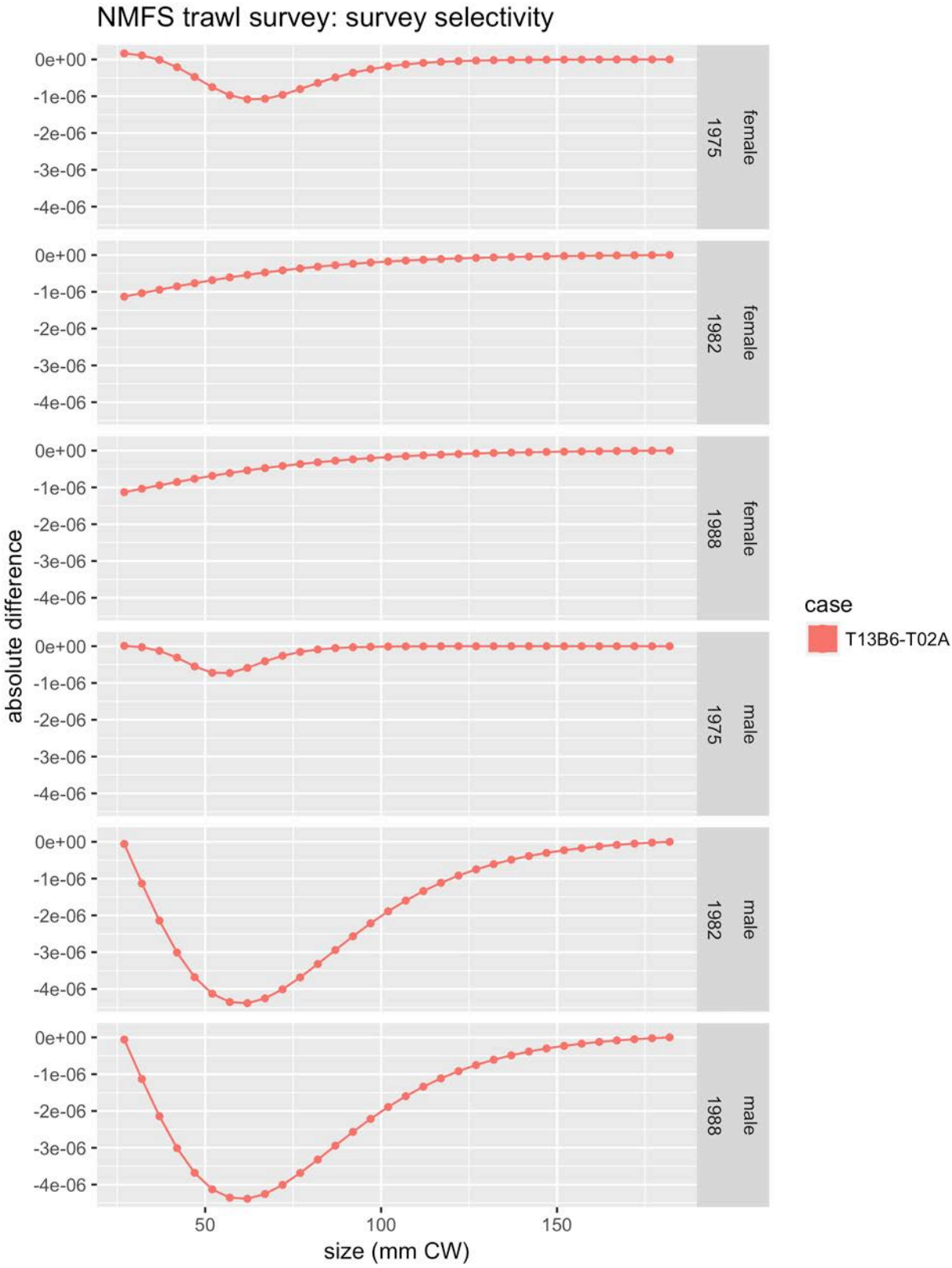

Figure 36. Differences for NMFS trawl survey: survey selectivity.

Survey abundance

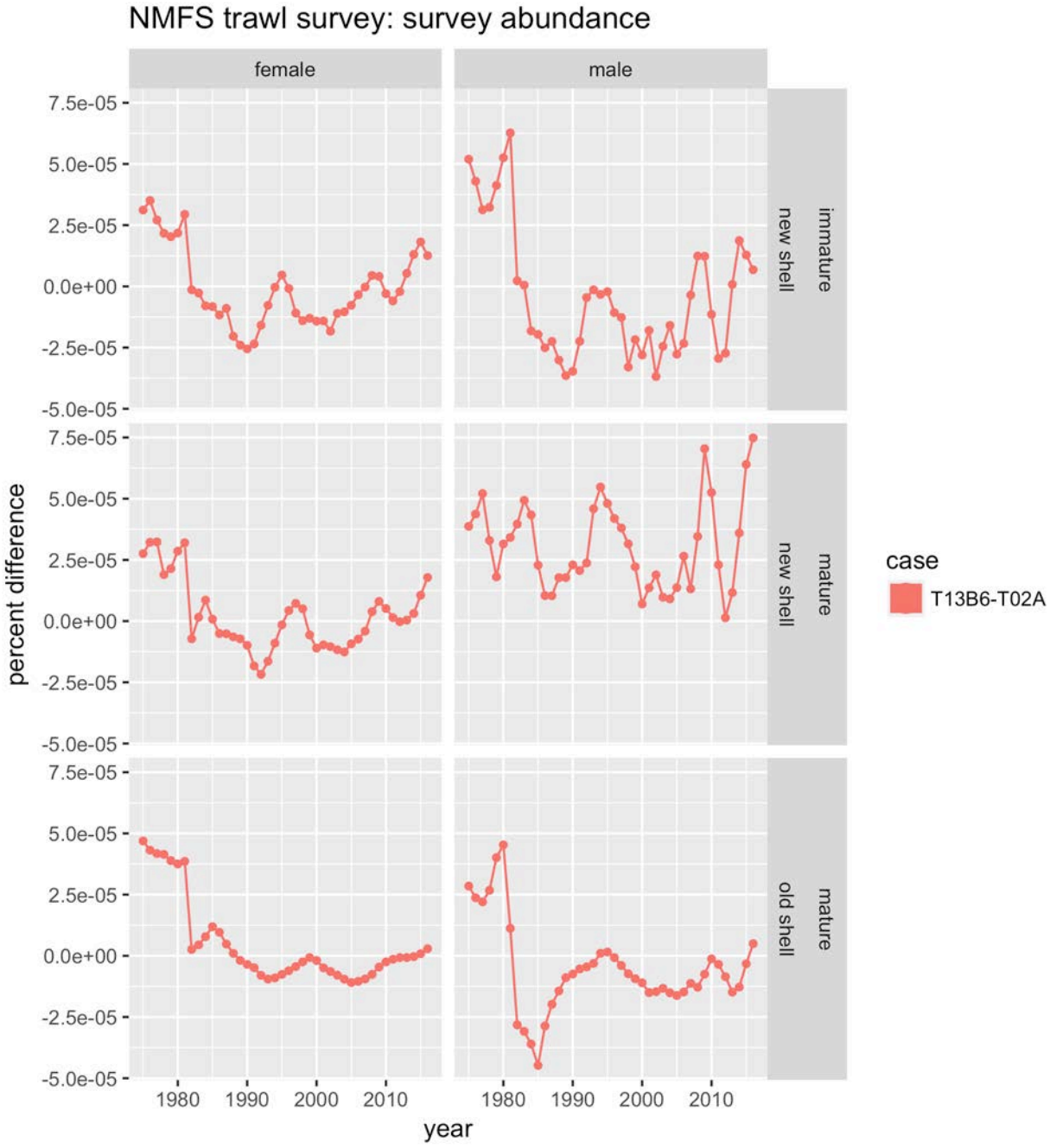

Figure 37. Differences for NMFS trawl survey: survey abundance.

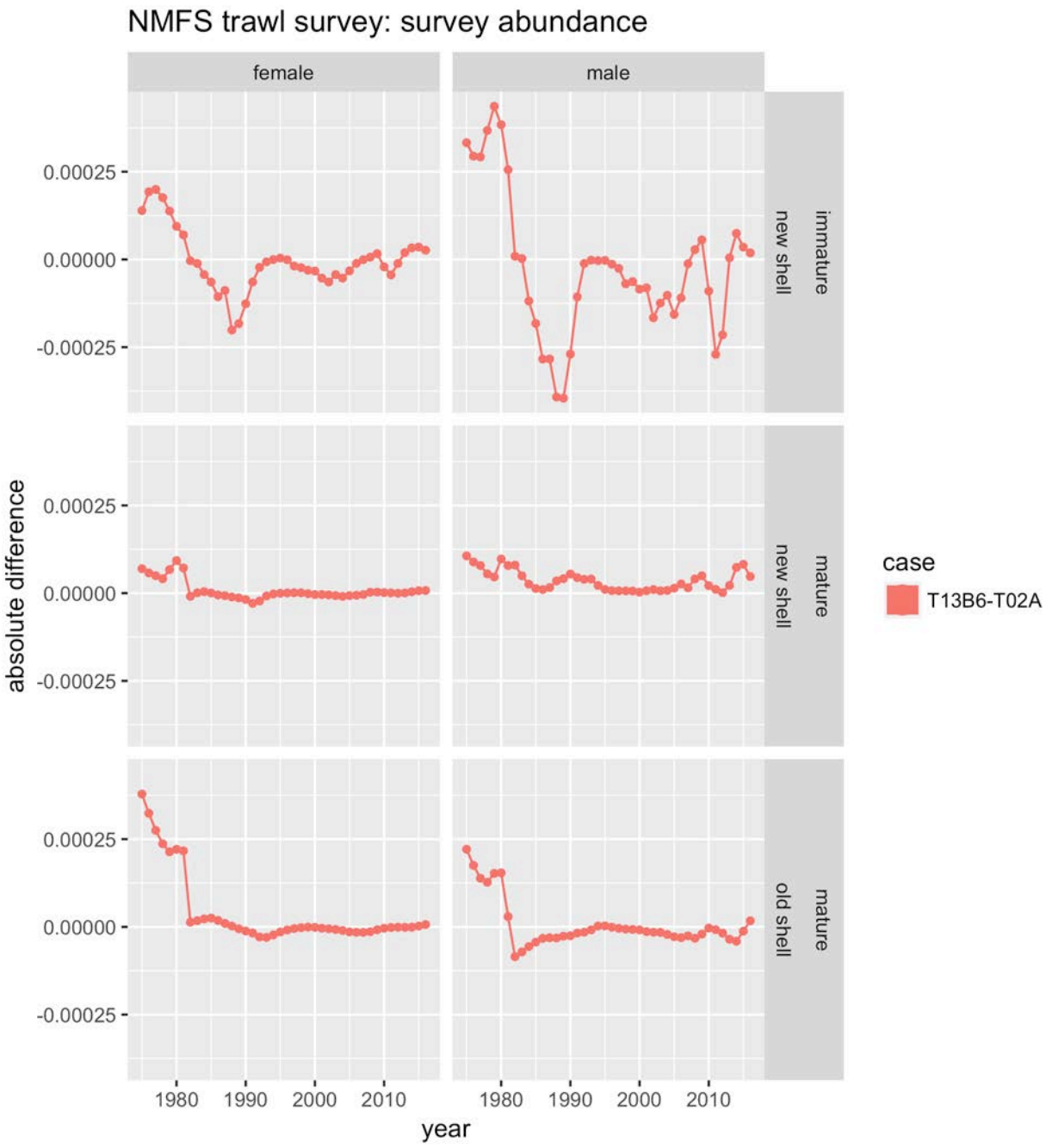

Figure 38. Differences for NMFS trawl survey: survey abundance.

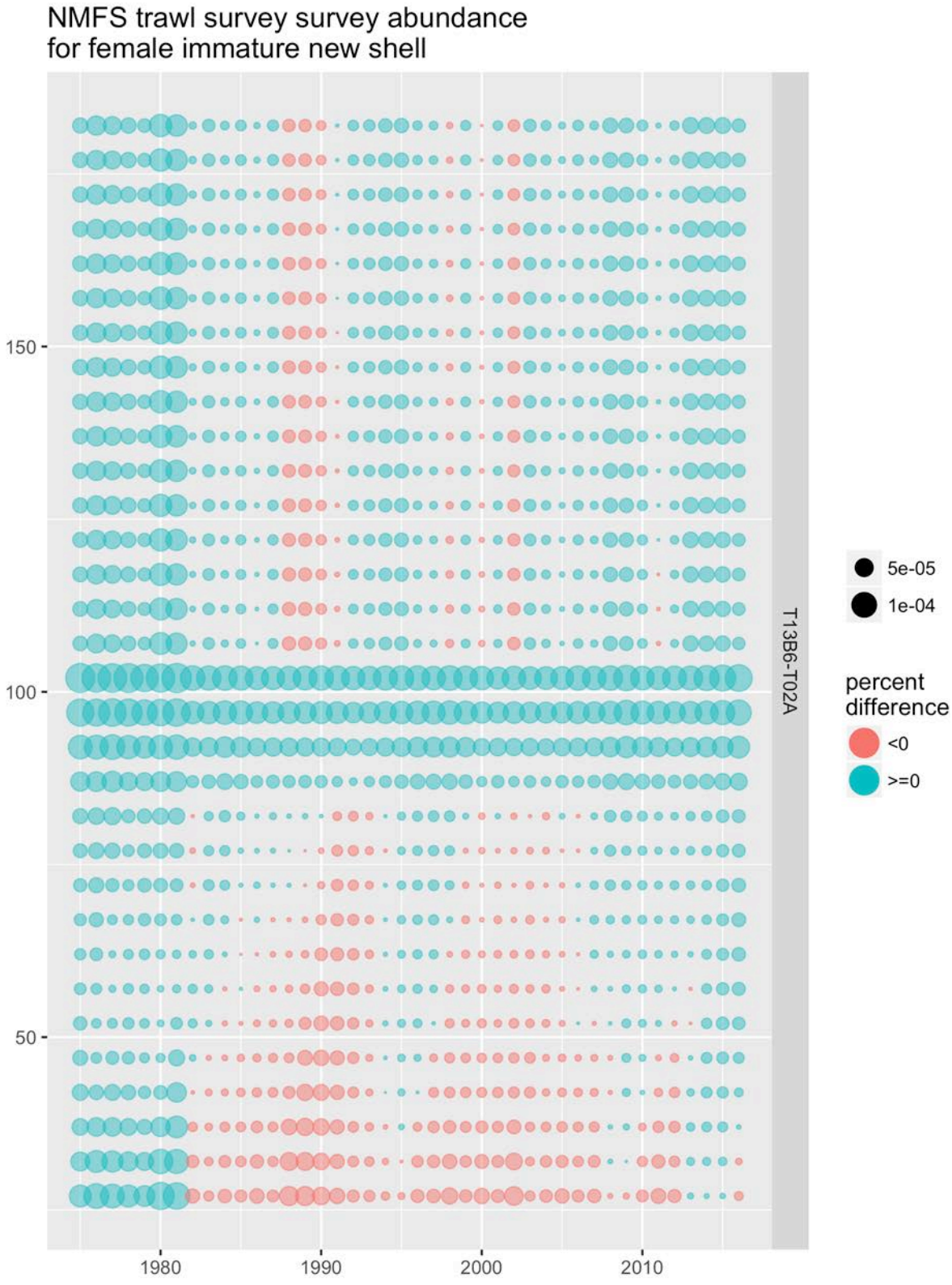

Figure 39. Differences for NMFS trawl survey survey abundance for female immature new shell.

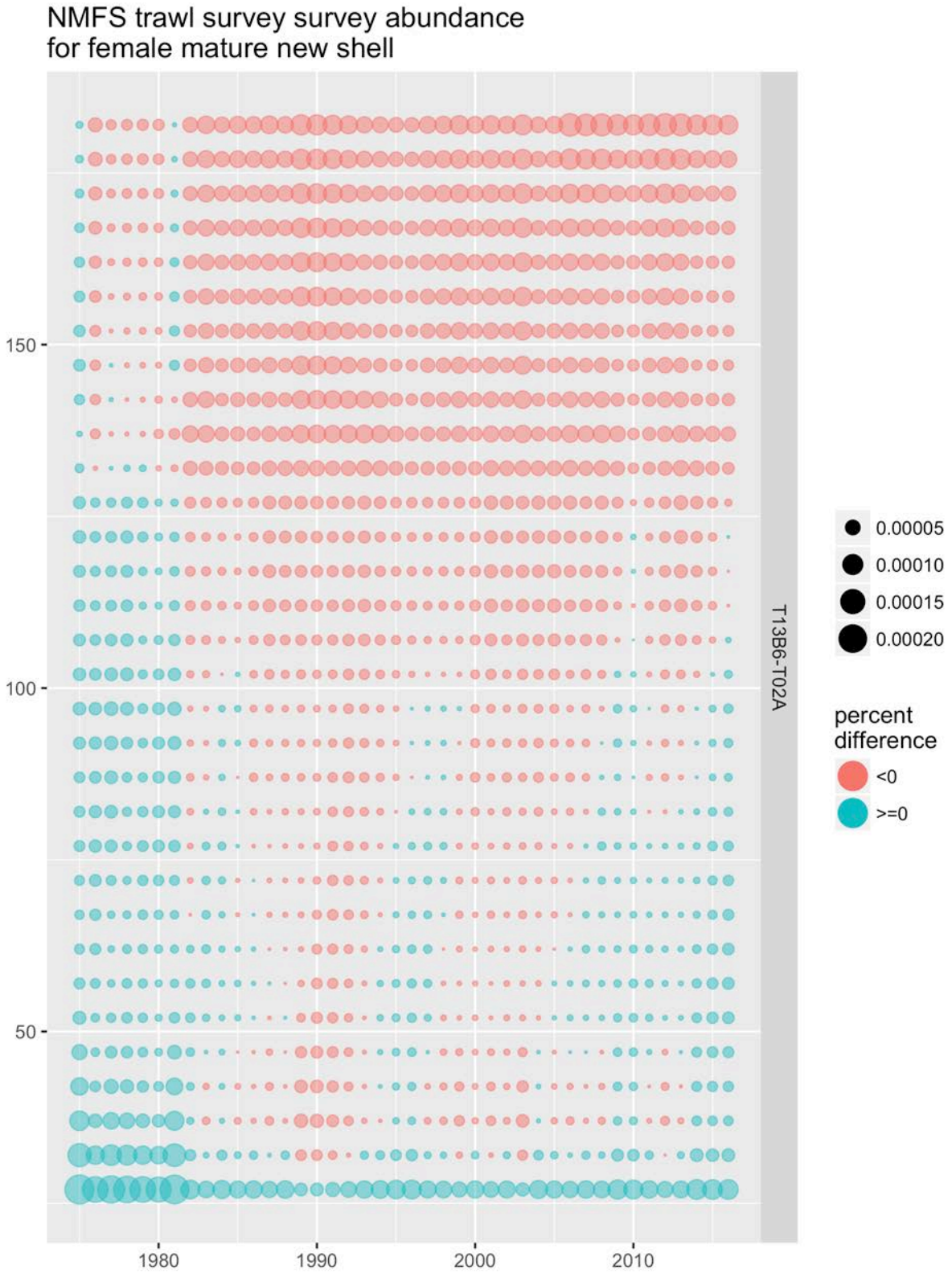

Figure 40. Differences for NMFS trawl survey survey abundance for female mature new shell.

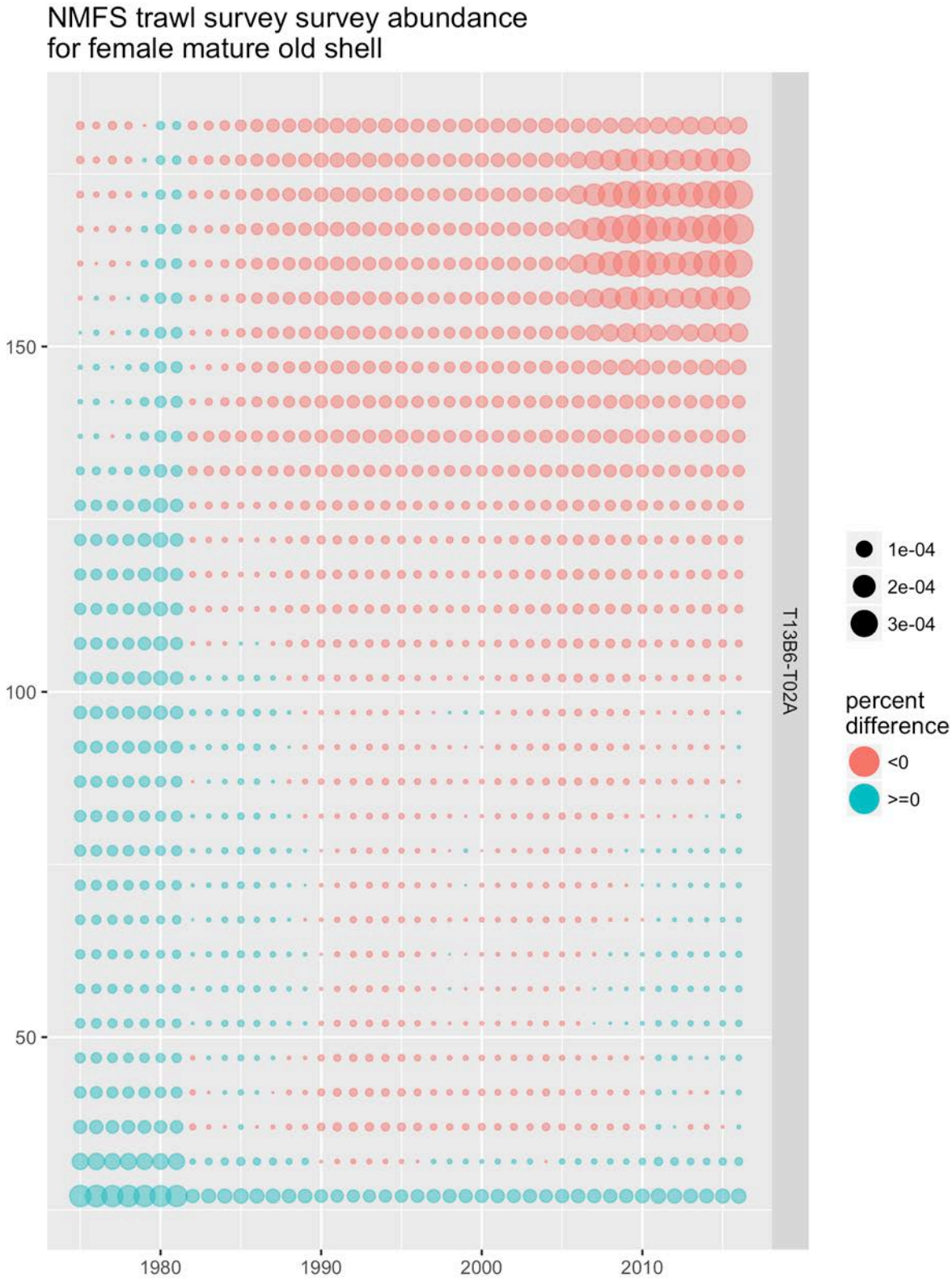

Figure 41. Differences for NMFS trawl survey survey abundance for female mature old shell.

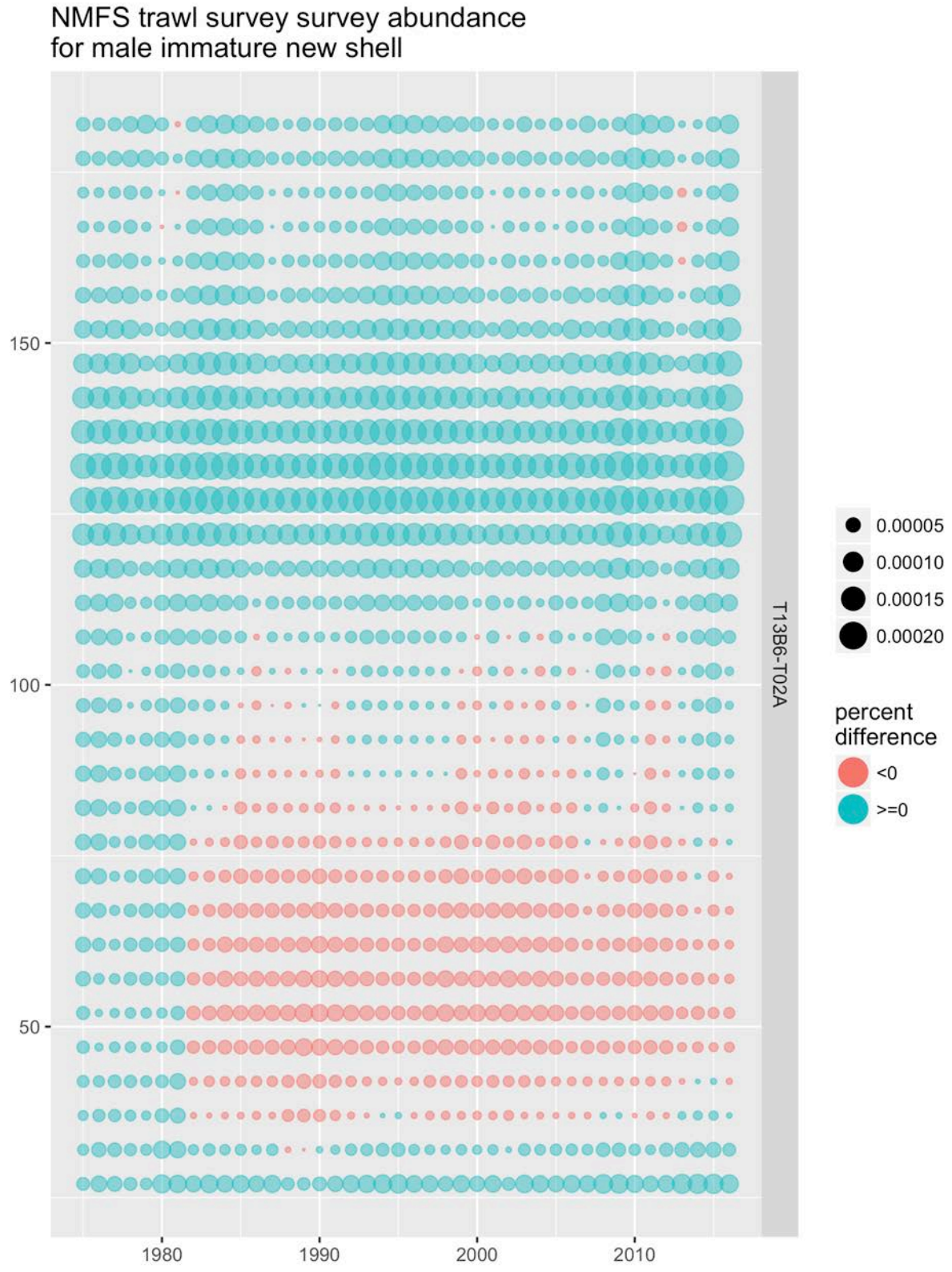

Figure 42. Differences for NMFS trawl survey survey abundance for male immature new shell.

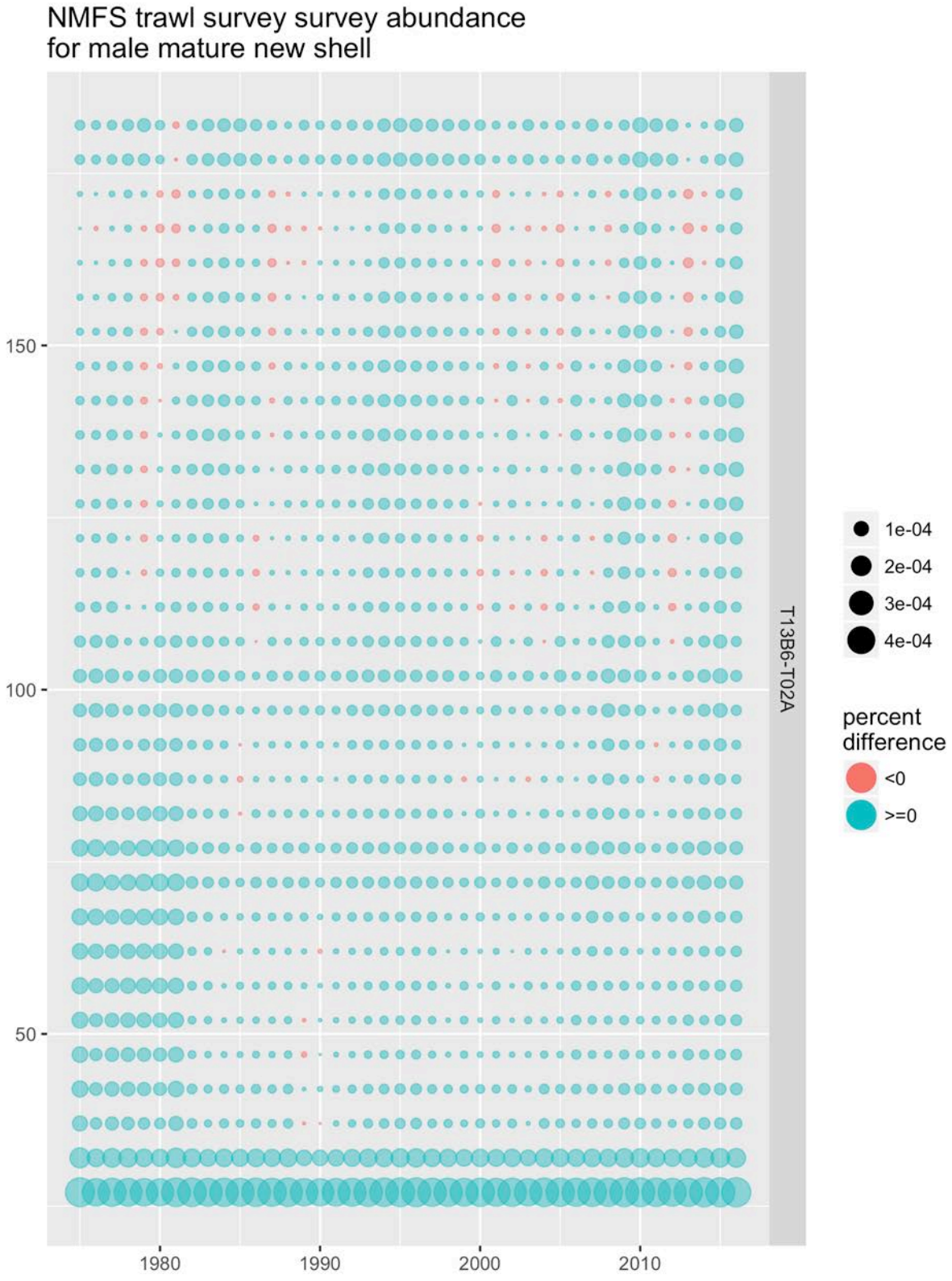

Figure 43. Differences for NMFS trawl survey survey abundance for male mature new shell.

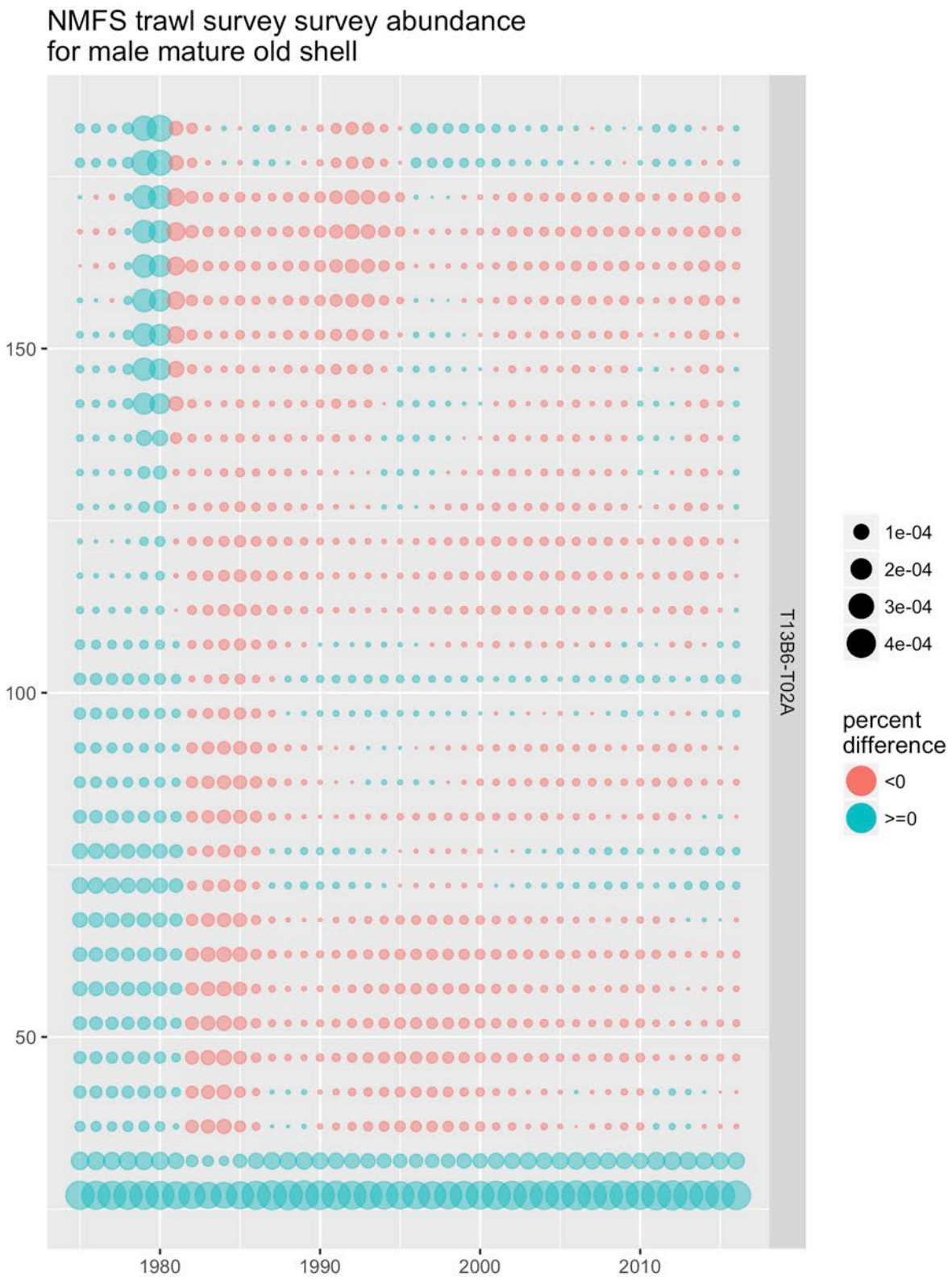

Figure 44. Differences for NMFS trawl survey survey abundance for male mature old shell.

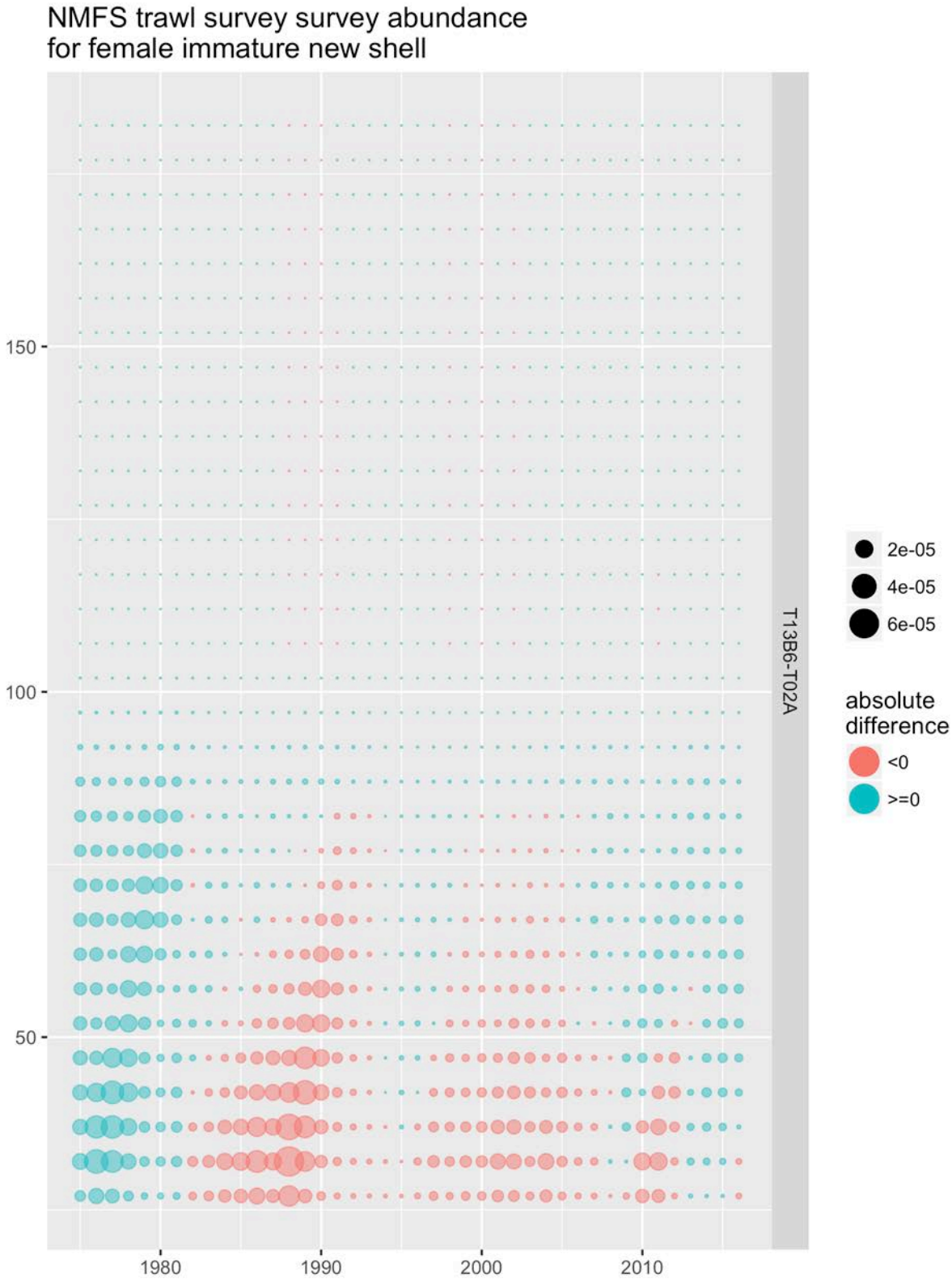

Figure 45. Differences for NMFS trawl survey survey abundance for female immature new shell.

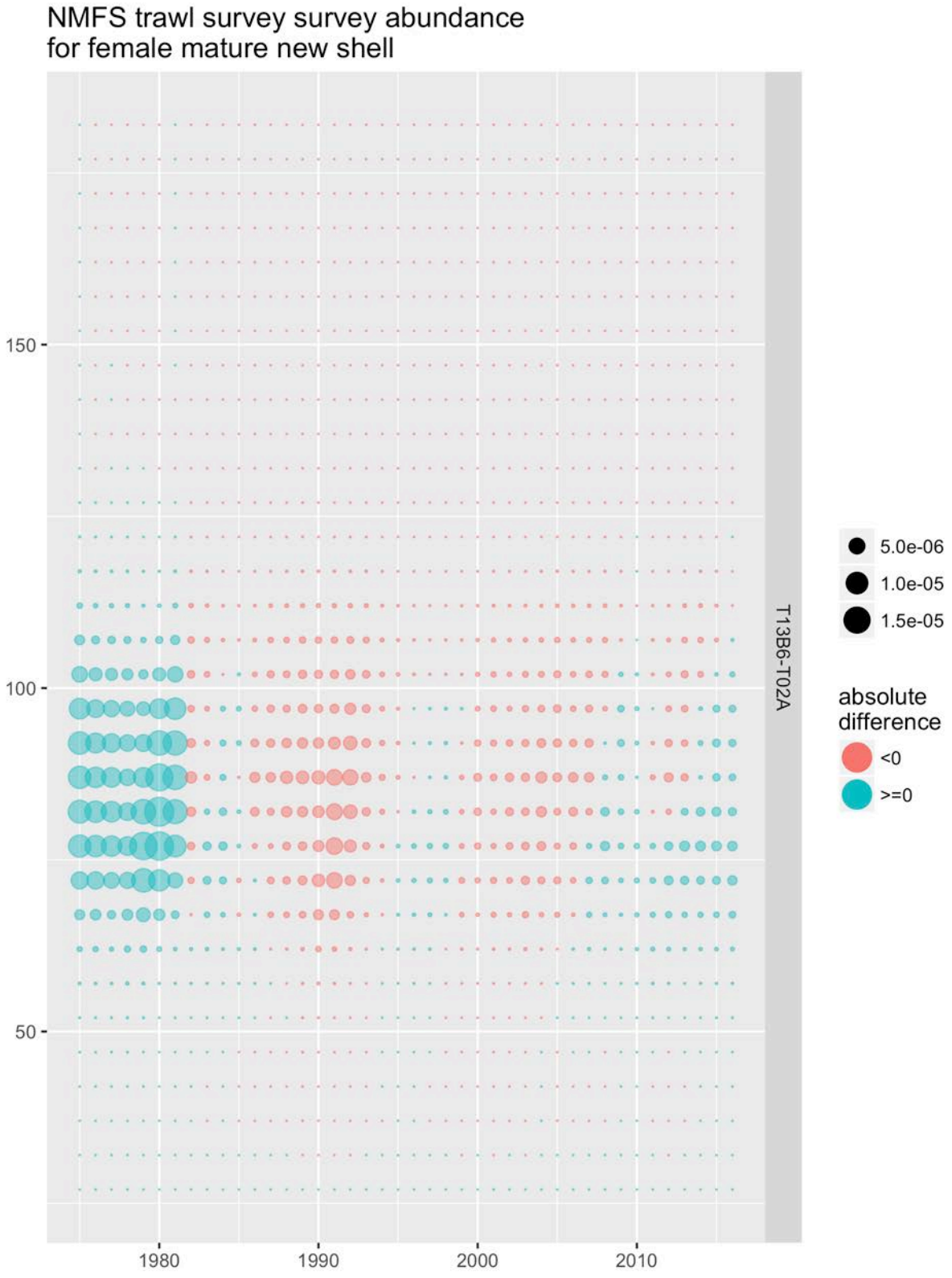

Figure 46. Differences for NMFS trawl survey survey abundance for female mature new shell.

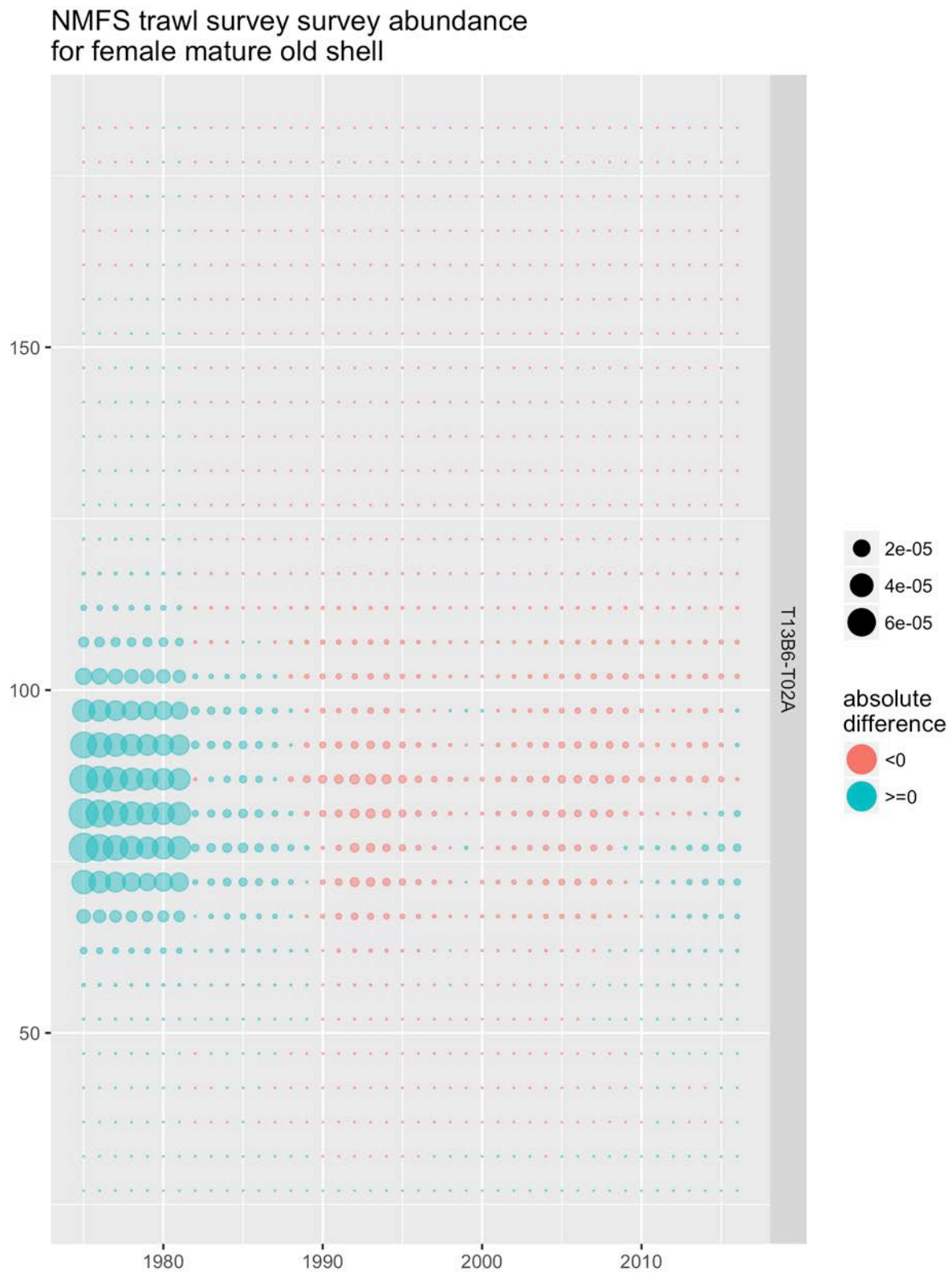

Figure 47. Differences for NMFS trawl survey survey abundance for female mature old shell.

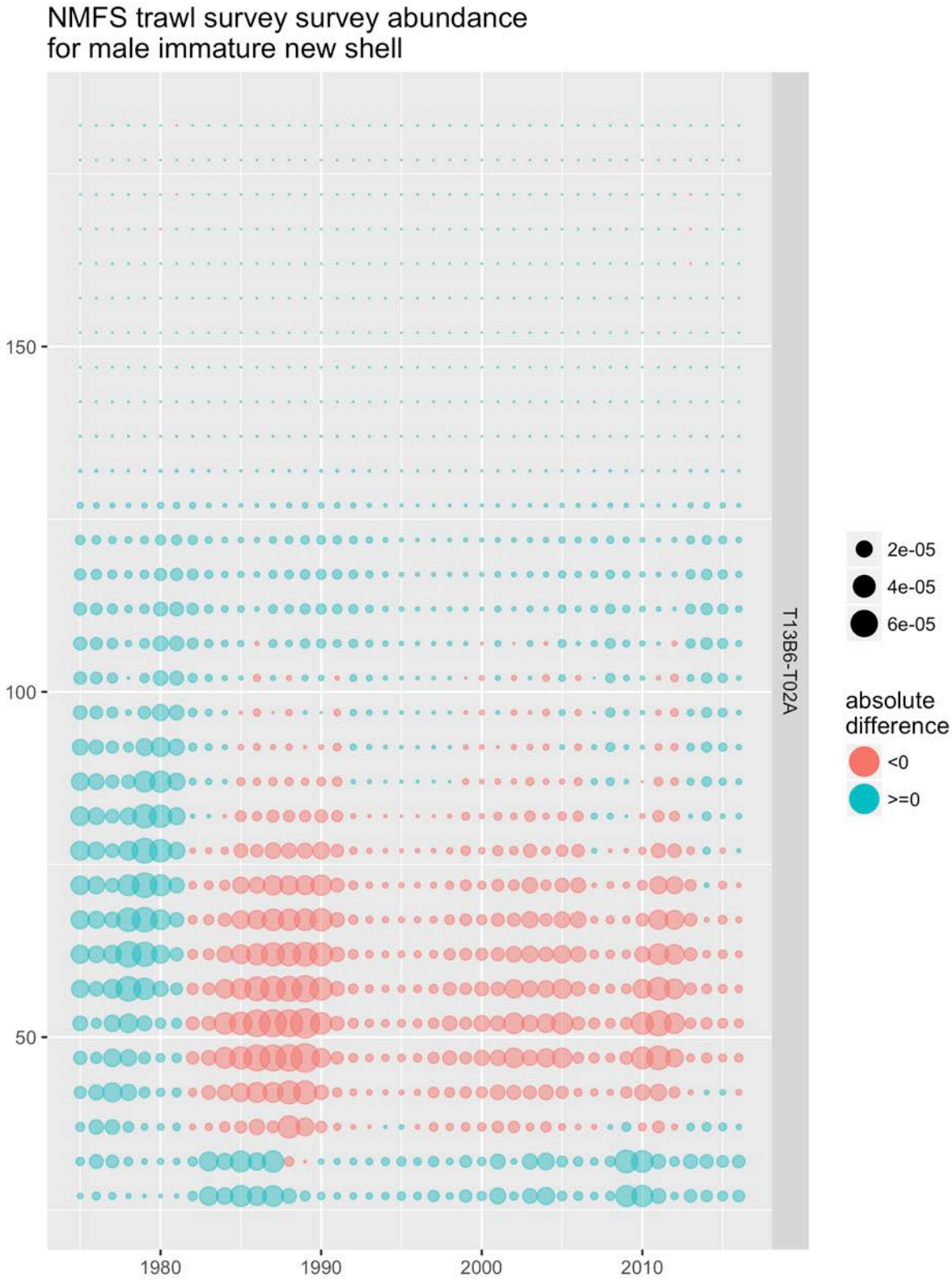

Figure 48. Differences for NMFS trawl survey survey abundance for male immature new shell.

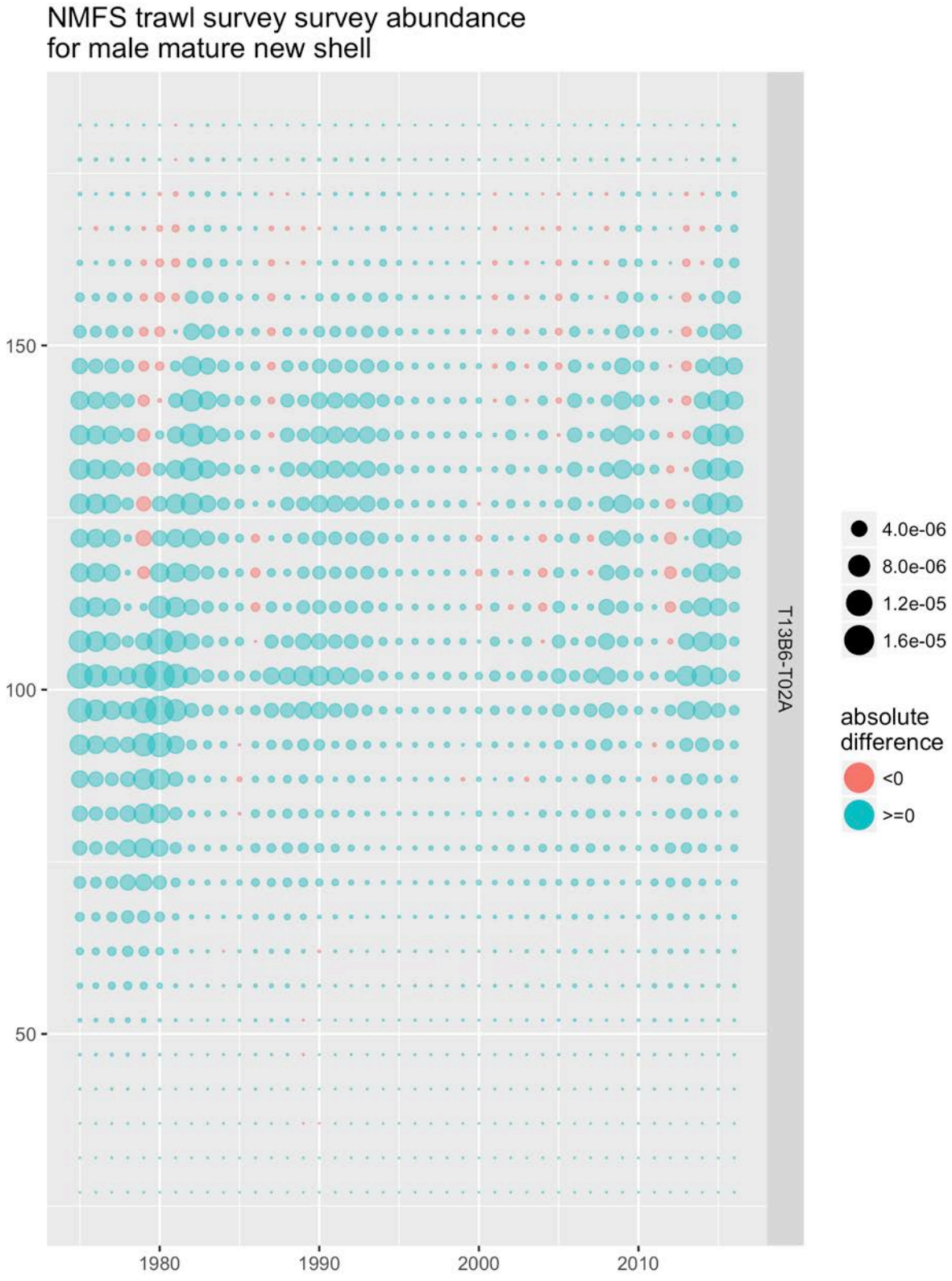

Figure 49. Differences for NMFS trawl survey survey abundance for male mature new shell.

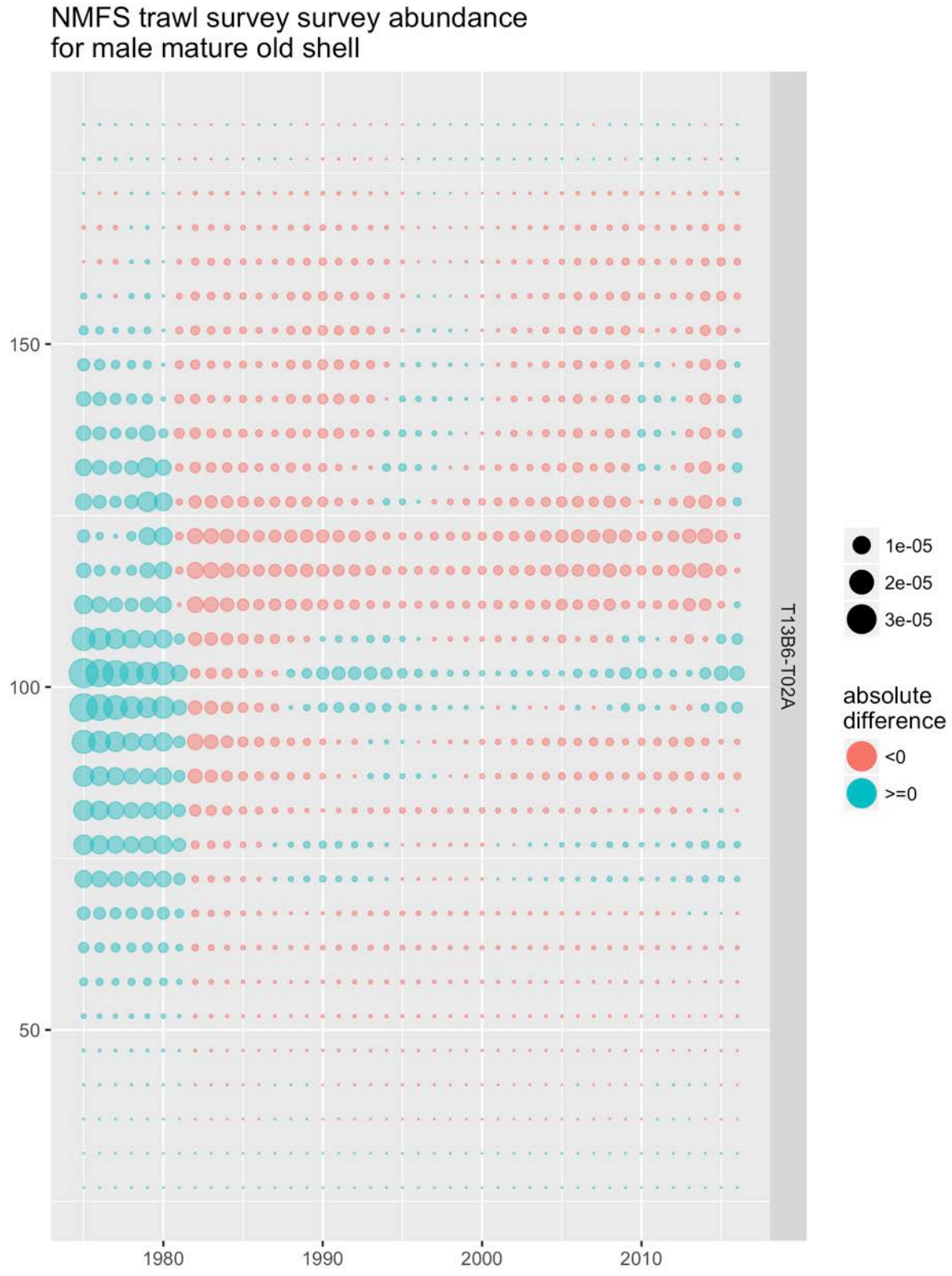

Figure 50. Differences for NMFS trawl survey survey abundance for male mature old shell.

Survey biomass

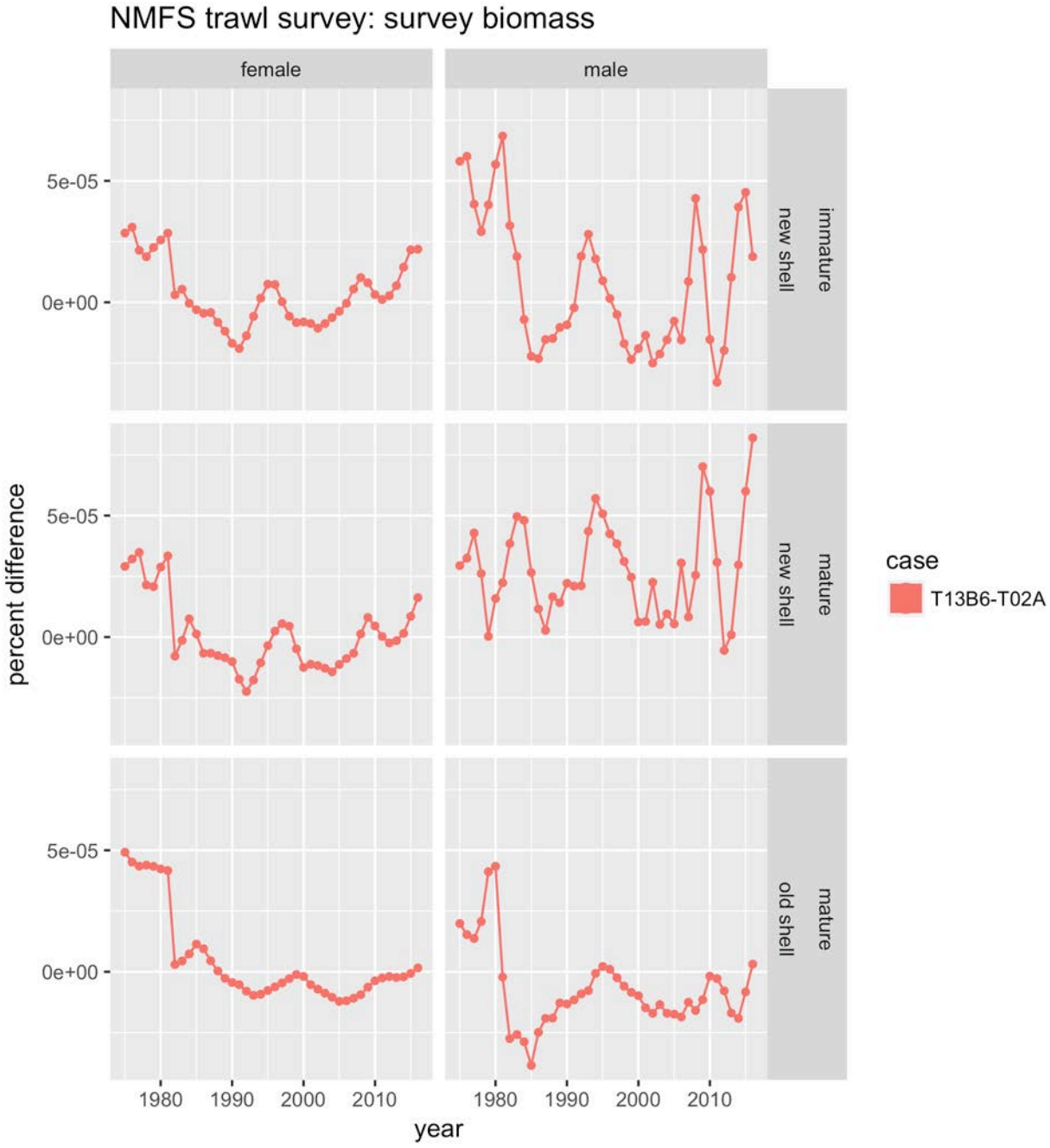

Figure 51. Differences for NMFS trawl survey: survey biomass.

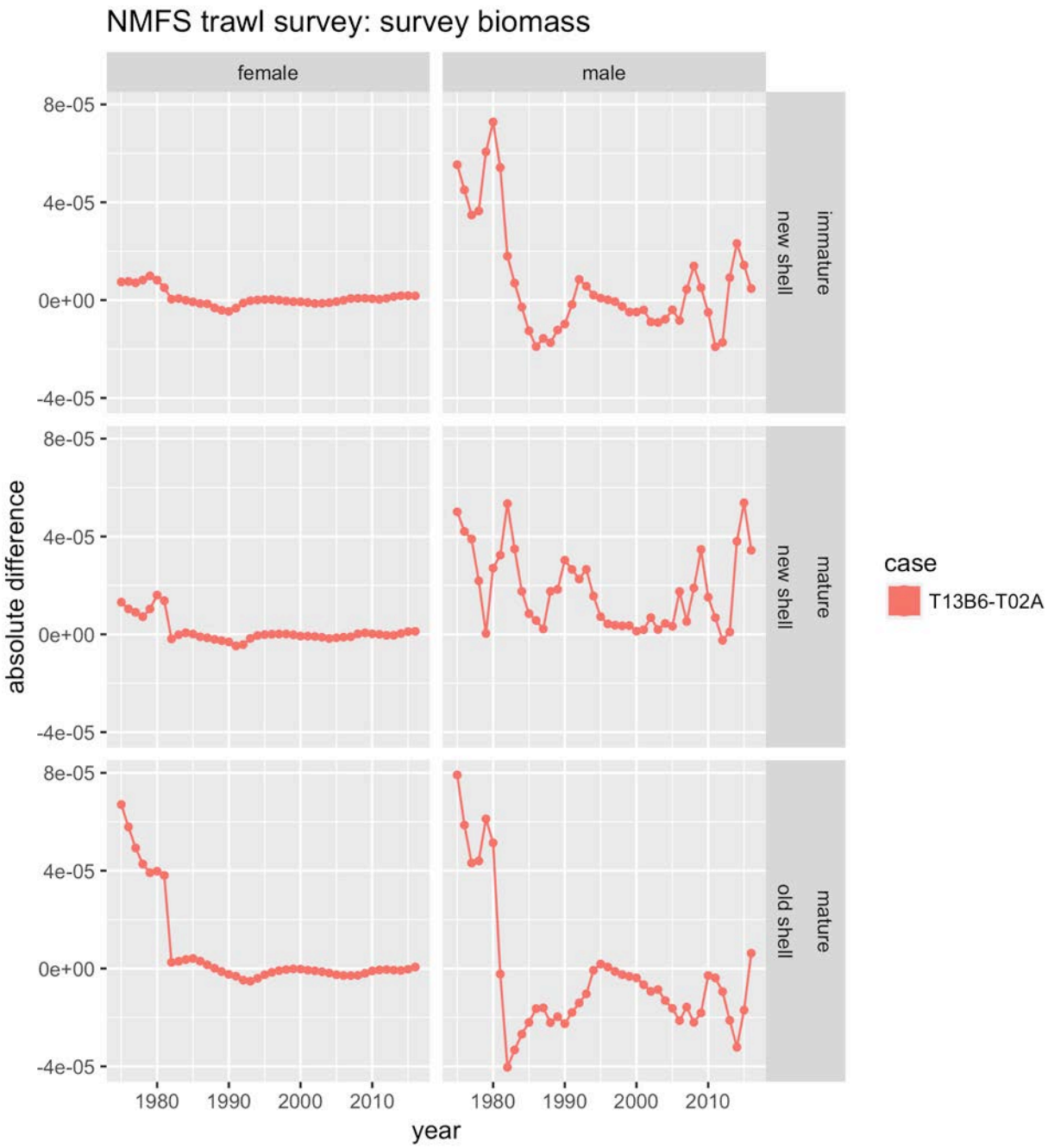

Figure 52. Differences for NMFS trawl survey: survey biomass.

Fisheries

Fishery catchability

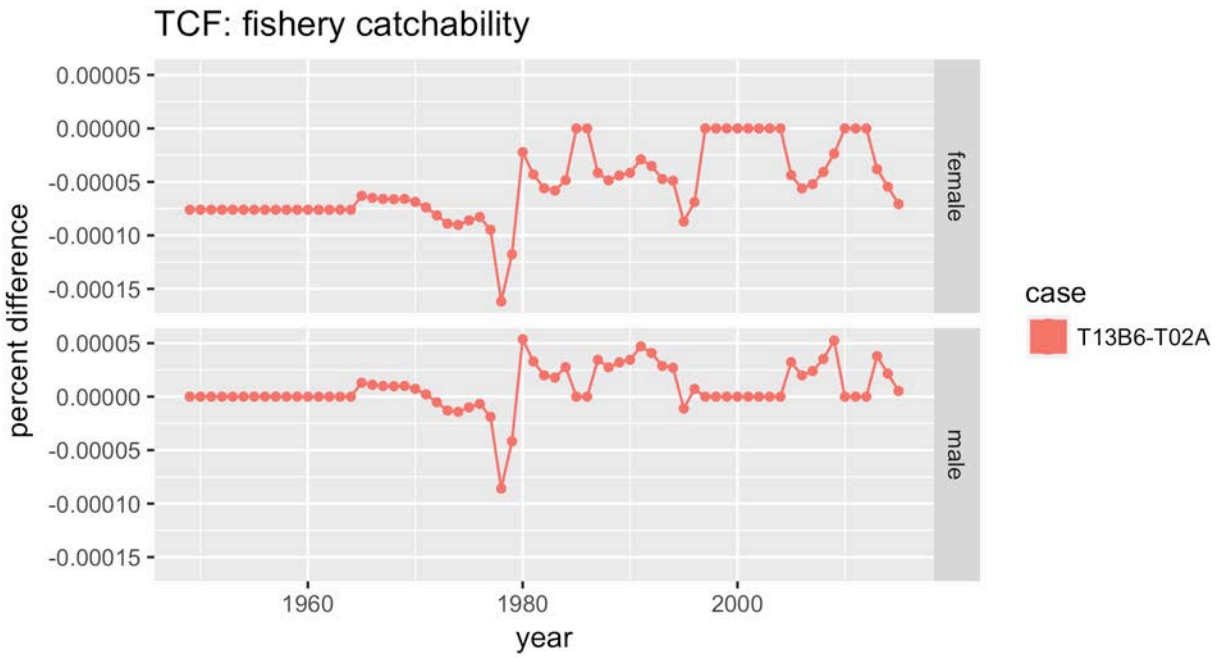

Figure 53. Differences for TCF: fishery catchability.

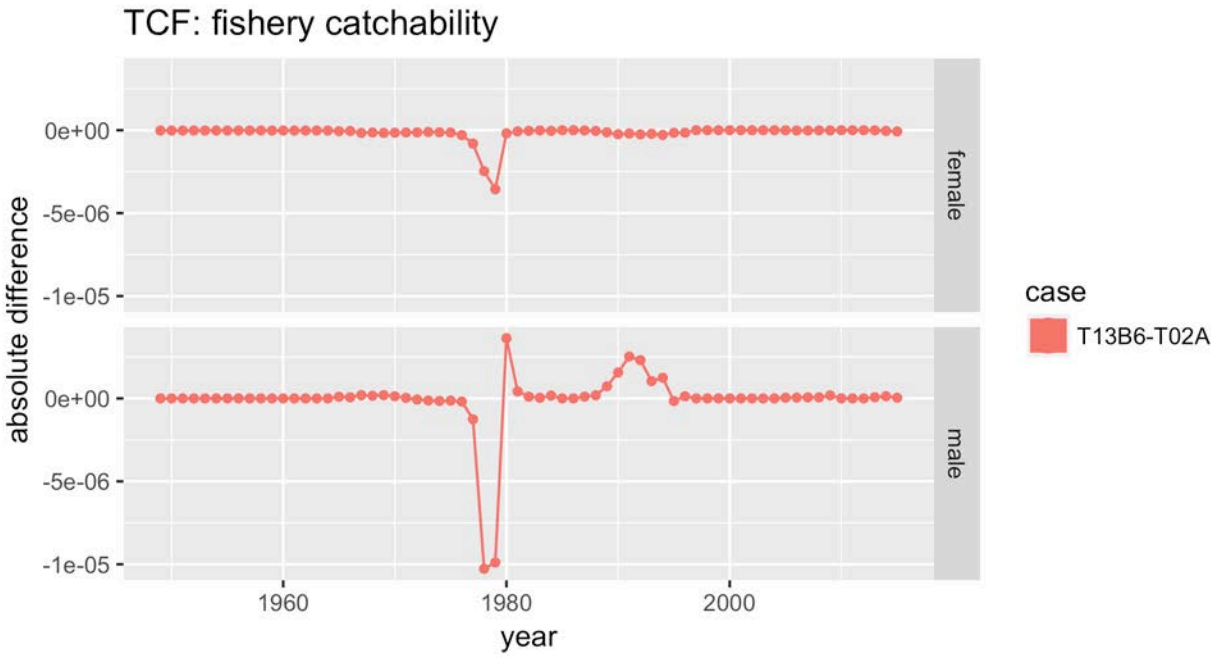

Figure 54. Differences for TCF: fishery catchability.

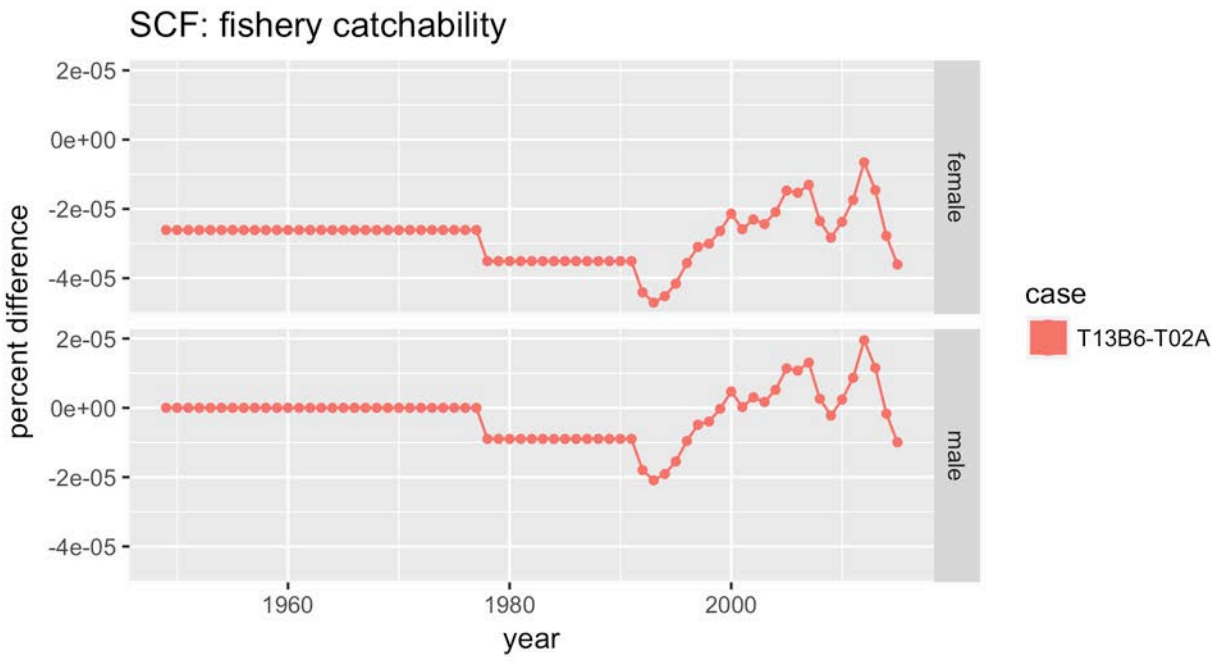

Figure 55. Differences for SCF: fishery catchability.

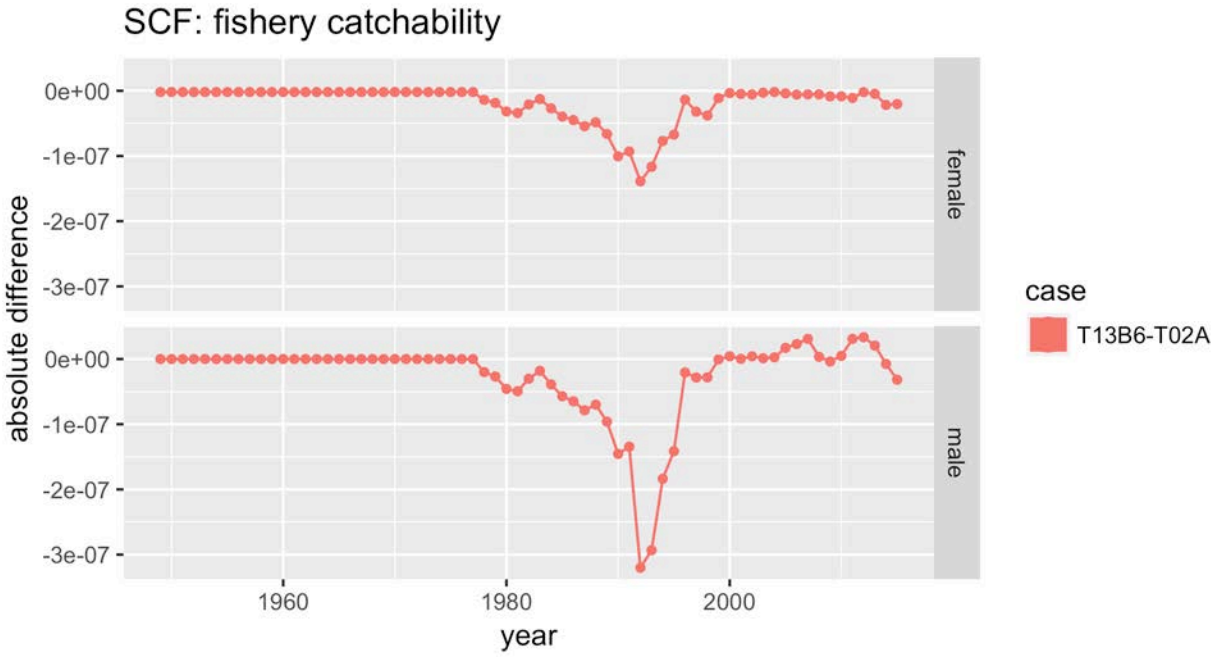

Figure 56. Differences for SCF: fishery catchability.

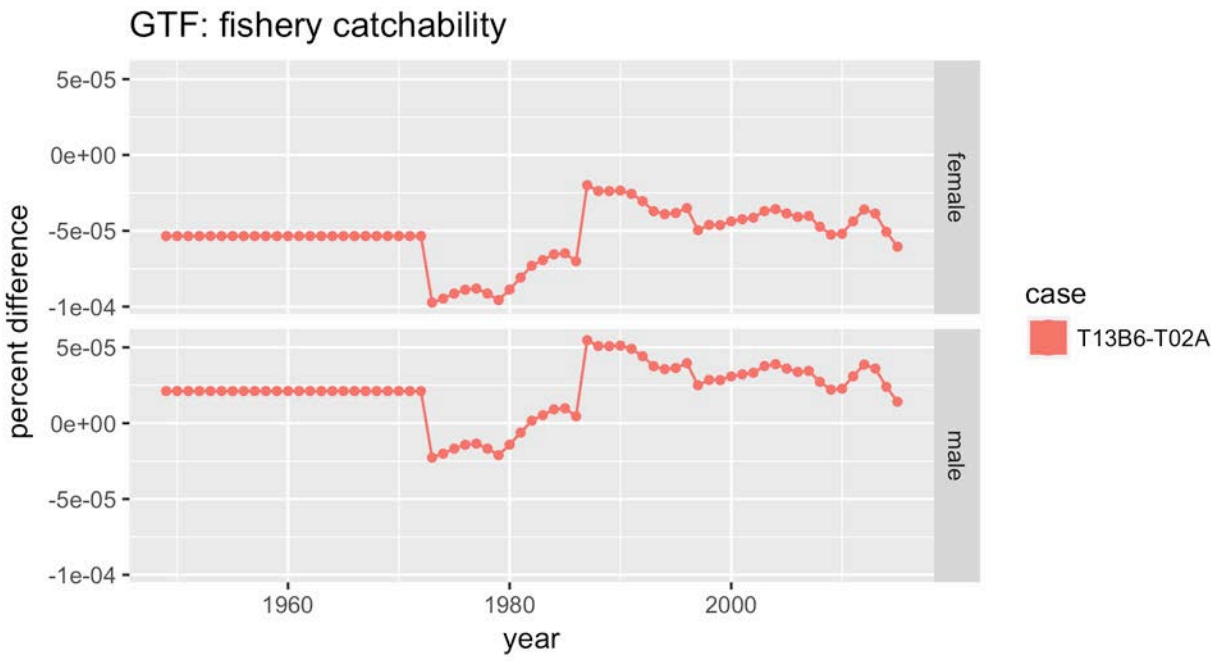

Figure 57. Differences for GTF: fishery catchability.

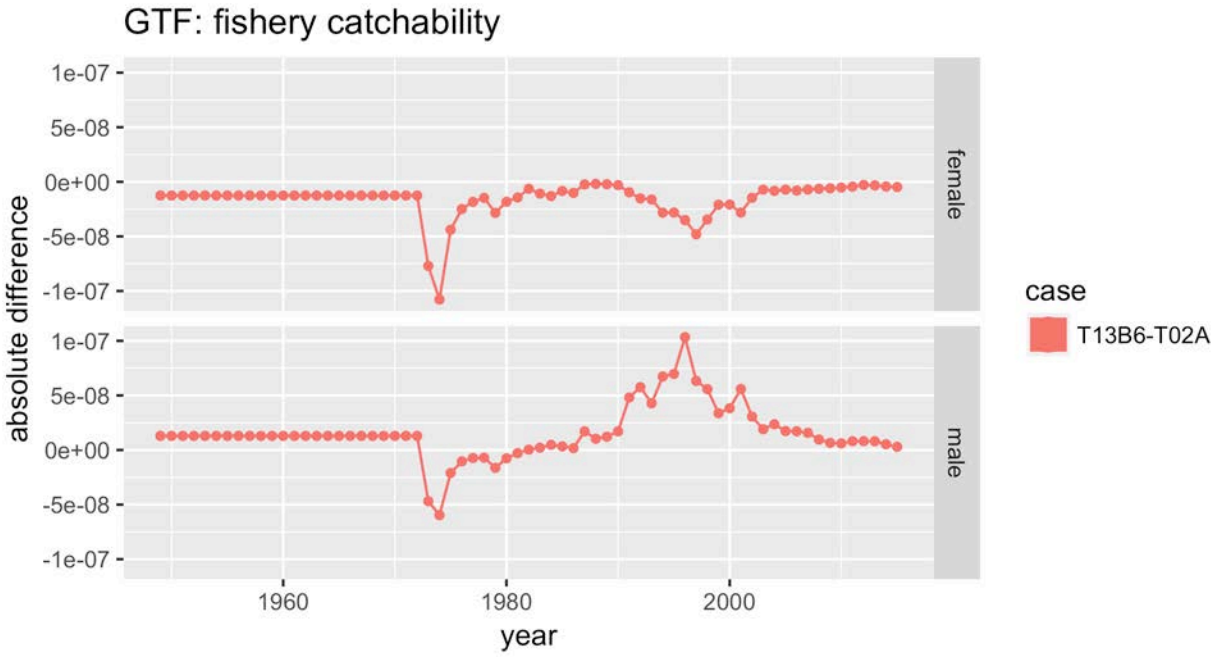

Figure 58. Differences for GTF: fishery catchability.

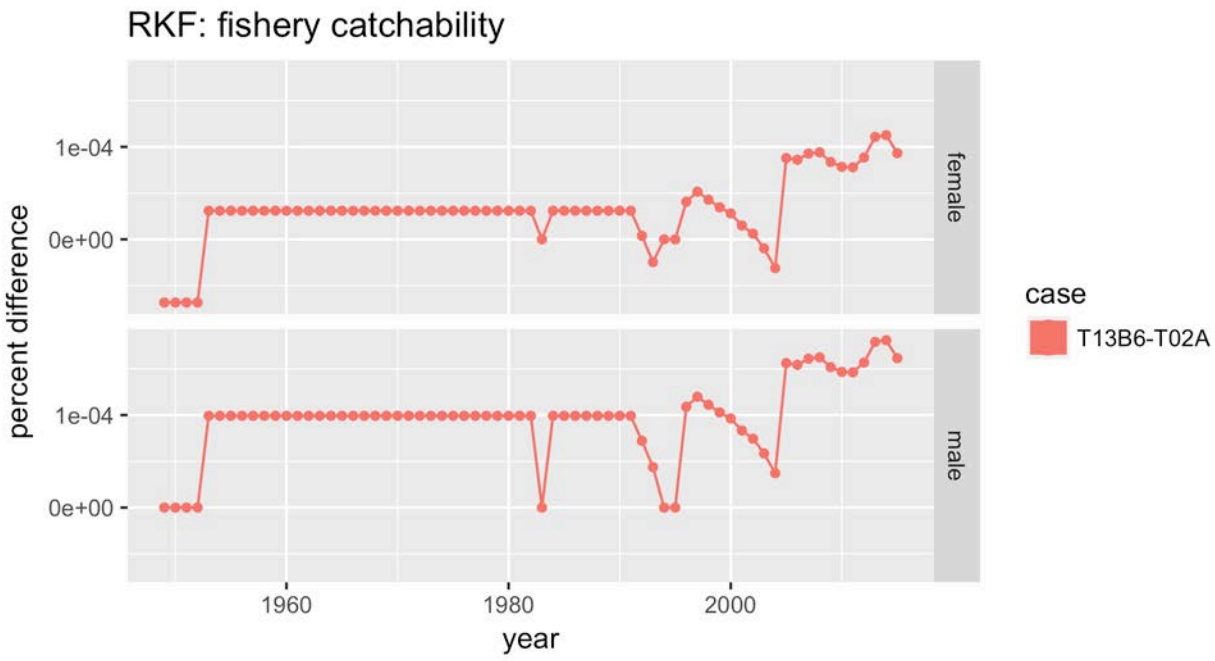

Figure 59. Differences for RKF: fishery catchability.

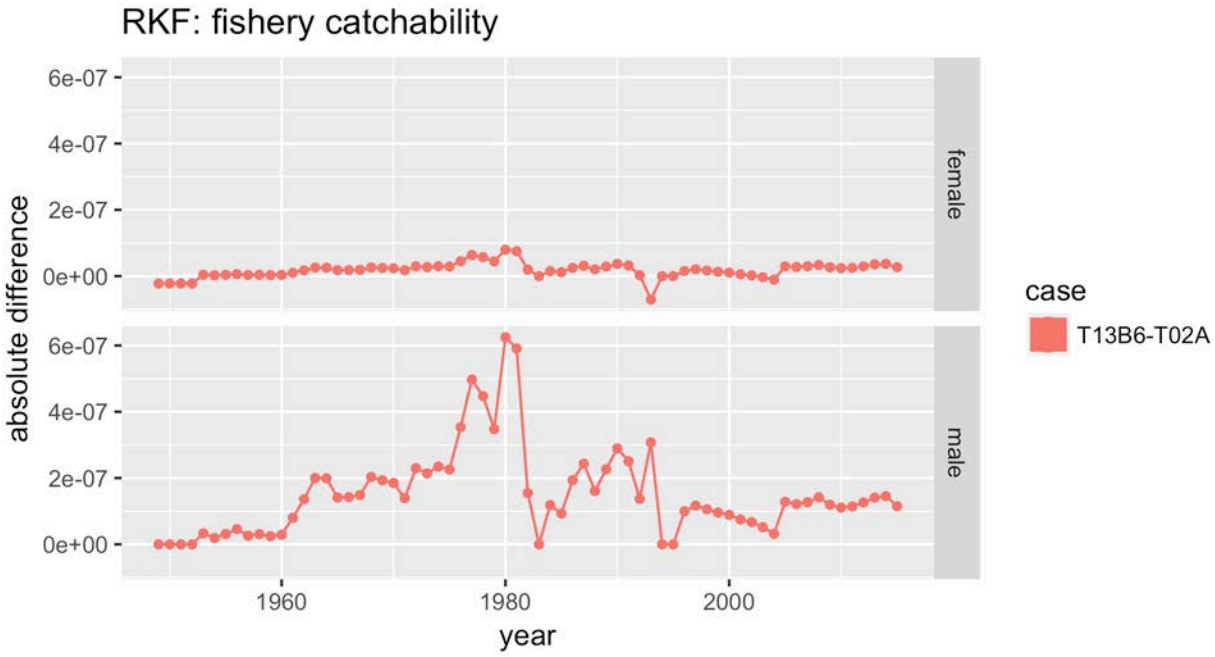

Figure 60. Differences for RKF: fishery catchability.

Total selectivity functions

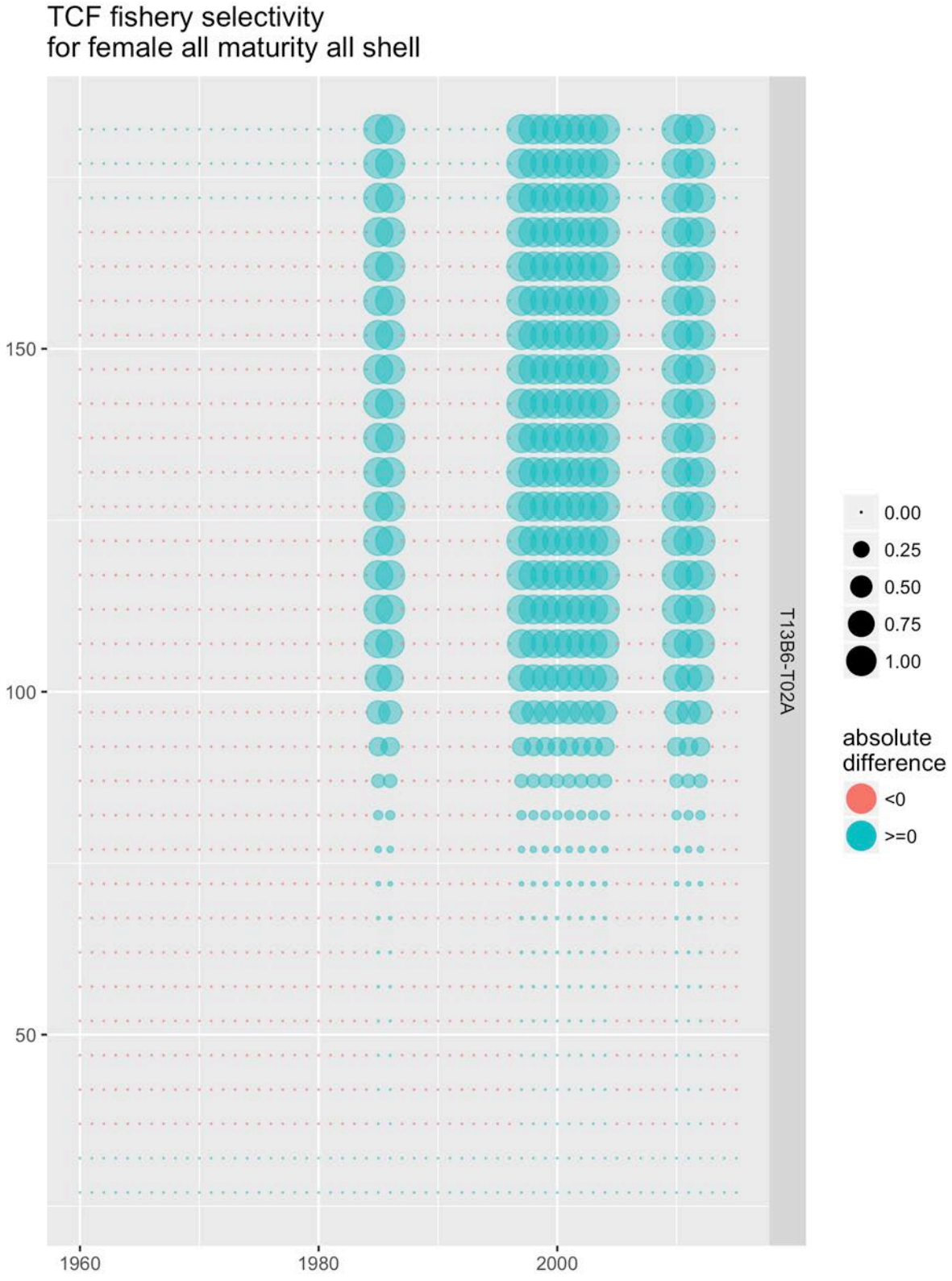

Figure 61. Differences for TCF fishery selectivity for female all maturity all shell.

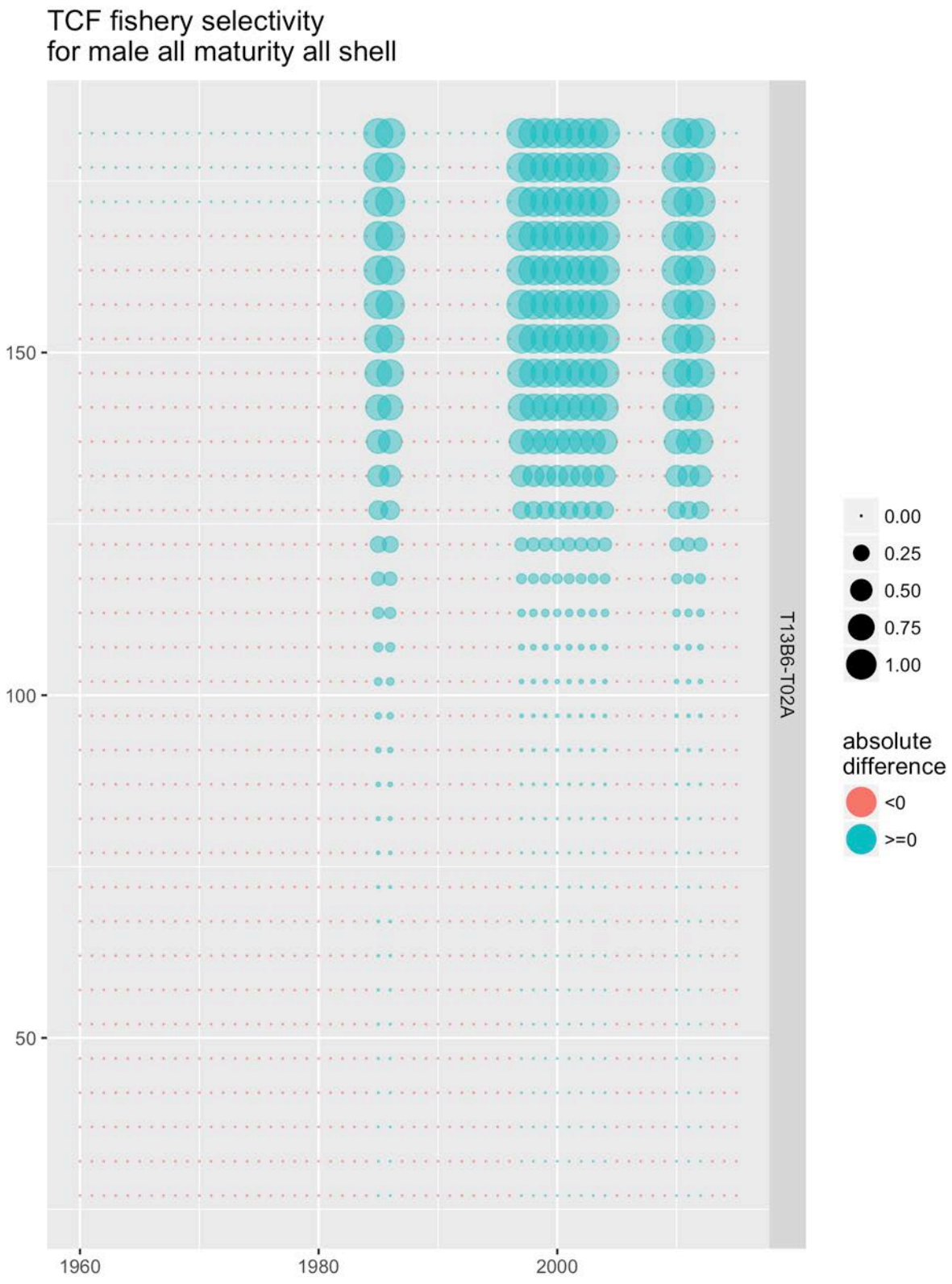

Figure 62. Differences for TCF fishery selectivity for male all maturity all shell.

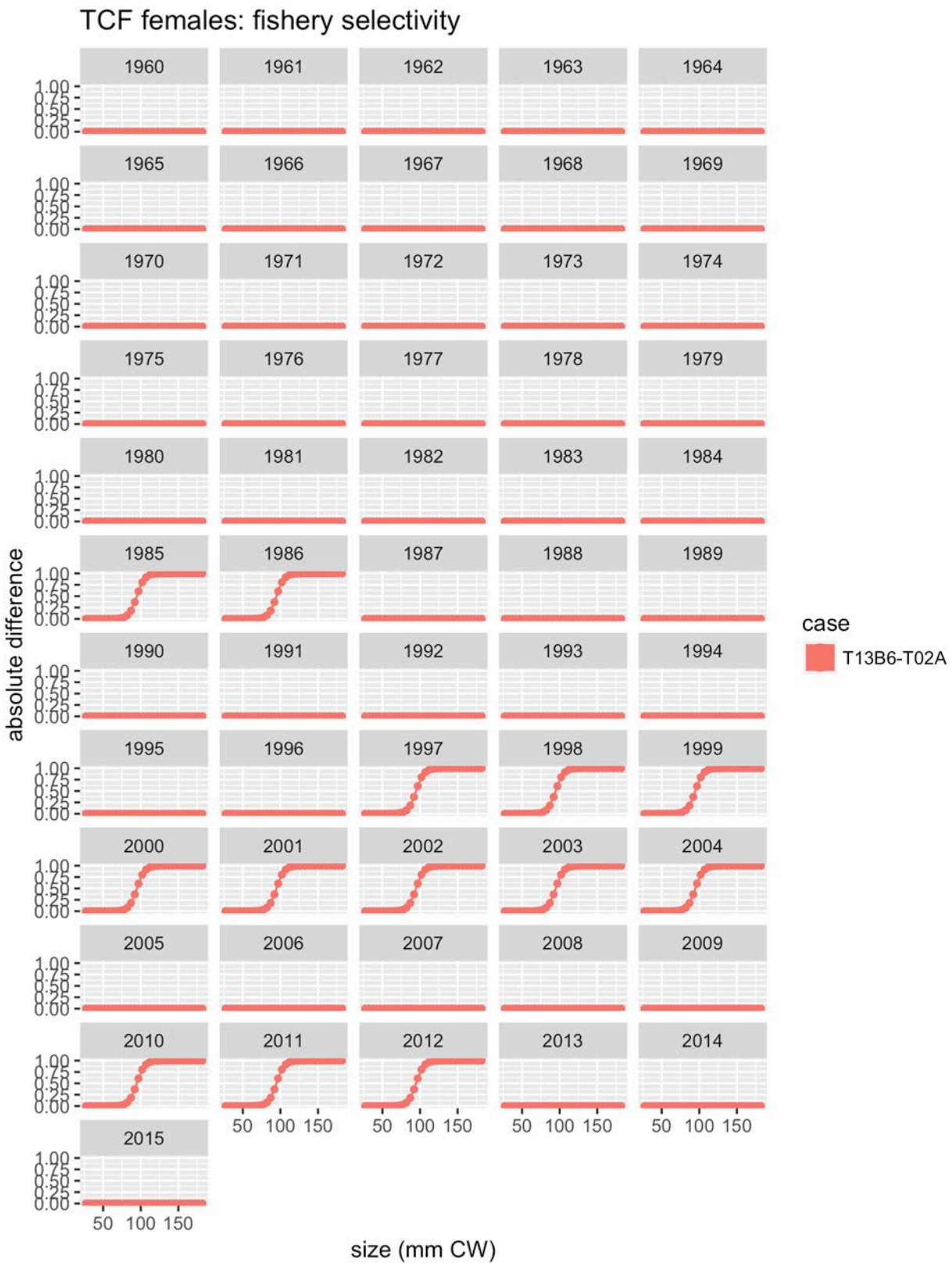

Figure 63. Differences for TCF females: fishery selectivity.

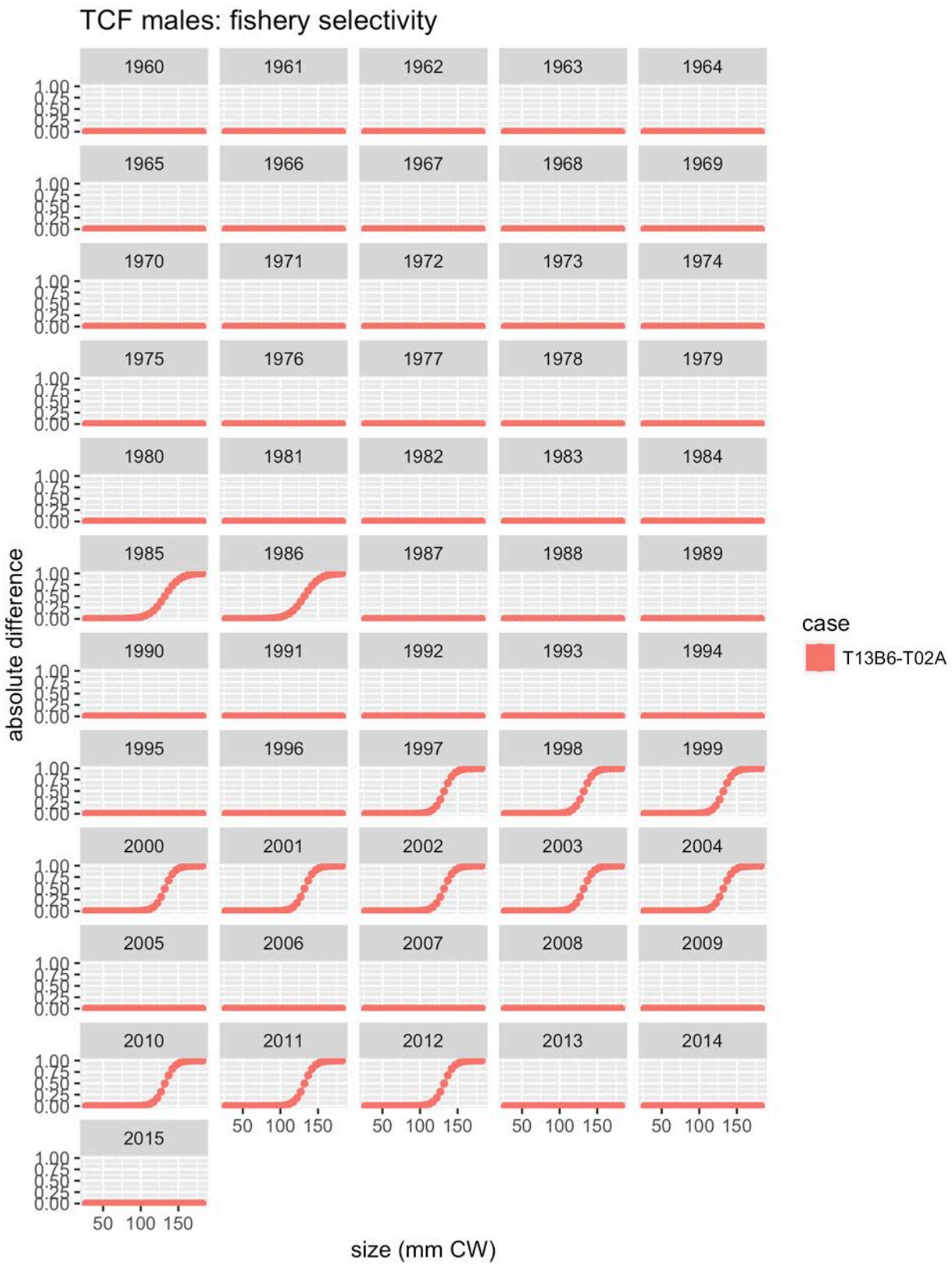

Figure 64. Differences for TCF males: fishery selectivity.

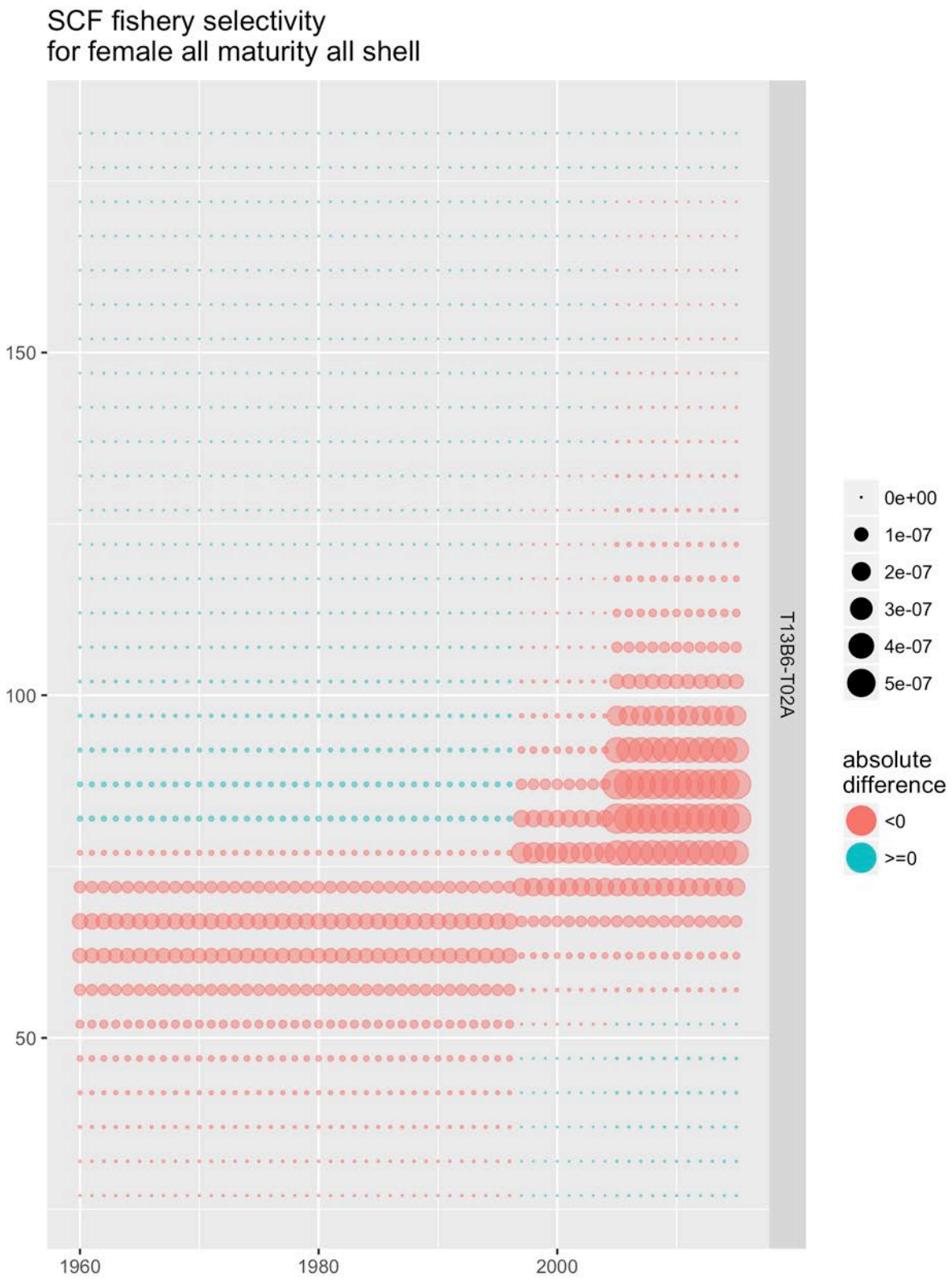

Figure 65. Differences for SCF fishery selectivity for female all maturity all shell.

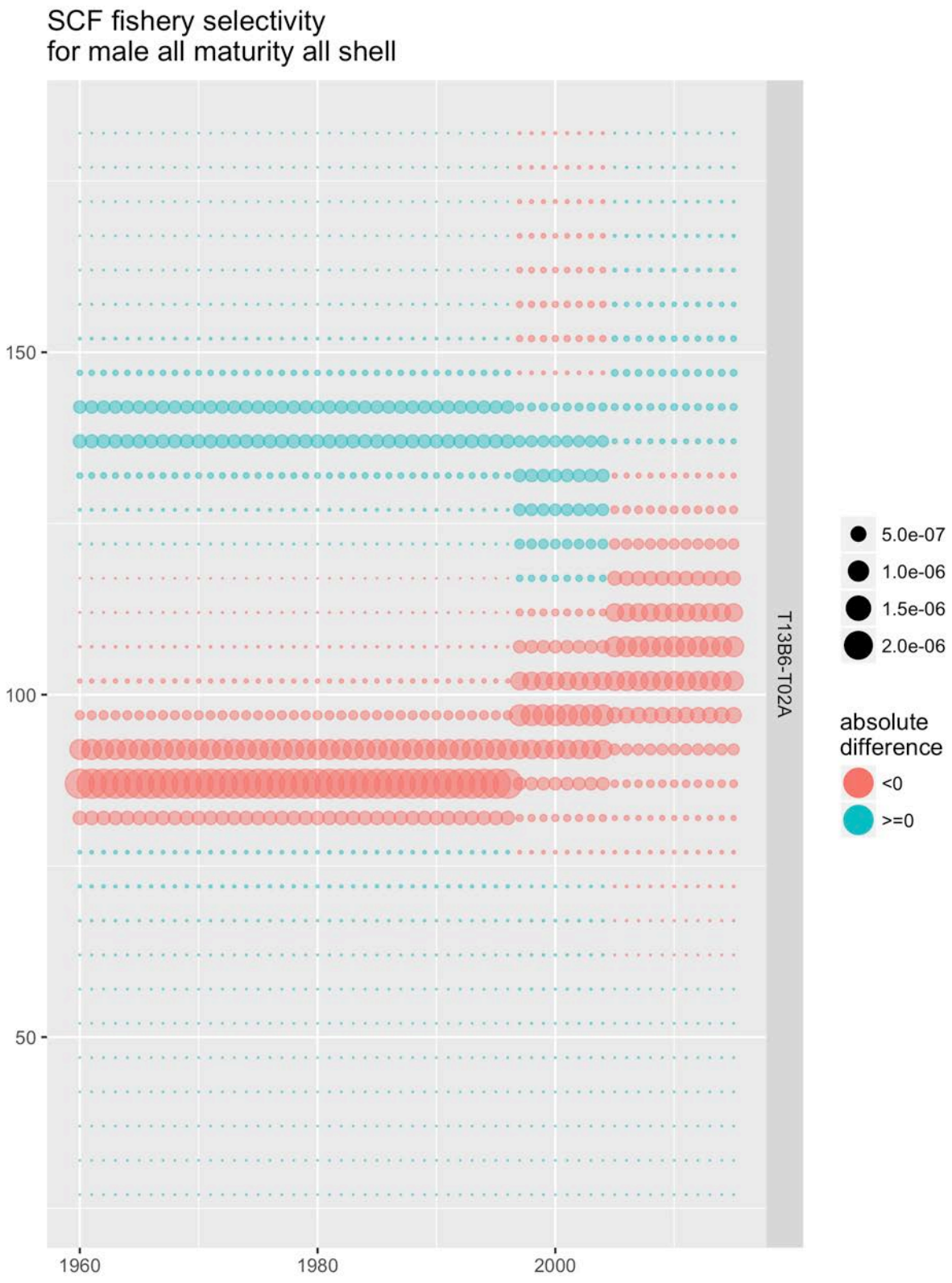

Figure 66. Differences for SCF fishery selectivity for male all maturity all shell.

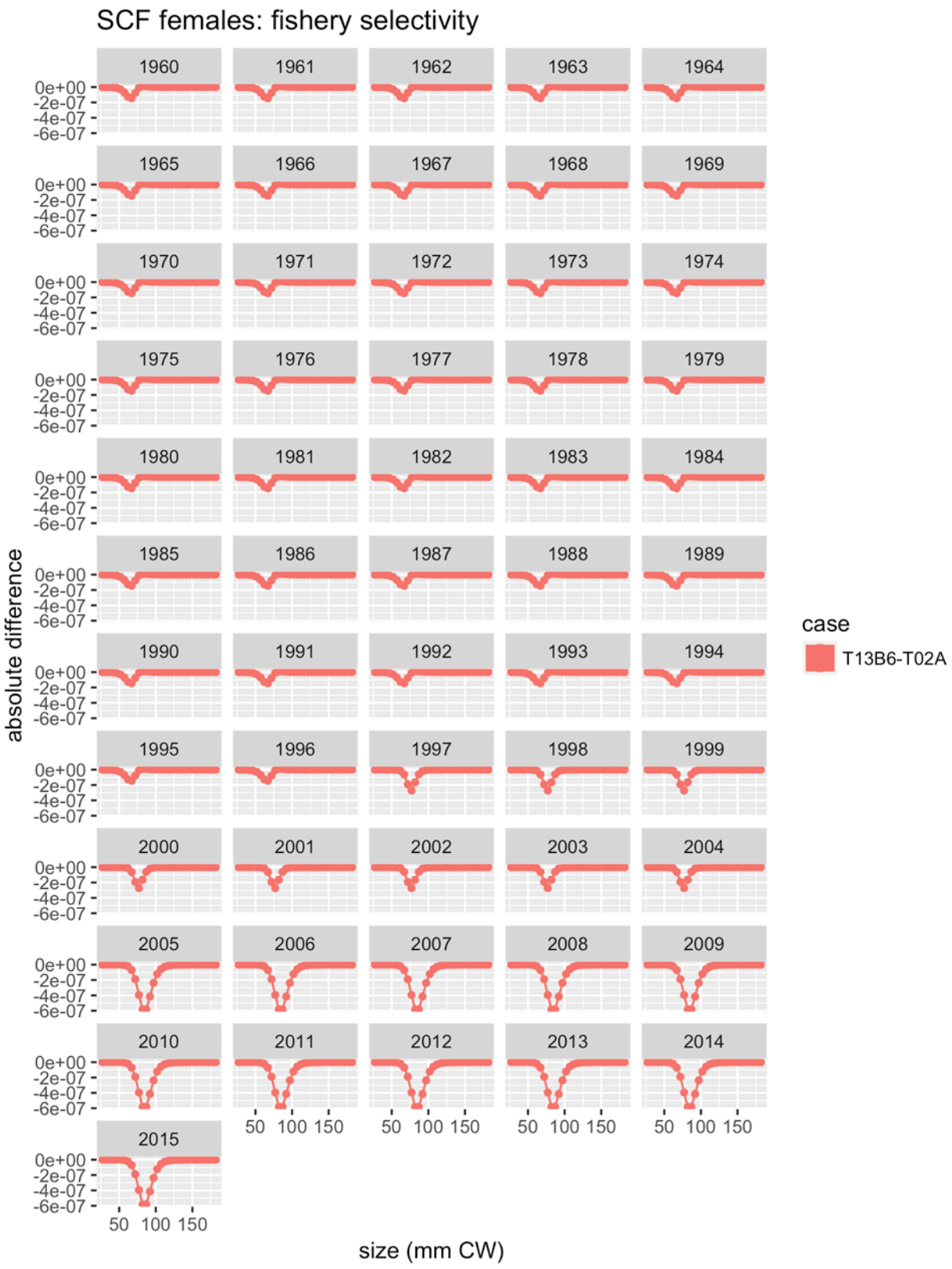

Figure 67. Differences for SCF females: fishery selectivity.

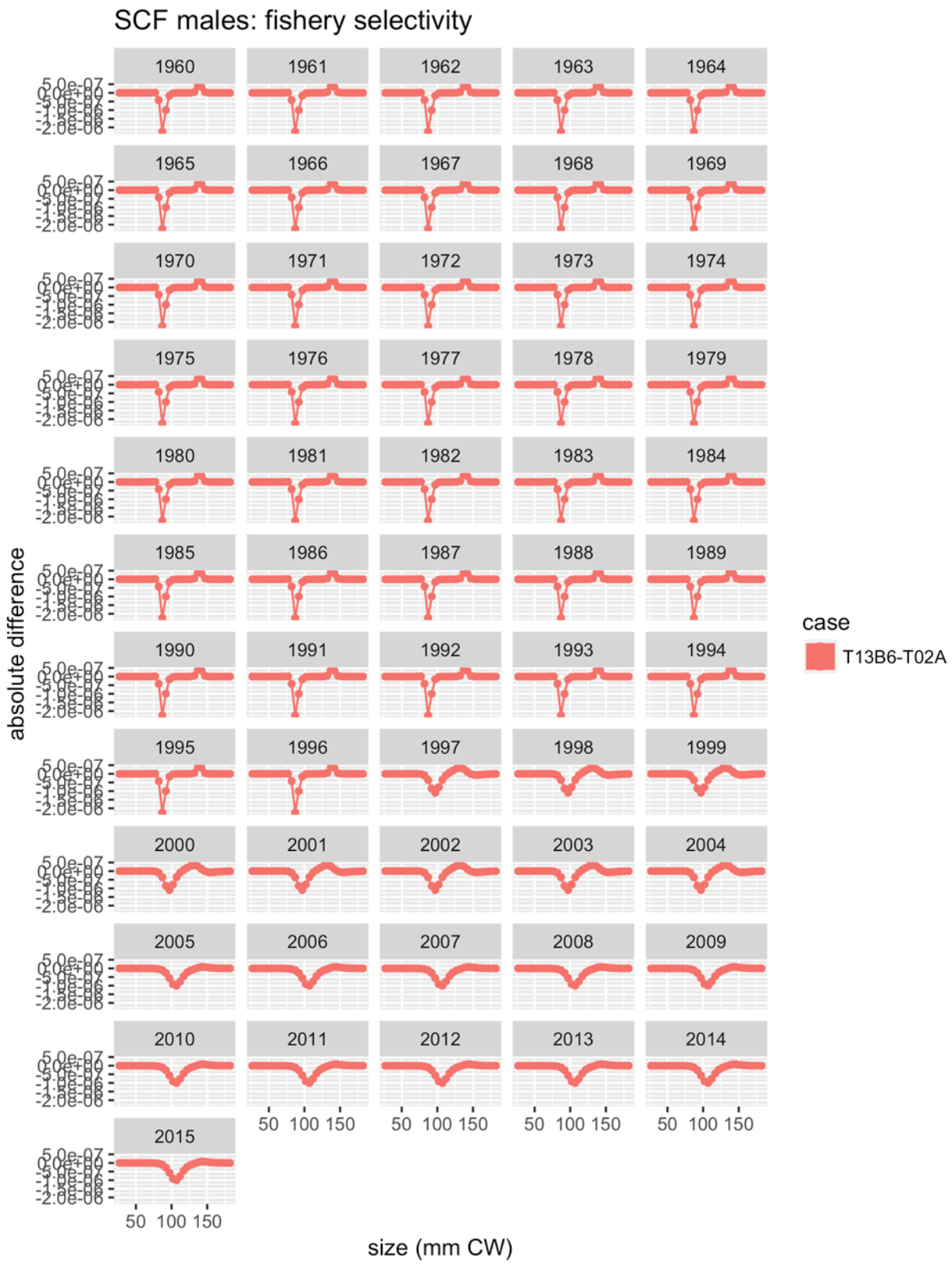

Figure 68. Differences for SCF males: fishery selectivity.

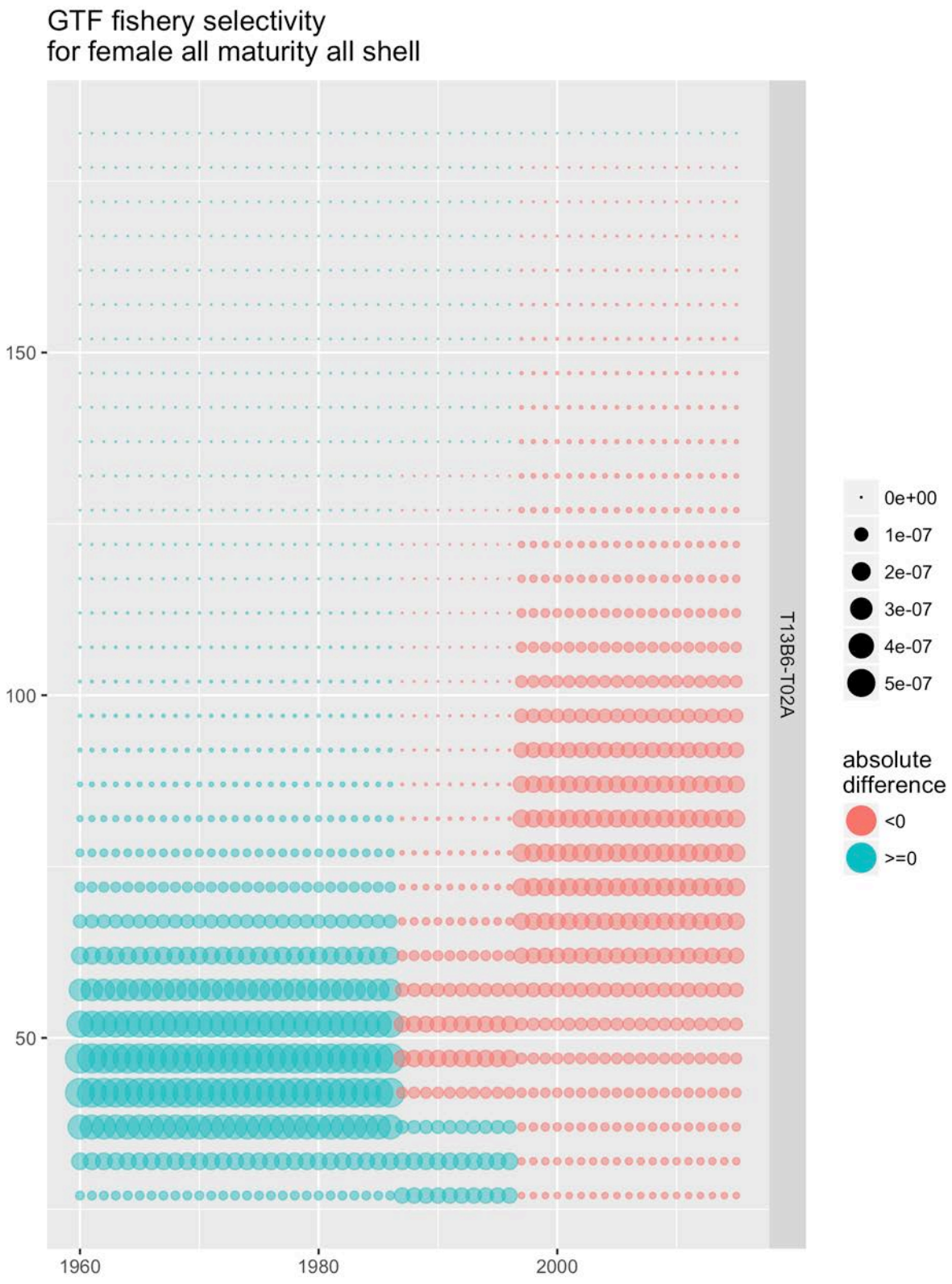

Figure 69. Differences for GTF fishery selectivity for female all maturity all shell.

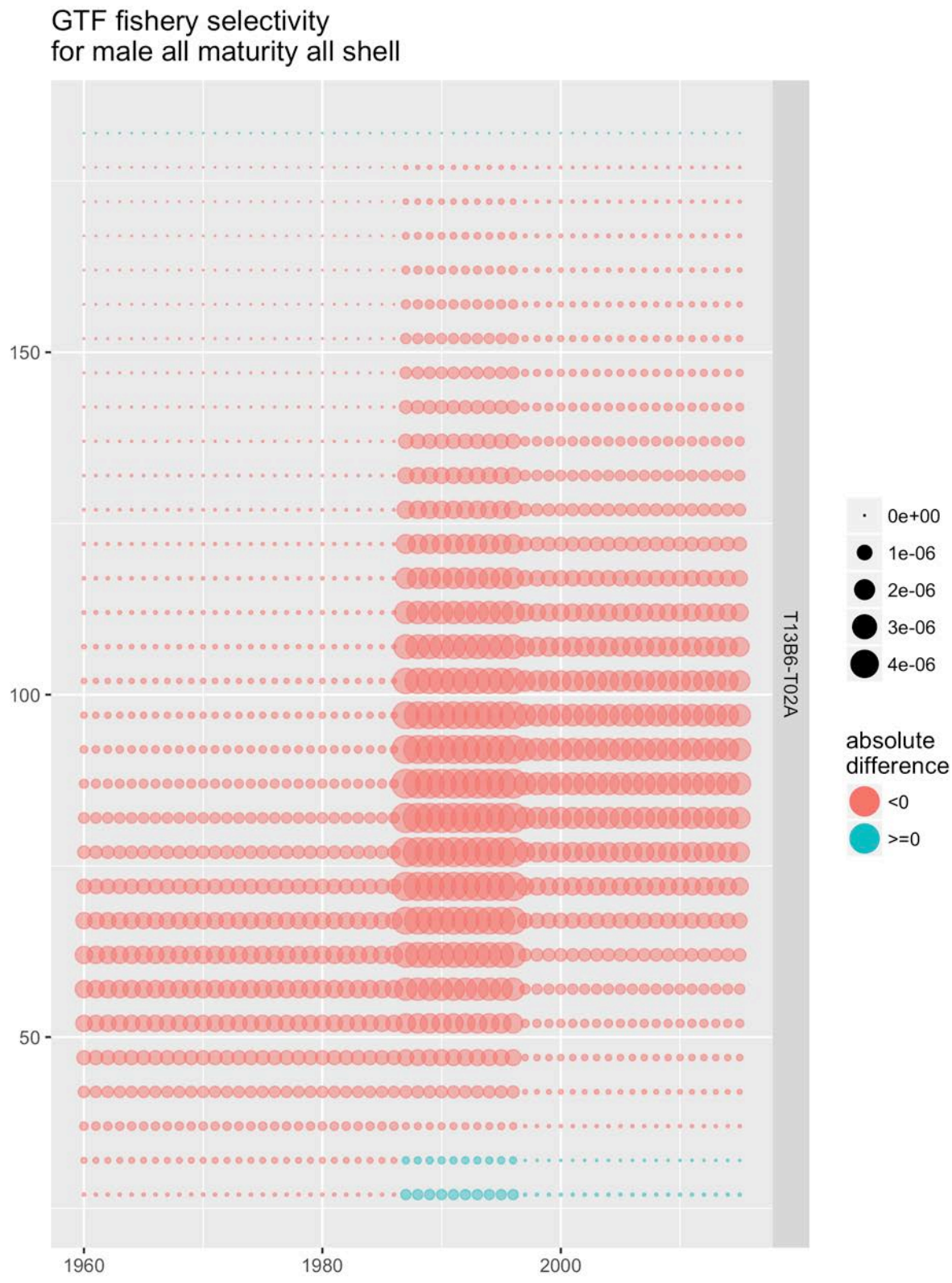

Figure 70. Differences for GTF fishery selectivity for male all maturity all shell.

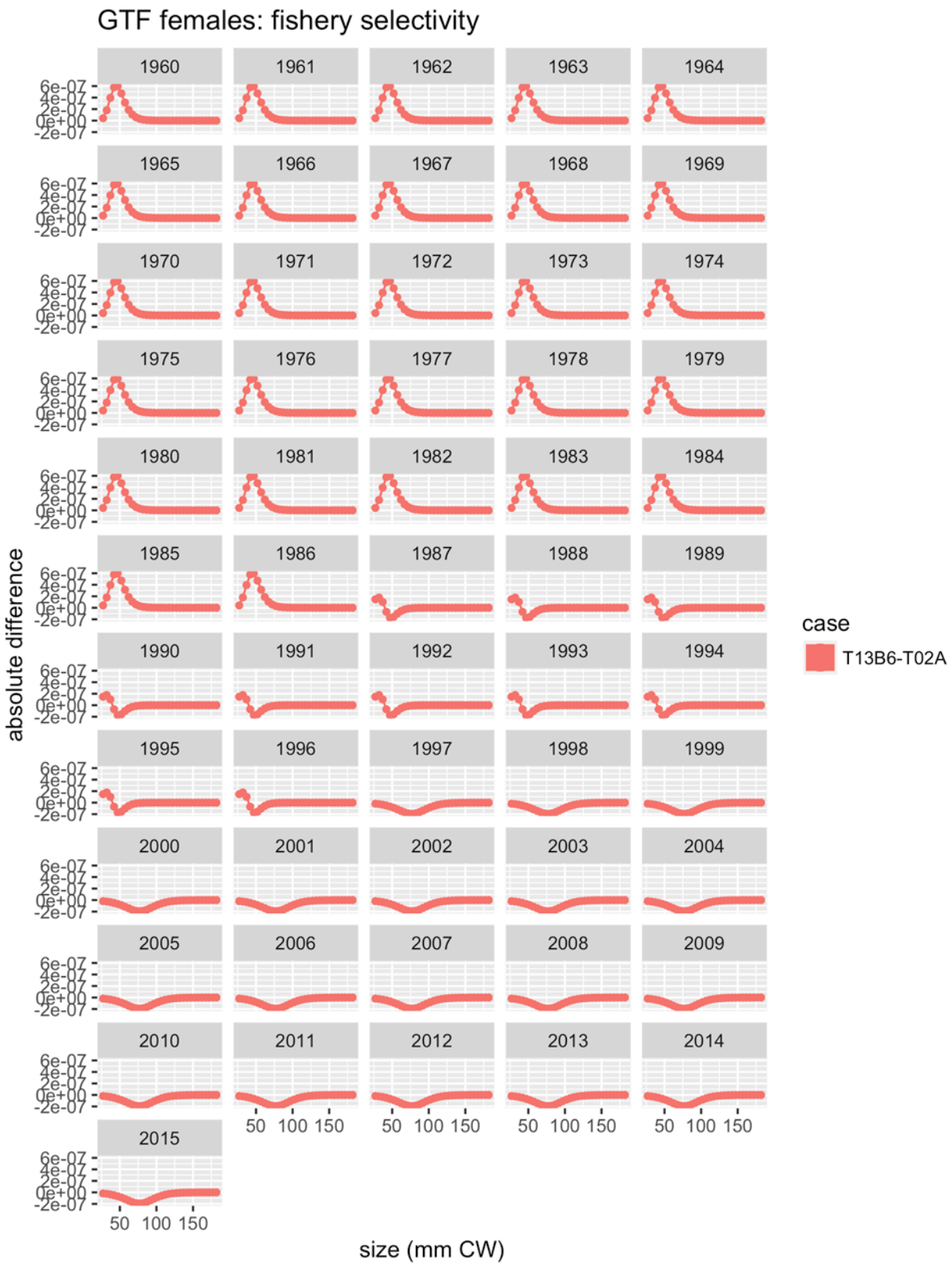

Figure 71. Differences for GTF females: fishery selectivity.

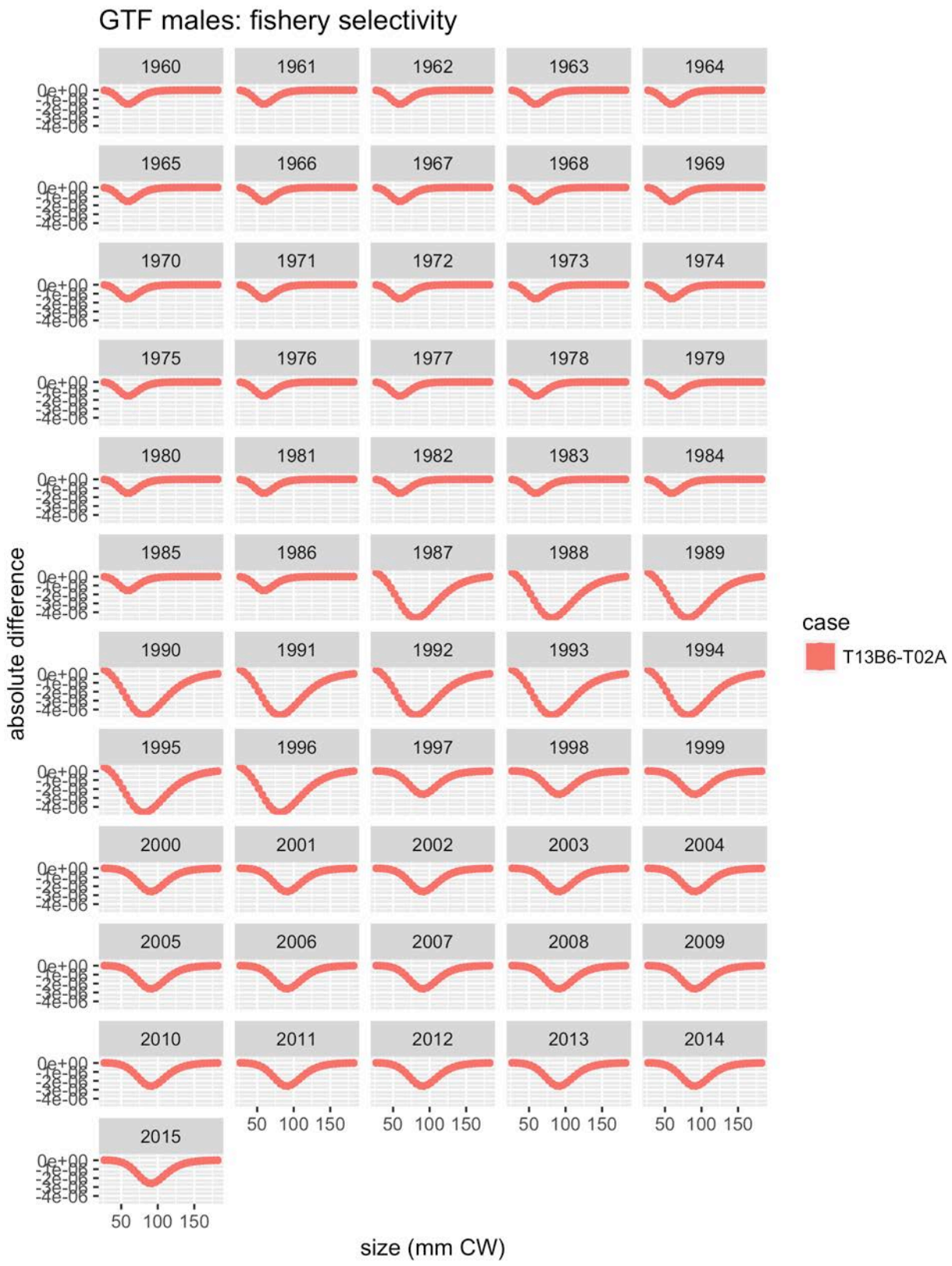

Figure 72. Differences for GTF males: fishery selectivity.

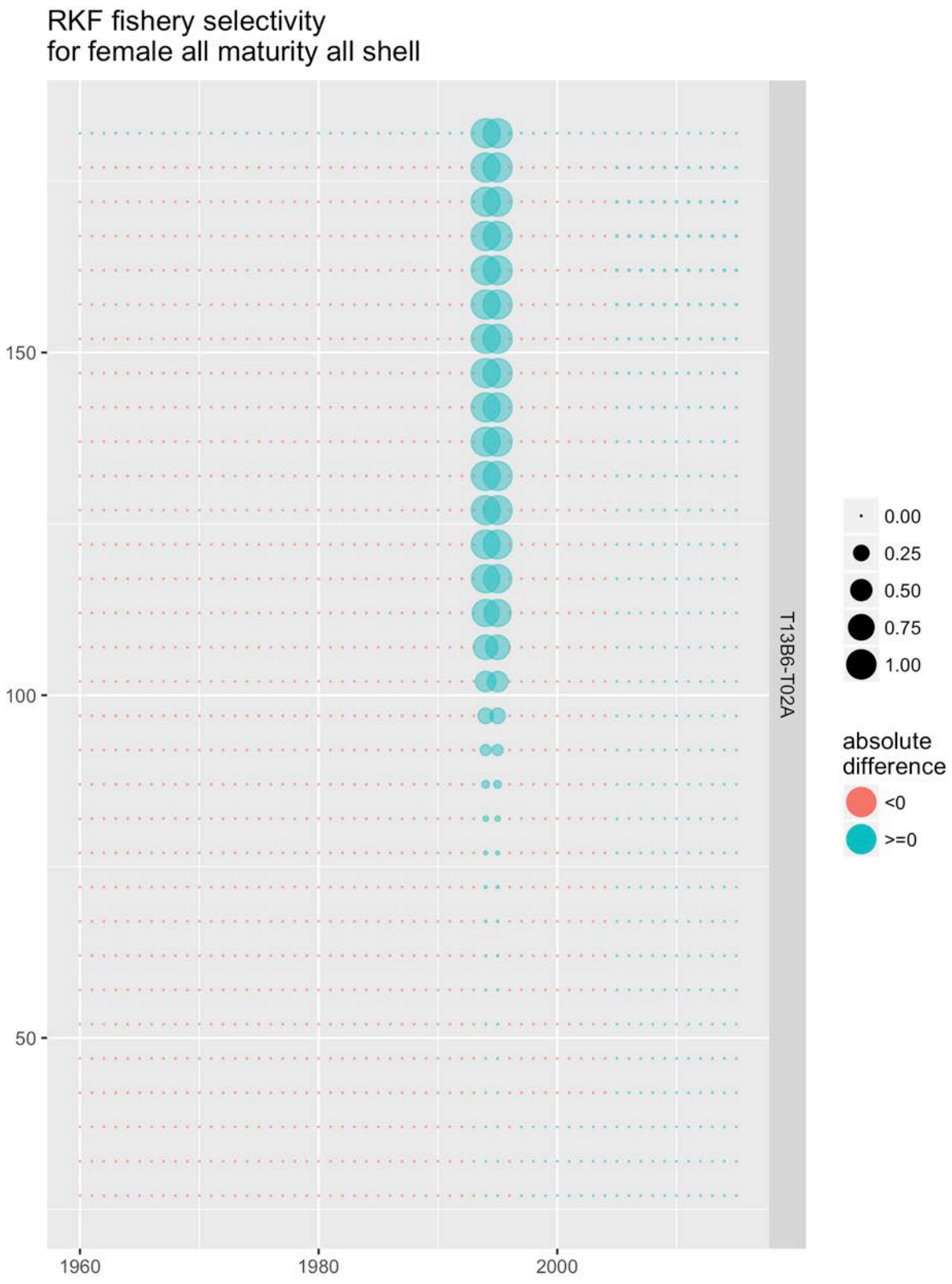

Figure 73. Differences for RKF fishery selectivity for female all maturity all shell.

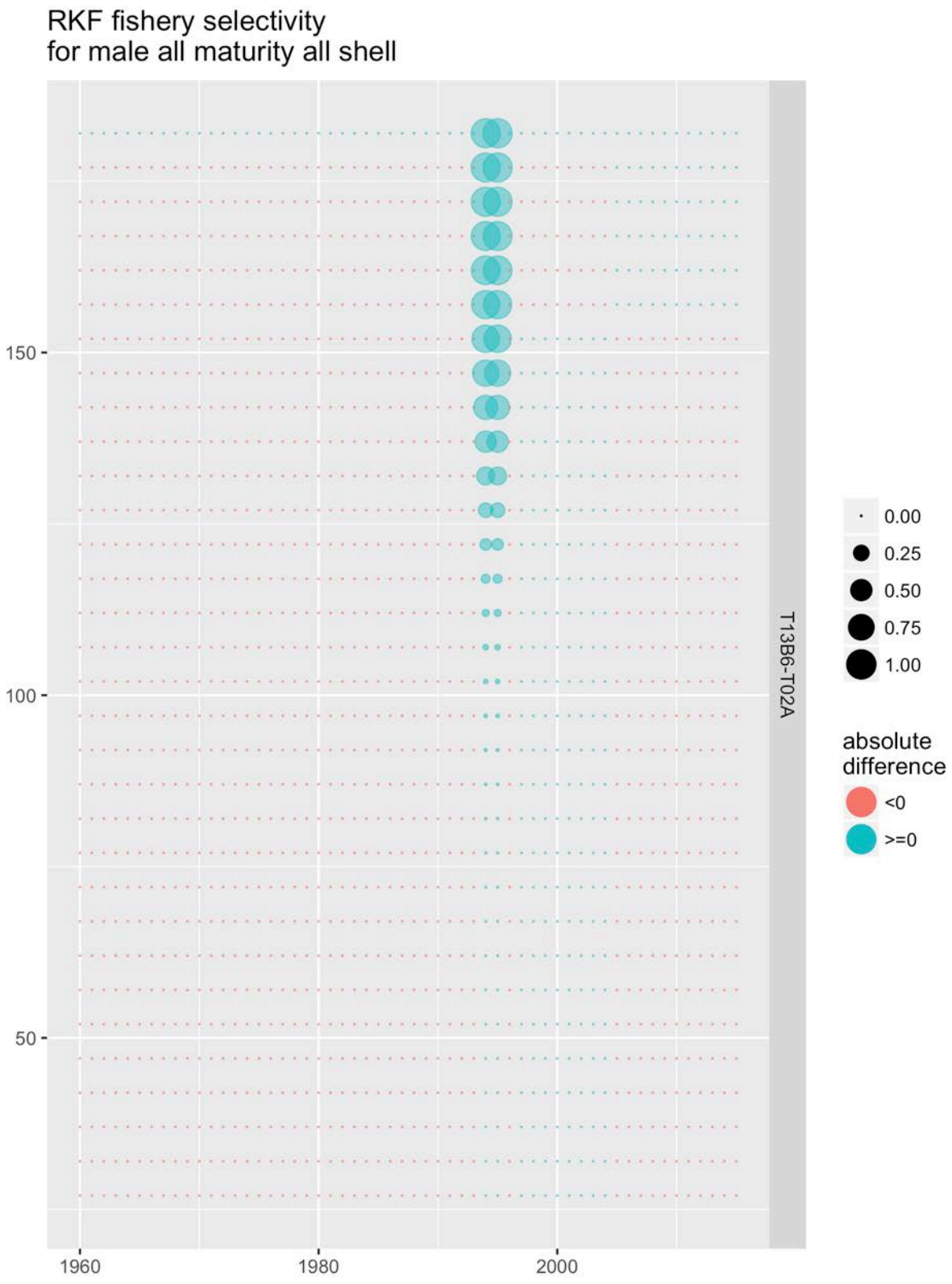

Figure 74. Differences for RKF fishery selectivity for male all maturity all shell.

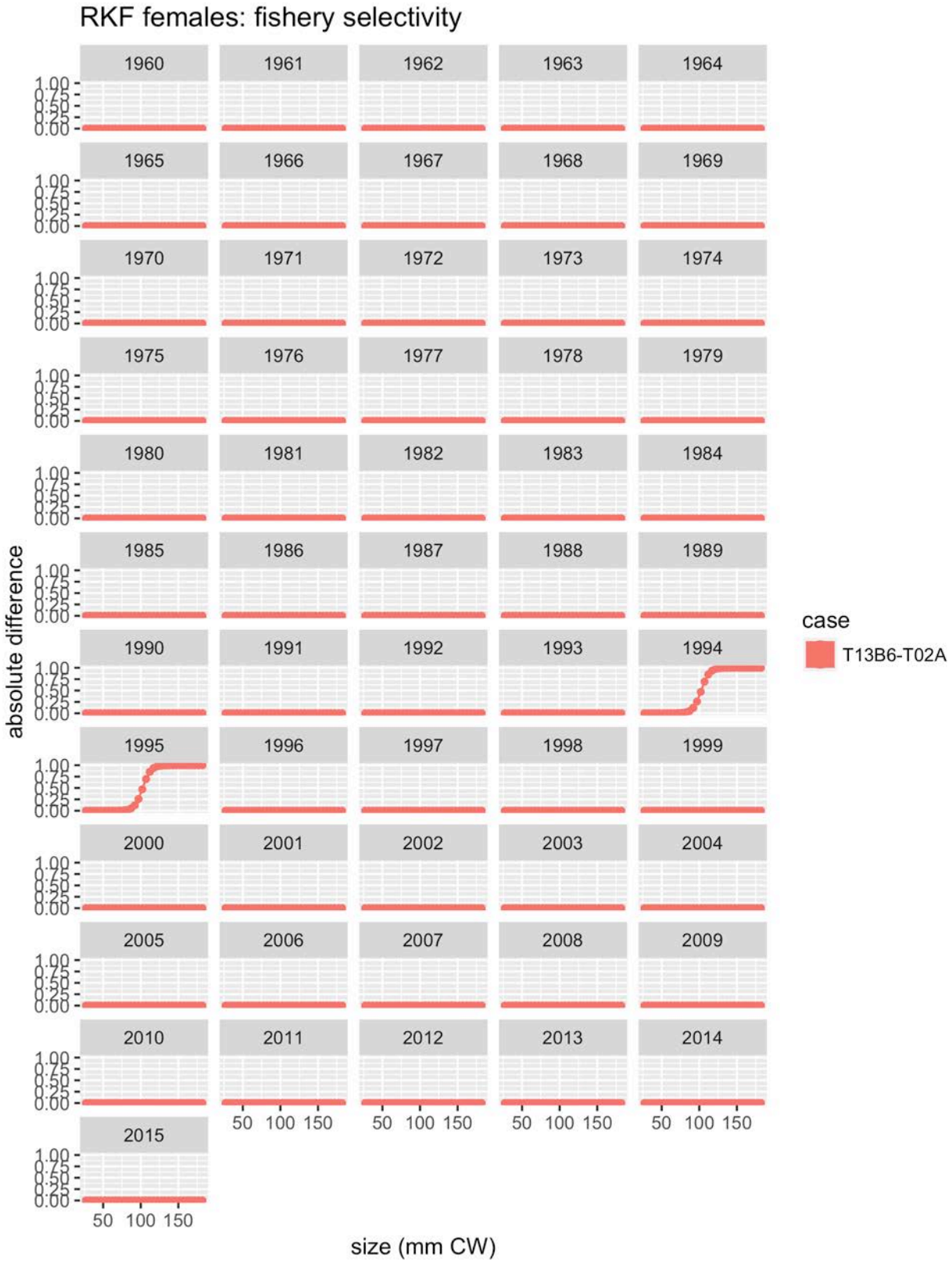

Figure 75. Differences for RKF females: fishery selectivity.

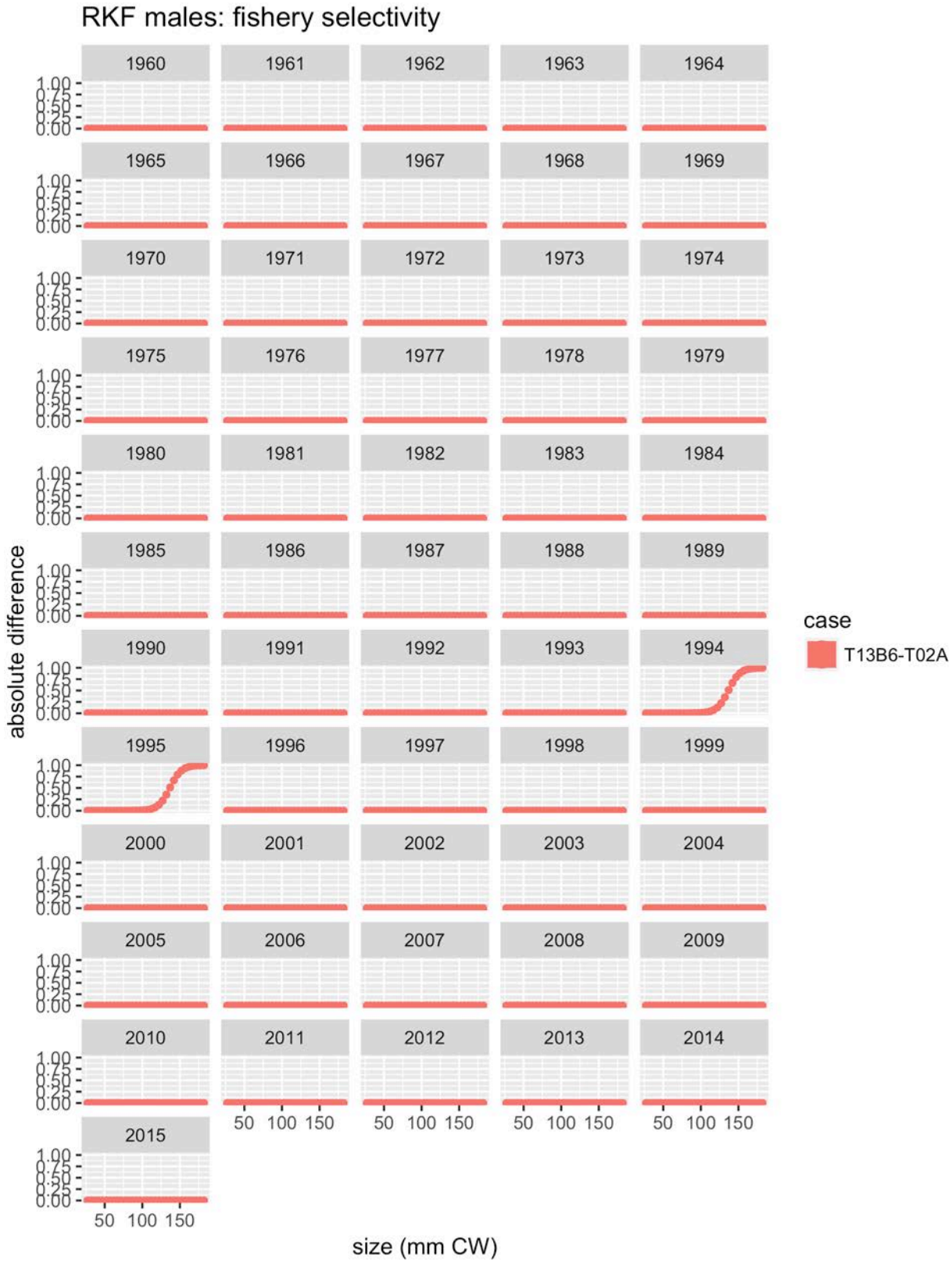

Figure 76. Differences for RKF males: fishery selectivity.

Retention functions

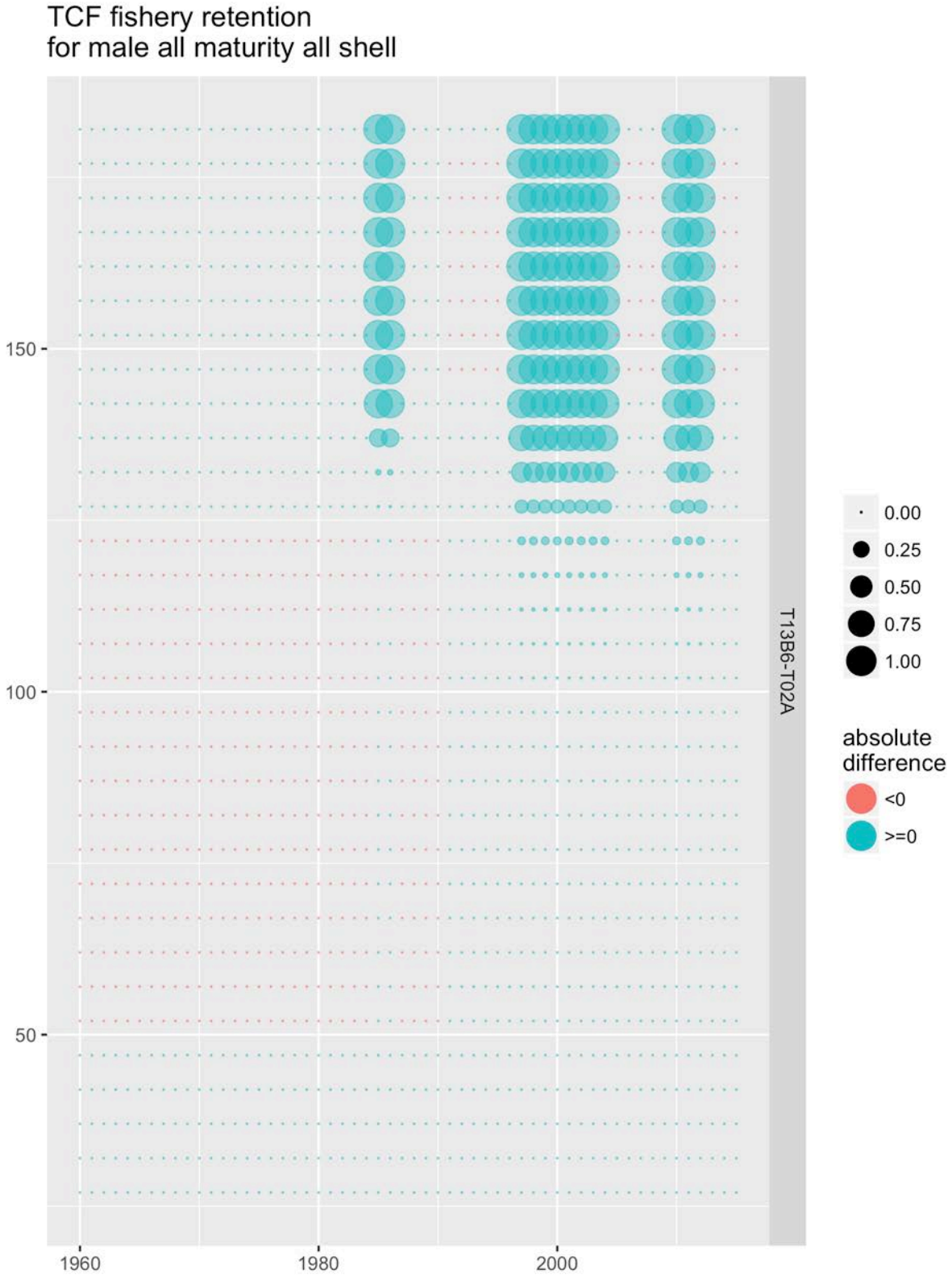

Figure 77. Differences for TCF fishery retention for male all maturity all shell.

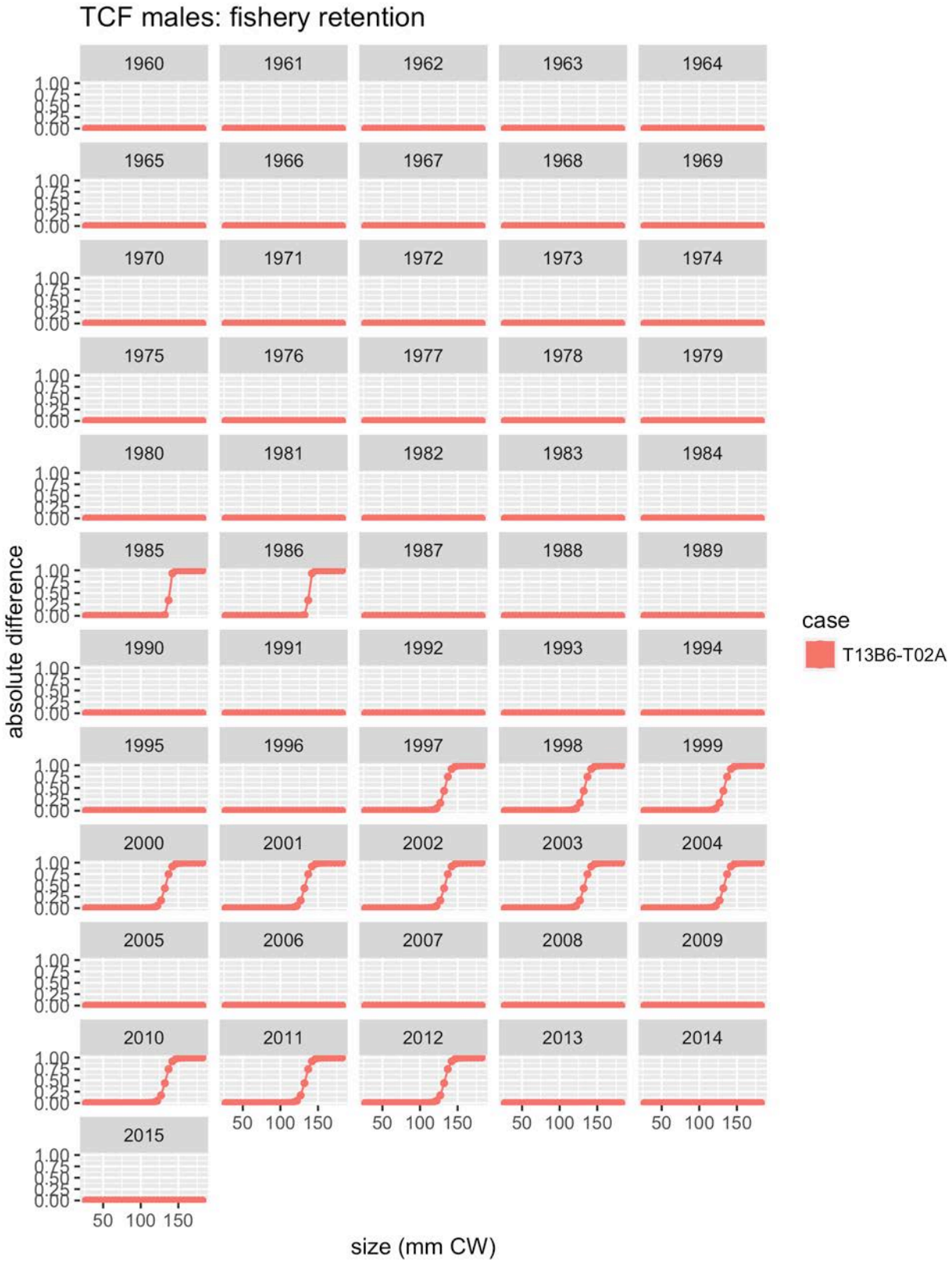

Figure 78. Differences for TCF males: fishery retention.

Total catch abundance

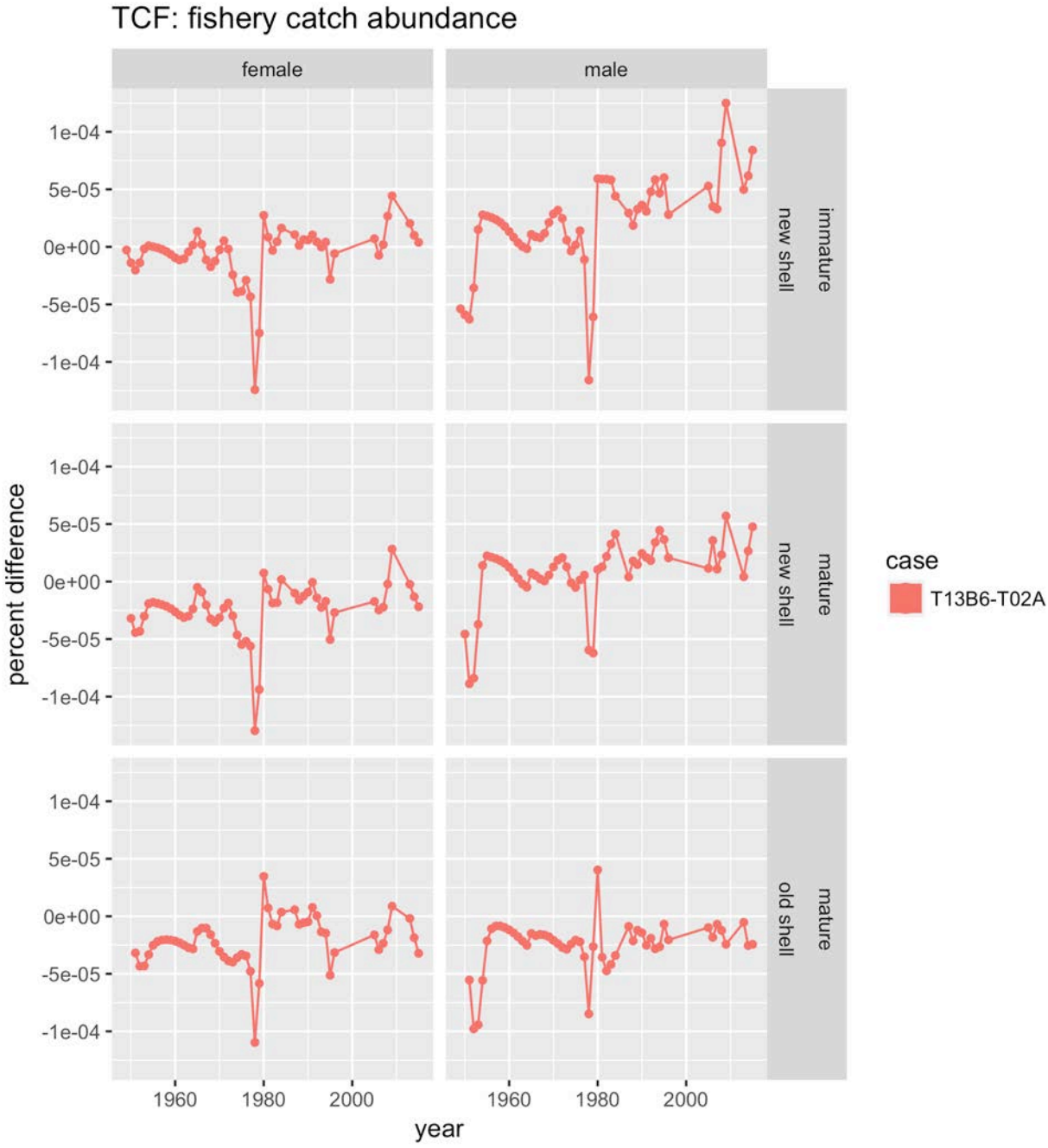

Figure 79. Differences for TCF: fishery catch abundance.

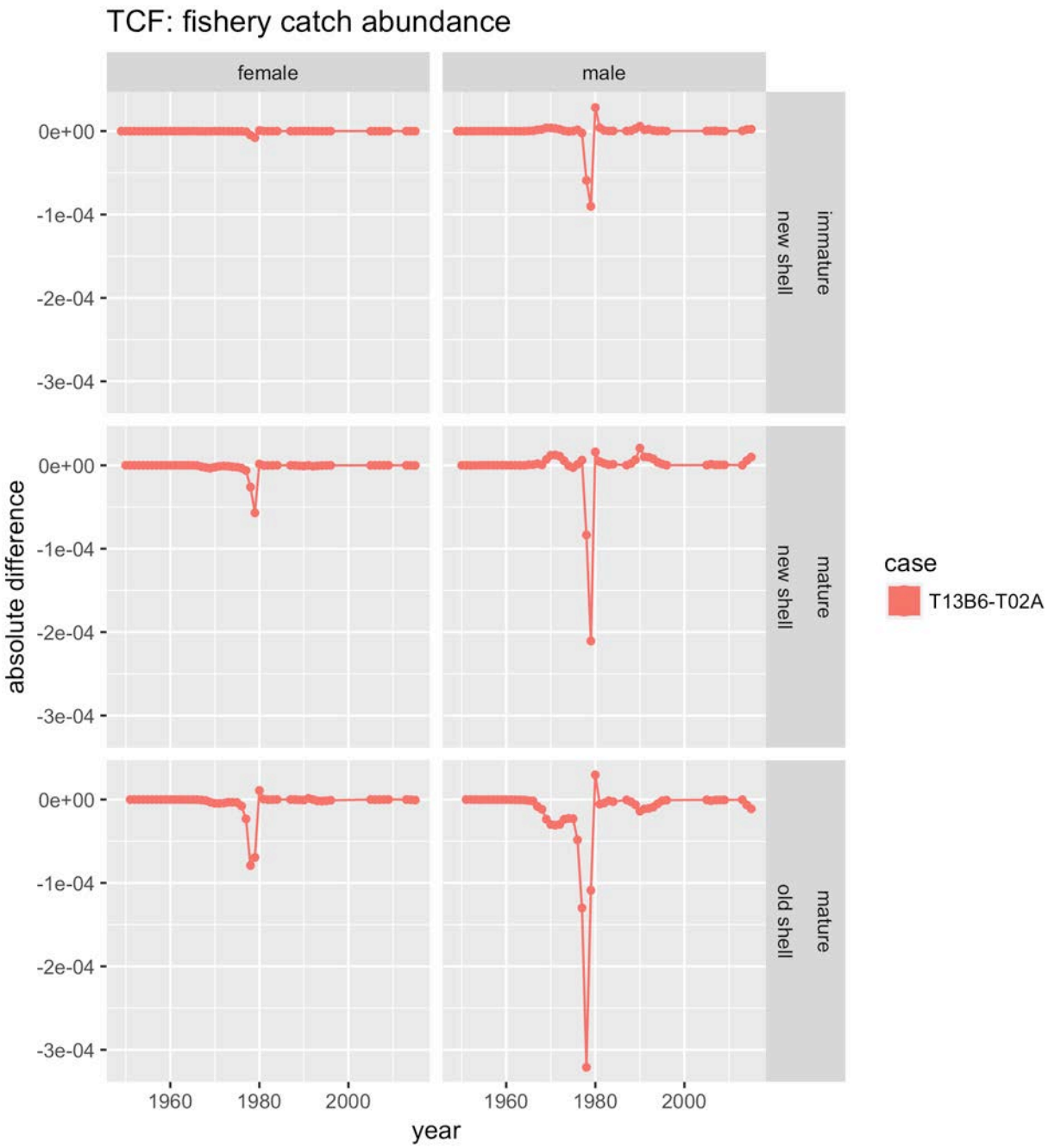

Figure 80. Differences for TCF: fishery catch abundance.

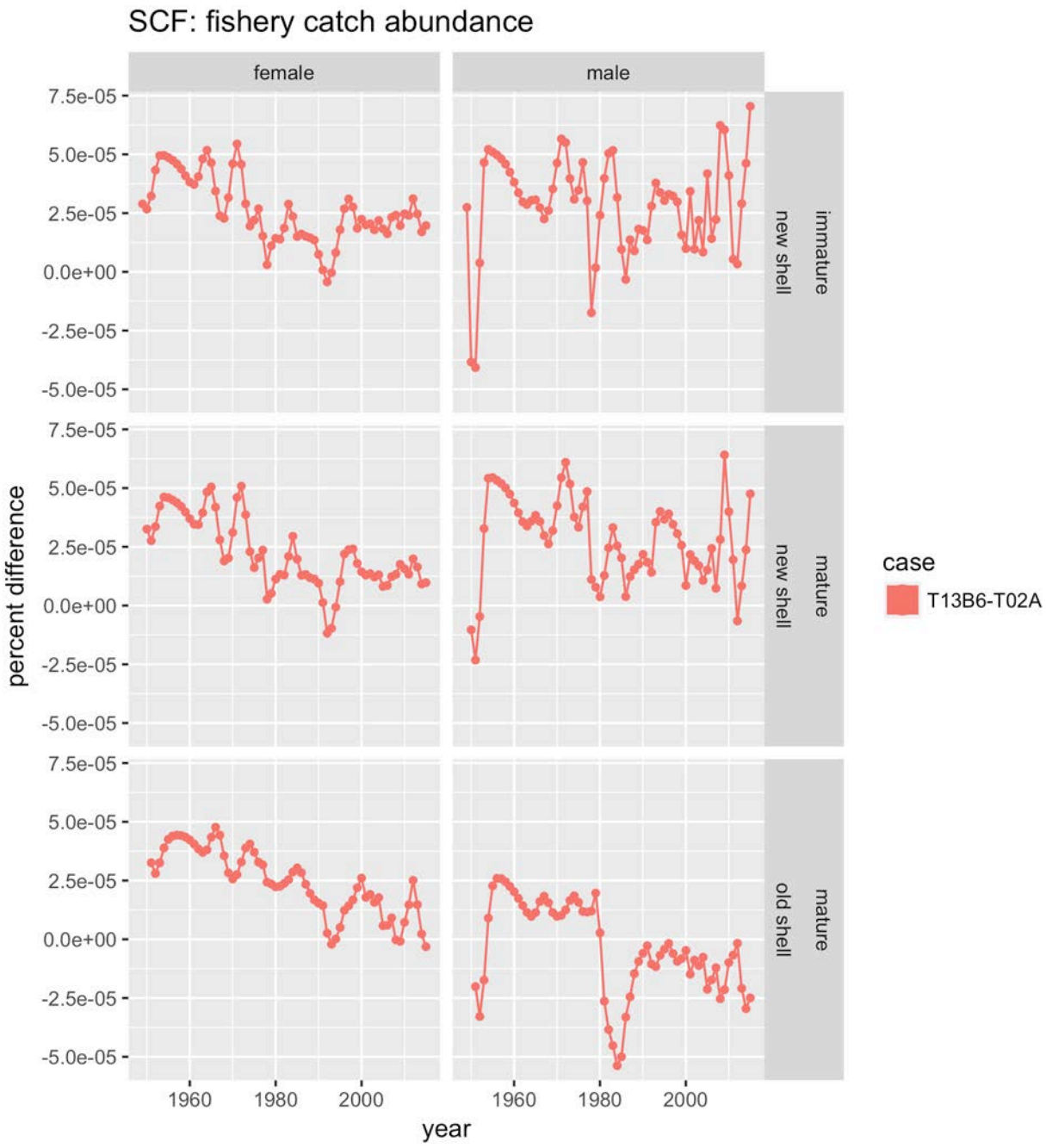

Figure 81. Differences for SCF: fishery catch abundance.

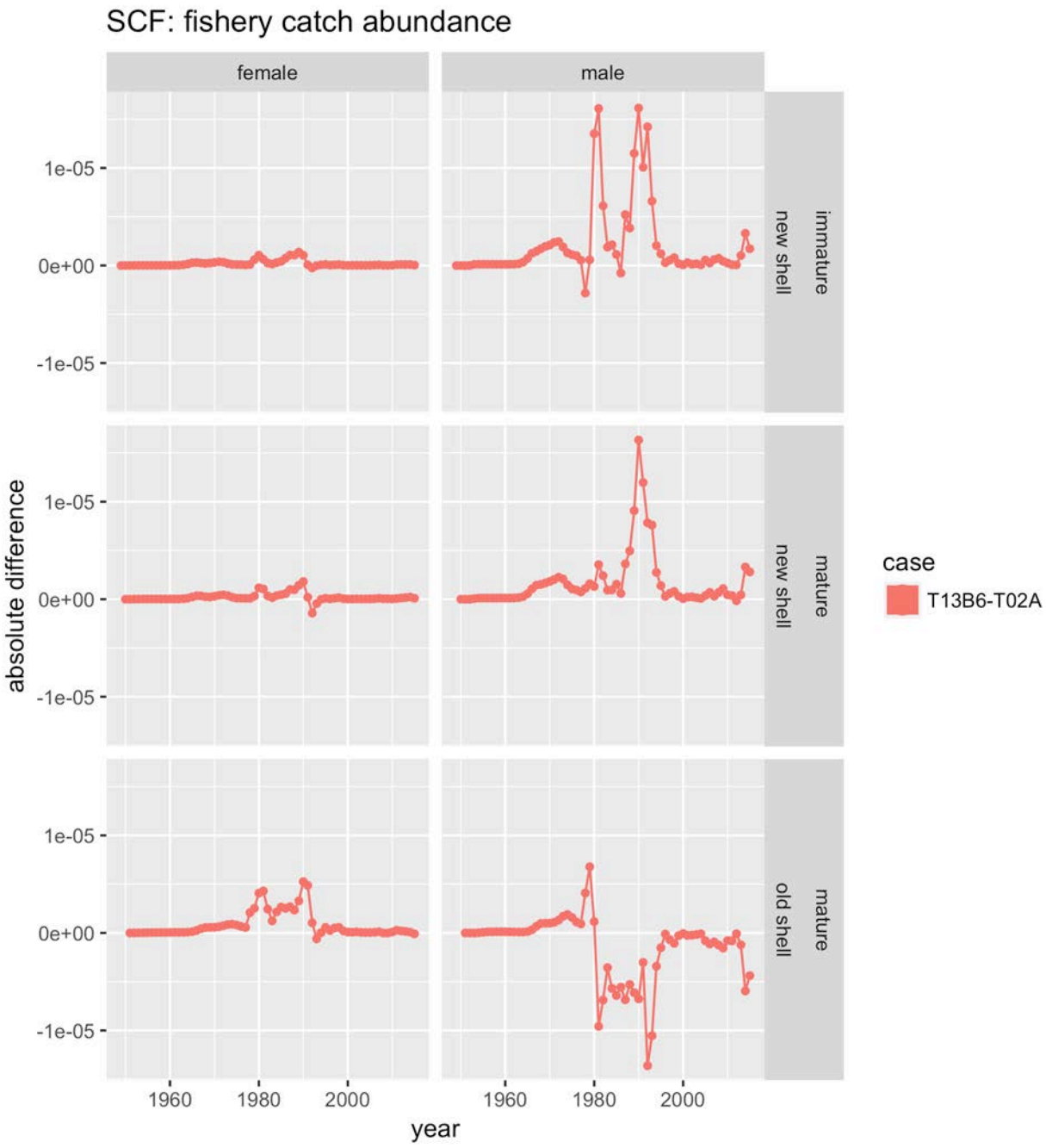

Figure 82. Differences for SCF: fishery catch abundance.

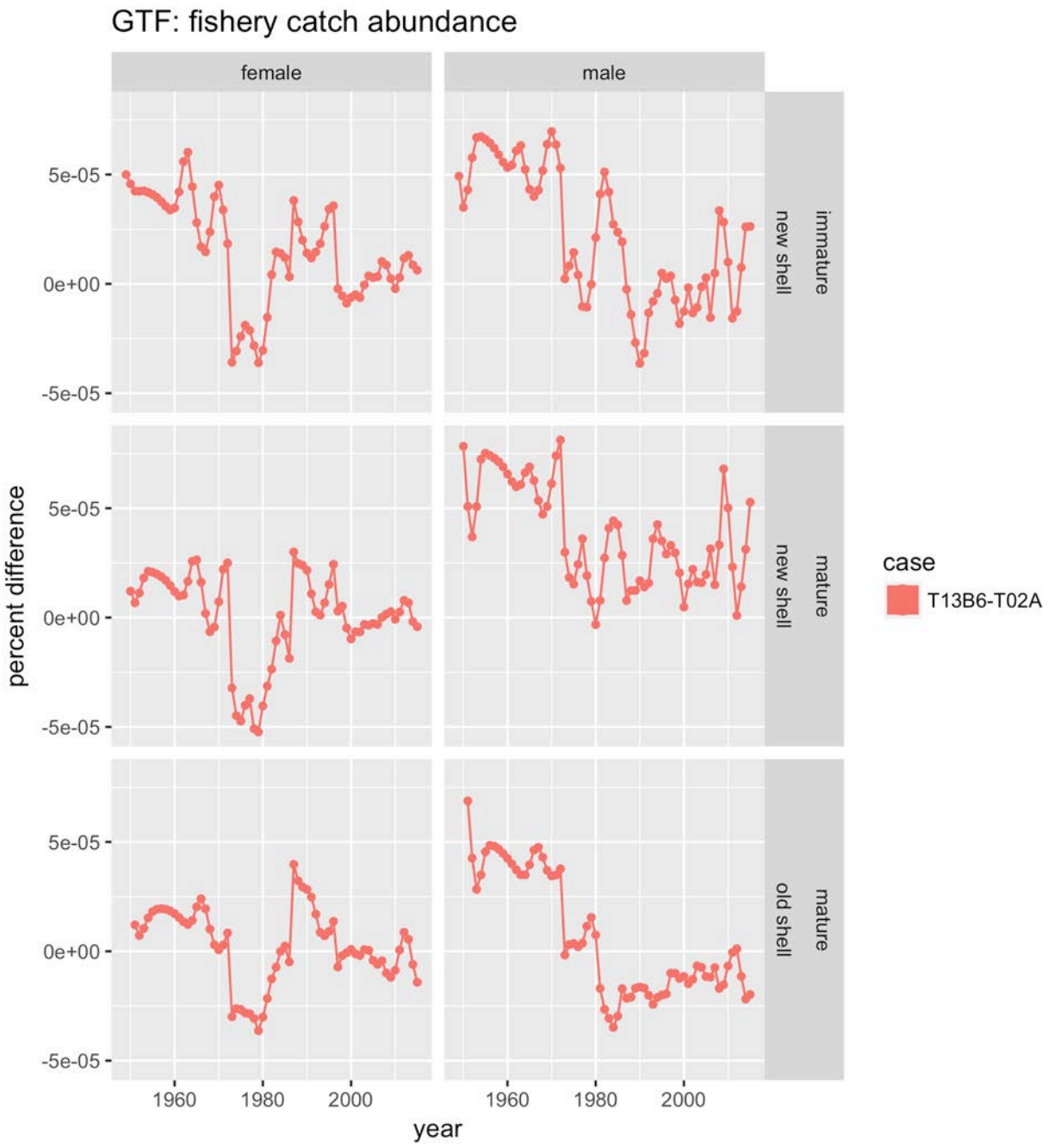

Figure 83. Differences for GTF: fishery catch abundance.

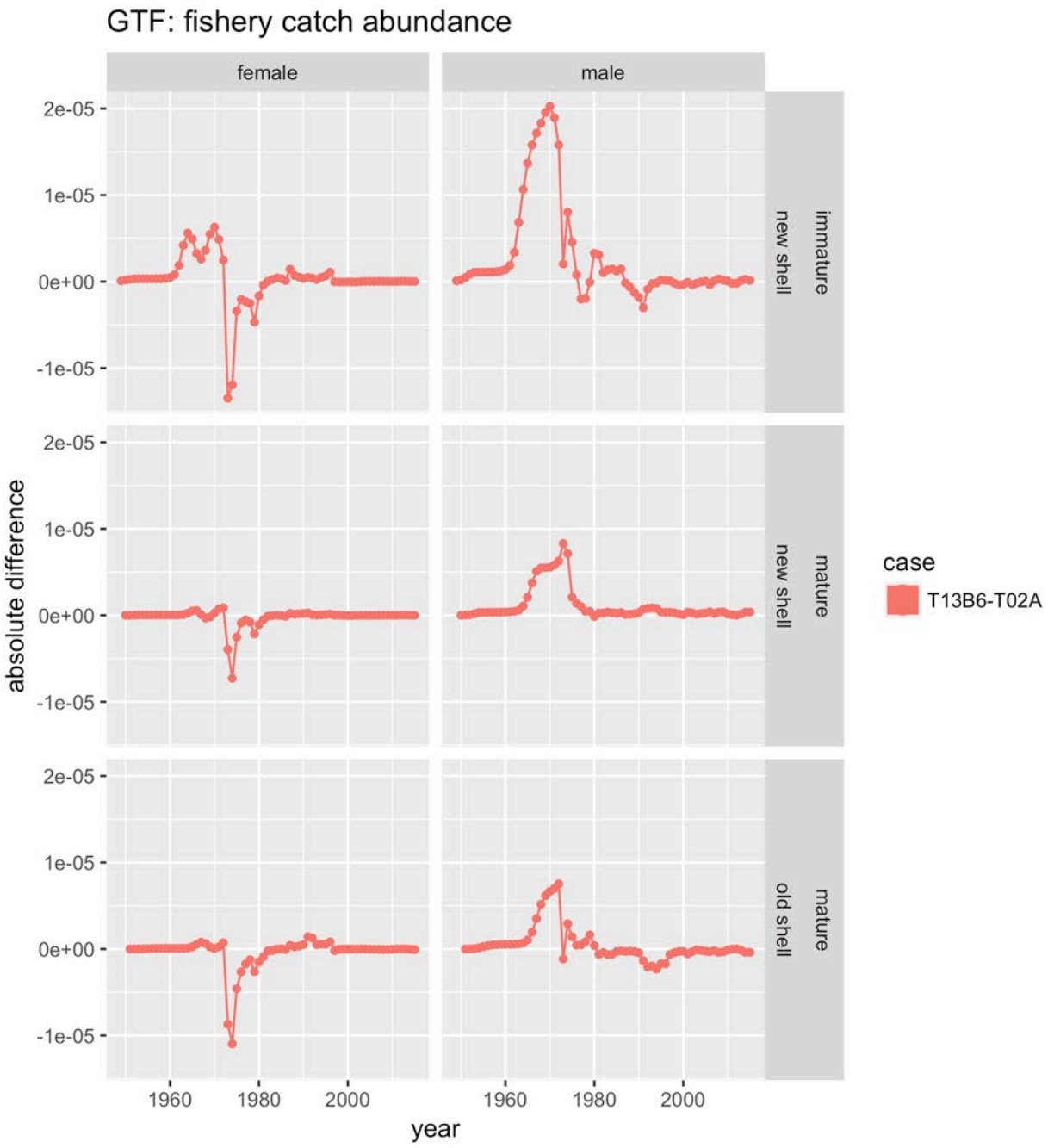

Figure 84. Differences for GTF: fishery catch abundance.

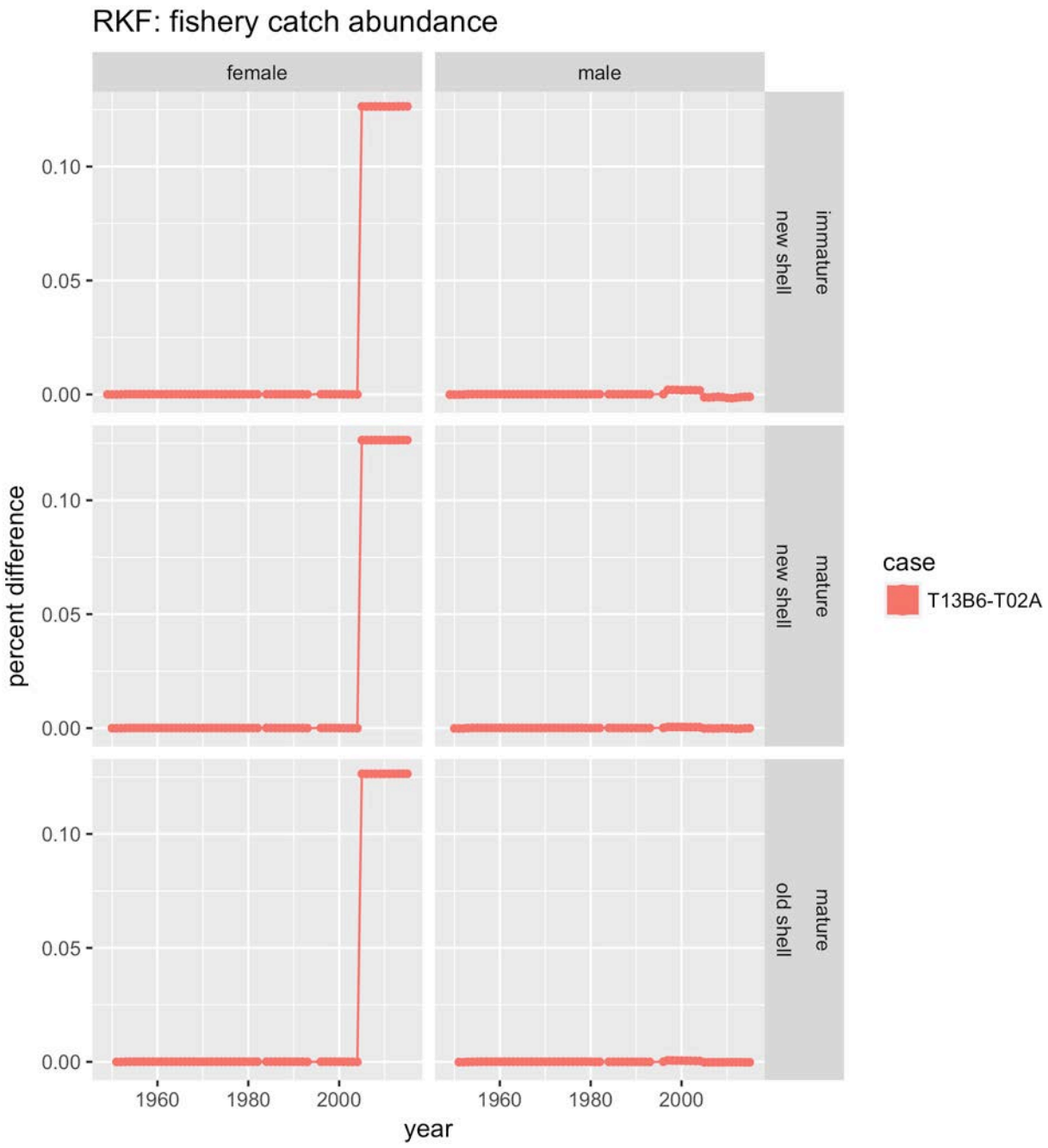

Figure 85. Differences for RKF: fishery catch abundance.

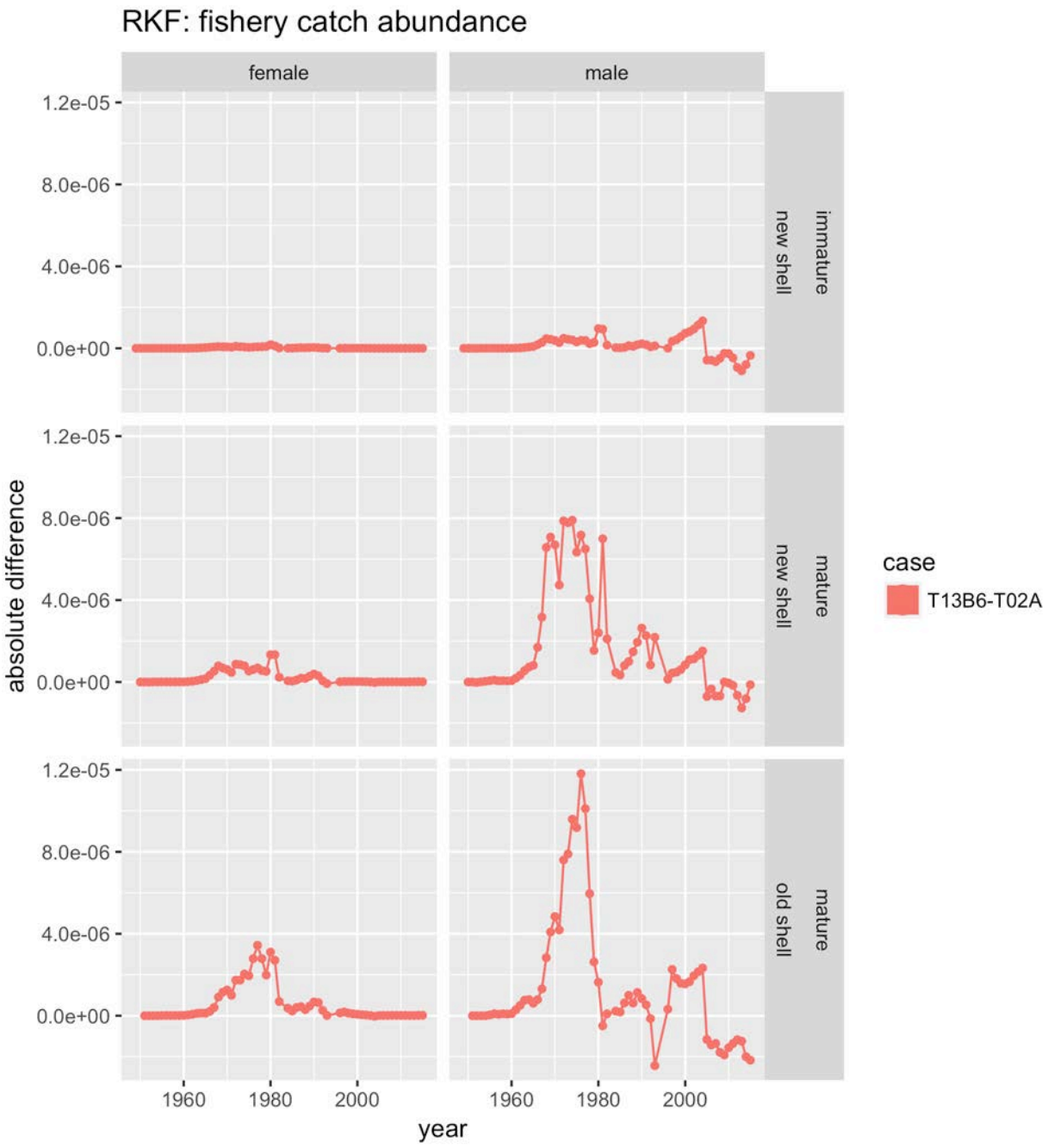

Figure 86. Differences for RKF: fishery catch abundance.

Figure 87. Differences for TCF fishery catch abundance for female immature new shell.

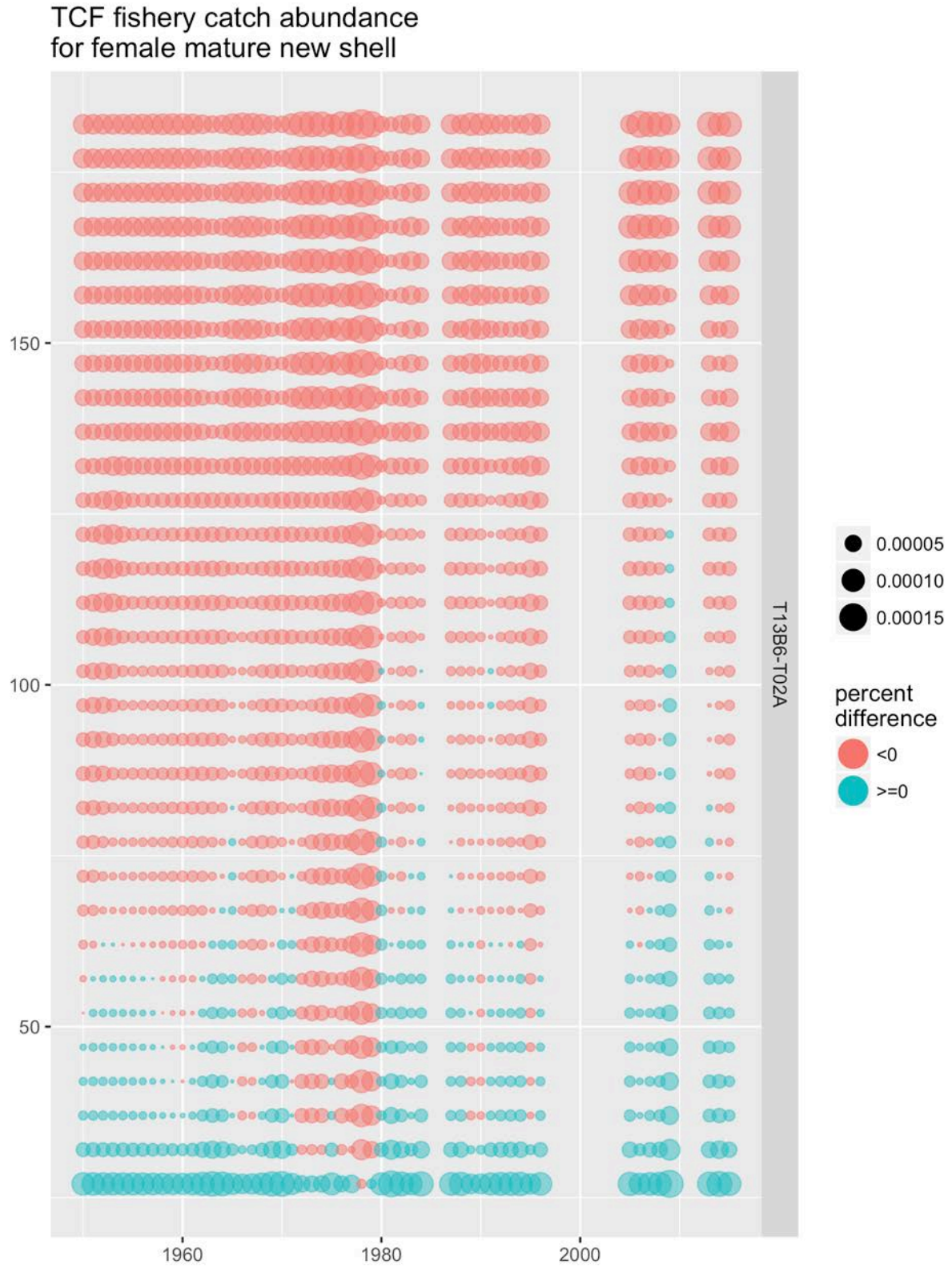

Figure 88. Differences for TCF fishery catch abundance for female mature new shell.

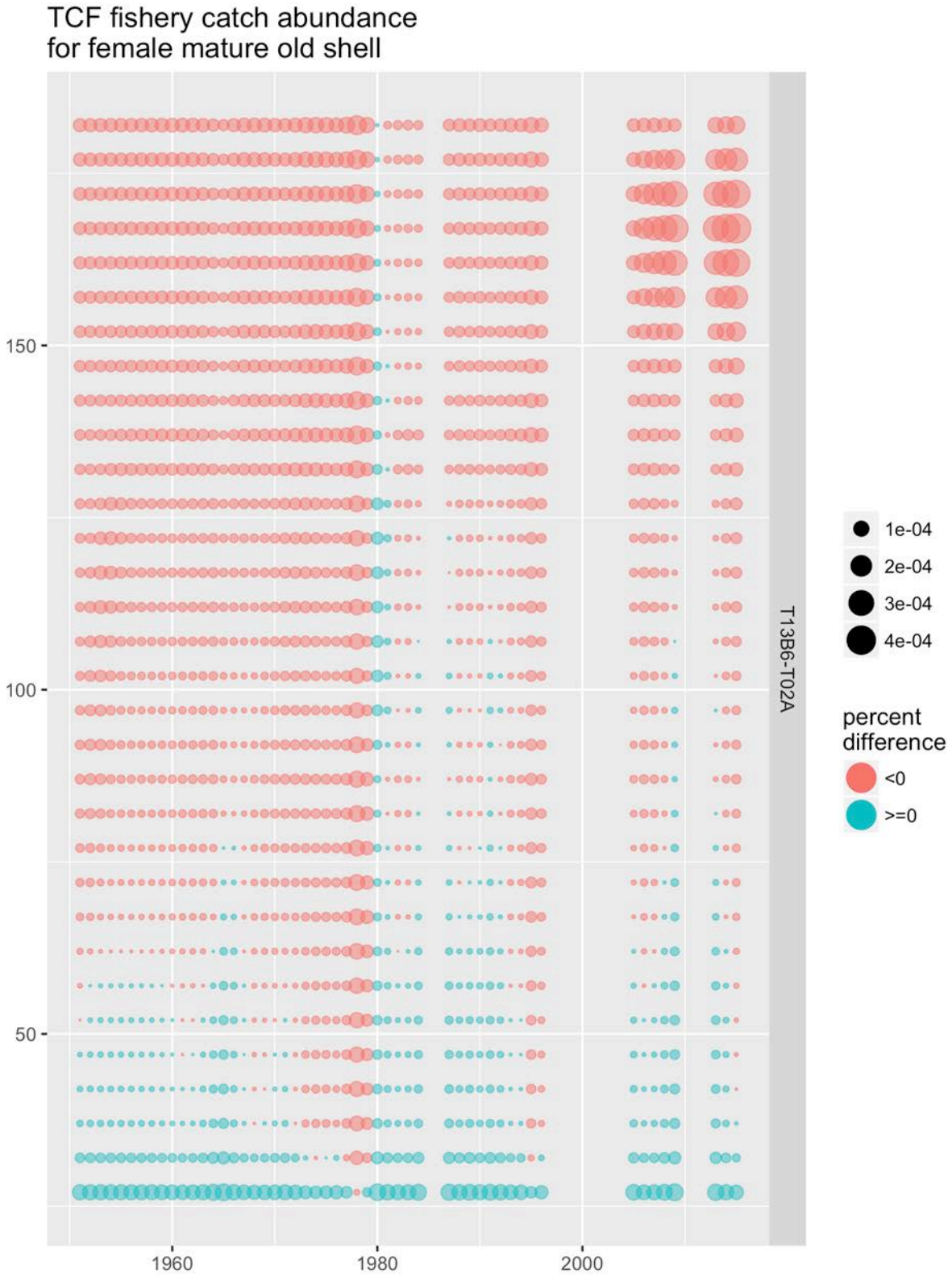

Figure 89. Differences for TCF fishery catch abundance for female mature old shell.

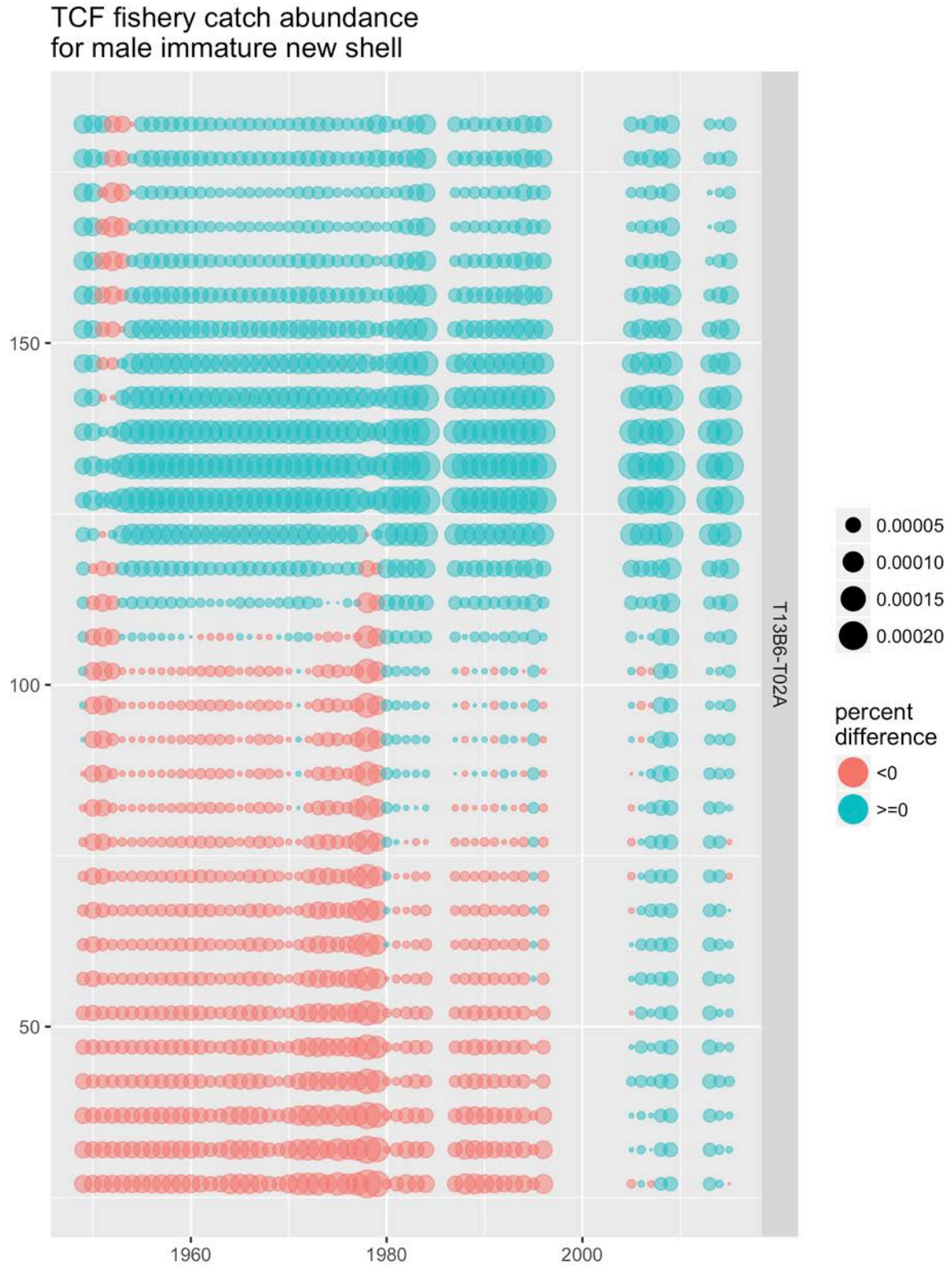

Figure 90. Differences for TCF fishery catch abundance for male immature new shell.

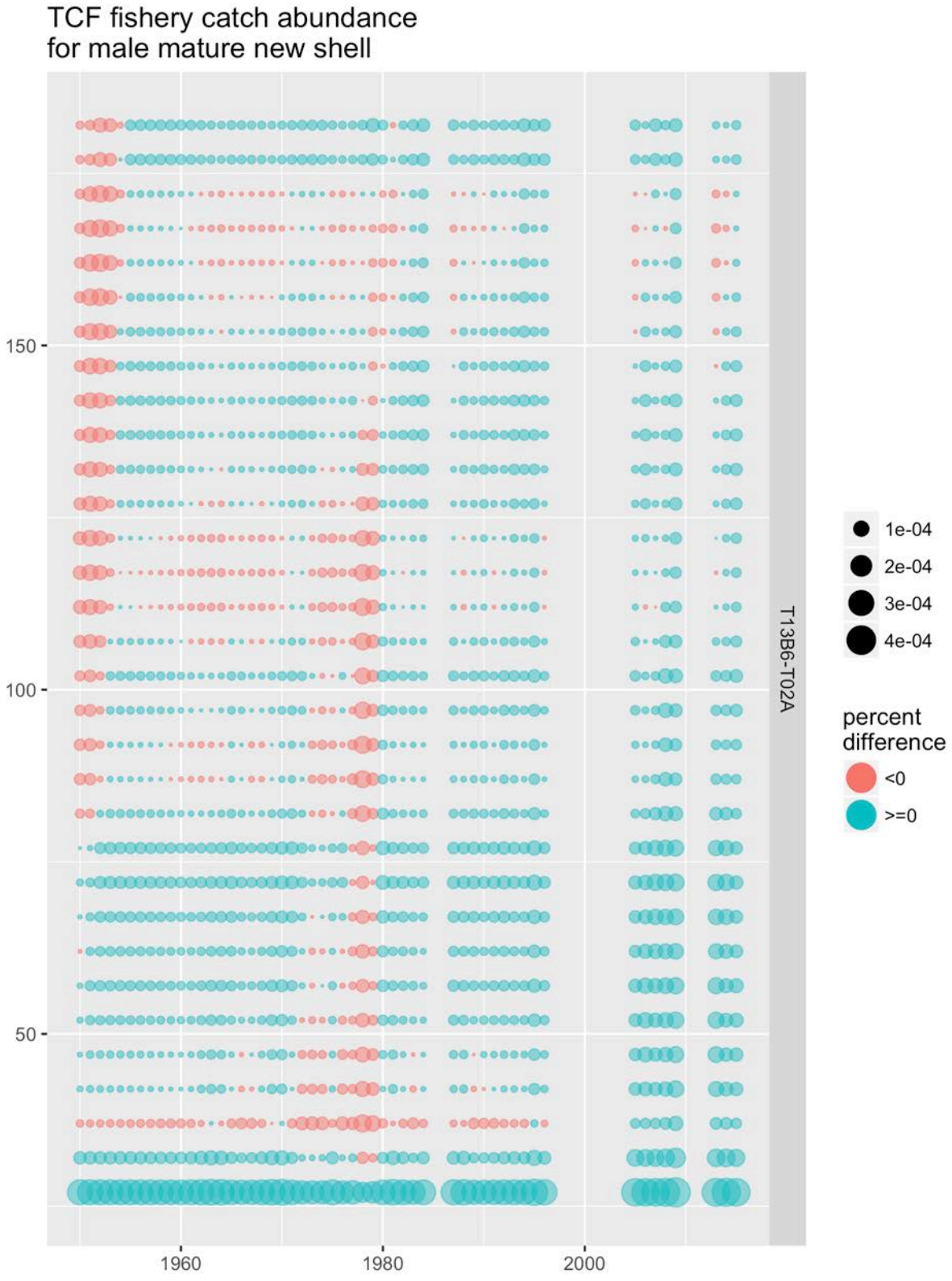

Figure 91. Differences for TCF fishery catch abundance for male mature new shell.

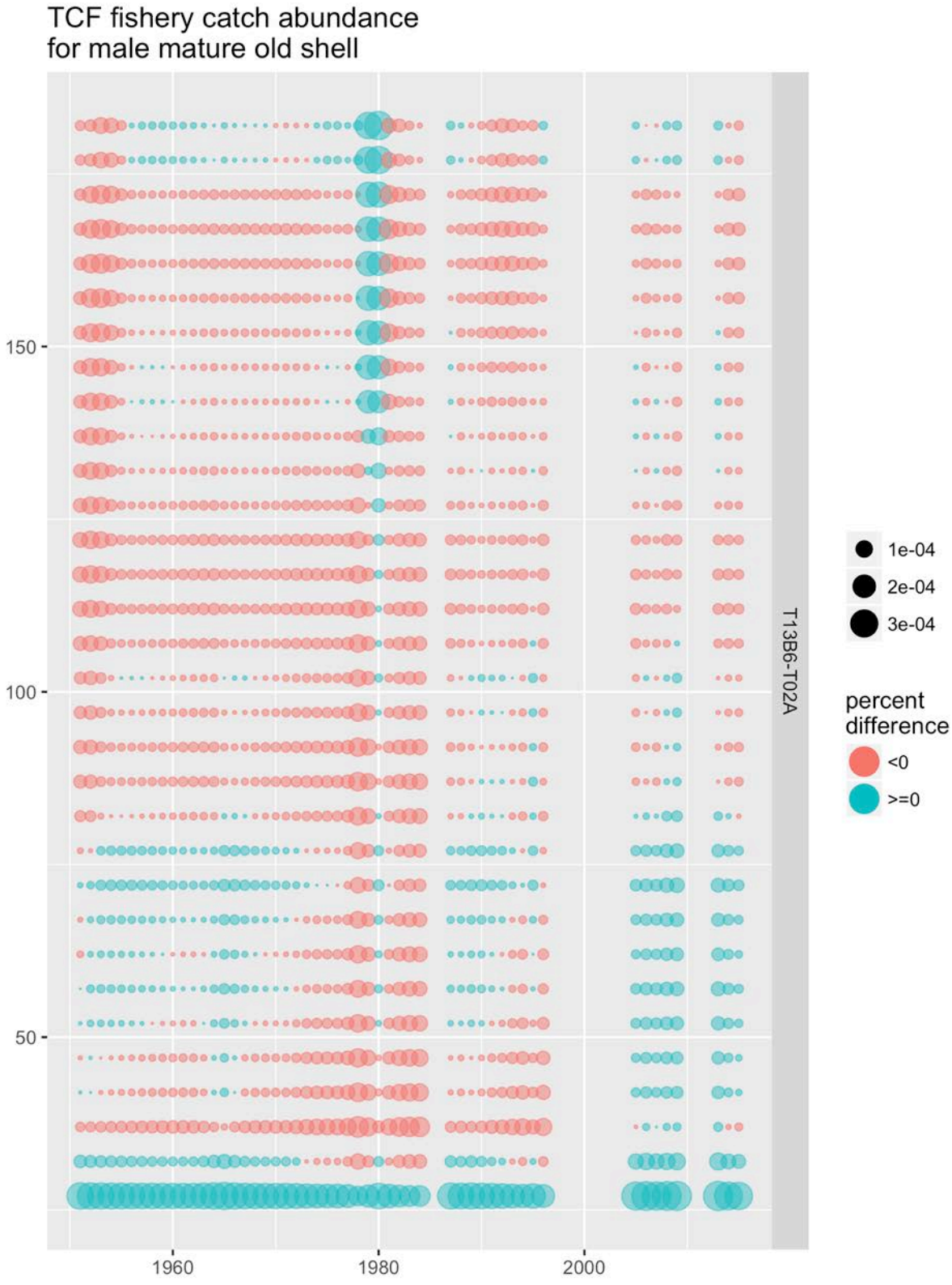

Figure 92. Differences for TCF fishery catch abundance for male mature old shell.

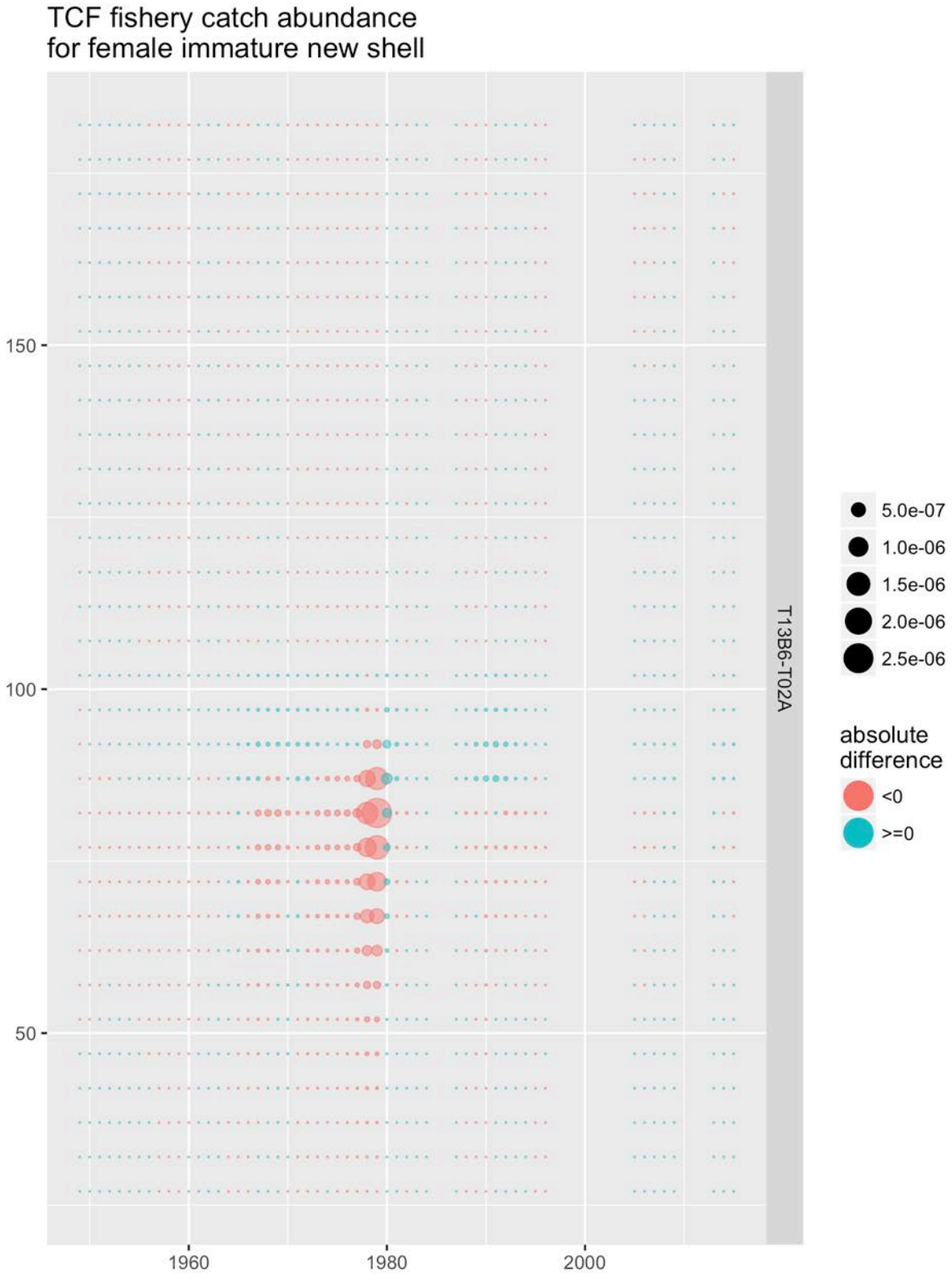

Figure 93. Differences for TCF fishery catch abundance for female immature new shell.

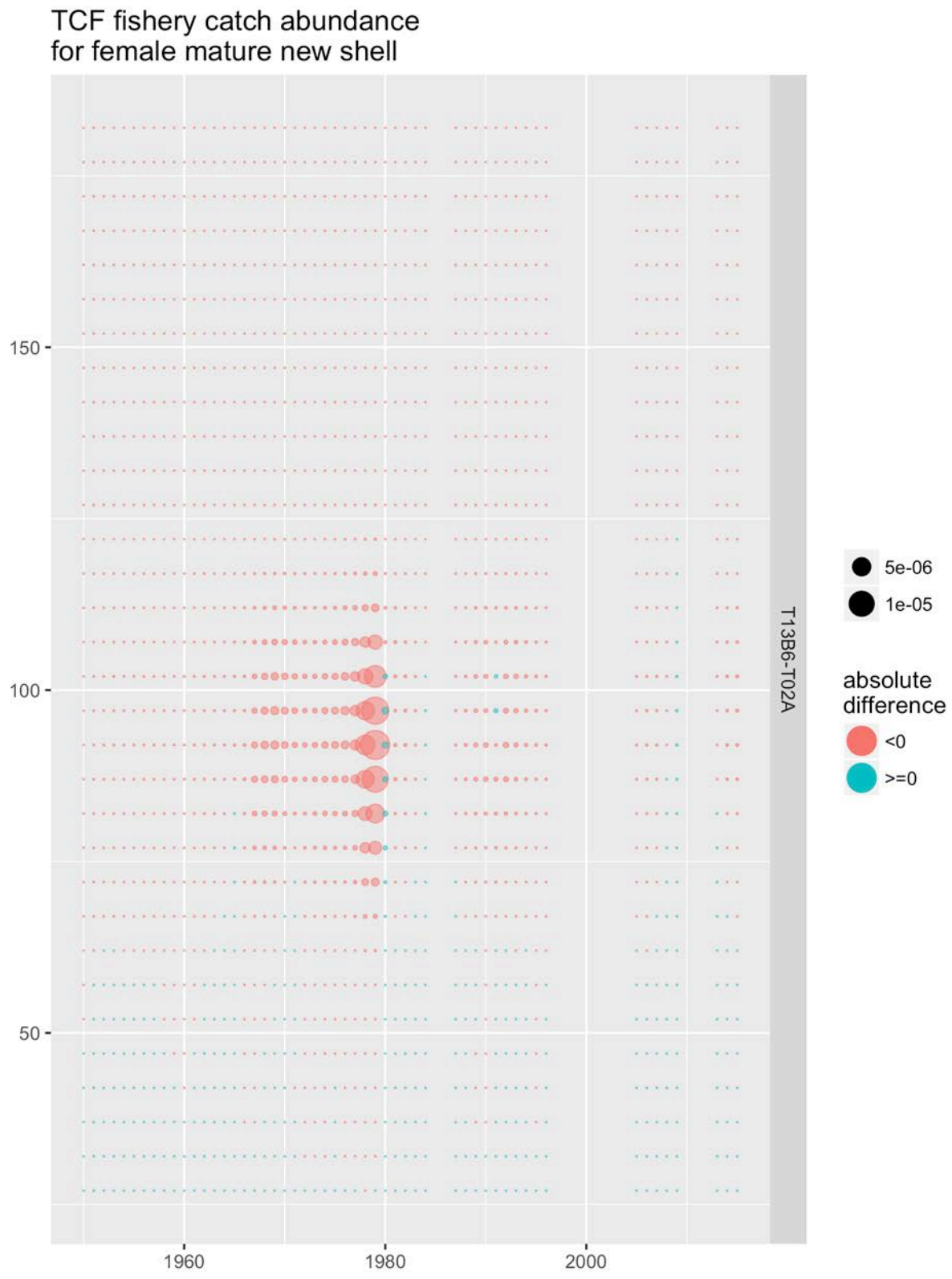

Figure 94. Differences for TCF fishery catch abundance for female mature new shell.

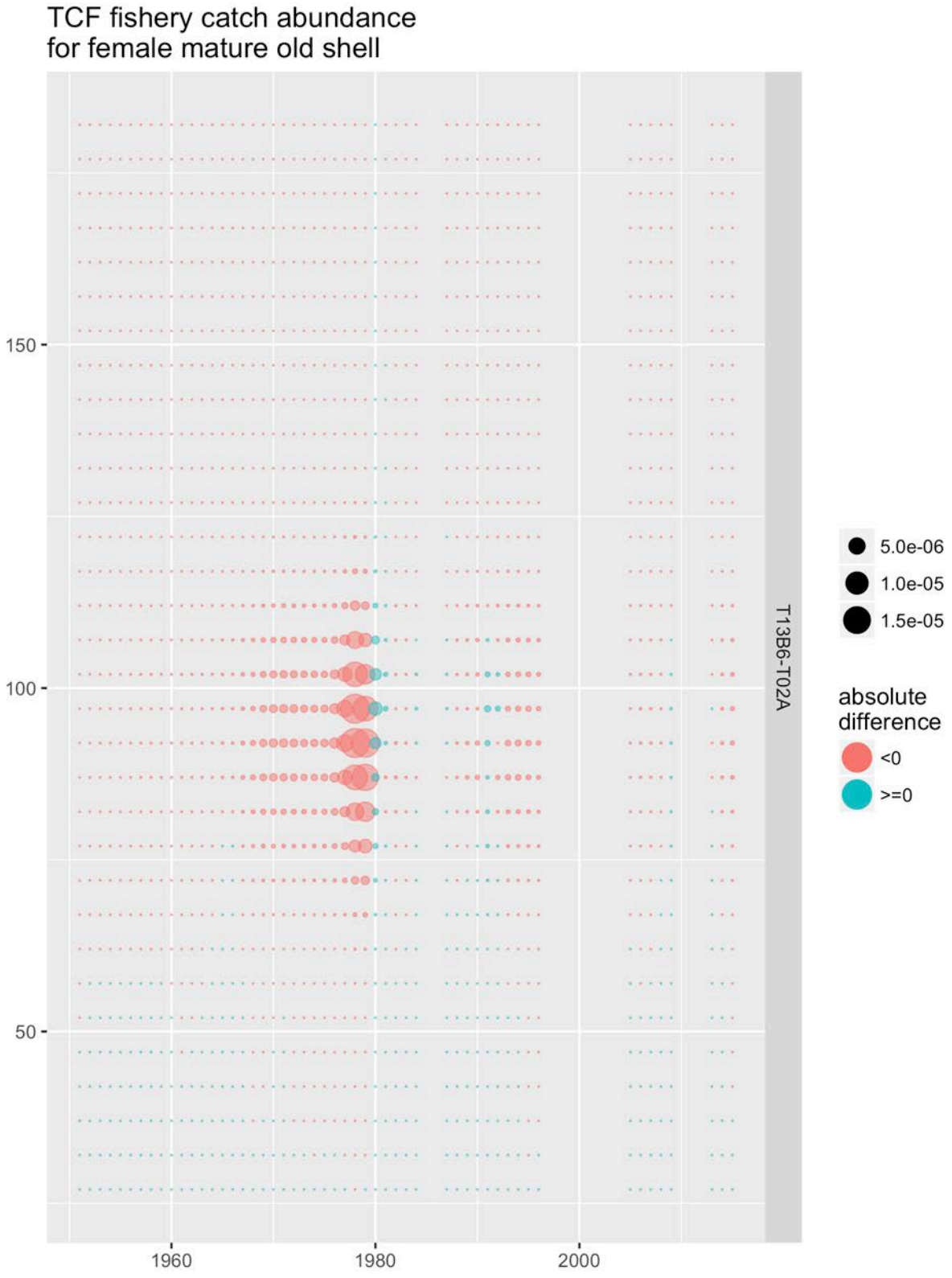

Figure 95. Differences for TCF fishery catch abundance for female mature old shell.

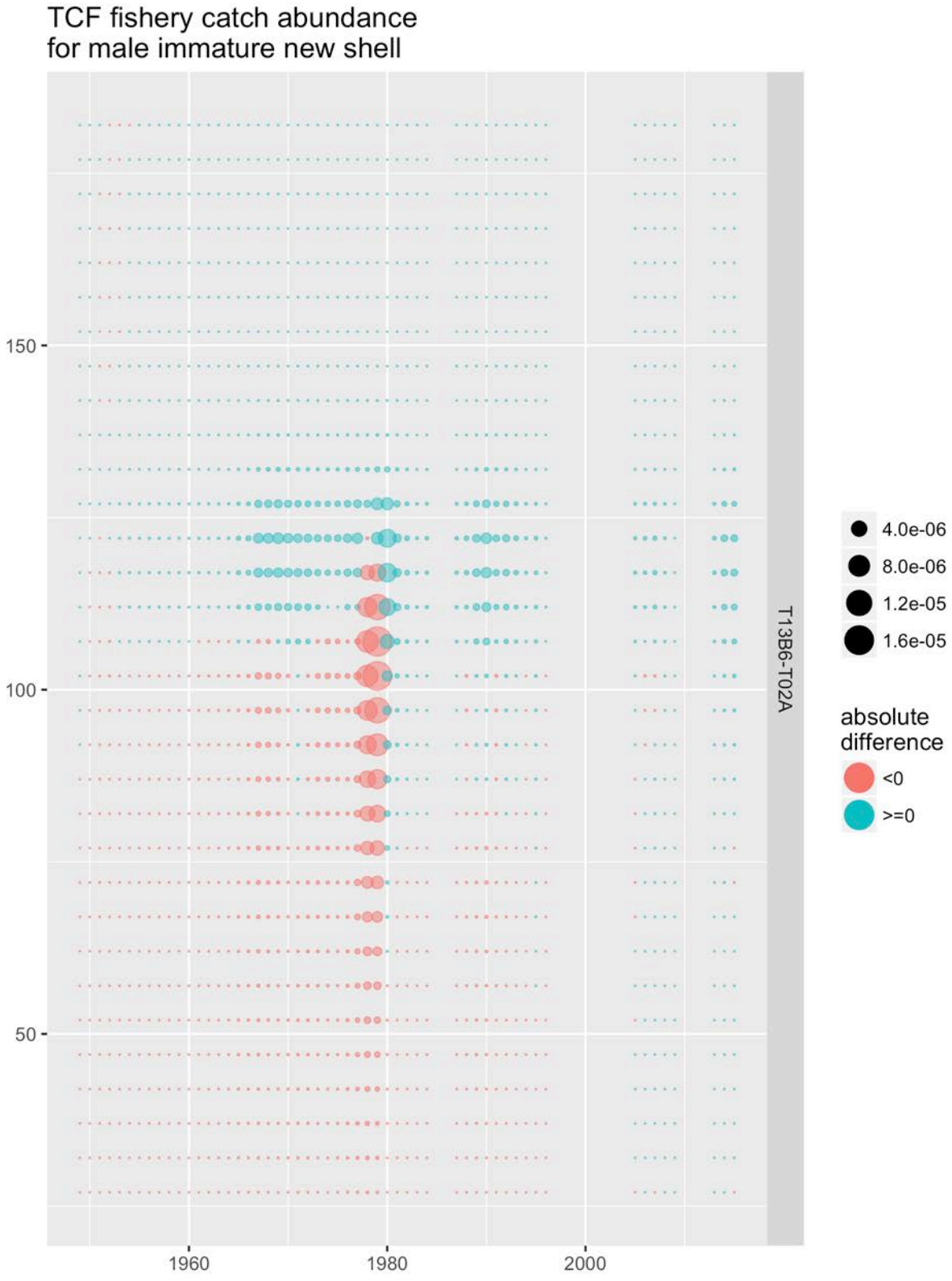

Figure 96. Differences for TCF fishery catch abundance for male immature new shell.

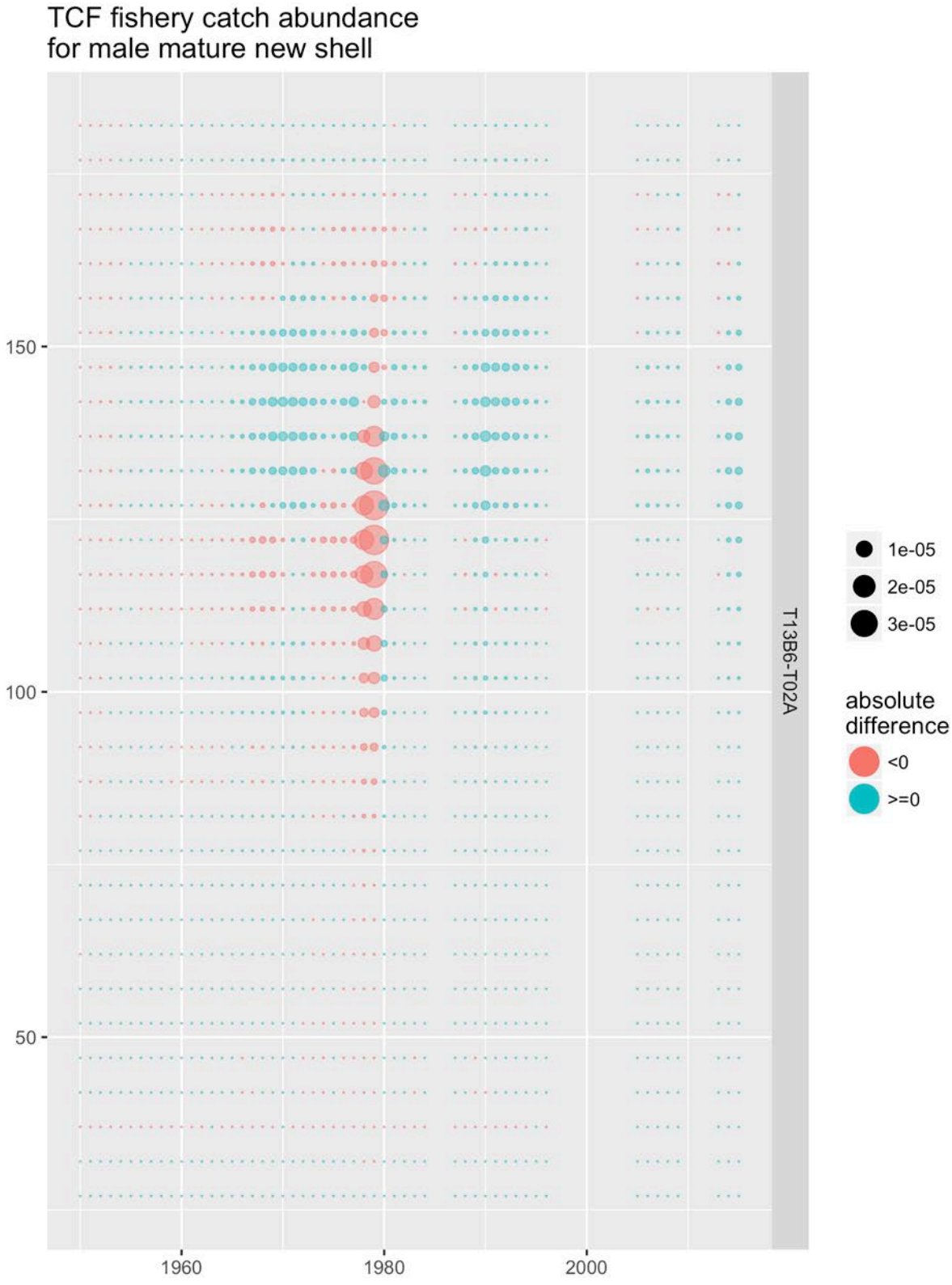

Figure 97. Differences for TCF fishery catch abundance for male mature new shell.

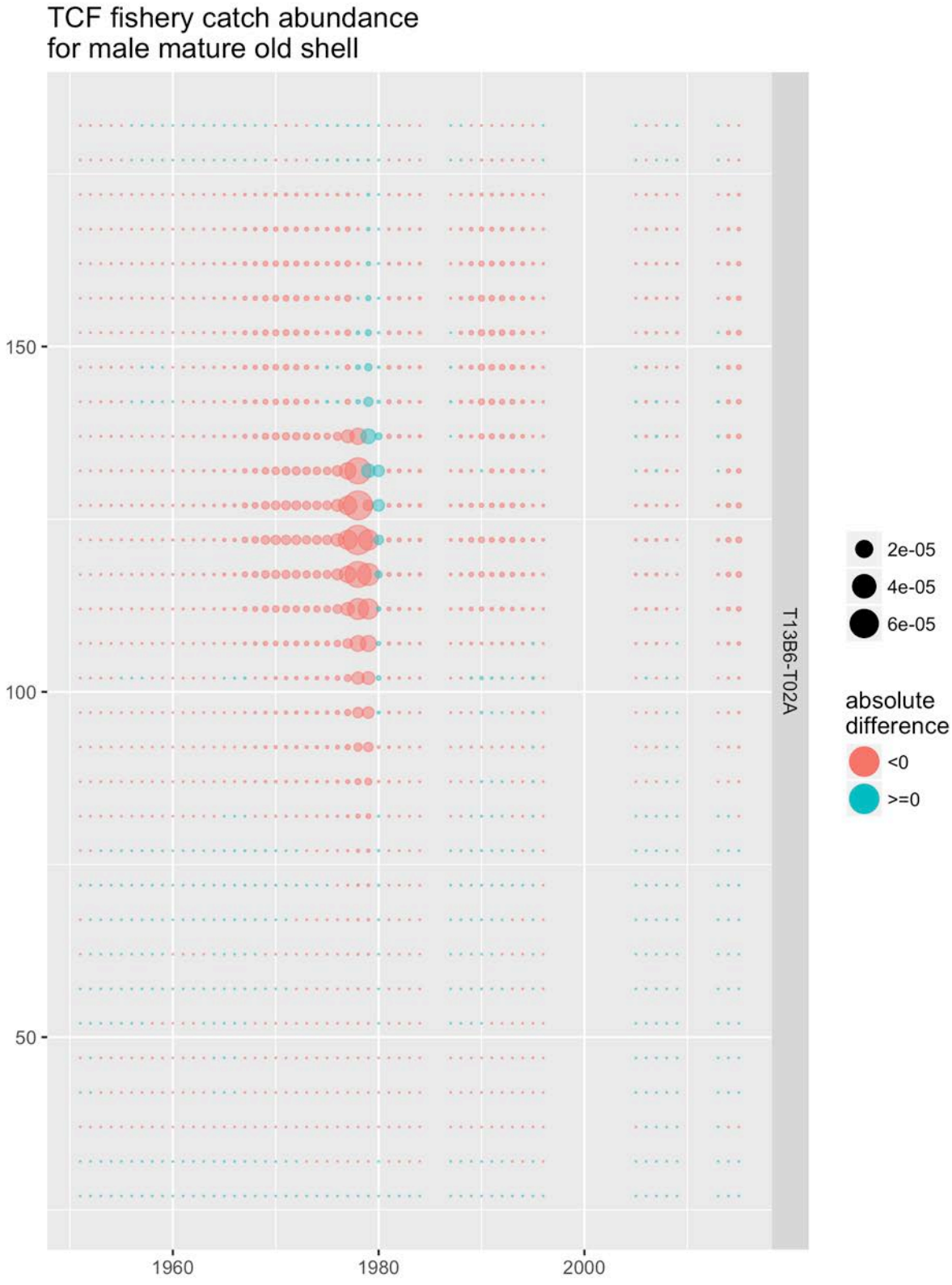

Figure 98. Differences for TCF fishery catch abundance for male mature old shell.

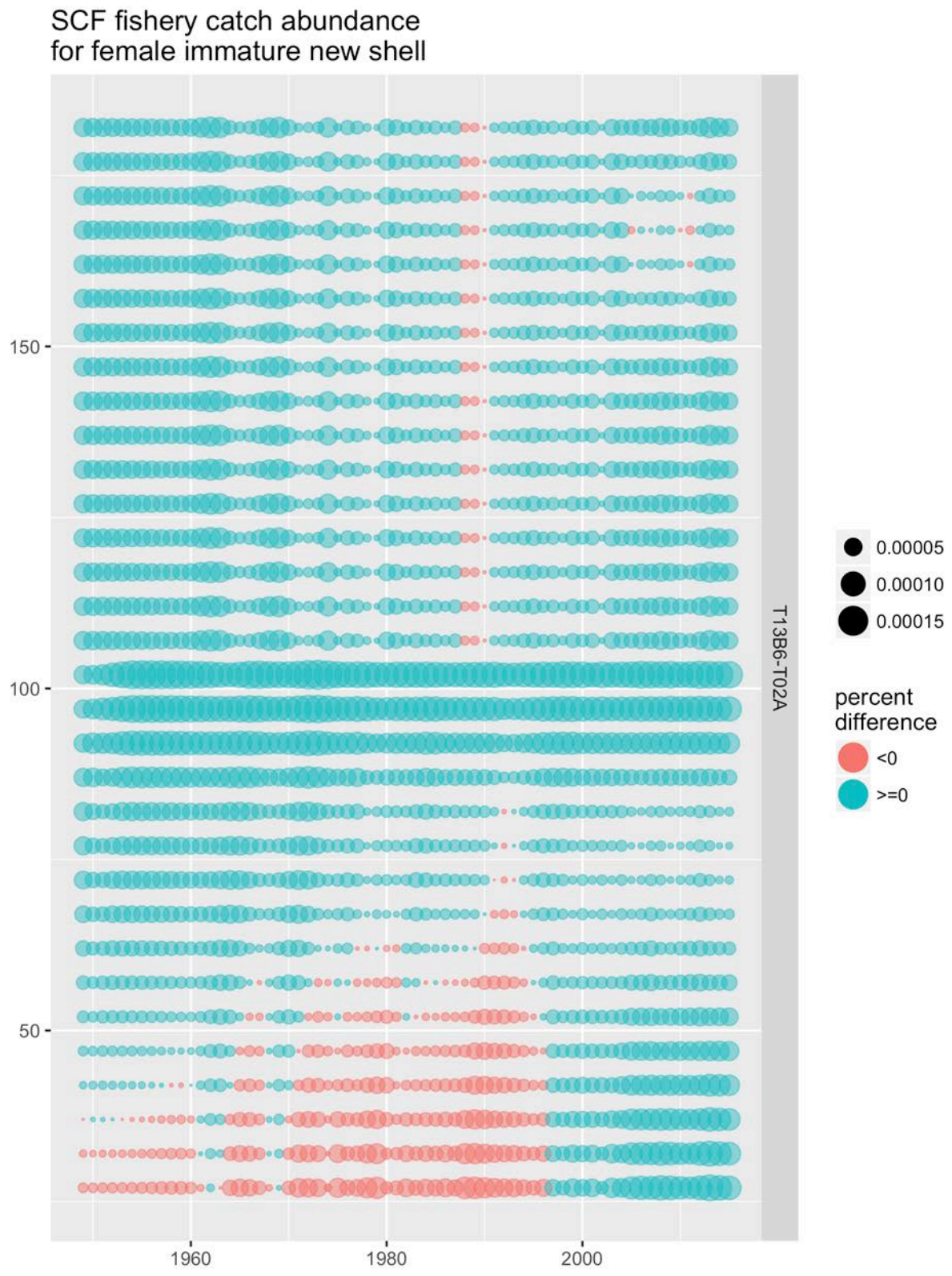

Figure 99. Differences for SCF fishery catch abundance for female immature new shell.

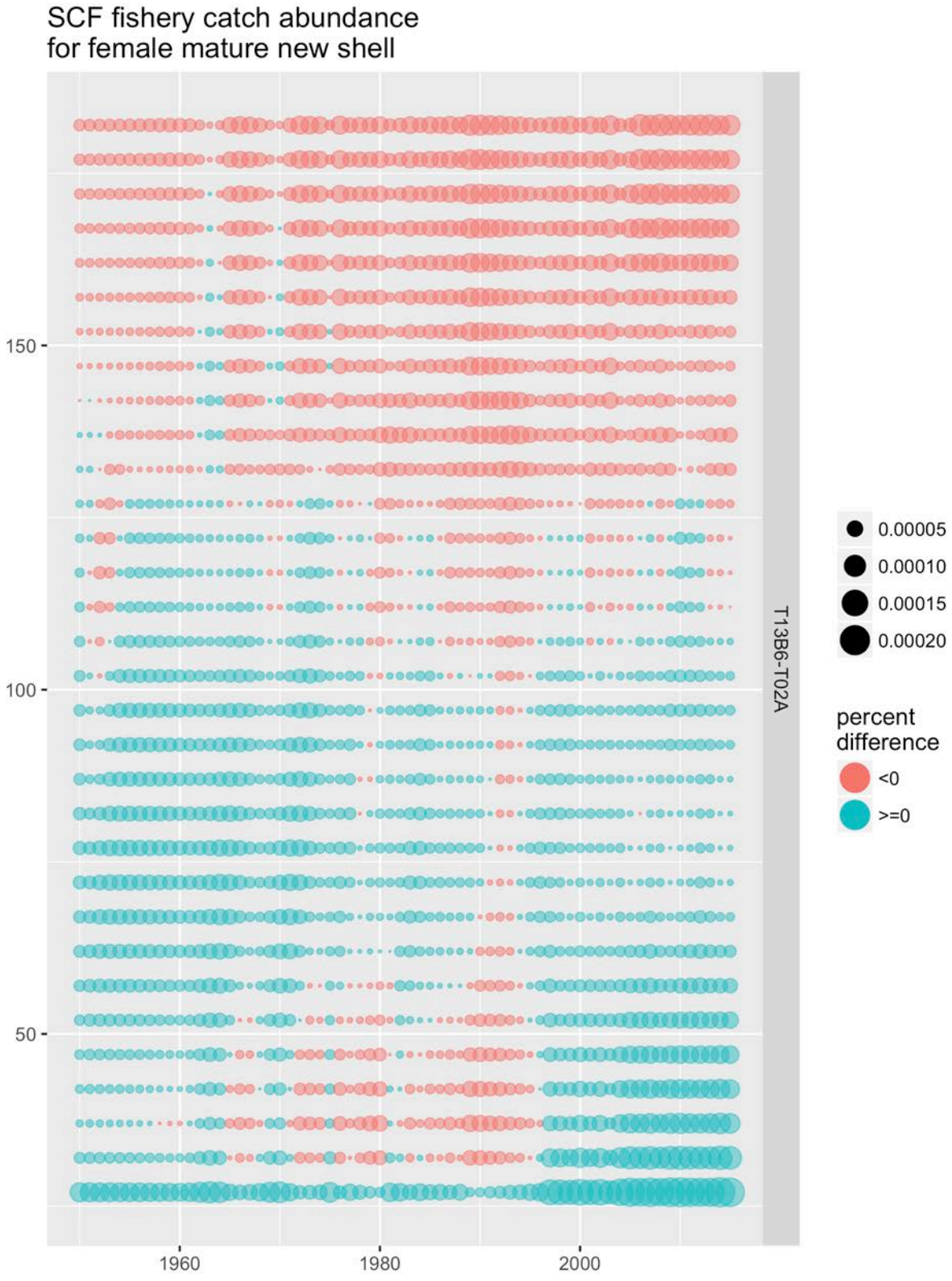

Figure 100. Differences for SCF fishery catch abundance for female mature new shell.

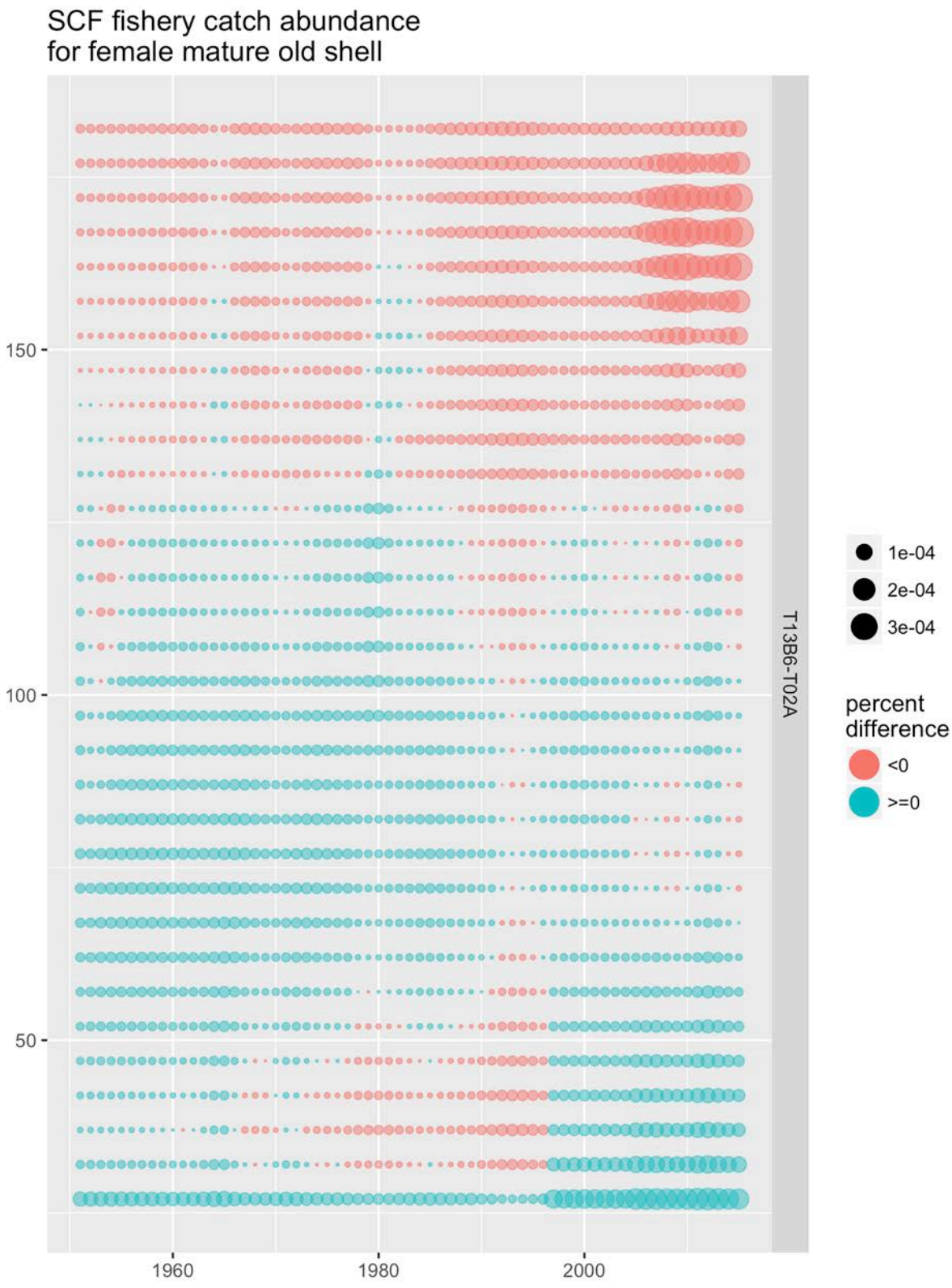

Figure 101. Differences for SCF fishery catch abundance for female mature old shell.

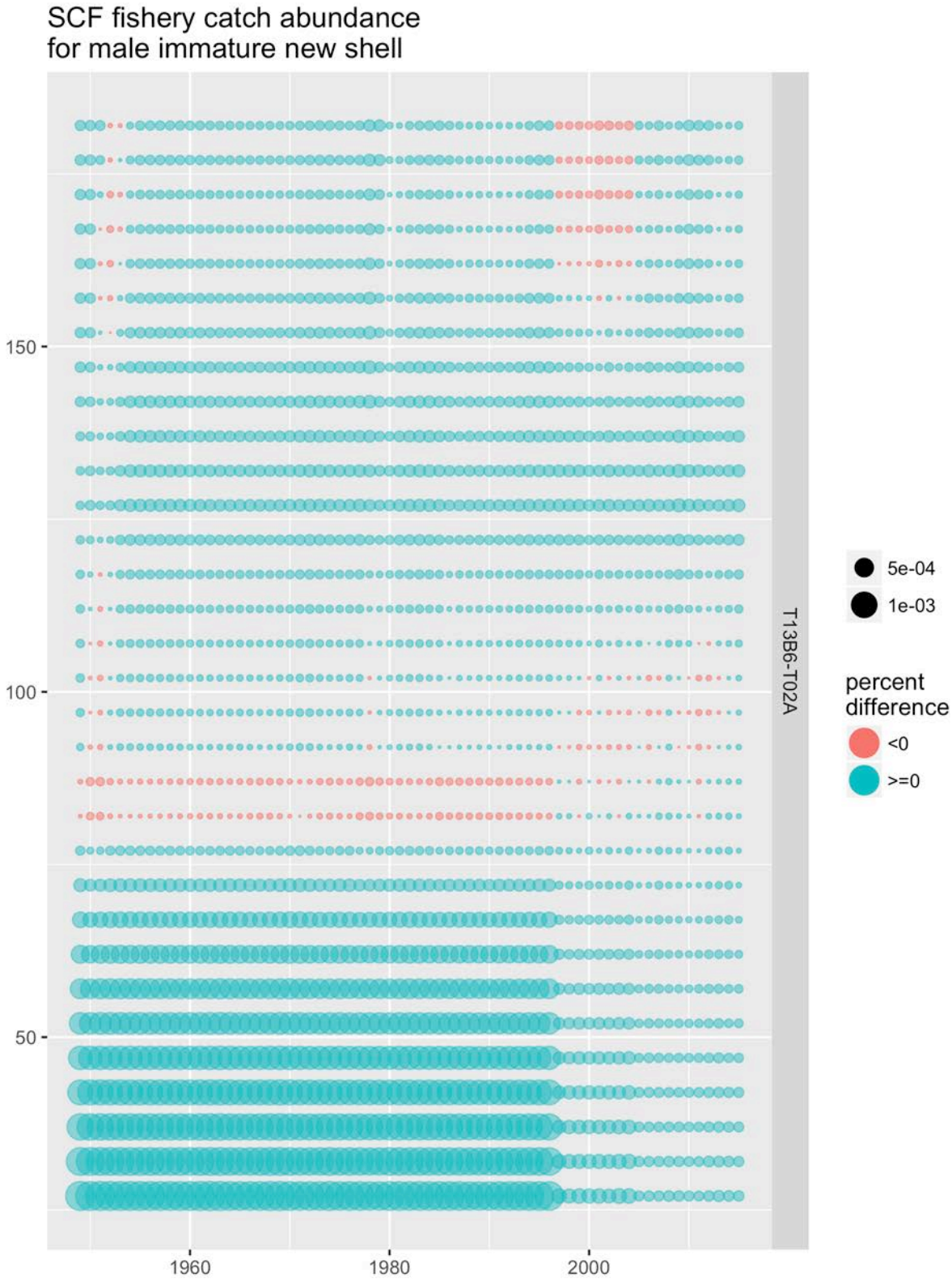

Figure 102. Differences for SCF fishery catch abundance for male immature new shell.

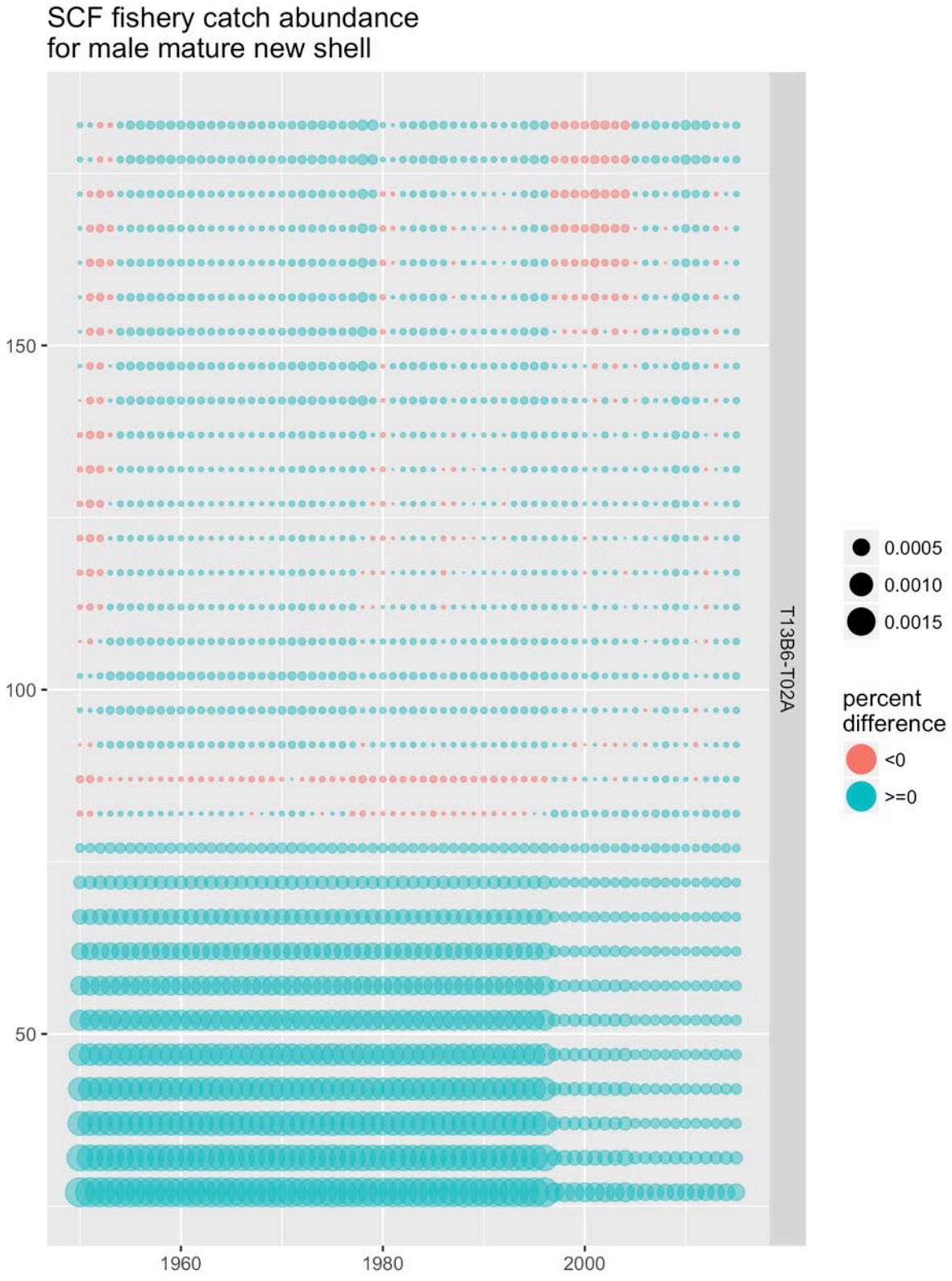

Figure 103. Differences for SCF fishery catch abundance for male mature new shell.

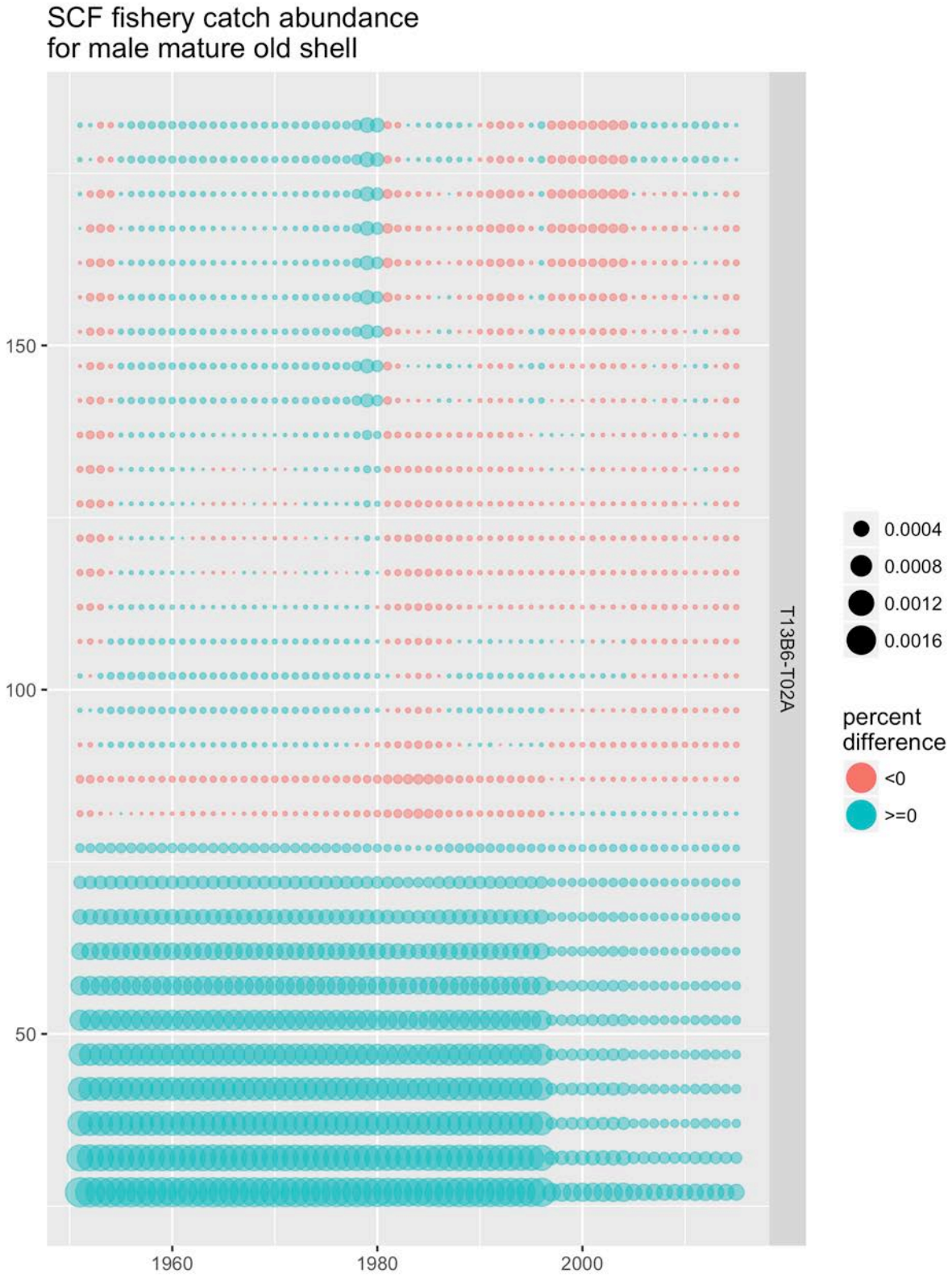

Figure 104. Differences for SCF fishery catch abundance for male mature old shell.

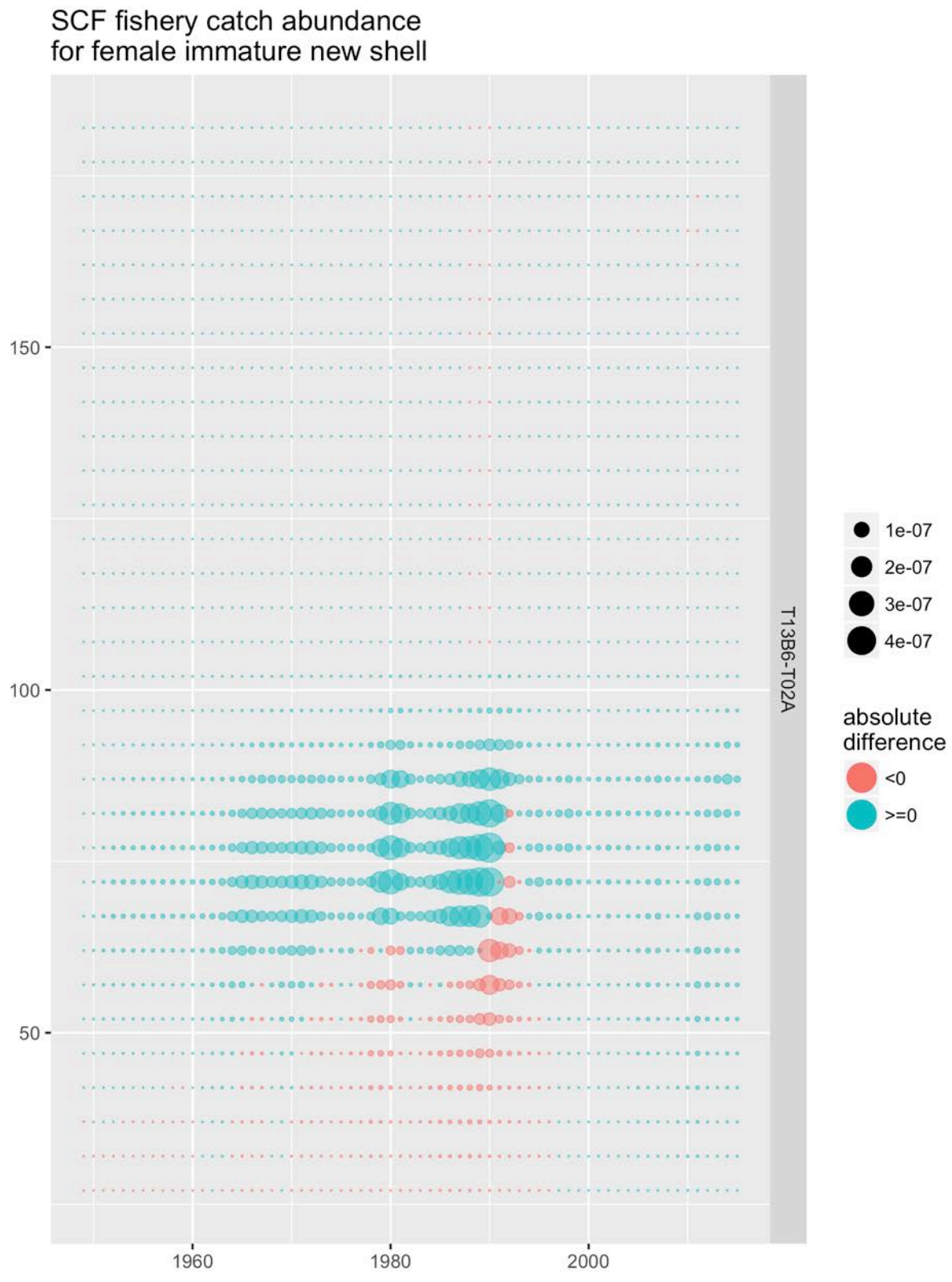

Figure 105. Differences for SCF fishery catch abundance for female immature new shell.

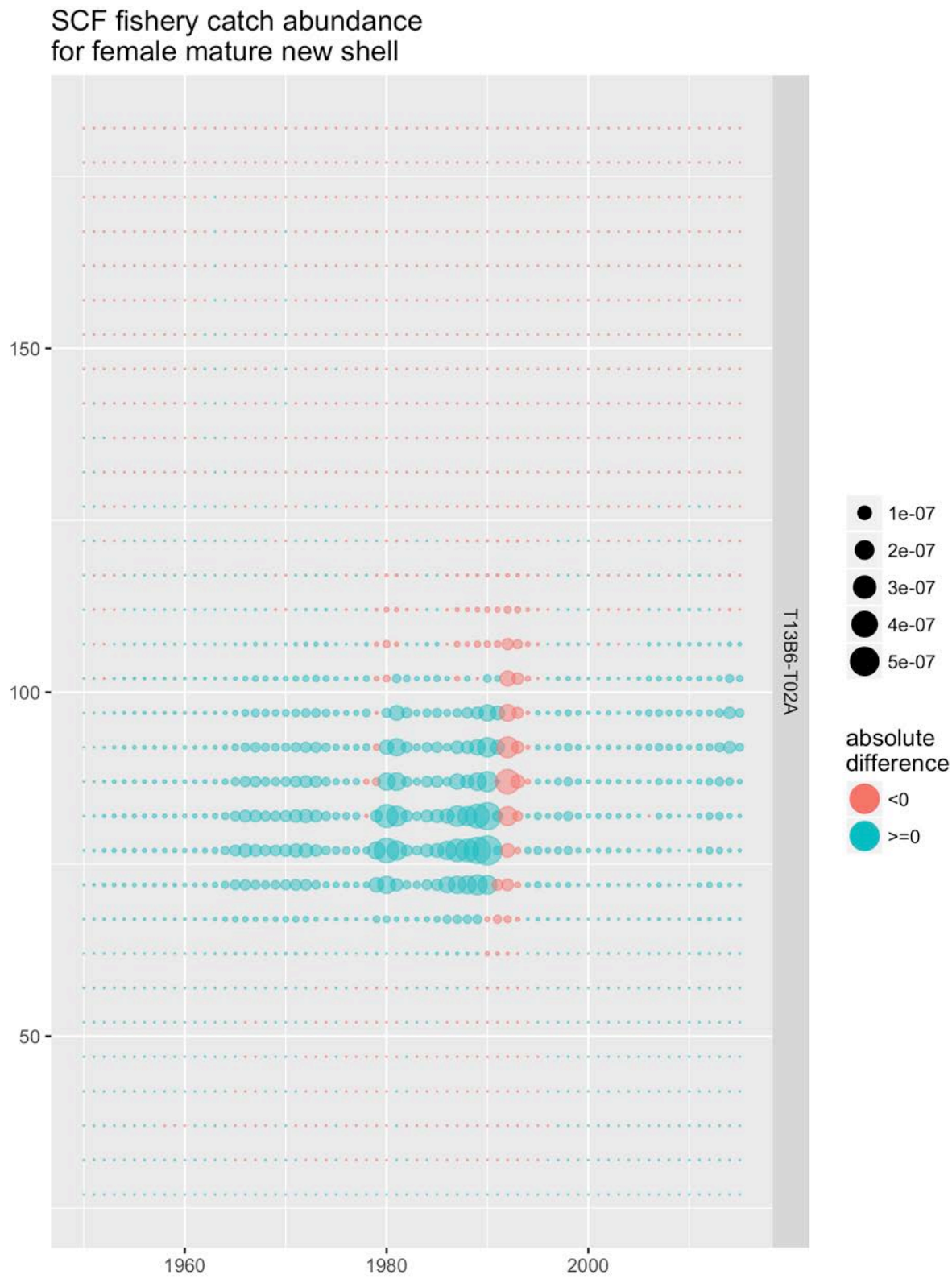

Figure 106. Differences for SCF fishery catch abundance for female mature new shell.

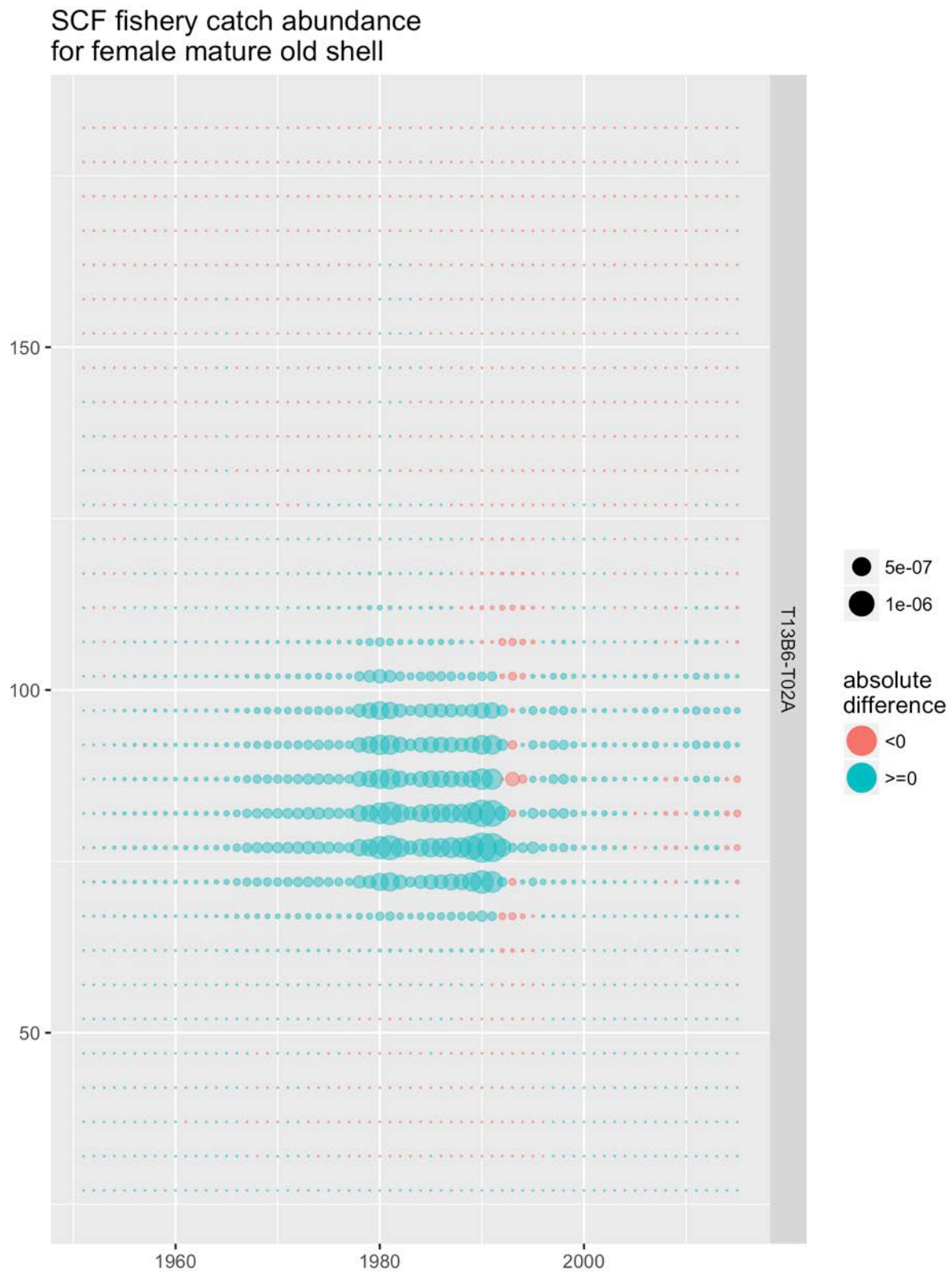

Figure 107. Differences for SCF fishery catch abundance for female mature old shell.

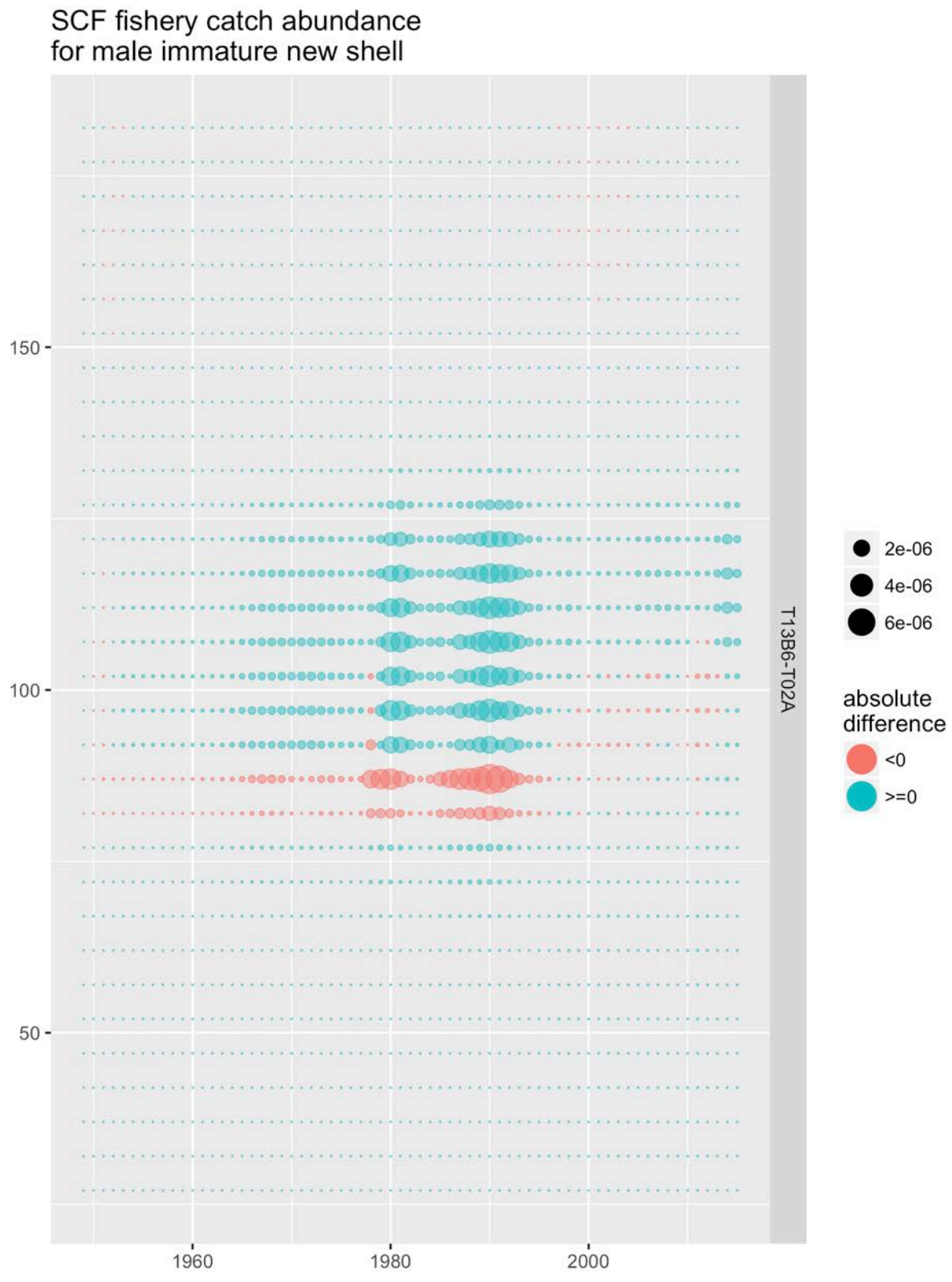

Figure 108. Differences for SCF fishery catch abundance for male immature new shell.

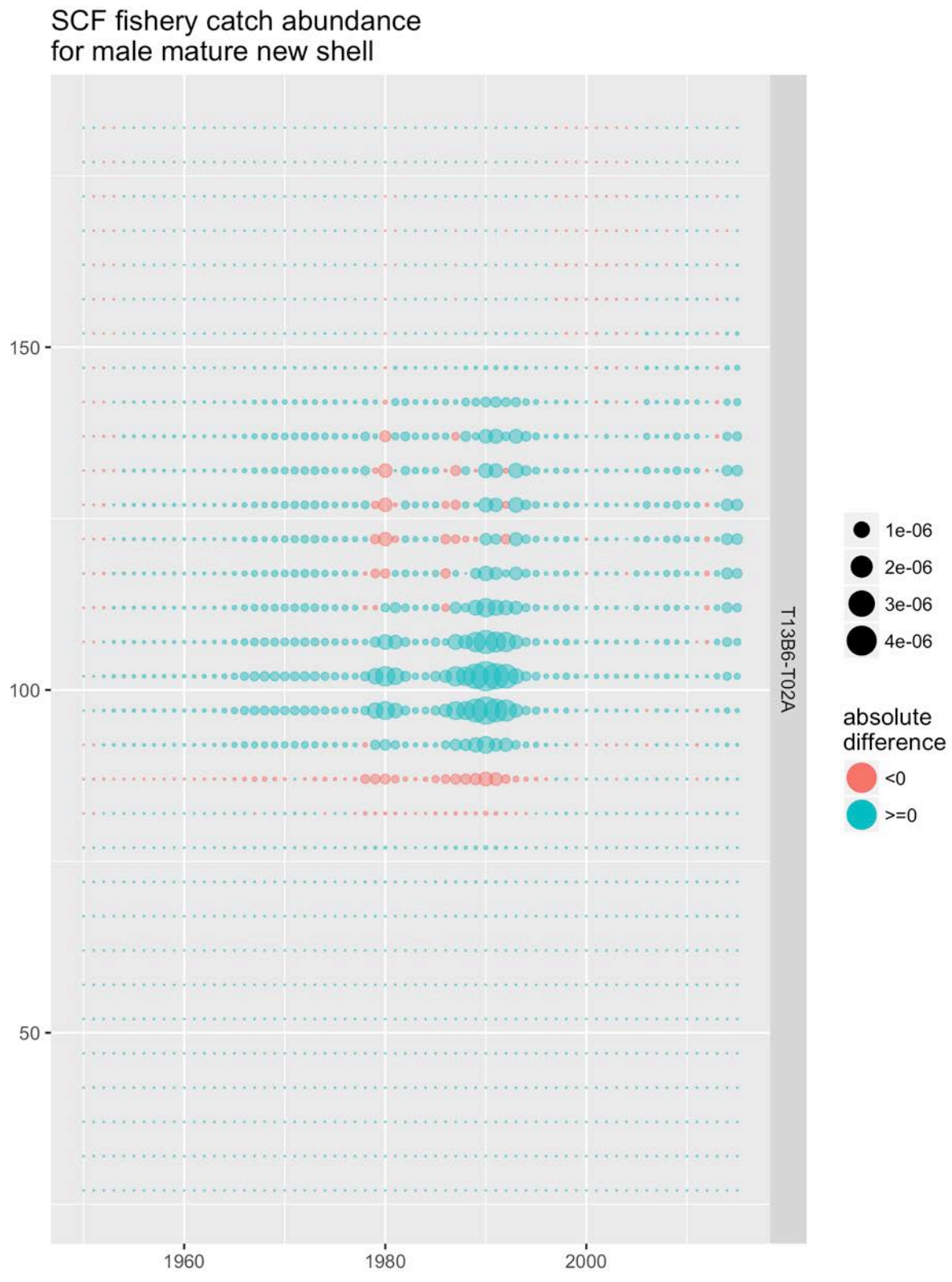

Figure 109. Differences for SCF fishery catch abundance for male mature new shell.

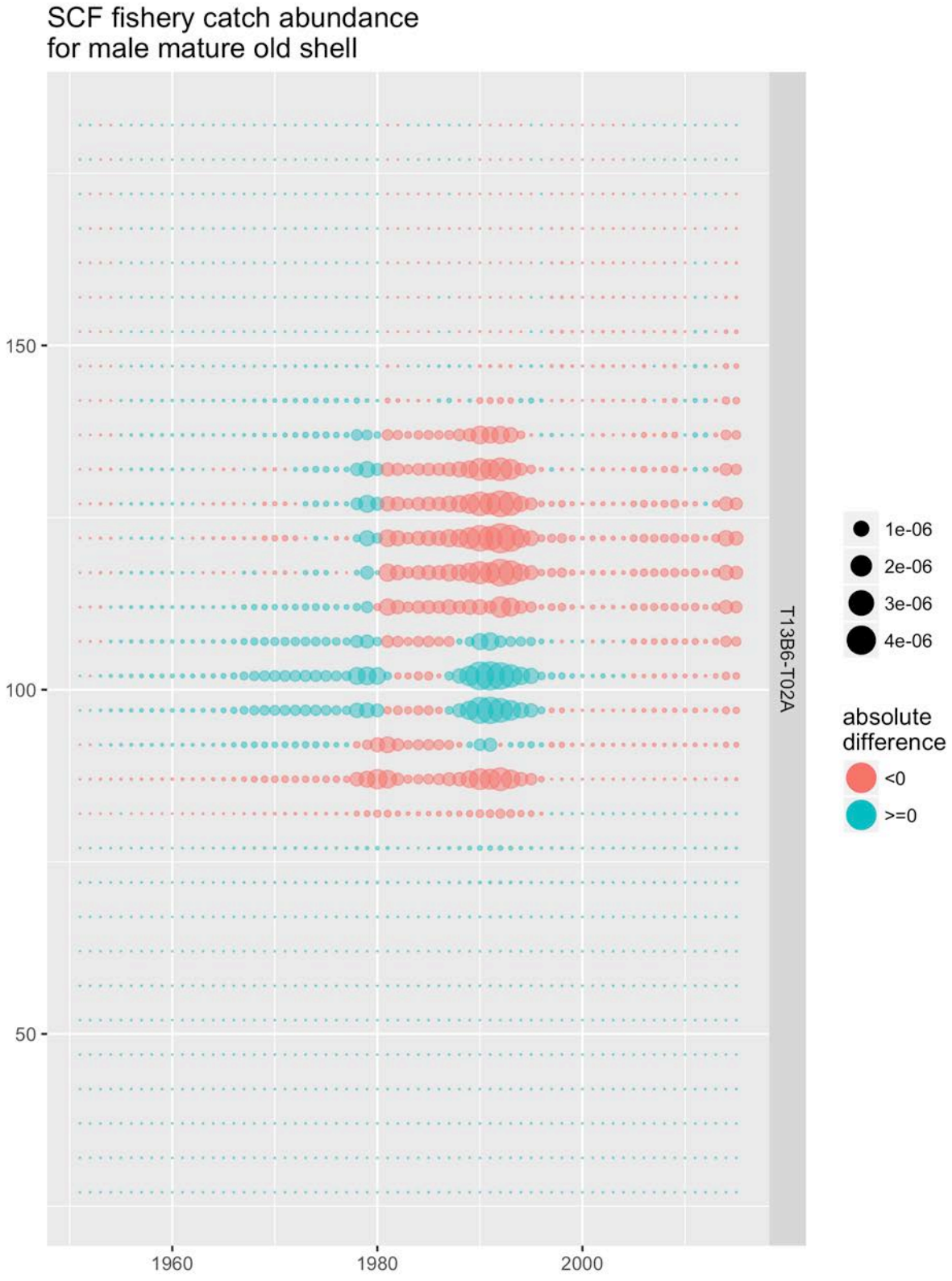

Figure 110. Differences for SCF fishery catch abundance for male mature old shell.

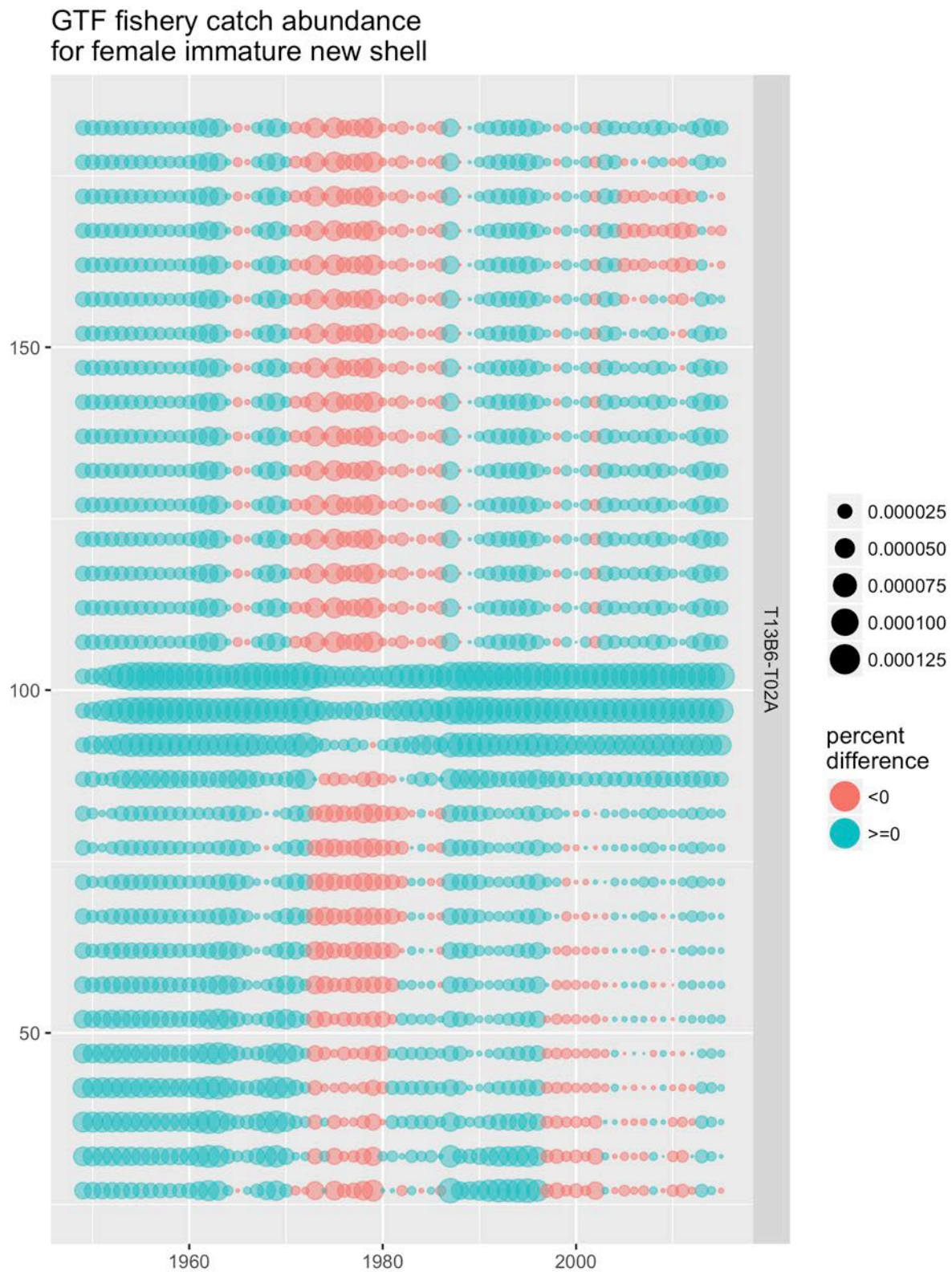

Figure 111. Differences for GTF fishery catch abundance for female immature new shell.

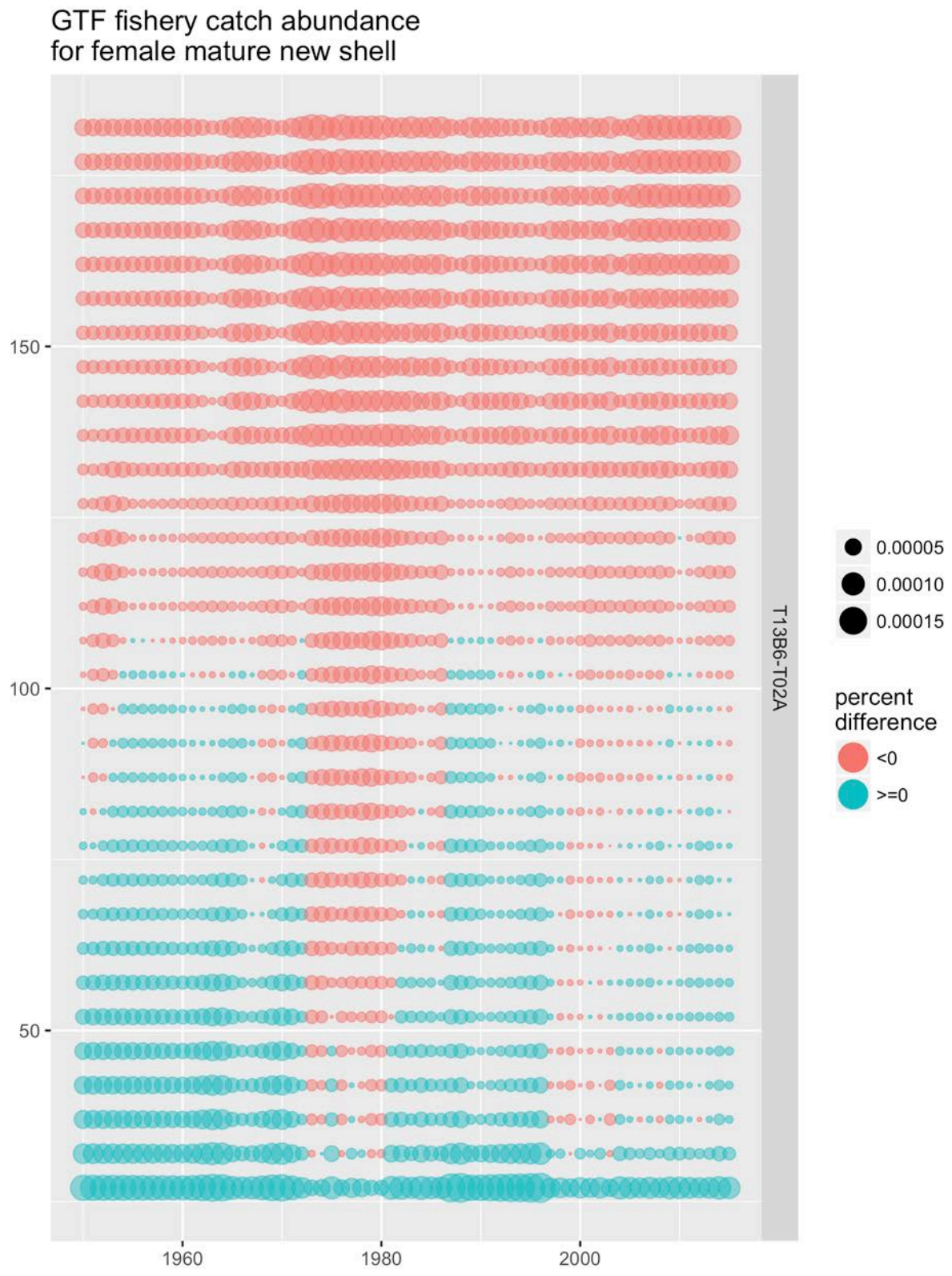

Figure 112. Differences for GTF fishery catch abundance for female mature new shell.

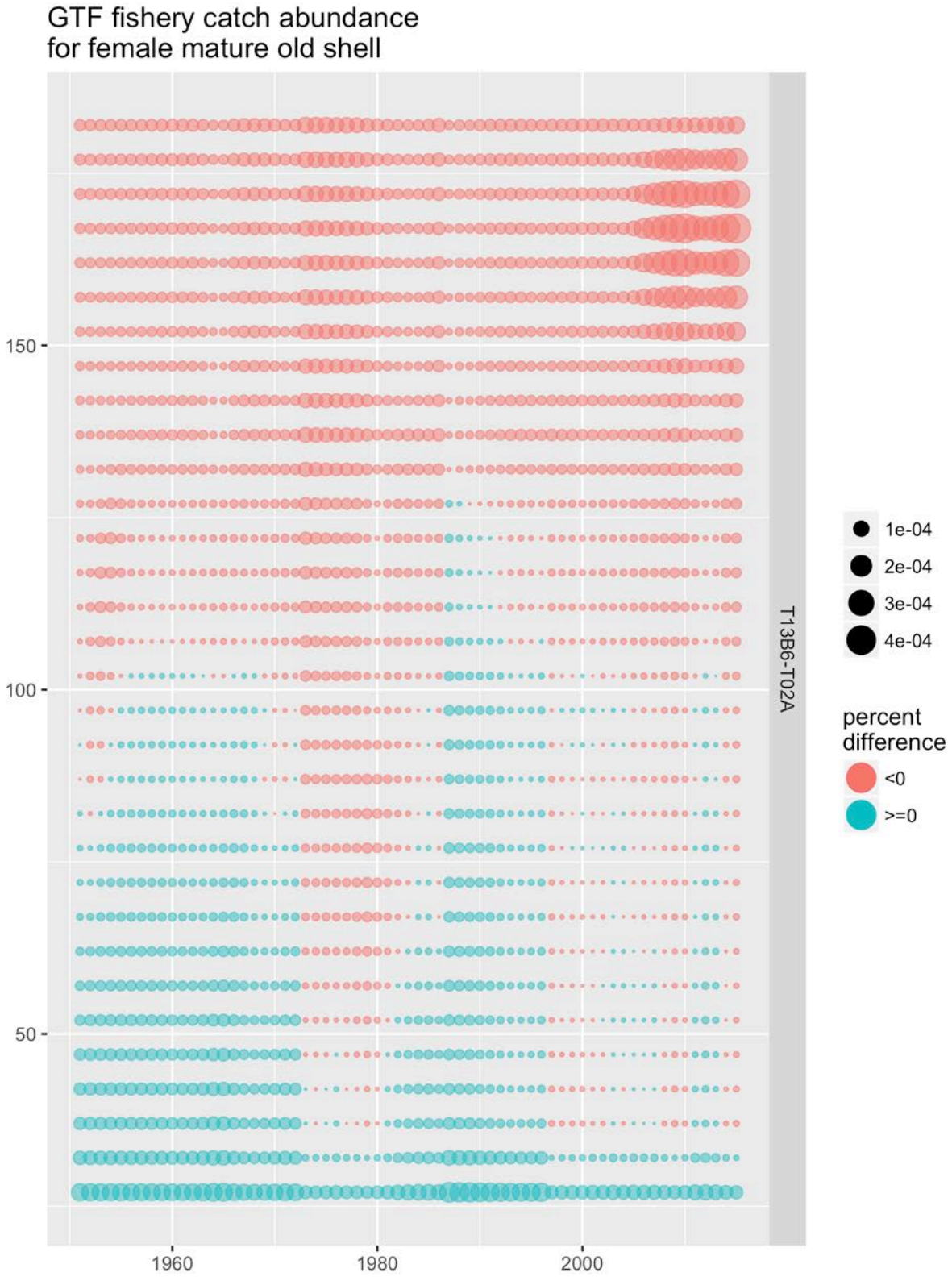

Figure 113. Differences for GTF fishery catch abundance for female mature old shell.

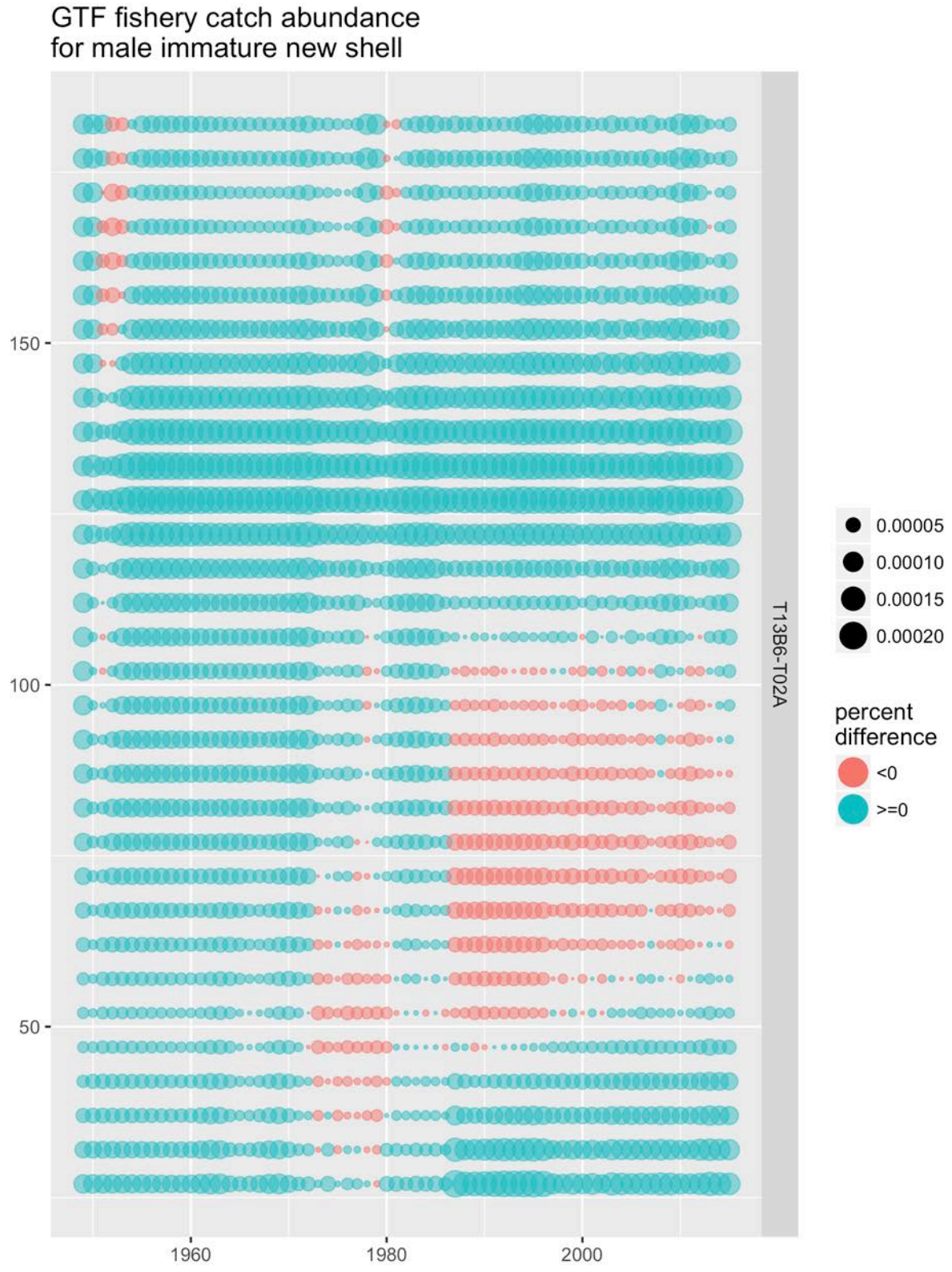

Figure 114. Differences for GTF fishery catch abundance for male immature new shell.

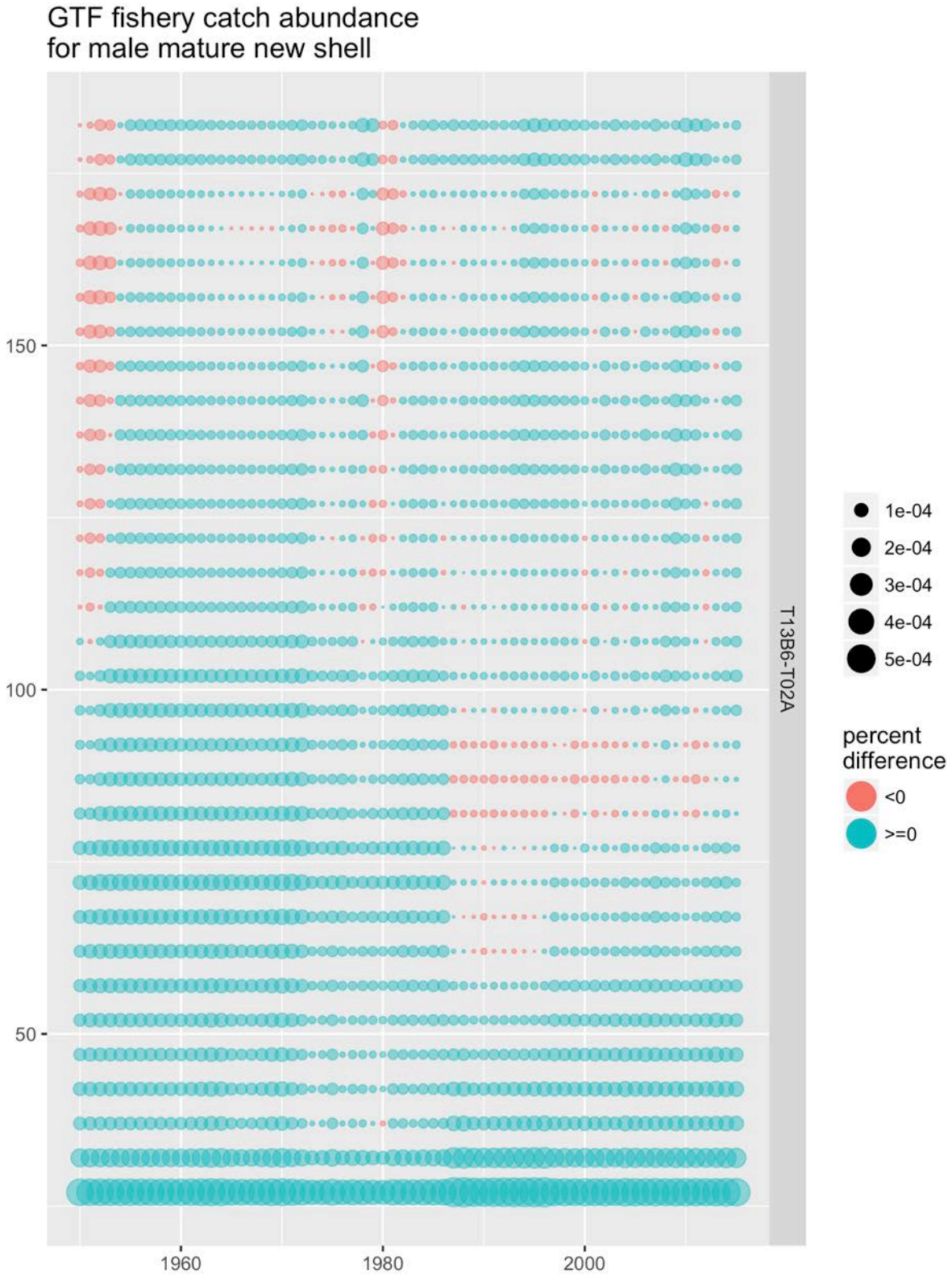

Figure 115. Differences for GTF fishery catch abundance for male mature new shell.

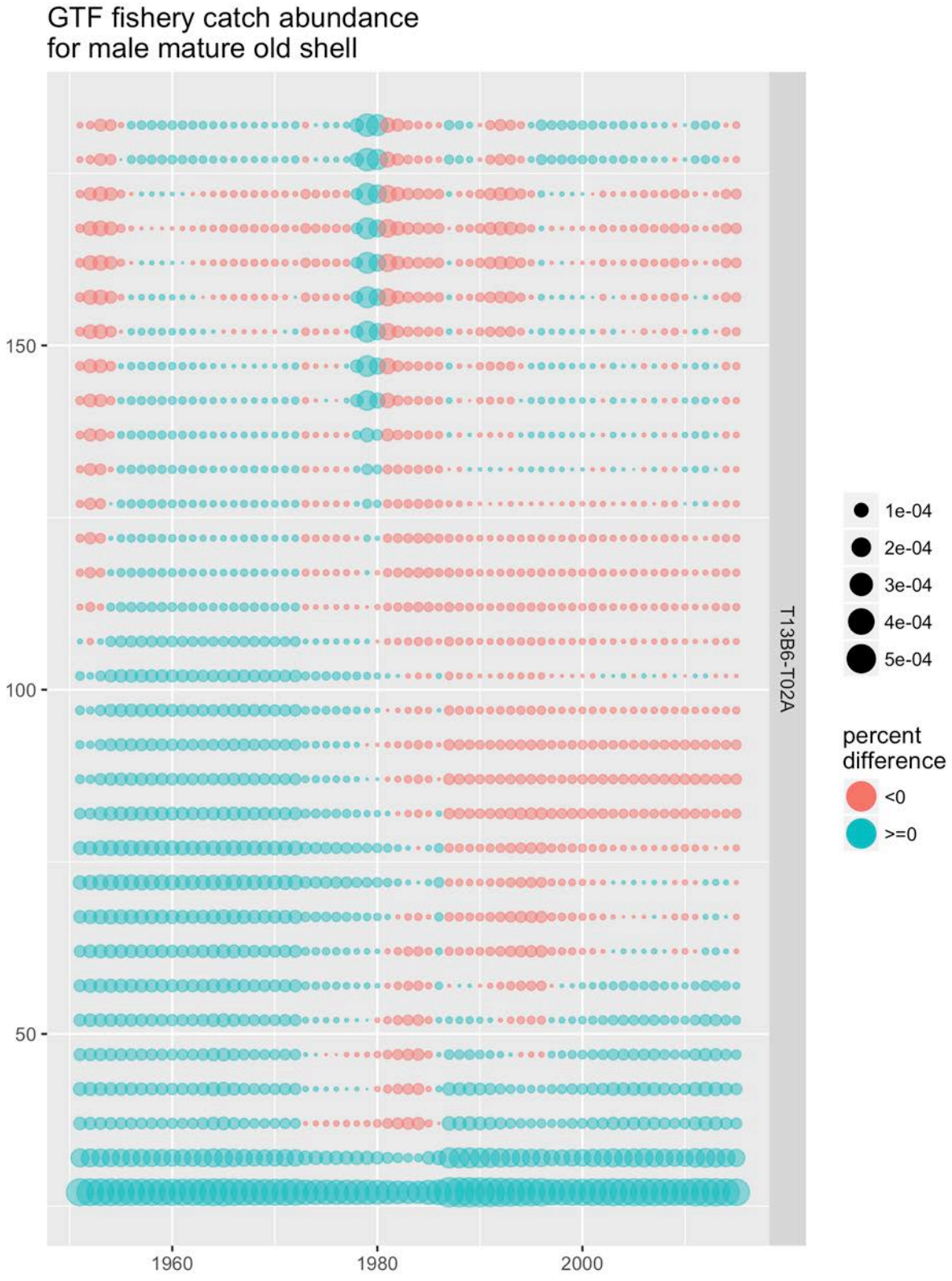

Figure 116. Differences for GTF fishery catch abundance for male mature old shell.

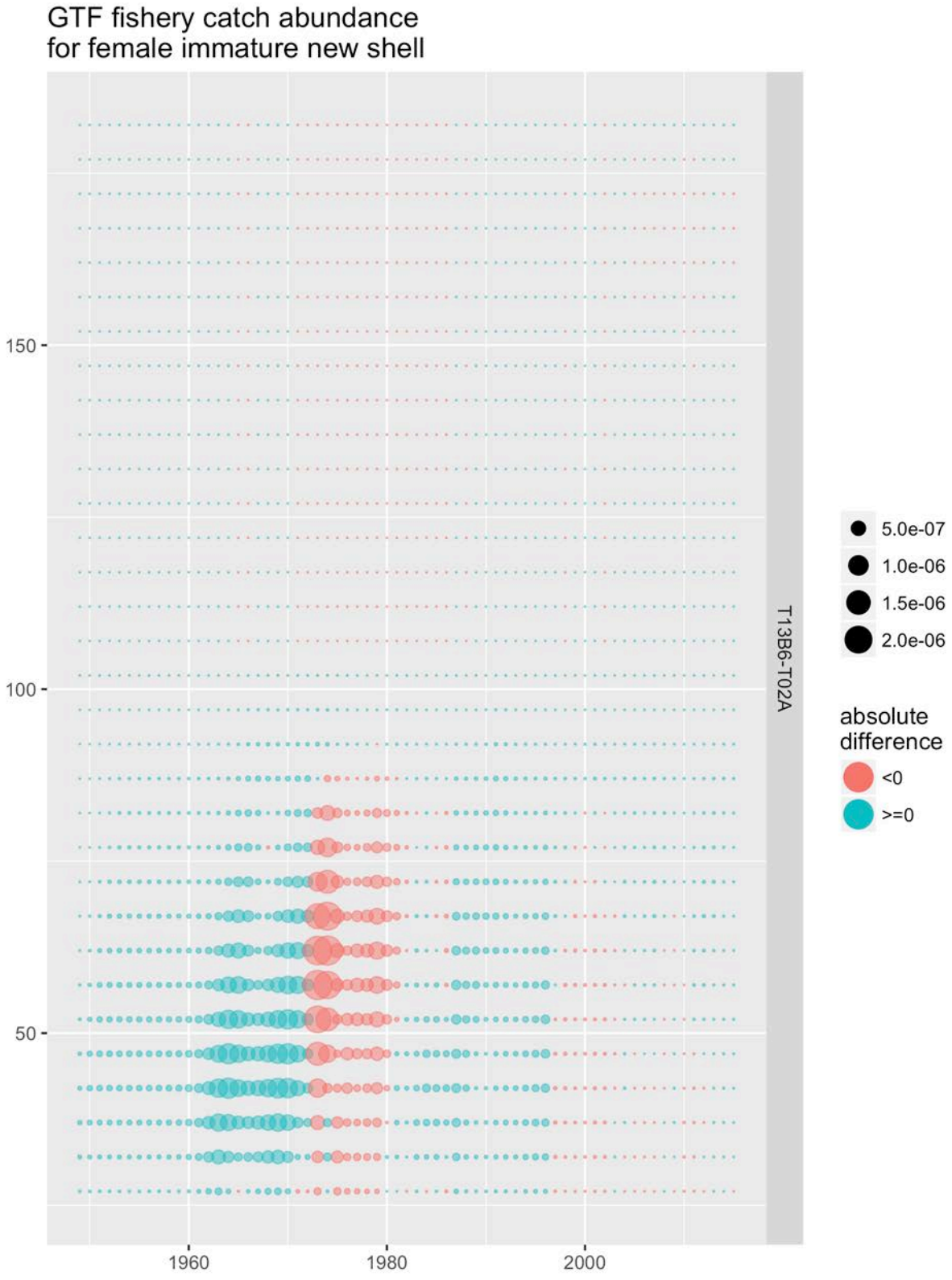

Figure 117. Differences for GTF fishery catch abundance for female immature new shell.

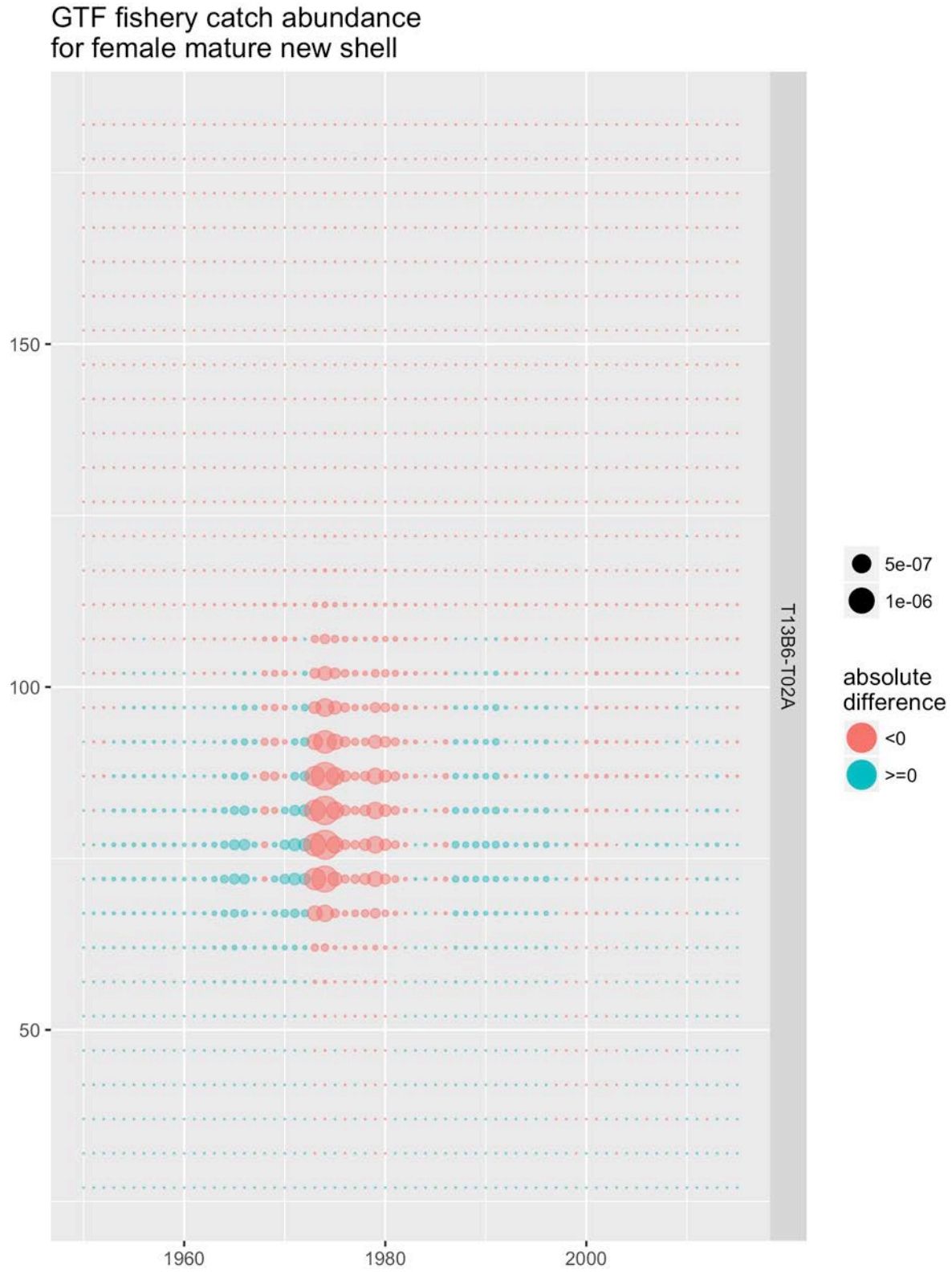

Figure 118. Differences for GTF fishery catch abundance for female mature new shell.

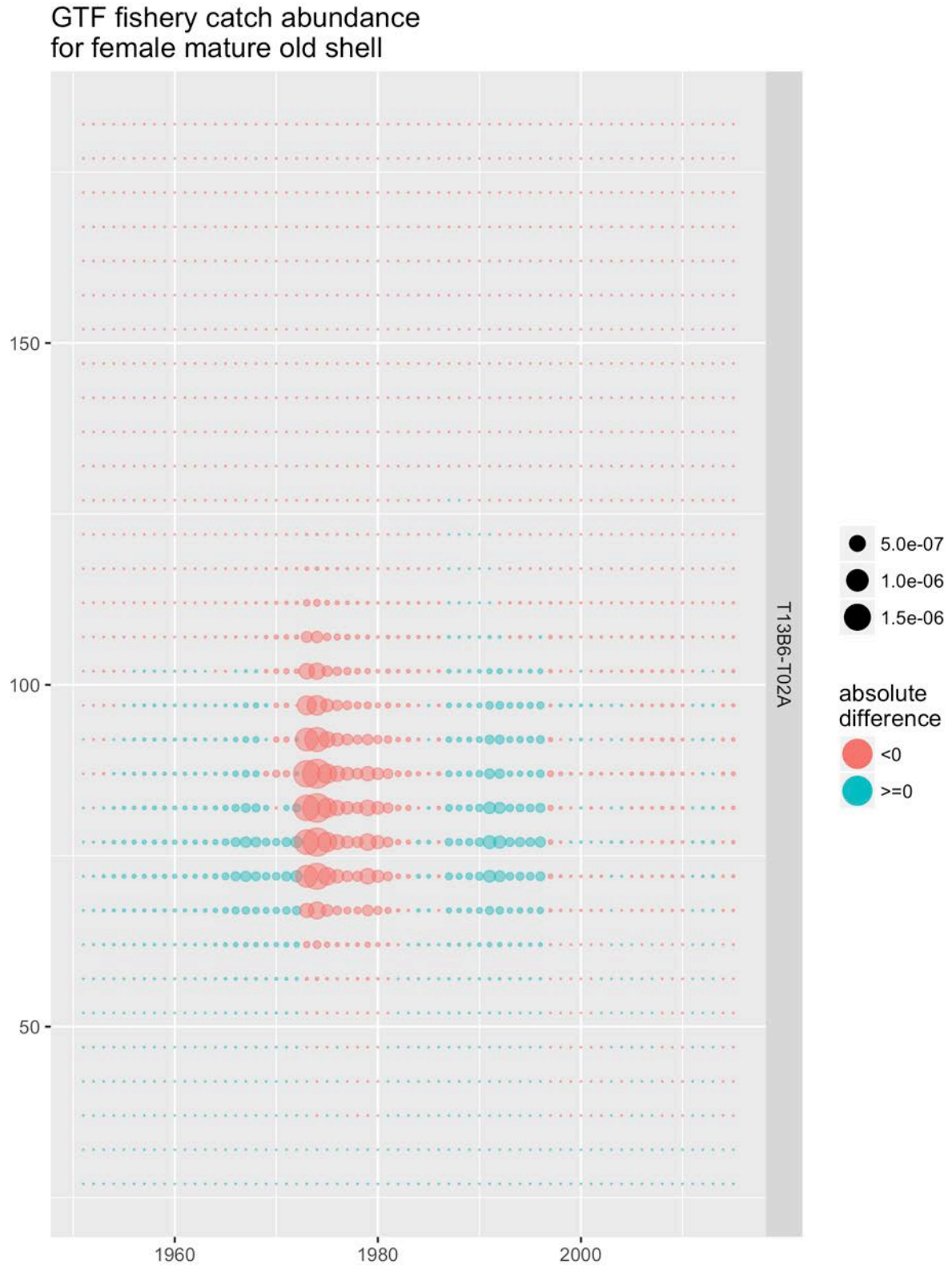

Figure 119. Differences for GTF fishery catch abundance for female mature old shell.

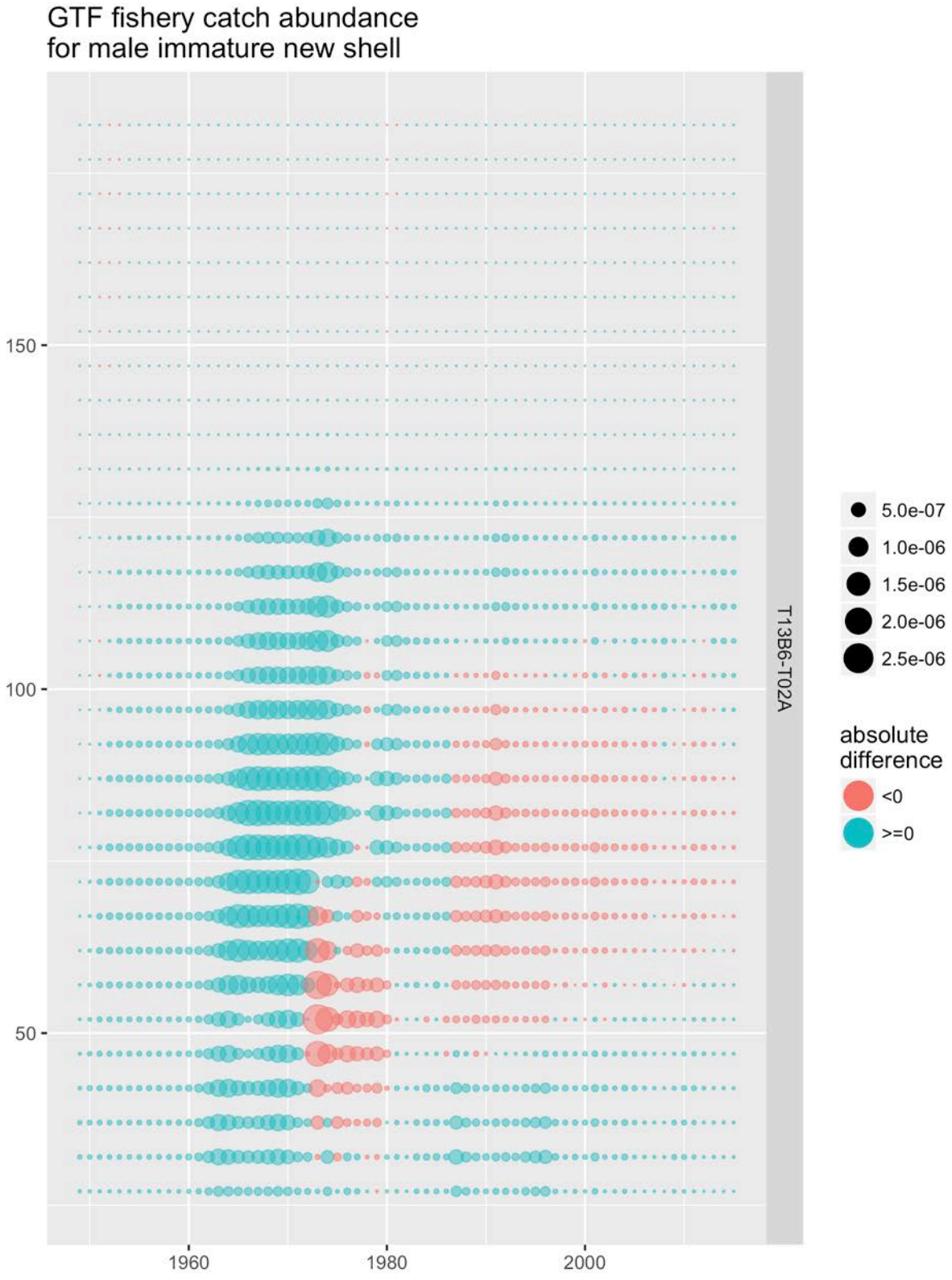

Figure 120. Differences for GTF fishery catch abundance for male immature new shell.

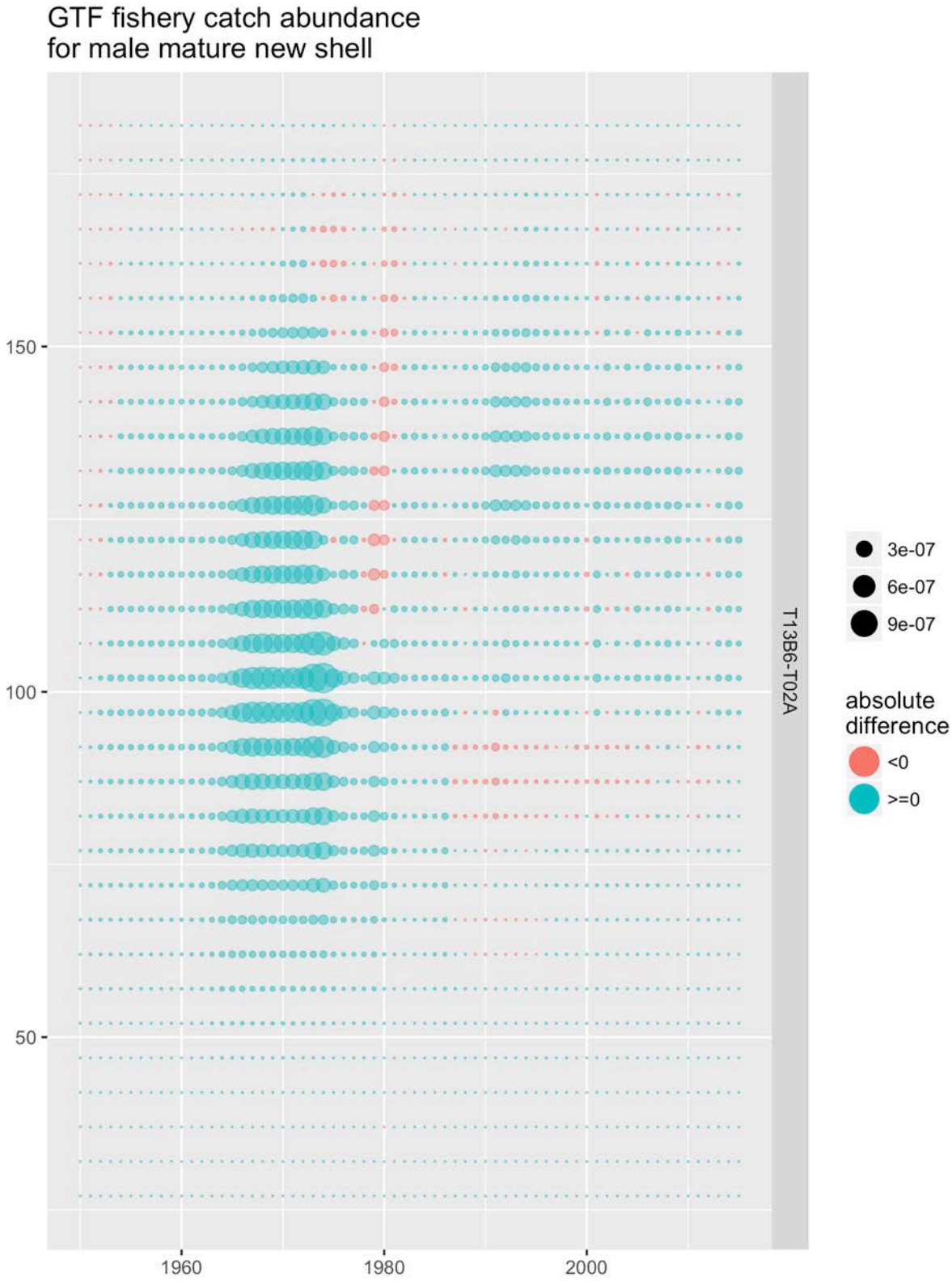

Figure 121. Differences for GTF fishery catch abundance for male mature new shell.

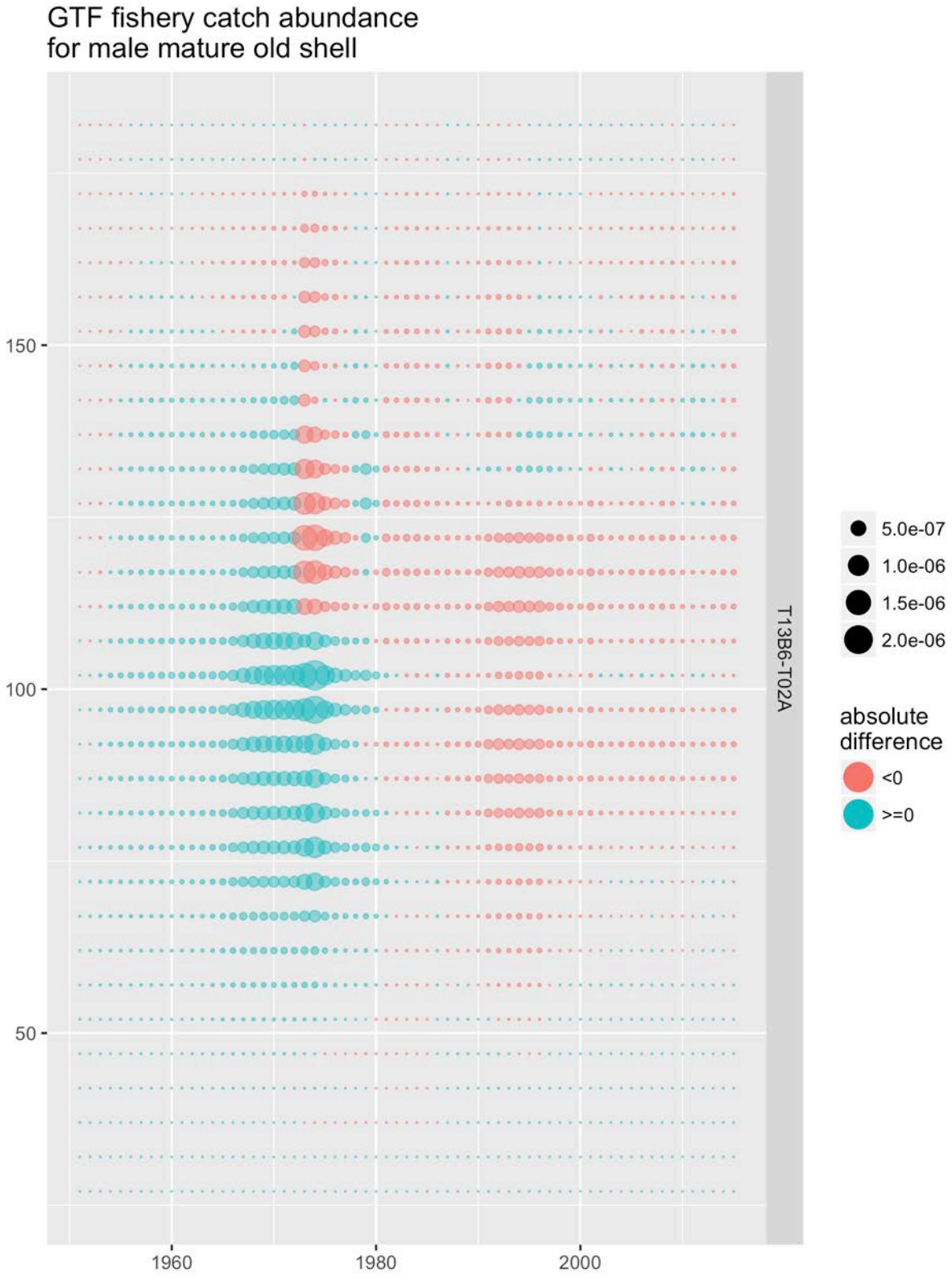

Figure 122. Differences for GTF fishery catch abundance for male mature old shell.

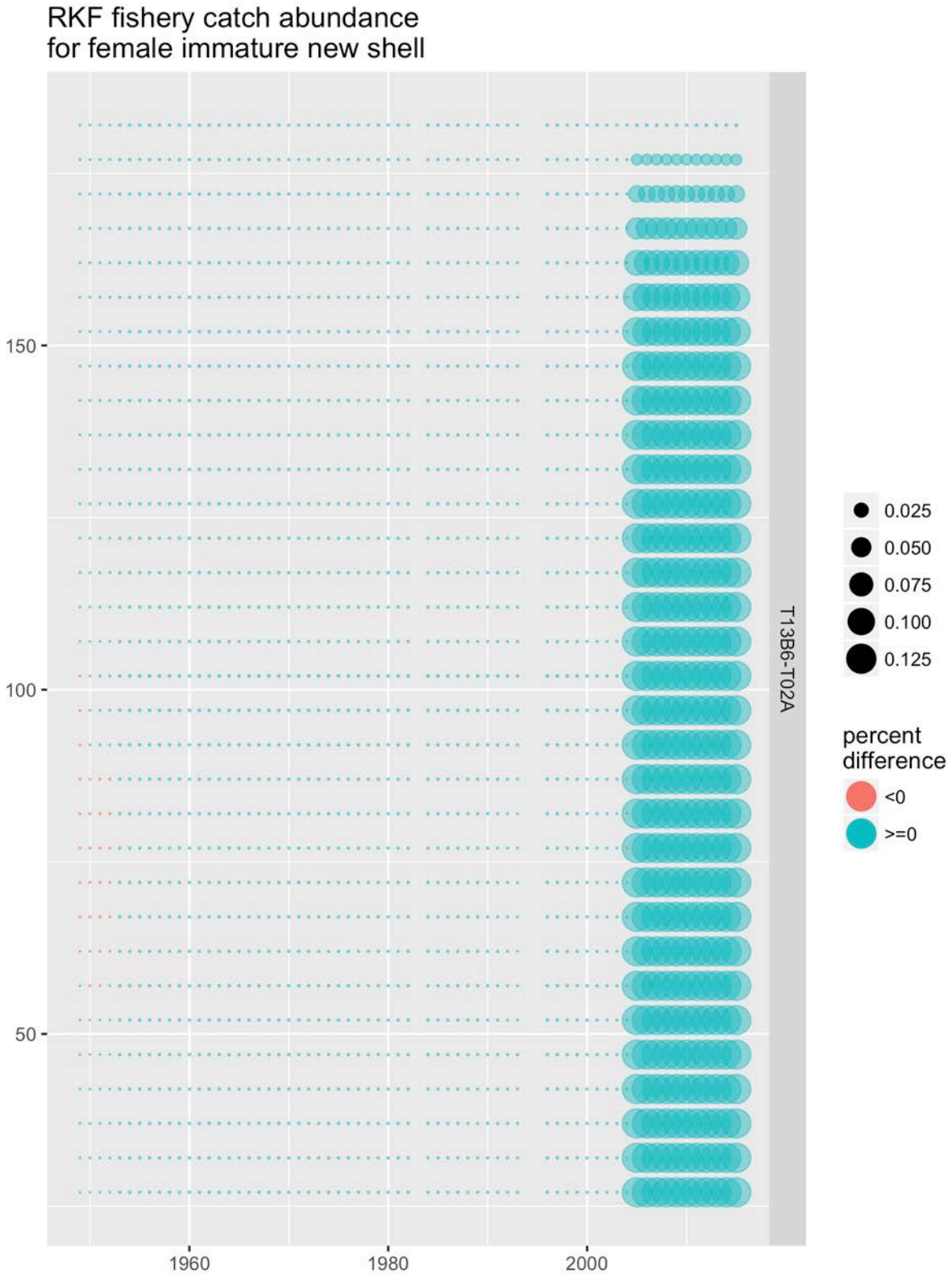

Figure 123. Differences for RKF fishery catch abundance for female immature new shell.

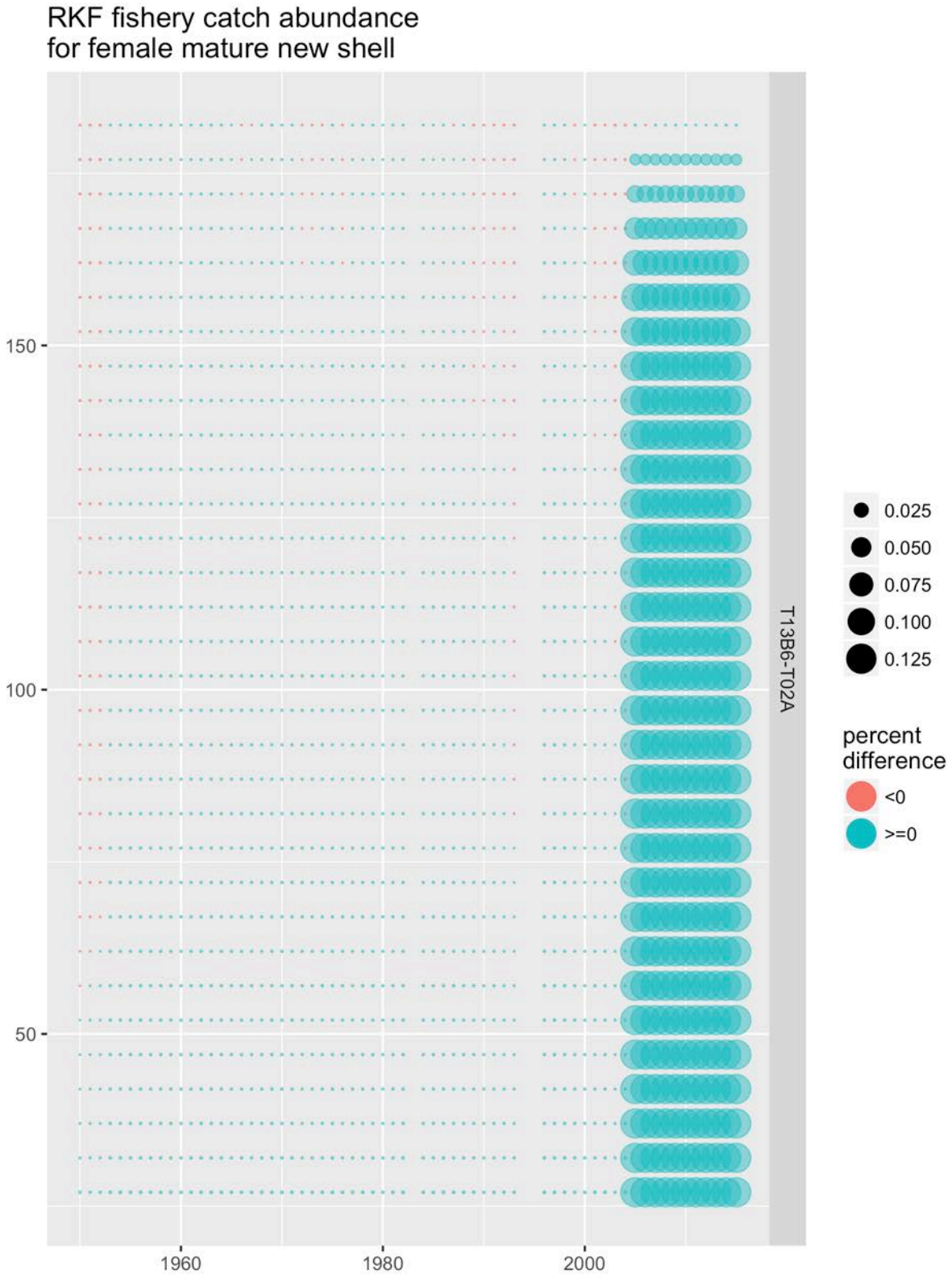

Figure 124. Differences for RKF fishery catch abundance for female mature new shell.

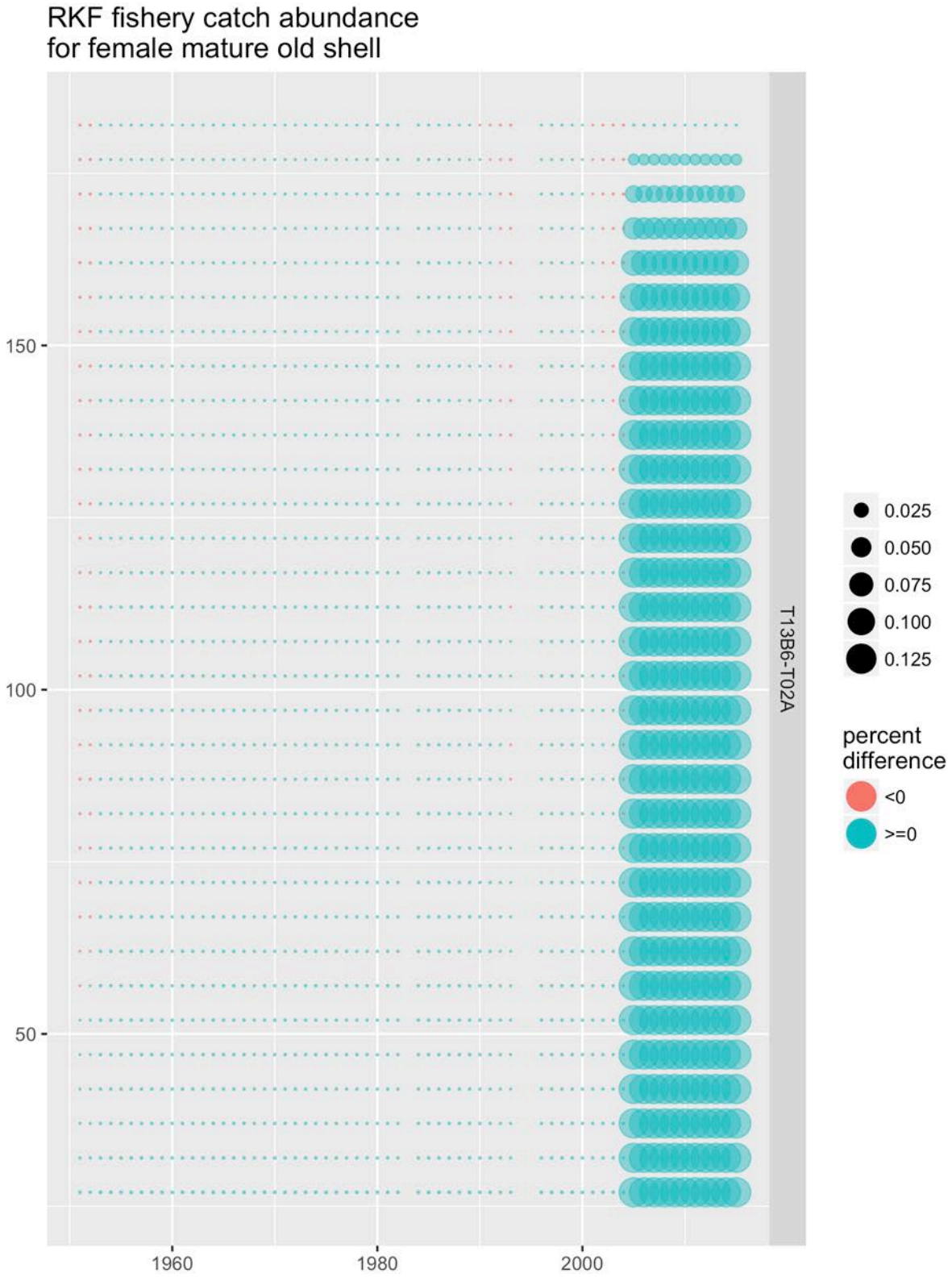

Figure 125. Differences for RKF fishery catch abundance for female mature old shell.

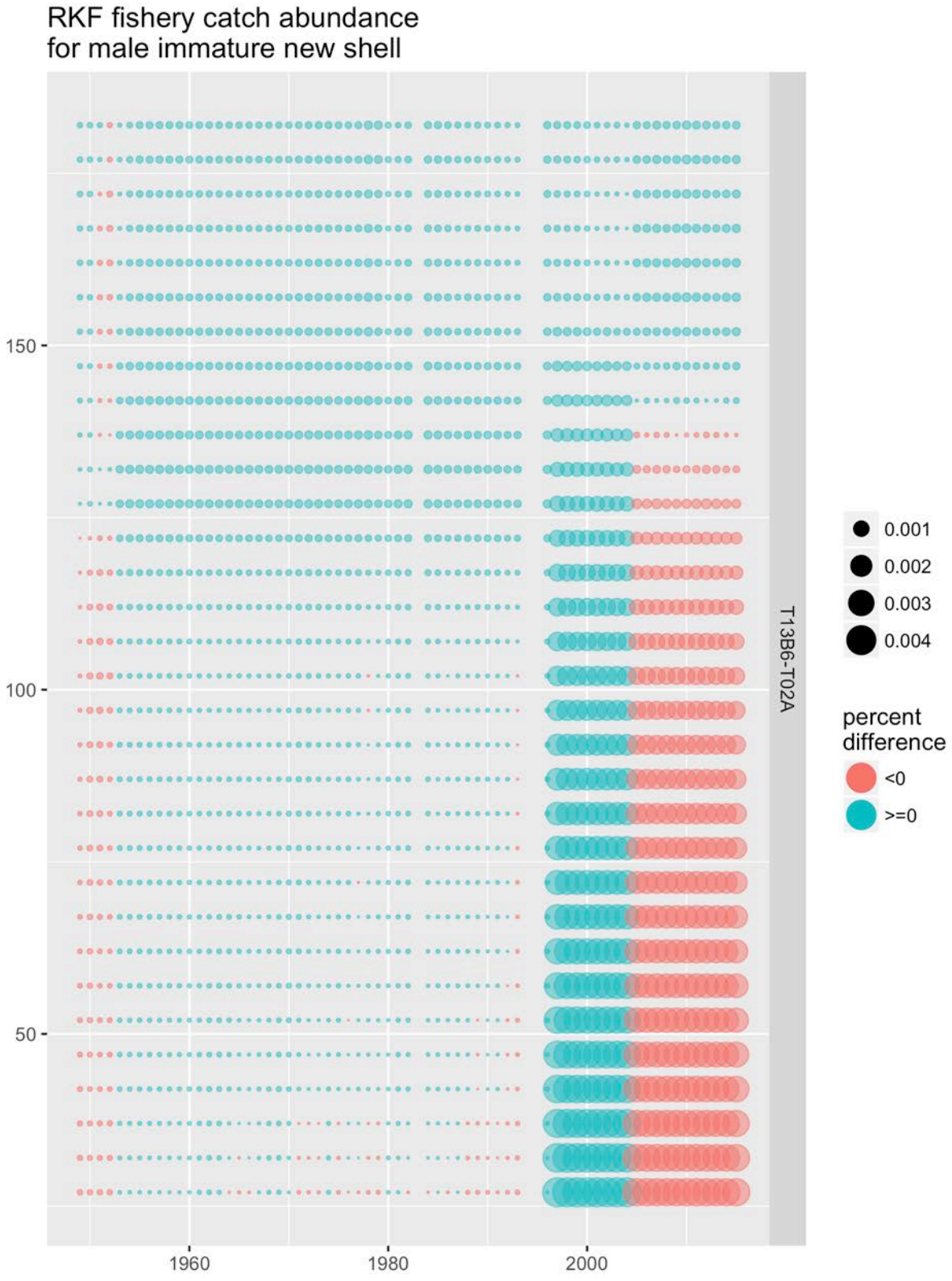

Figure 126. Differences for RKF fishery catch abundance for male immature new shell.

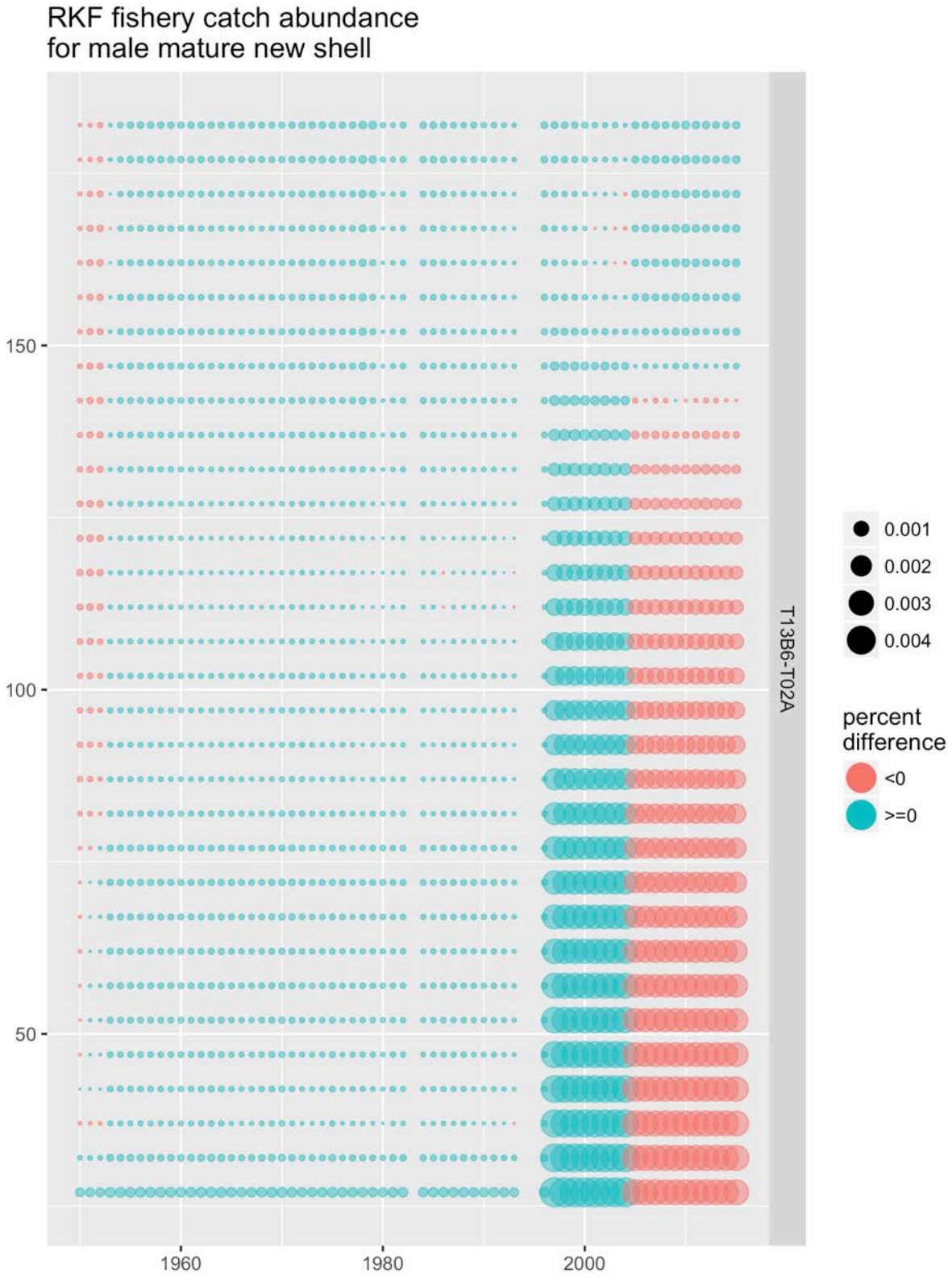

Figure 127. Differences for RKF fishery catch abundance for male mature new shell.

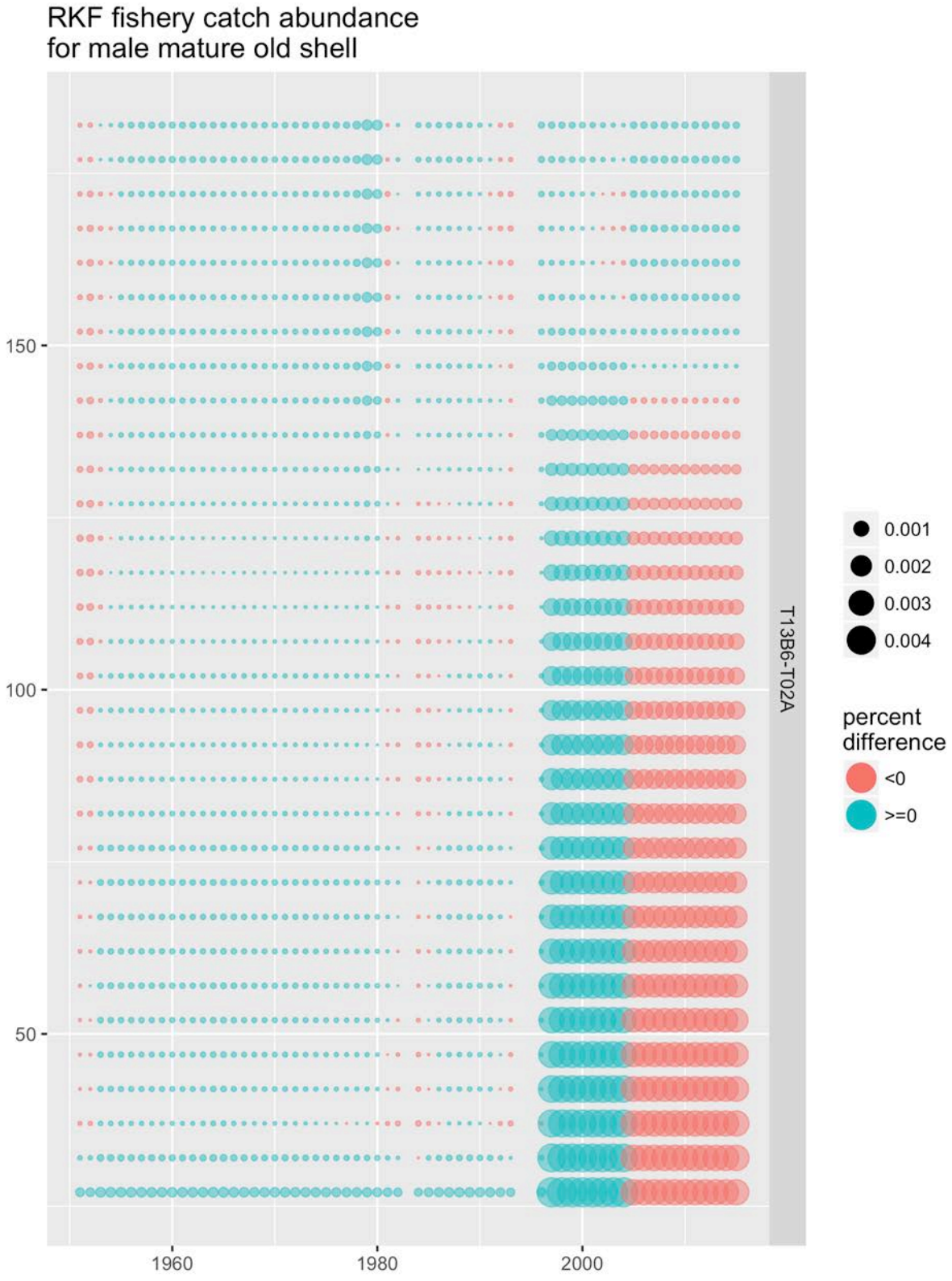

Figure 128. Differences for RKF fishery catch abundance for male mature old shell.

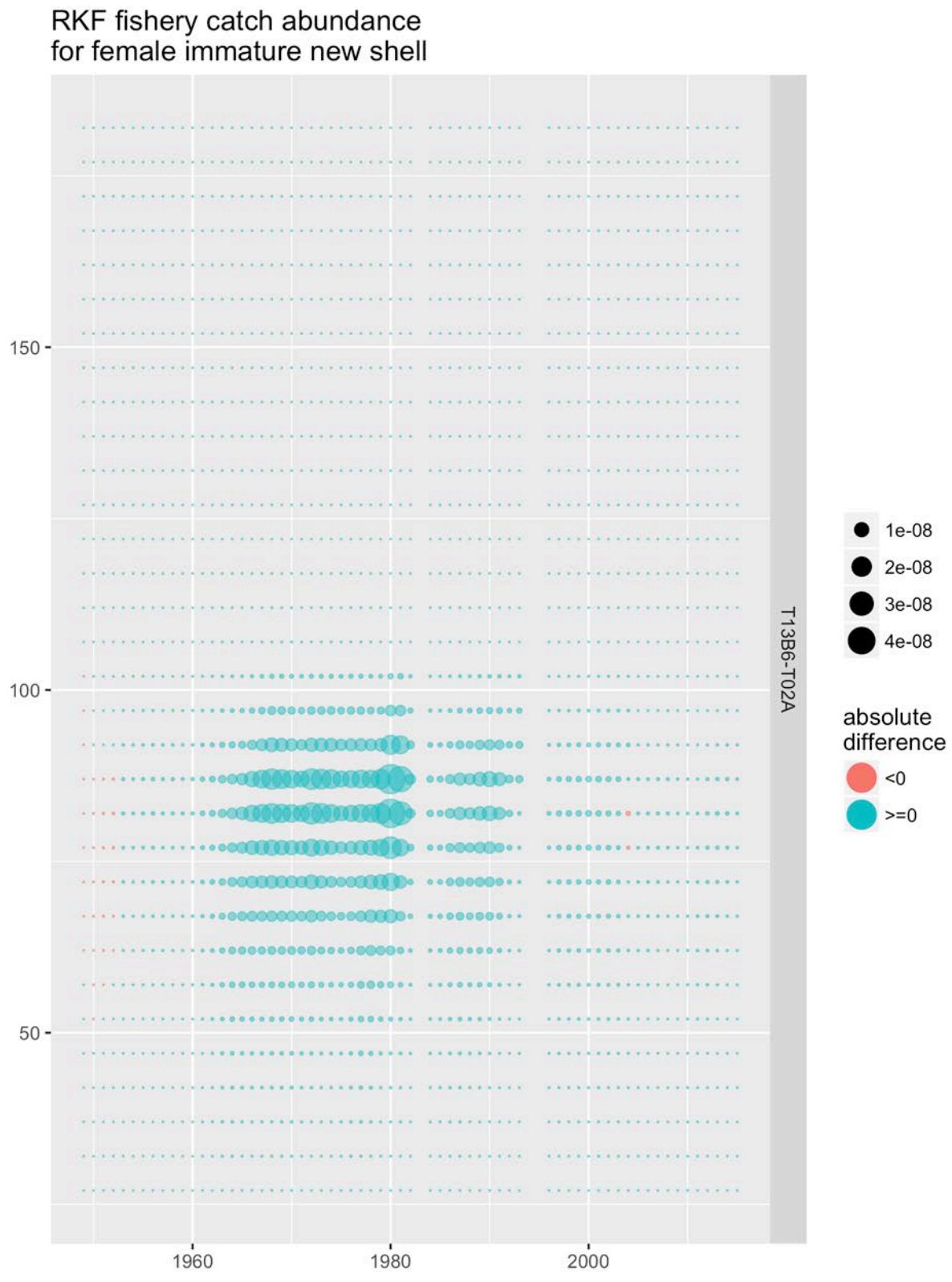

Figure 129. Differences for RKF fishery catch abundance for female immature new shell.

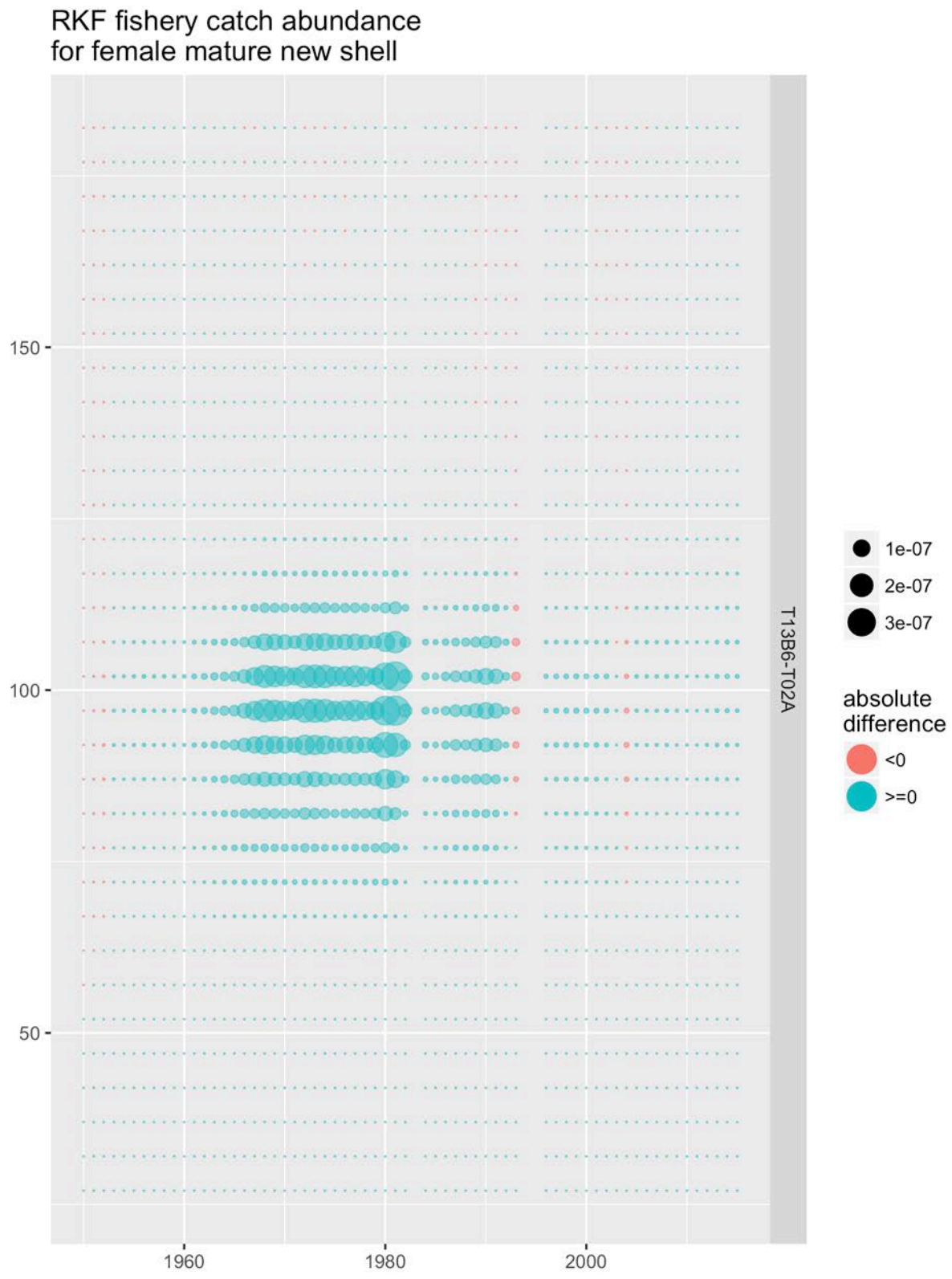

Figure 130. Differences for RKF fishery catch abundance for female mature new shell.

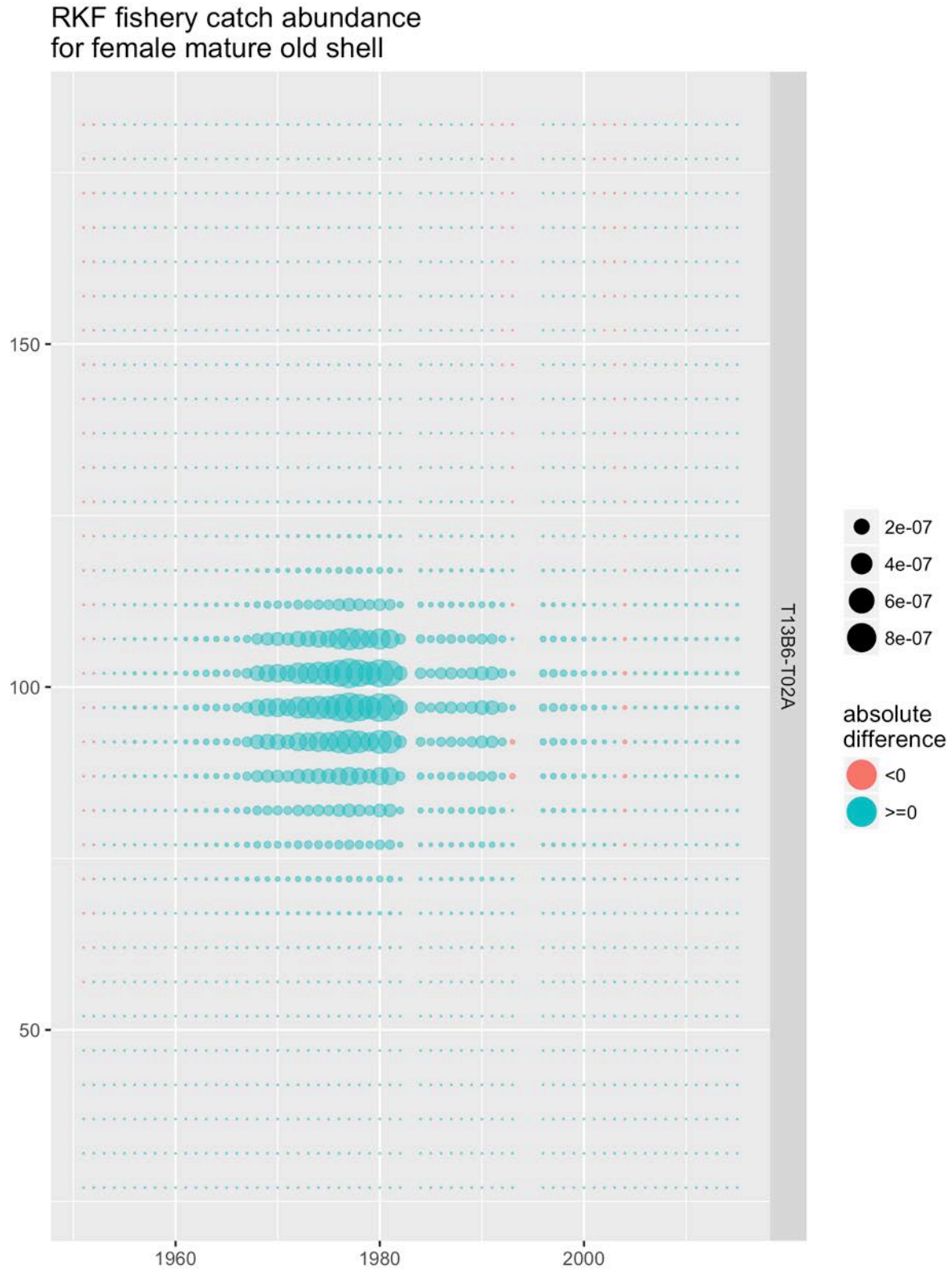

Figure 131. Differences for RKF fishery catch abundance for female mature old shell.

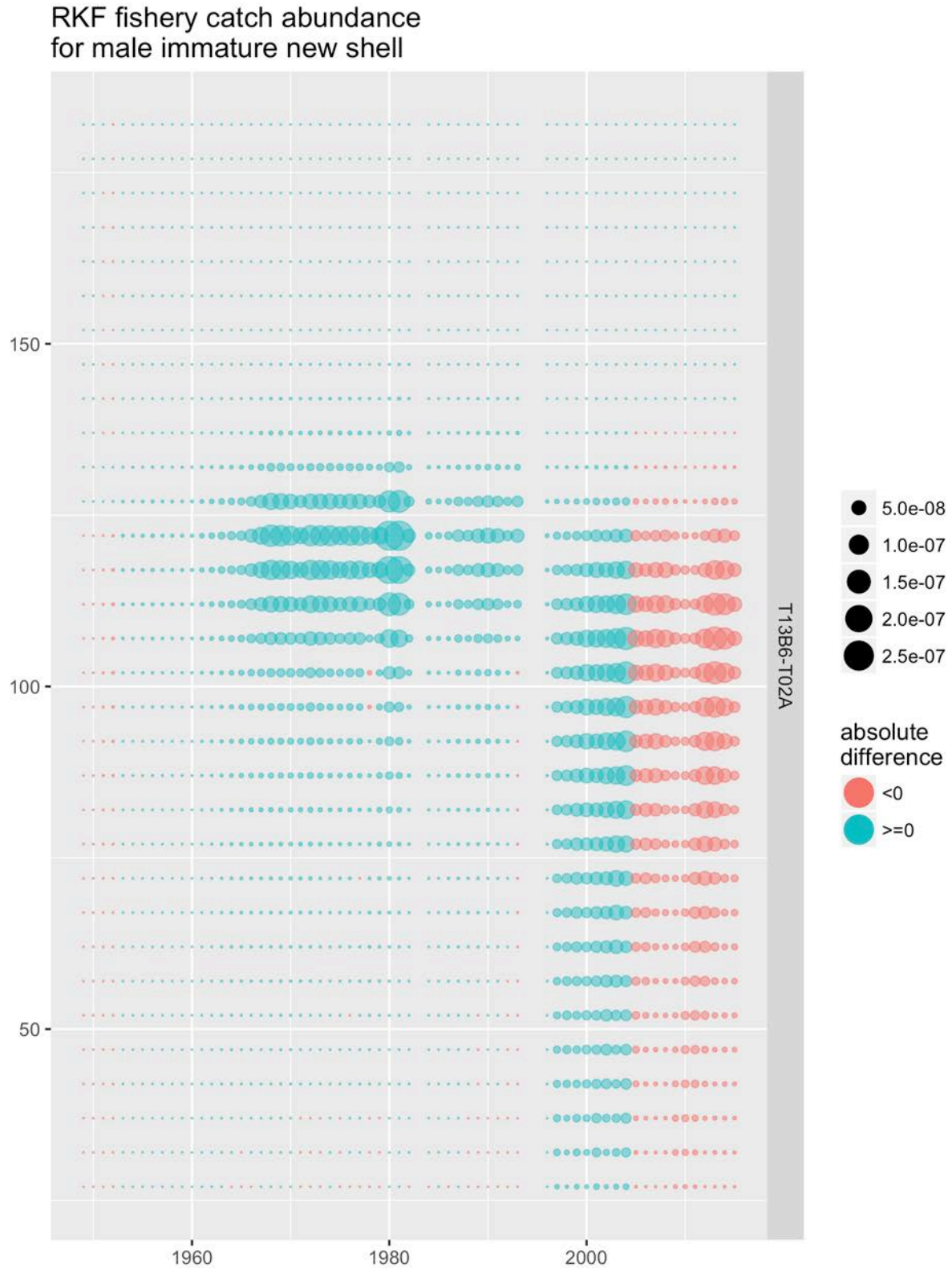

Figure 132. Differences for RKF fishery catch abundance for male immature new shell.

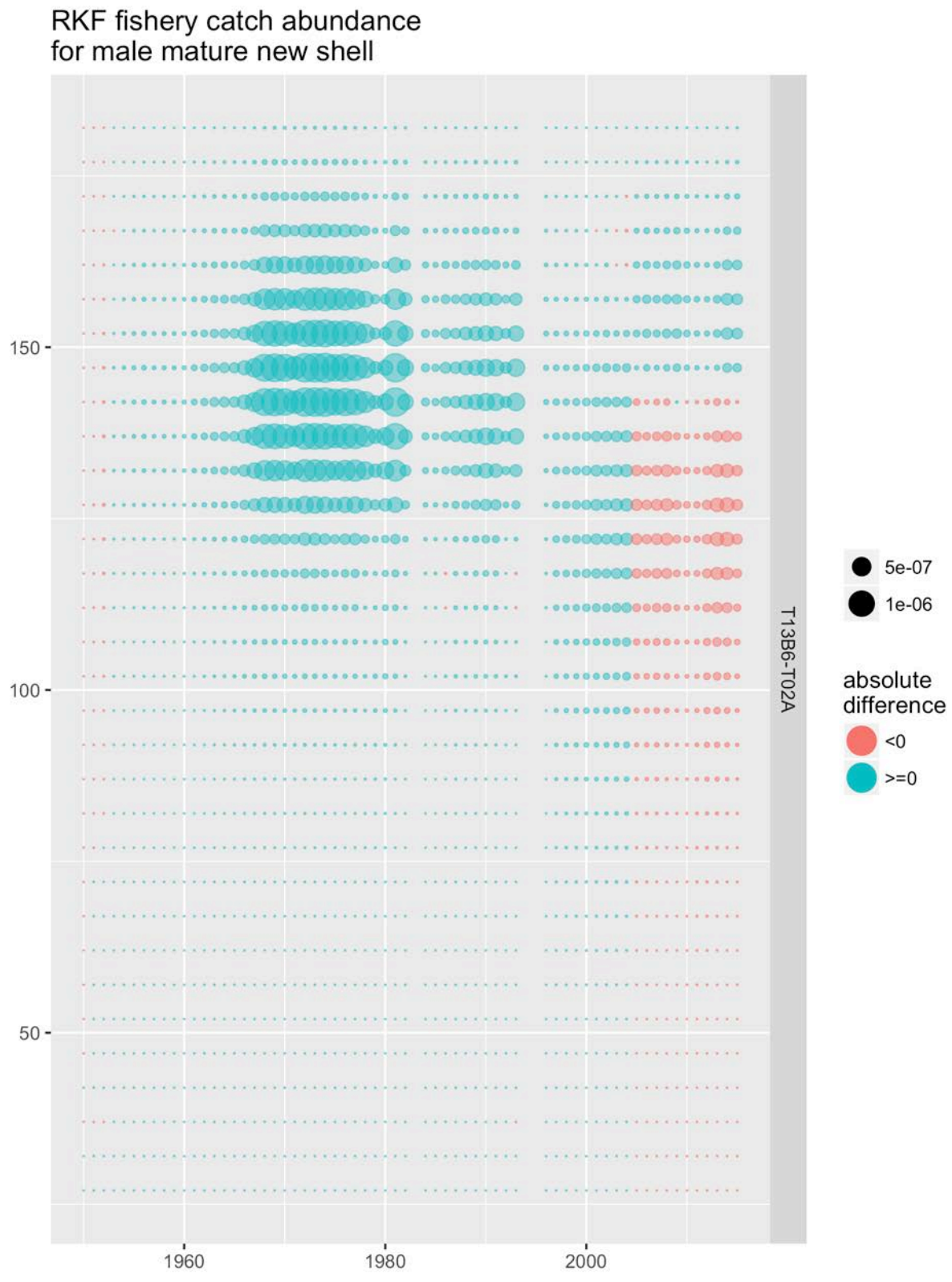

Figure 133. Differences for RKF fishery catch abundance for male mature new shell.

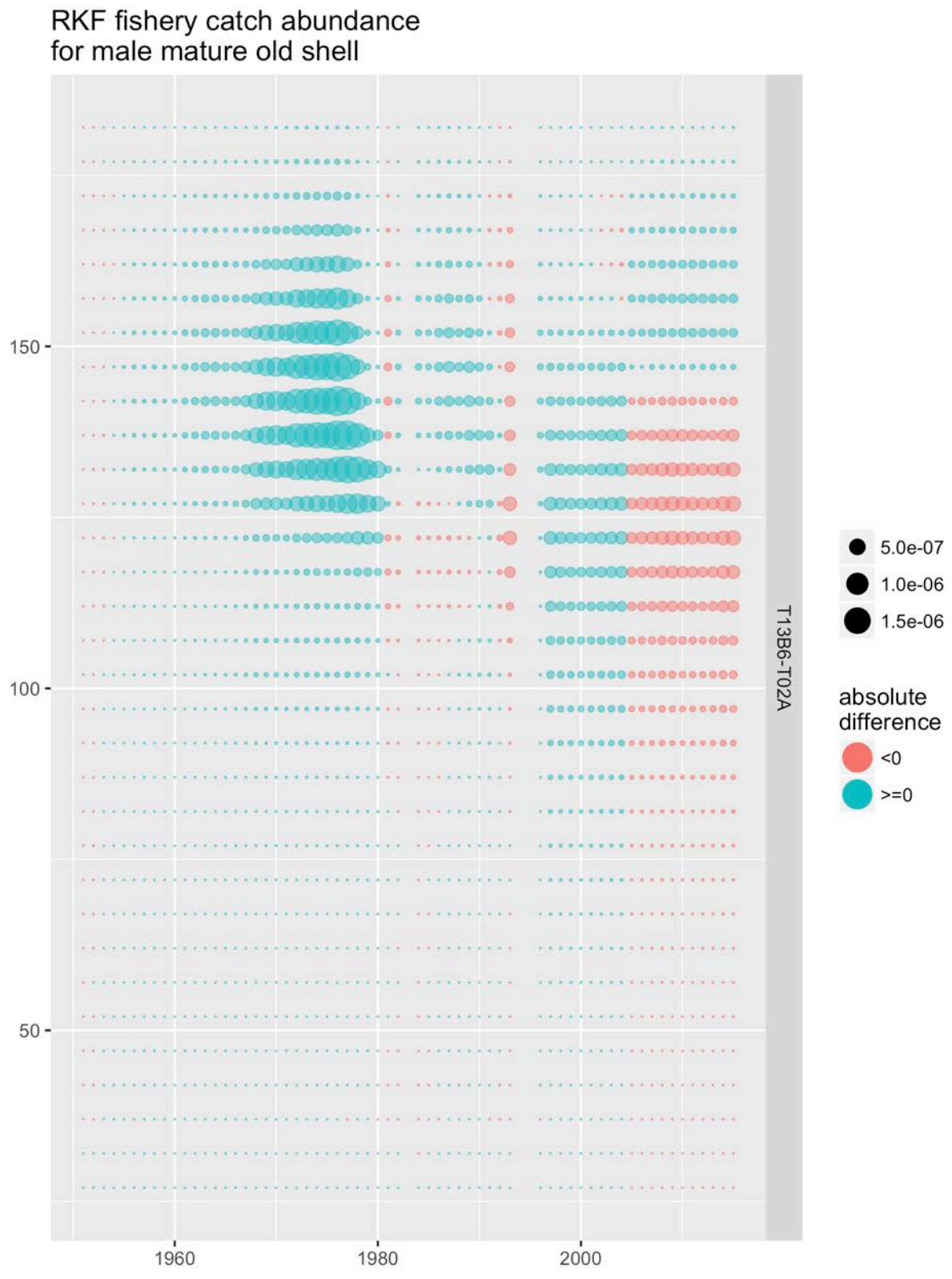

Figure 134. Differences for RKF fishery catch abundance for male mature old shell.

Total catch biomass

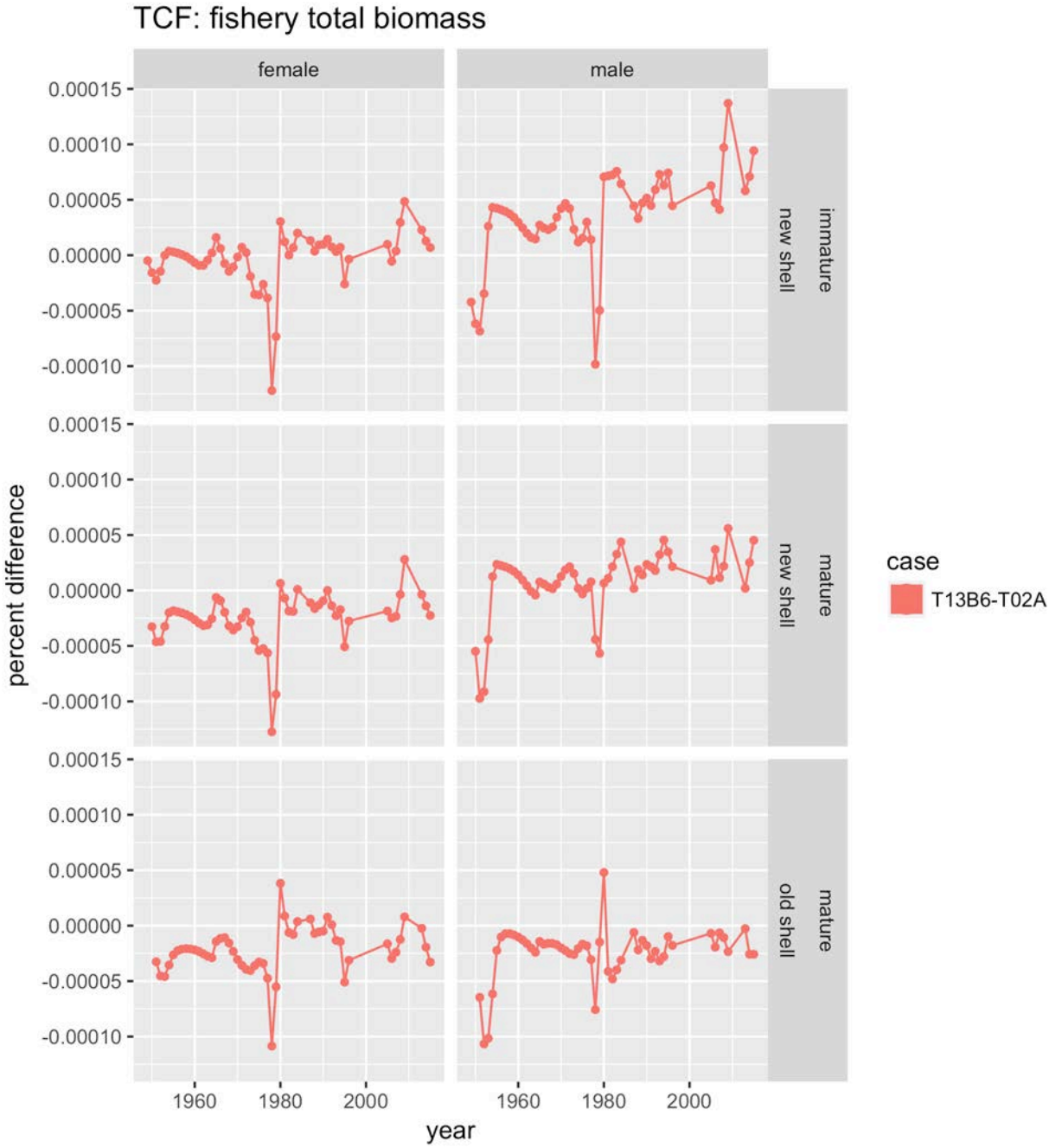

Figure 135. Differences for TCF: fishery total biomass.

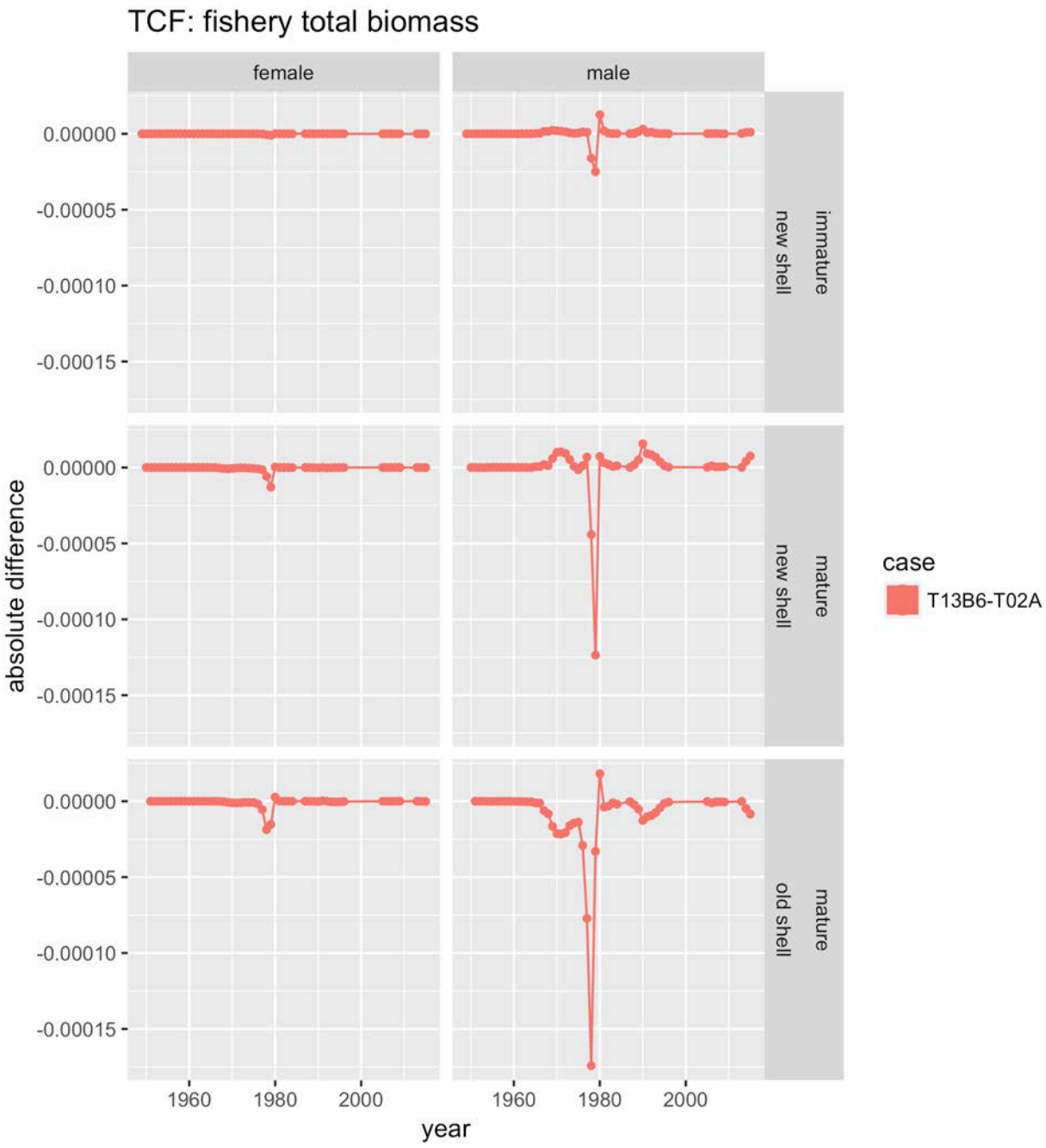

Figure 136. Differences for TCF: fishery total biomass.

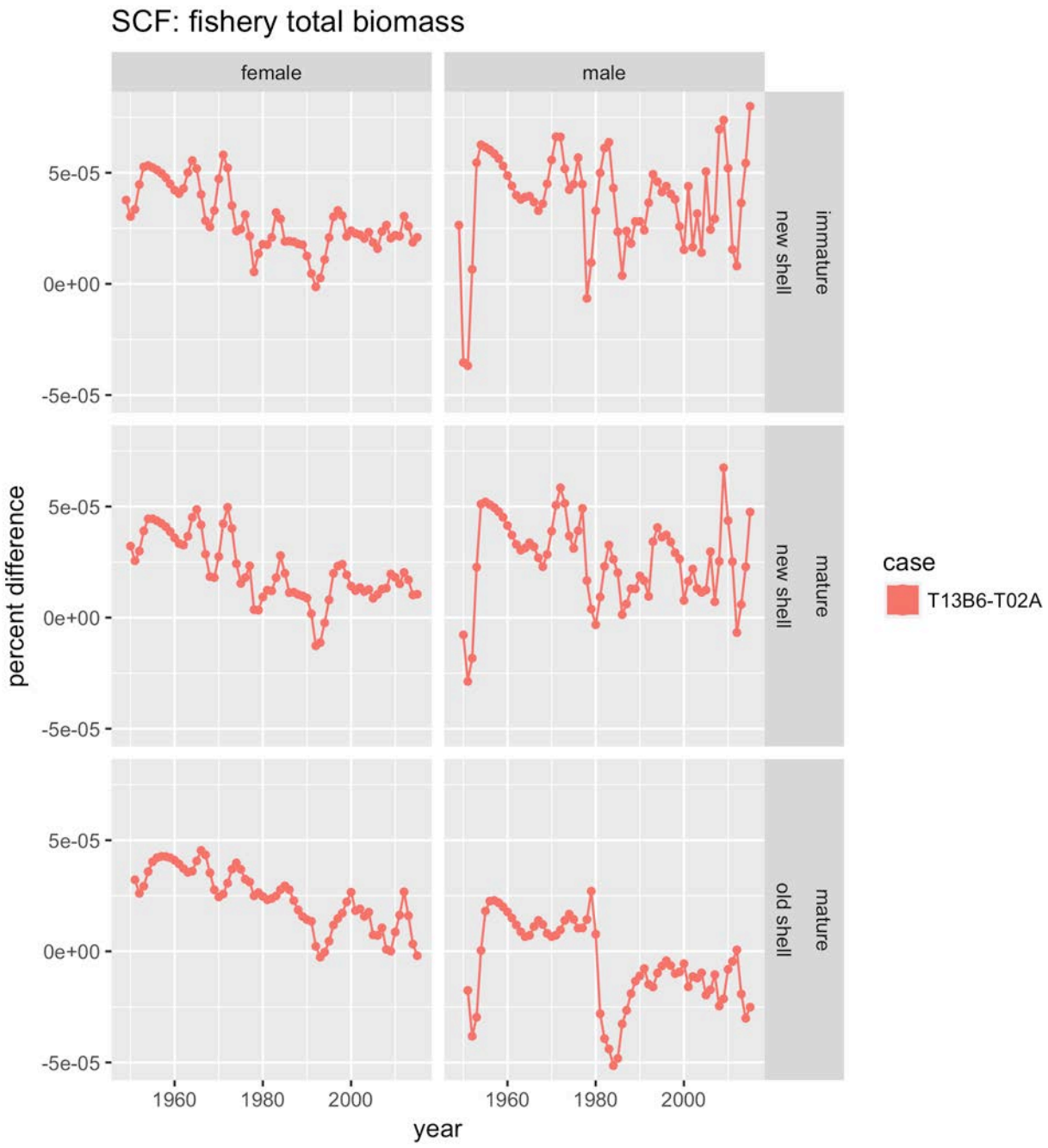

Figure 137. Differences for SCF: fishery total biomass.

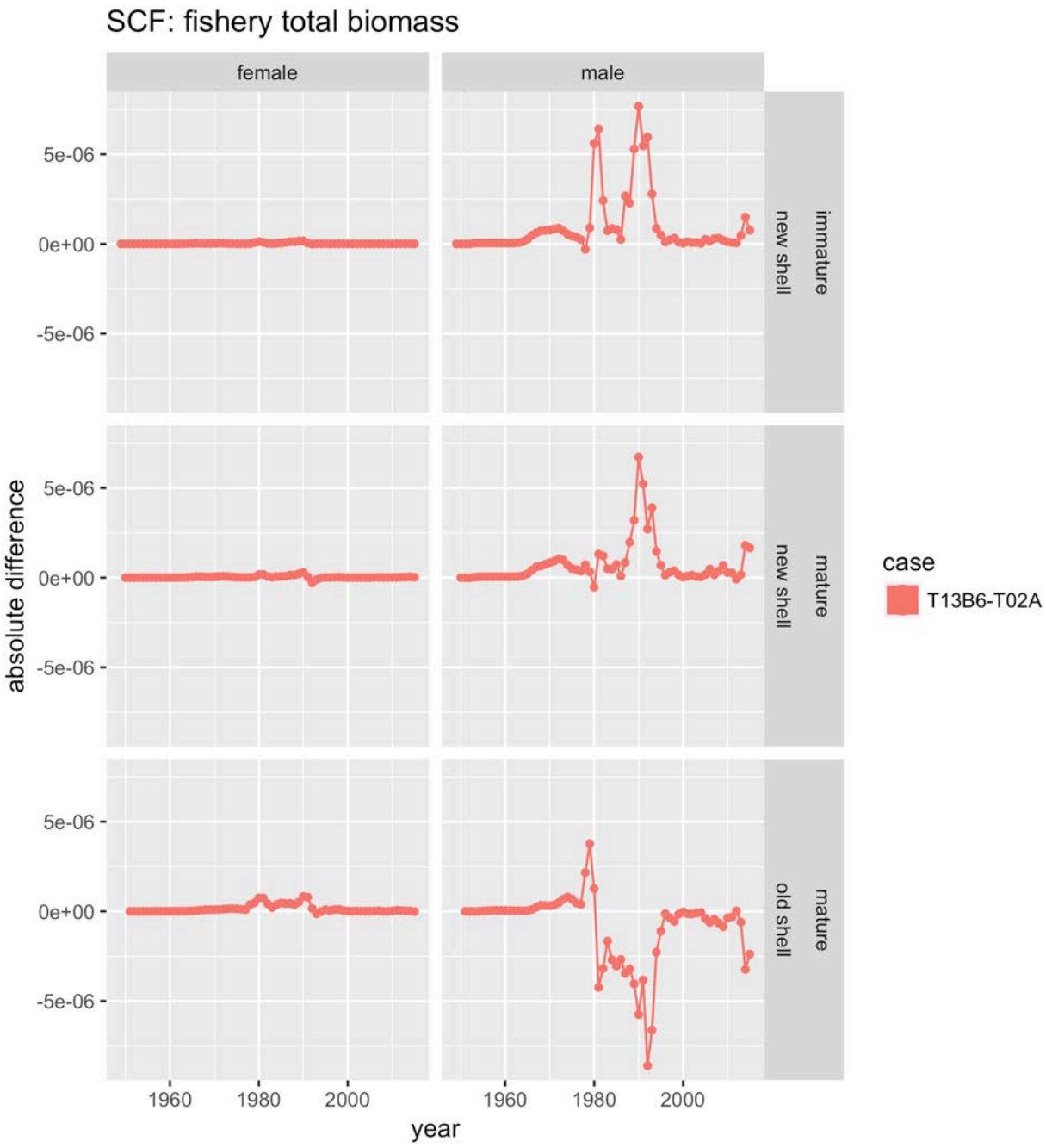

Figure 138. Differences for SCF: fishery total biomass.

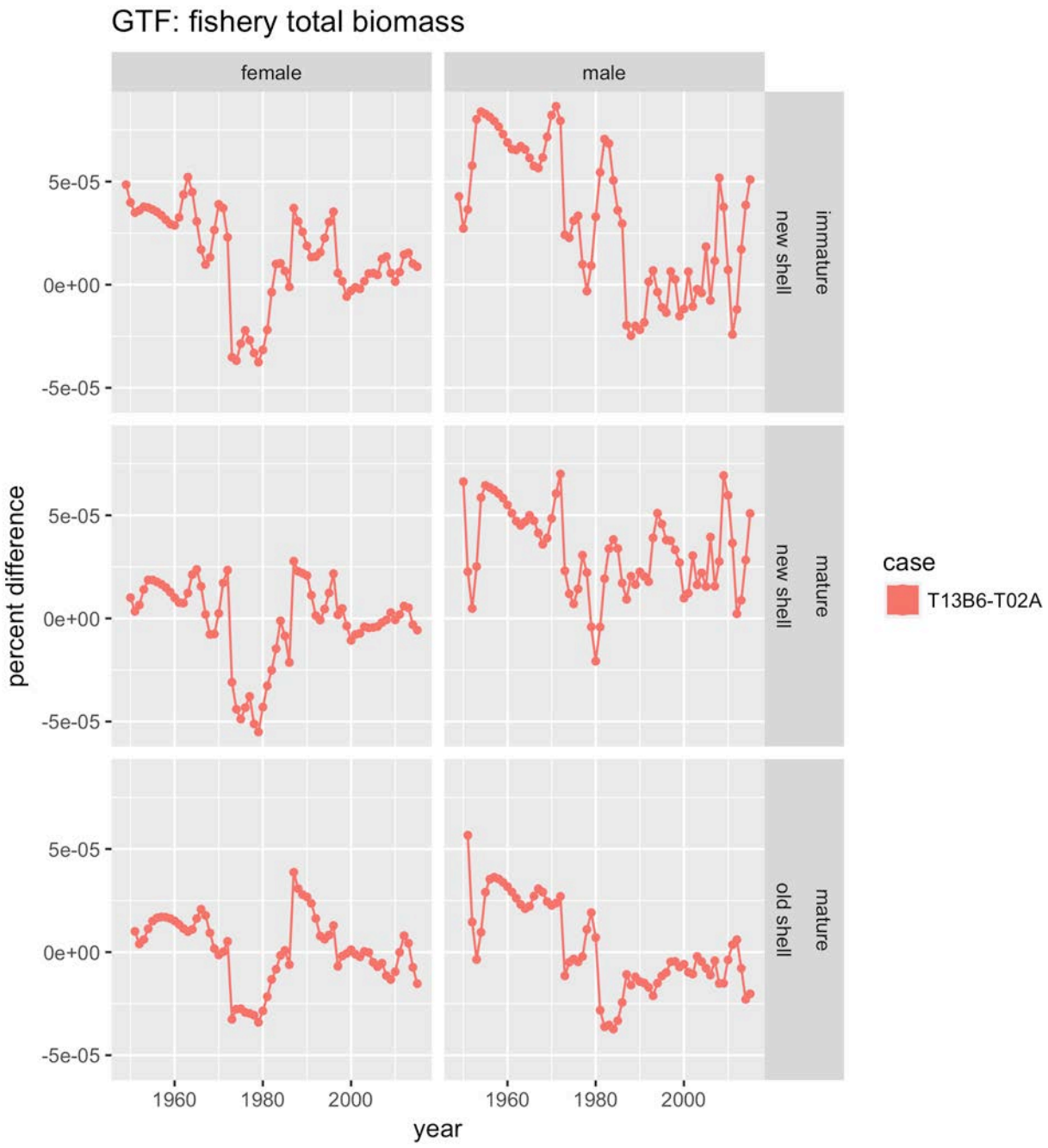

Figure 139. Differences for GTF: fishery total biomass.

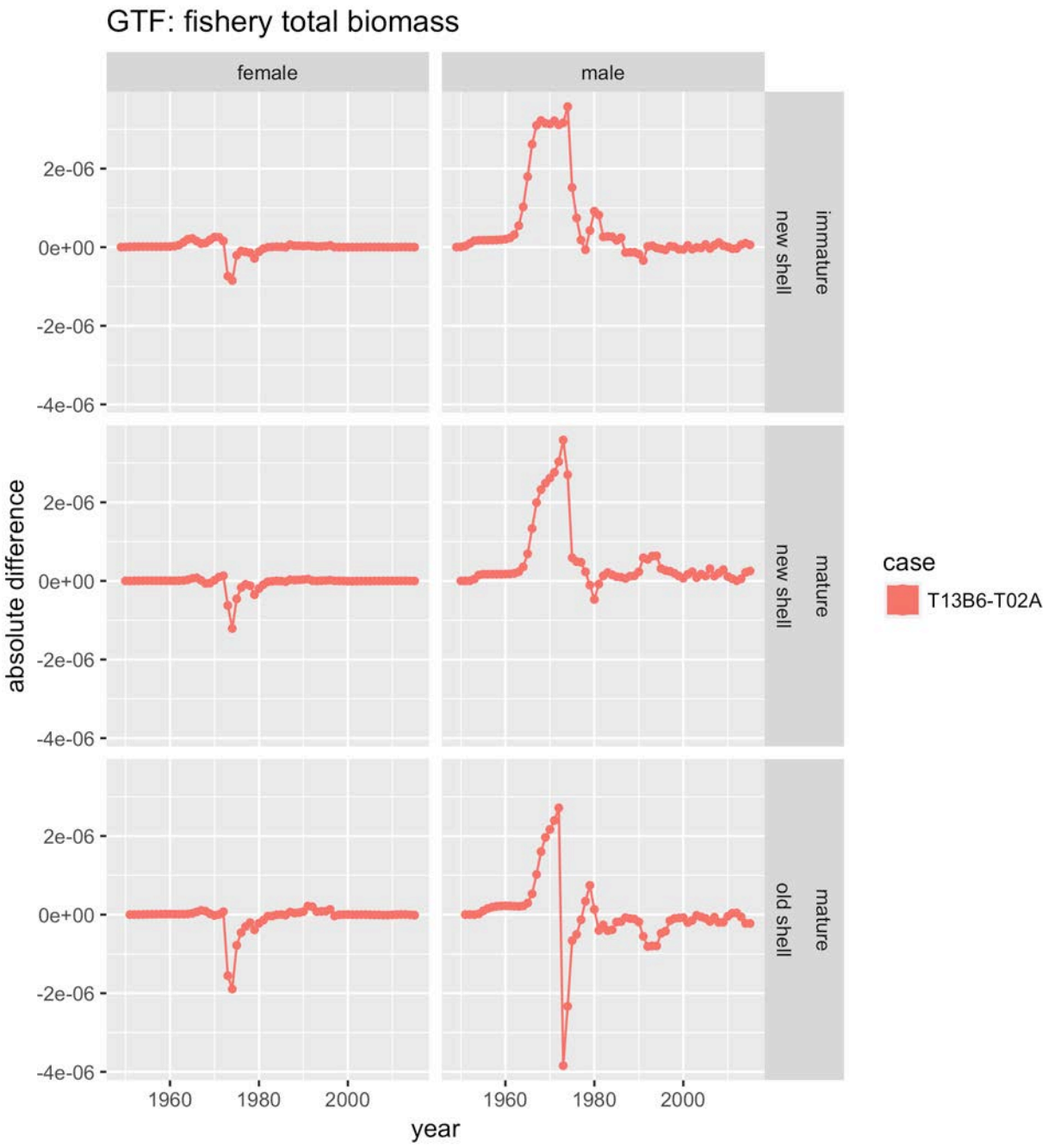

Figure 140. Differences for GTF: fishery total biomass.

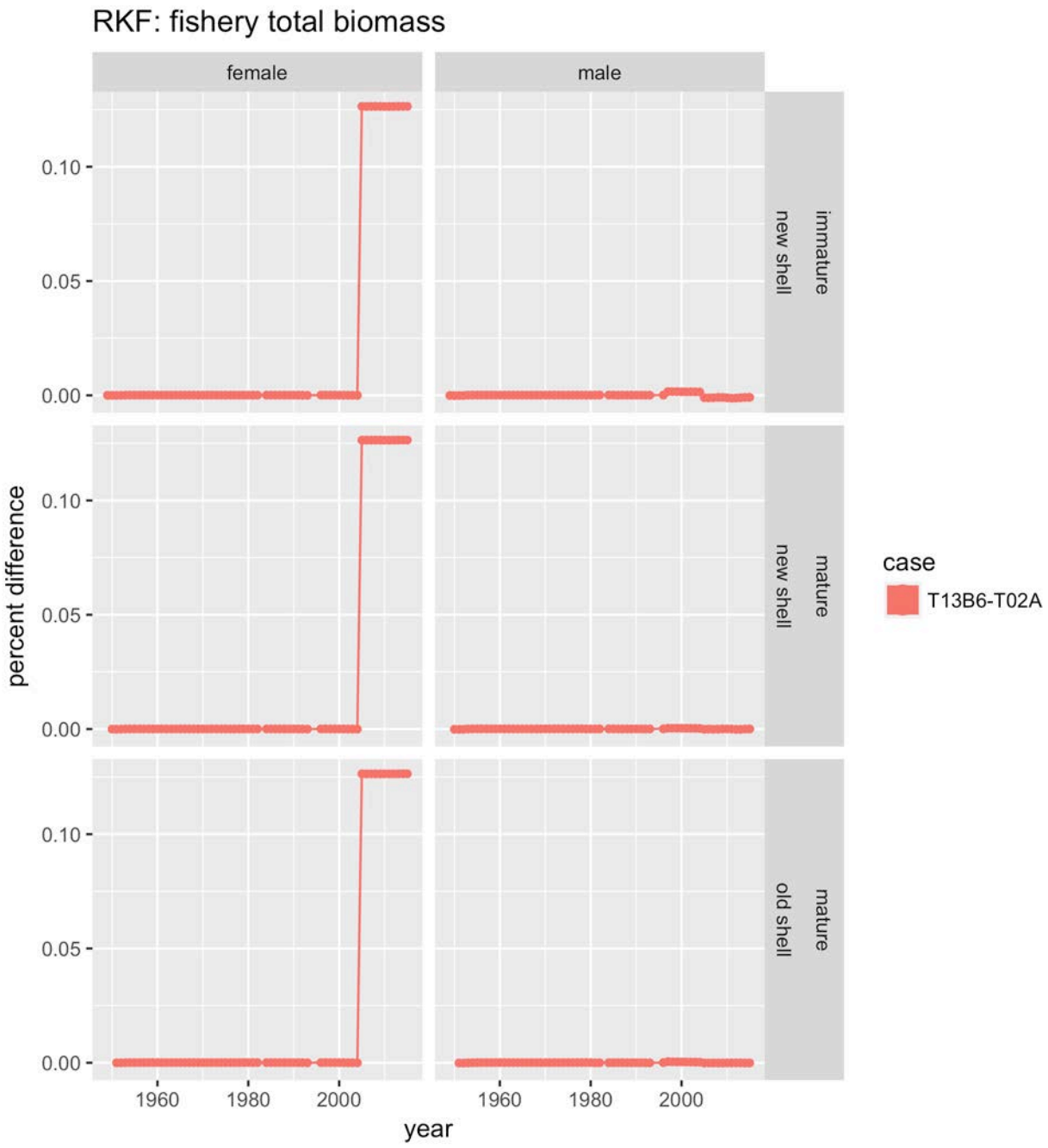

Figure 141. Differences for RKF: fishery total biomass.

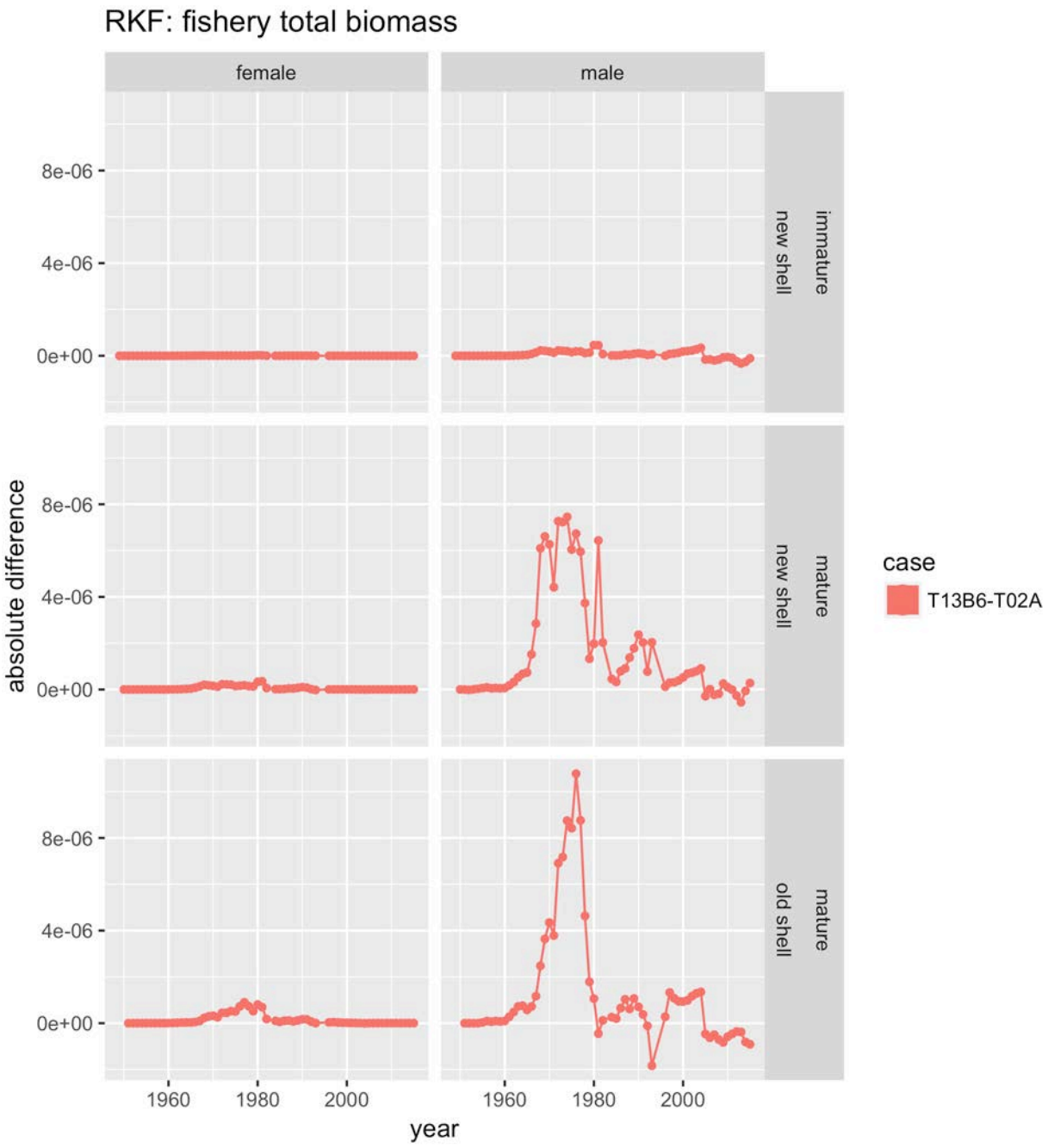

Figure 142. Differences for RKF: fishery total biomass.

Retained catch abundance

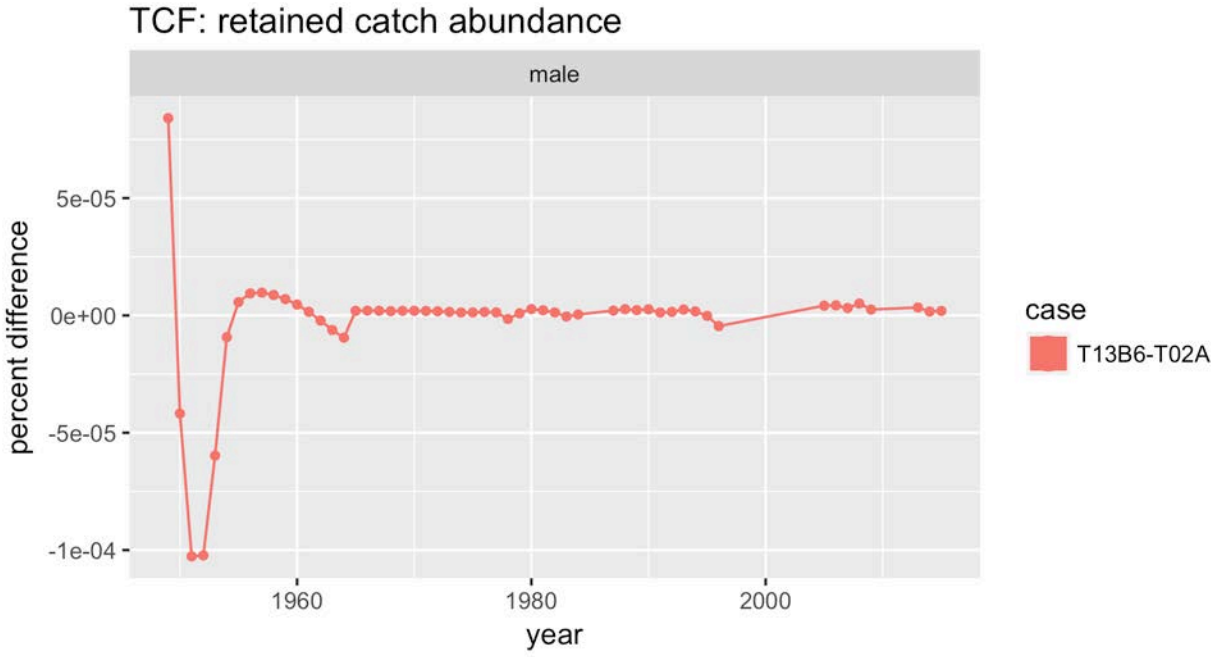

Figure 143. Differences for TCF: retained catch abundance.

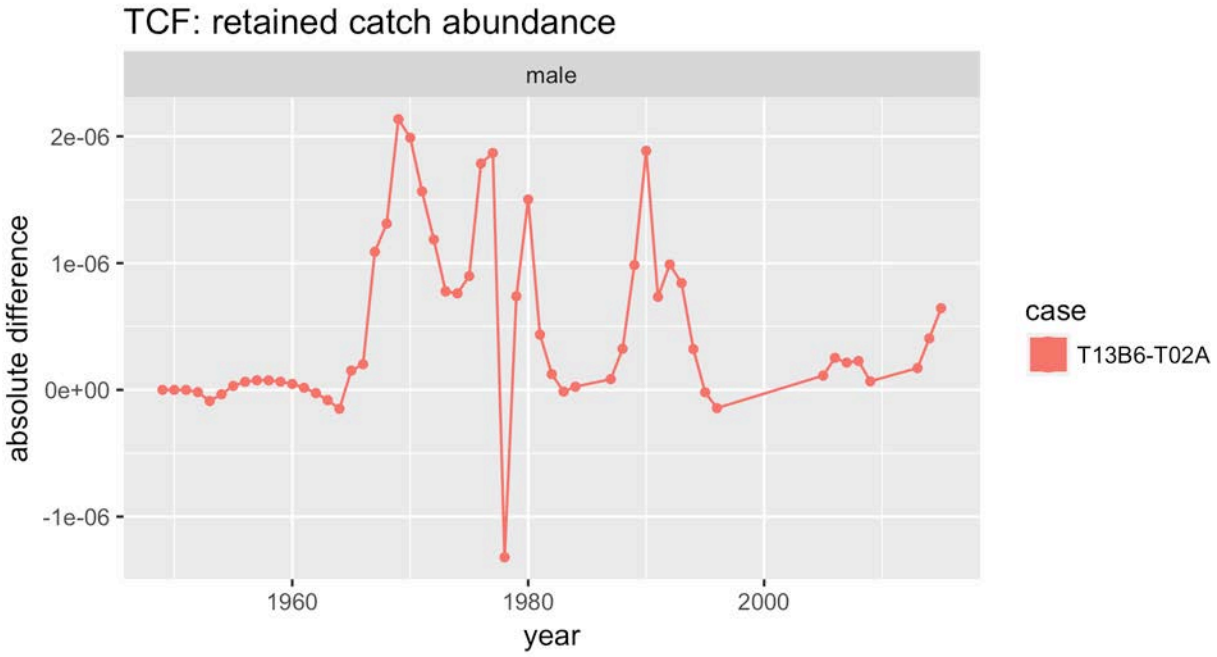

Figure 144. Differences for TCF: retained catch abundance.

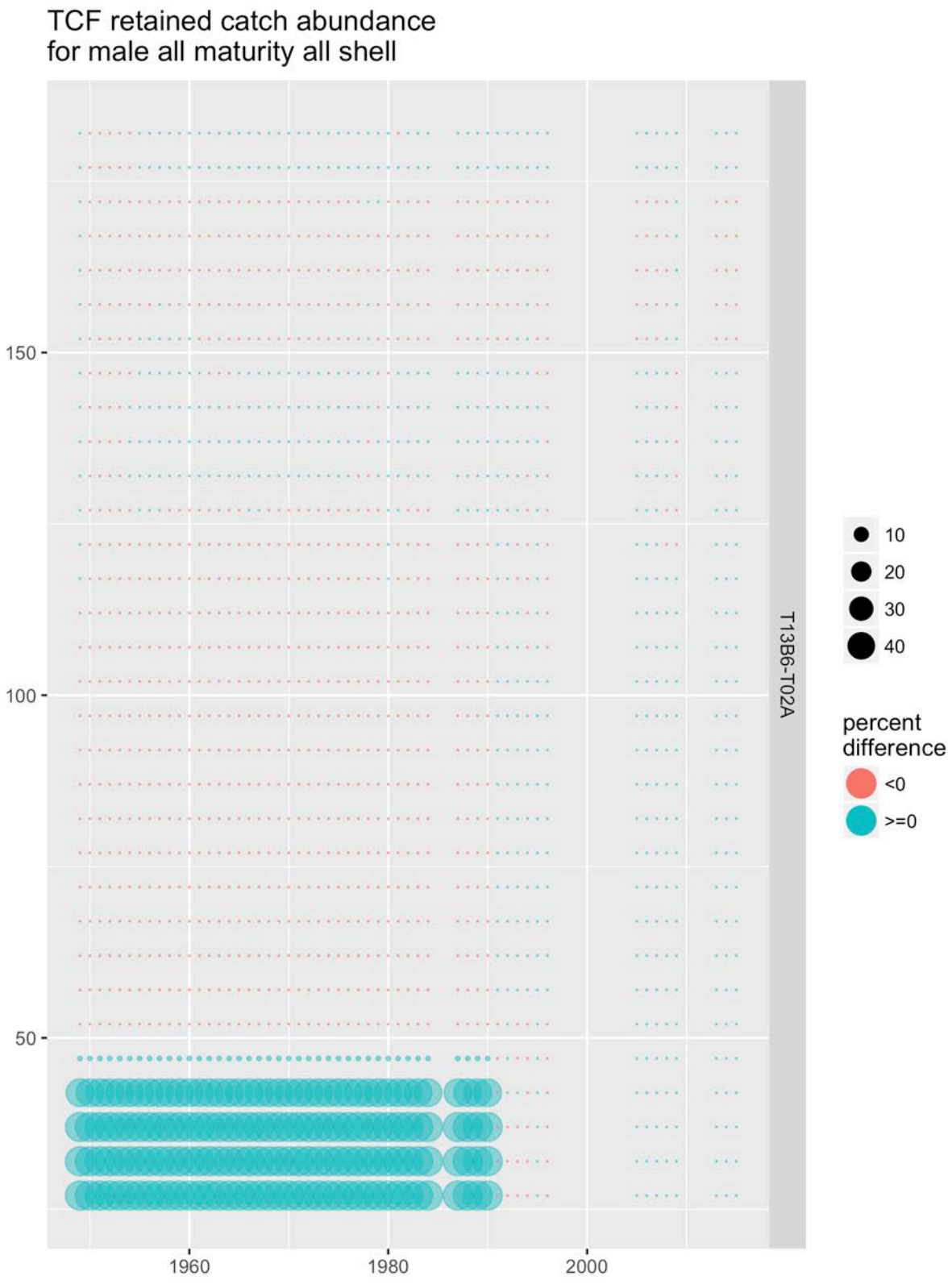

Figure 145. Differences for TCF retained catch abundance for male all maturity all shell.

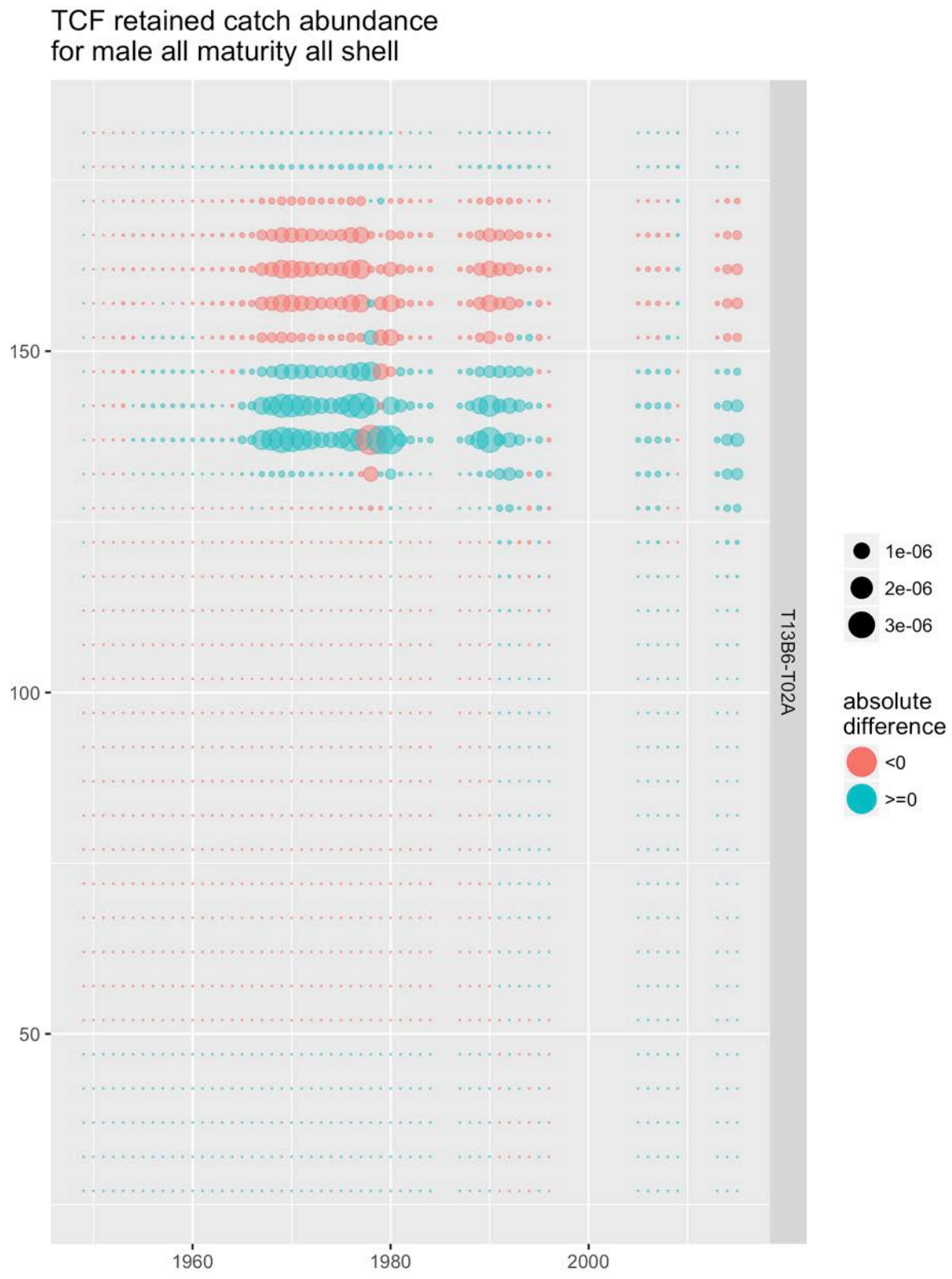

Figure 146. Differences for TCF retained catch abundance for male all maturity all shell.

Retained catch biomass

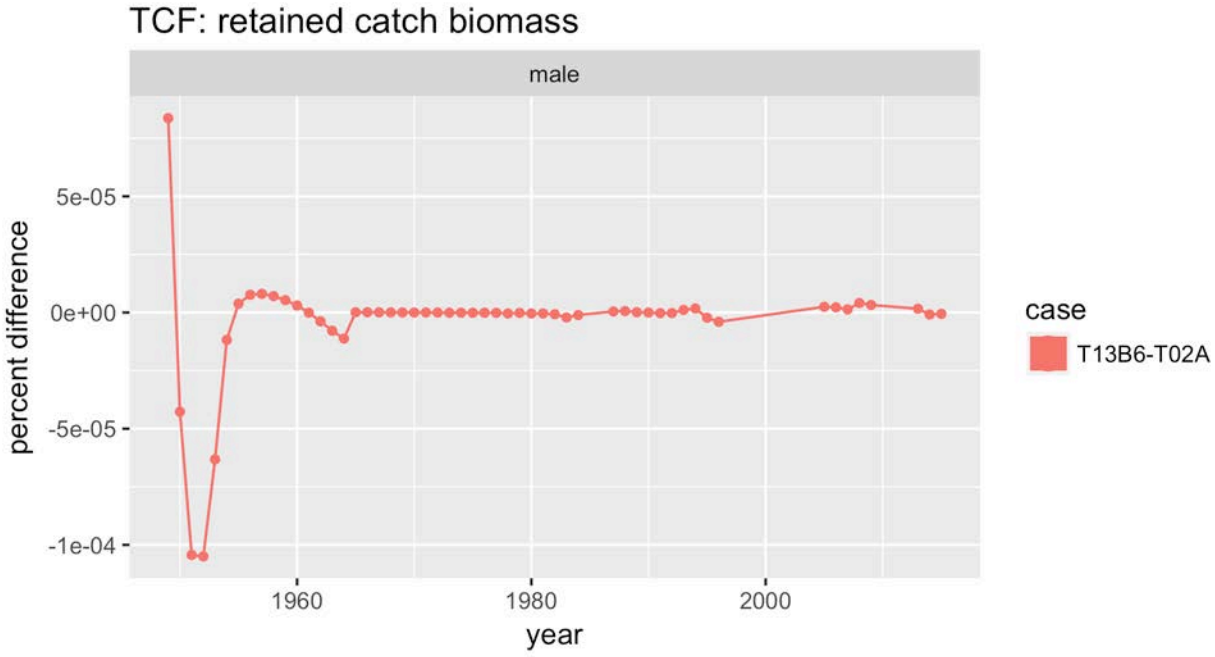

Figure 147. Differences for TCF: retained catch biomass.

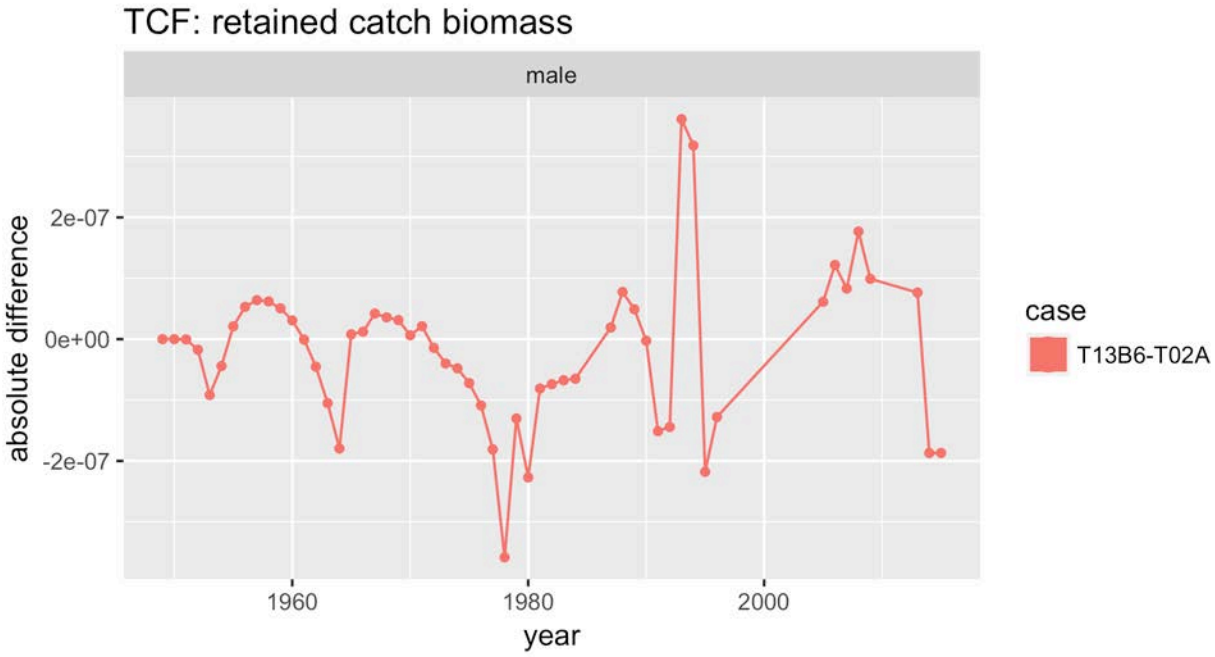

Figure 148. Differences for TCF: retained catch biomass.