1 Figures for the input hydrology models

1.1 A-Series models

1.1.1 A4

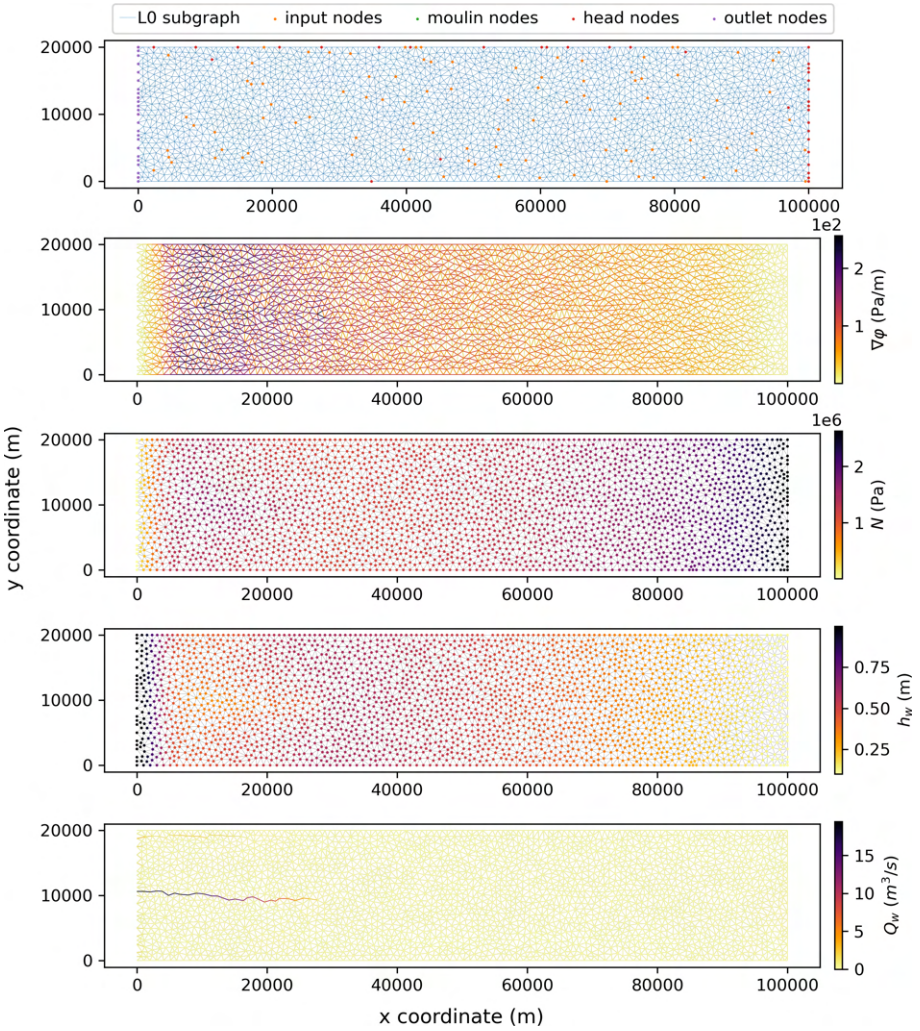


Figure S1. Graph representation of the model scenario A4 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.1.2 A5

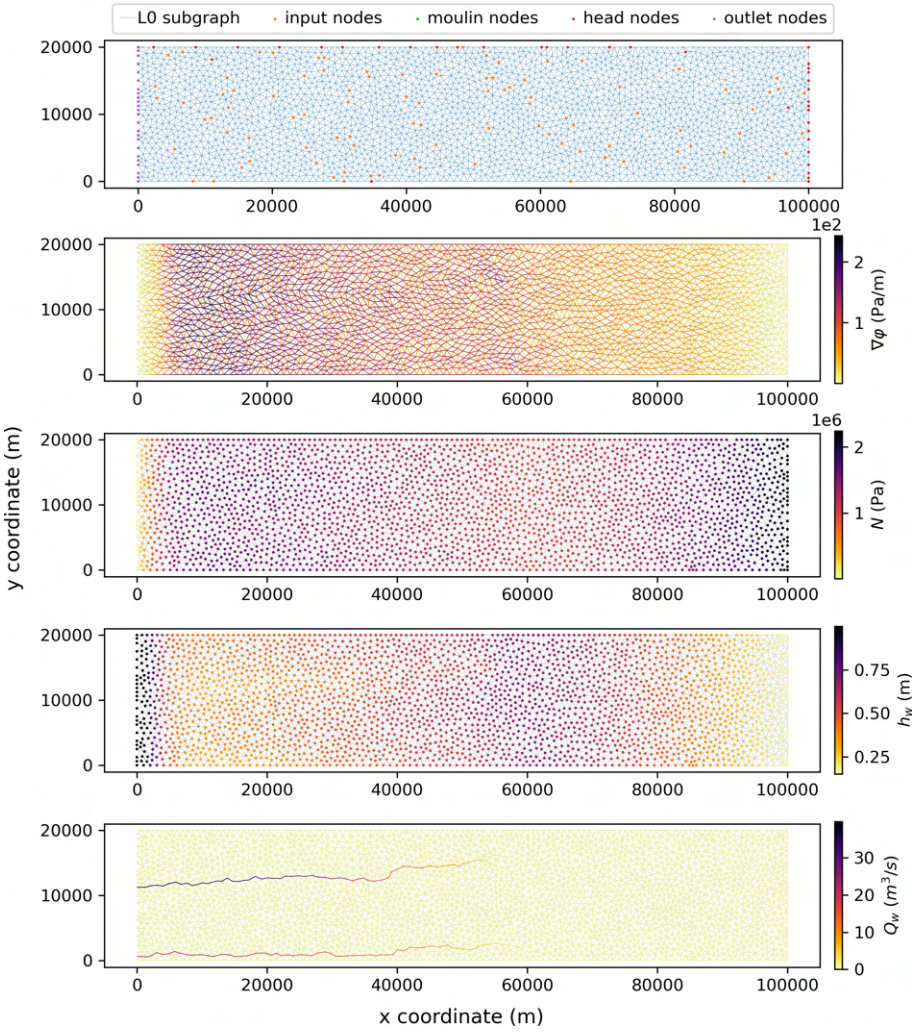


Figure S2. Graph representation of the model scenario A5 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.1.3 A7

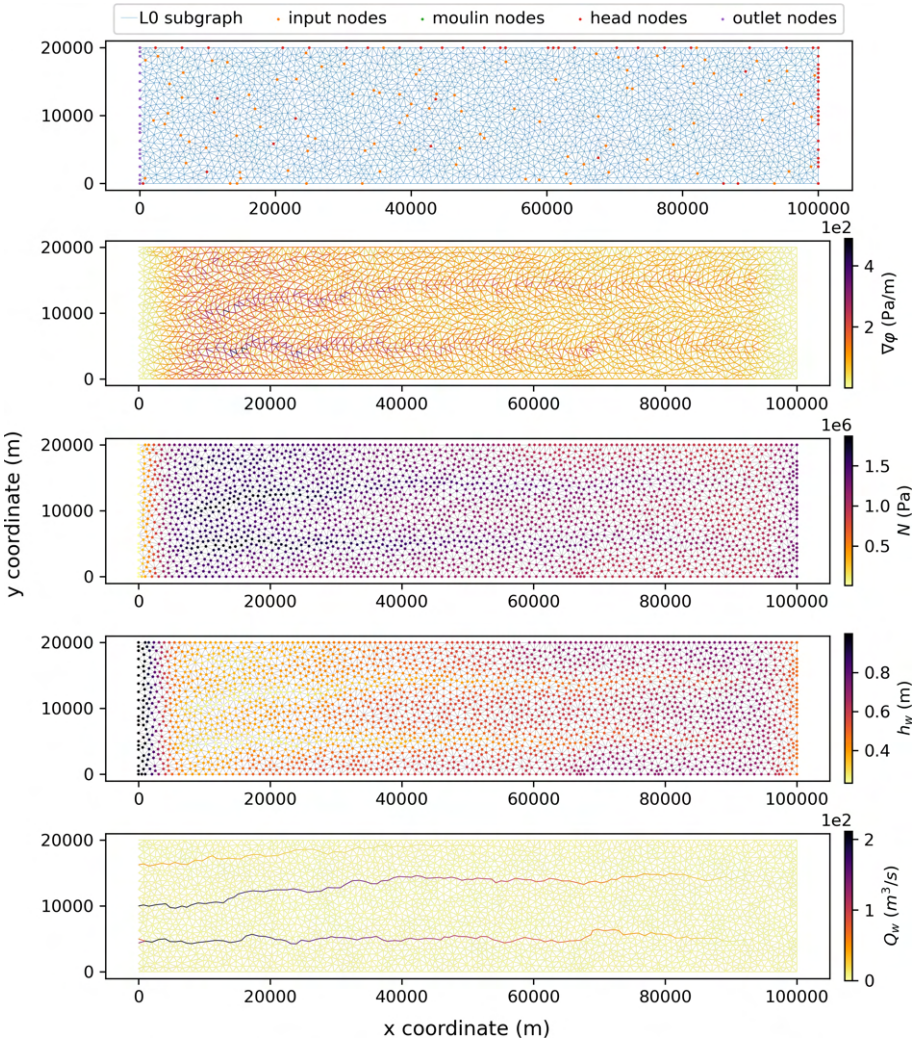


Figure S3. Graph representation of the model scenario A7 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.1.4 A8

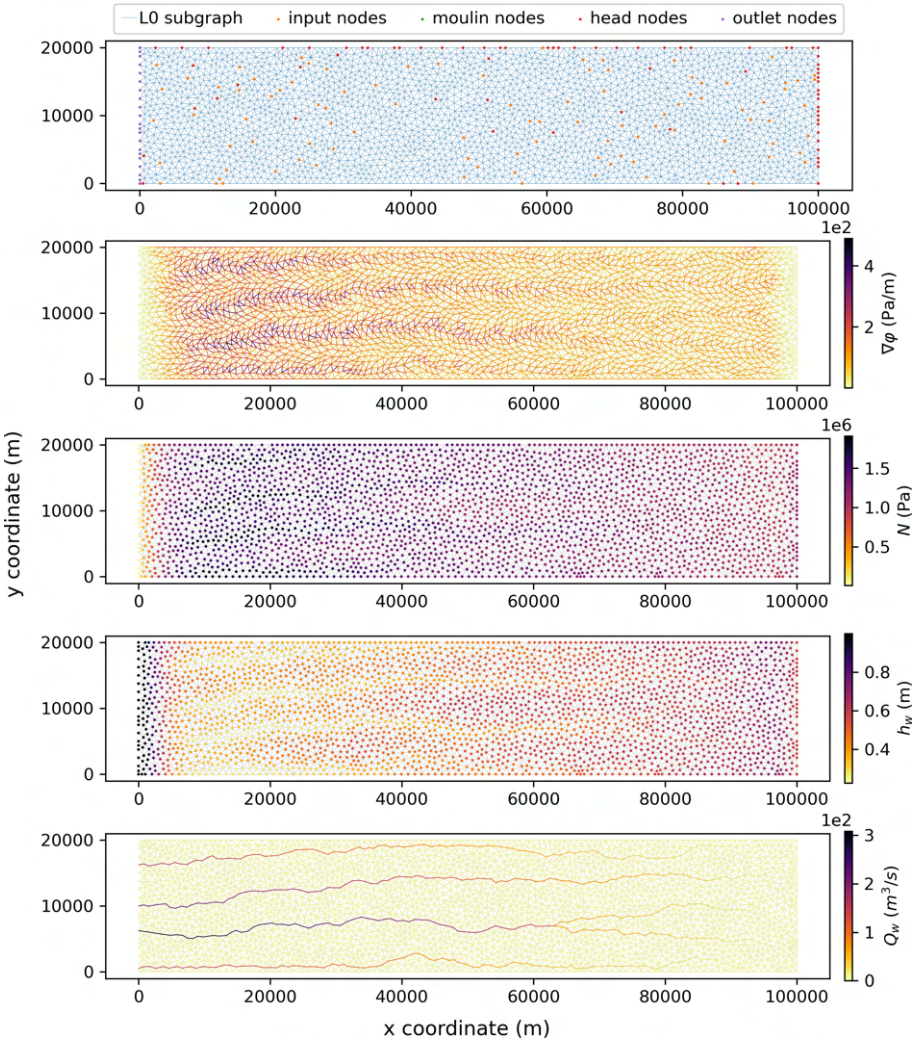


Figure S4. Graph representation of the model scenario A8 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.1.5 A6

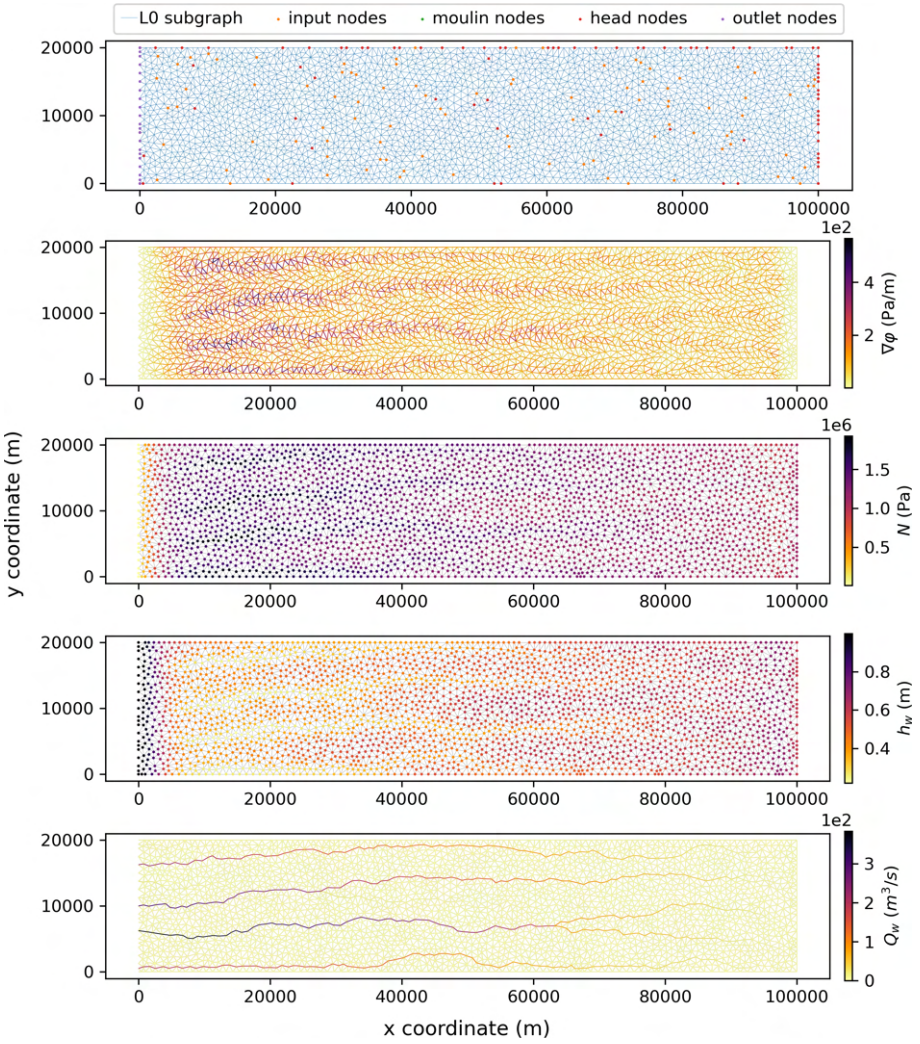


Figure S5. Graph representation of the model scenario A6 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.1.6 Edge-betweenness Centrality

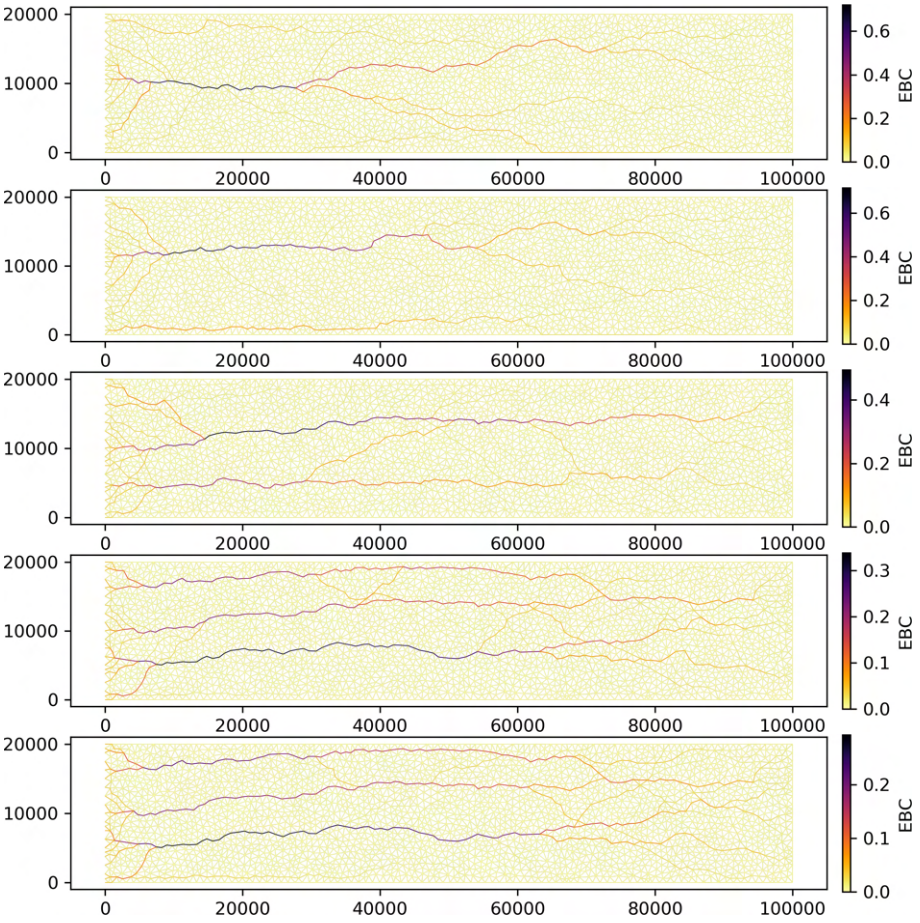


Figure S6. Edge-betweenness centrality (EBC) with increasing flux a) A4 b) A5 c) A7 d) A8 and e) A6

1.1.7 L1 and L2 networks

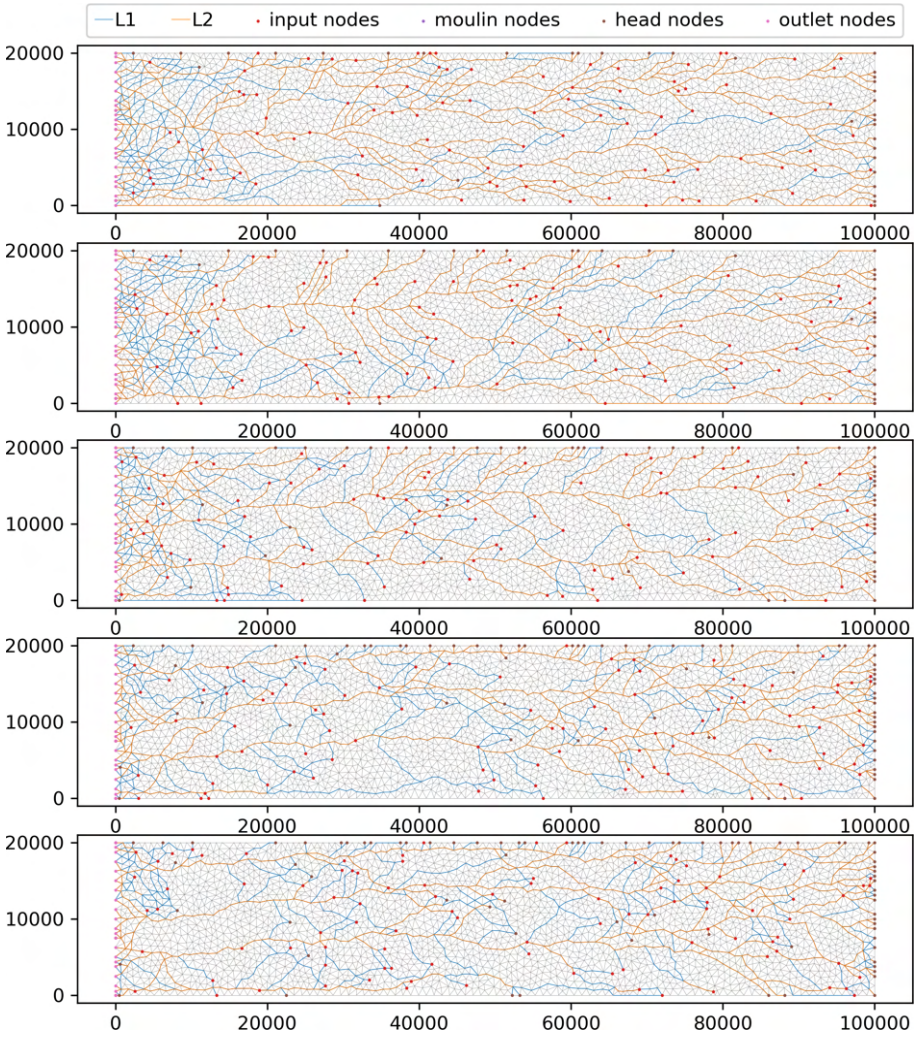


Figure S7. L1 and L2 networks for increasing flux a) A4 b) A5 c) A7 d) A8 and e) A6

1.2 B-Series models

1.2.1 B1

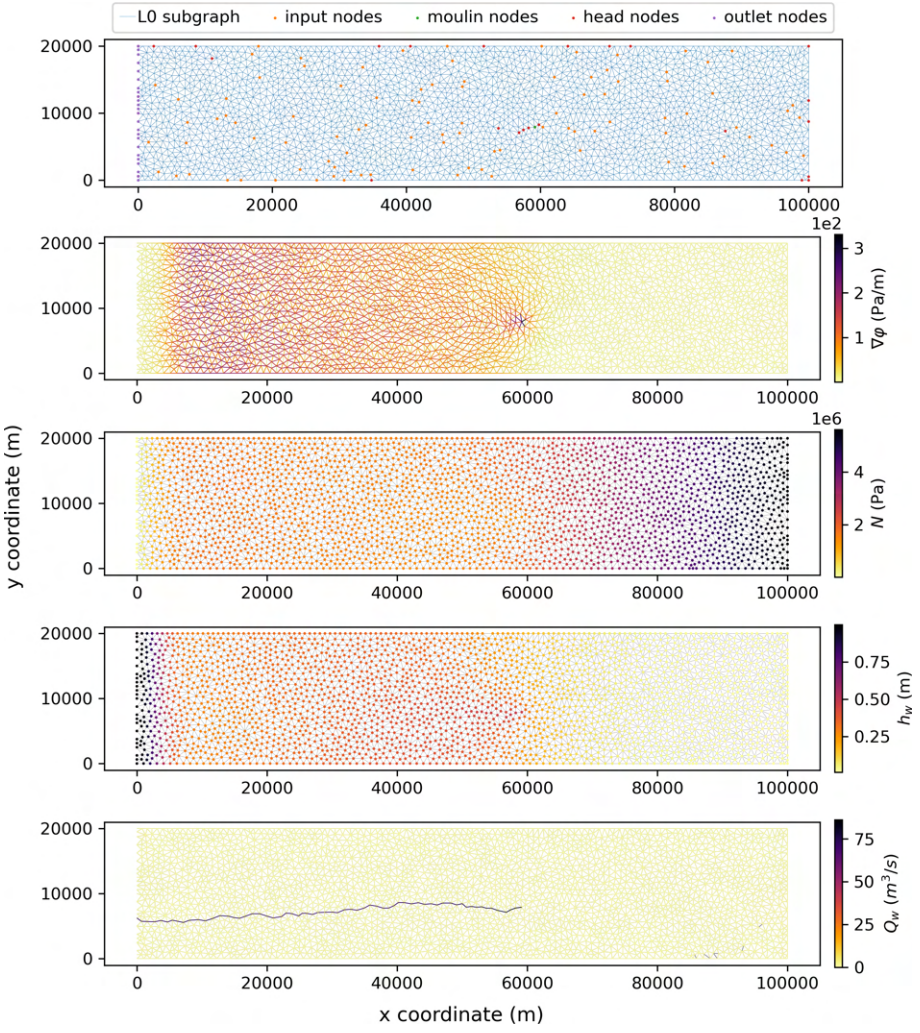


Figure S8. Graph representation of the model scenario B1 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.2.2 B2

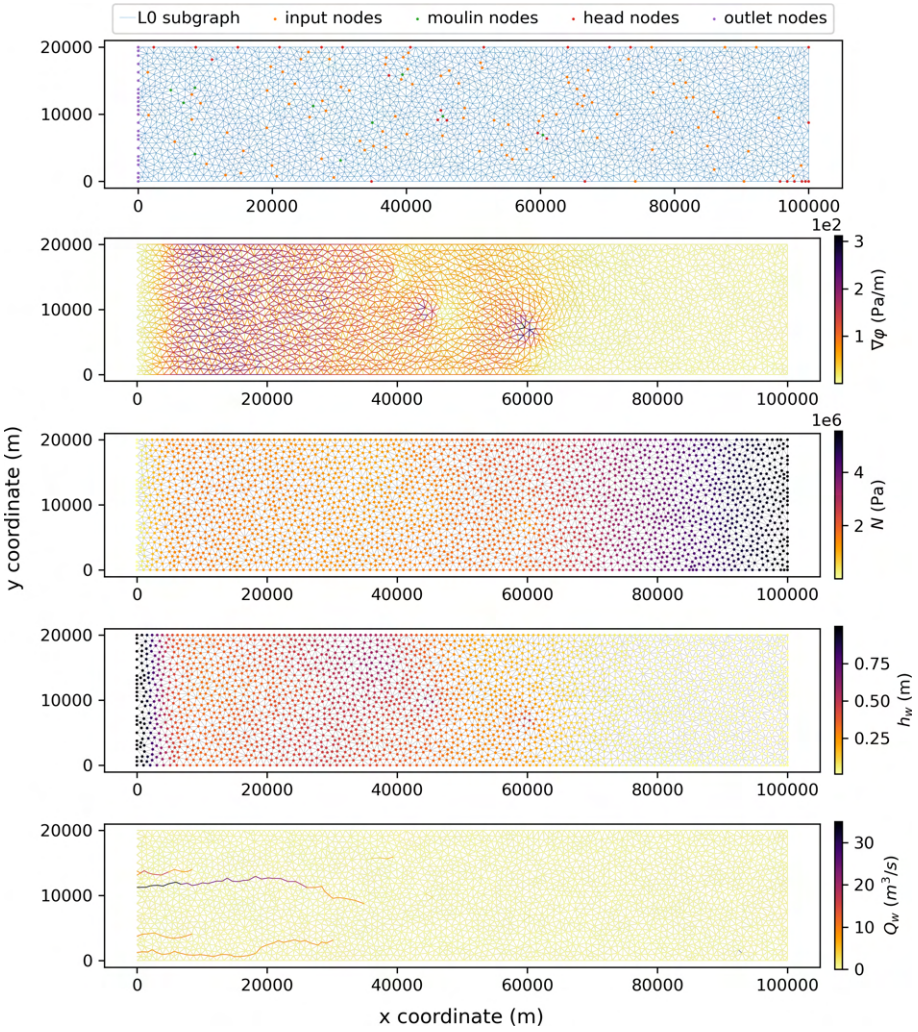


Figure S9. Graph representation of the model scenario B2 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.2.3 B3

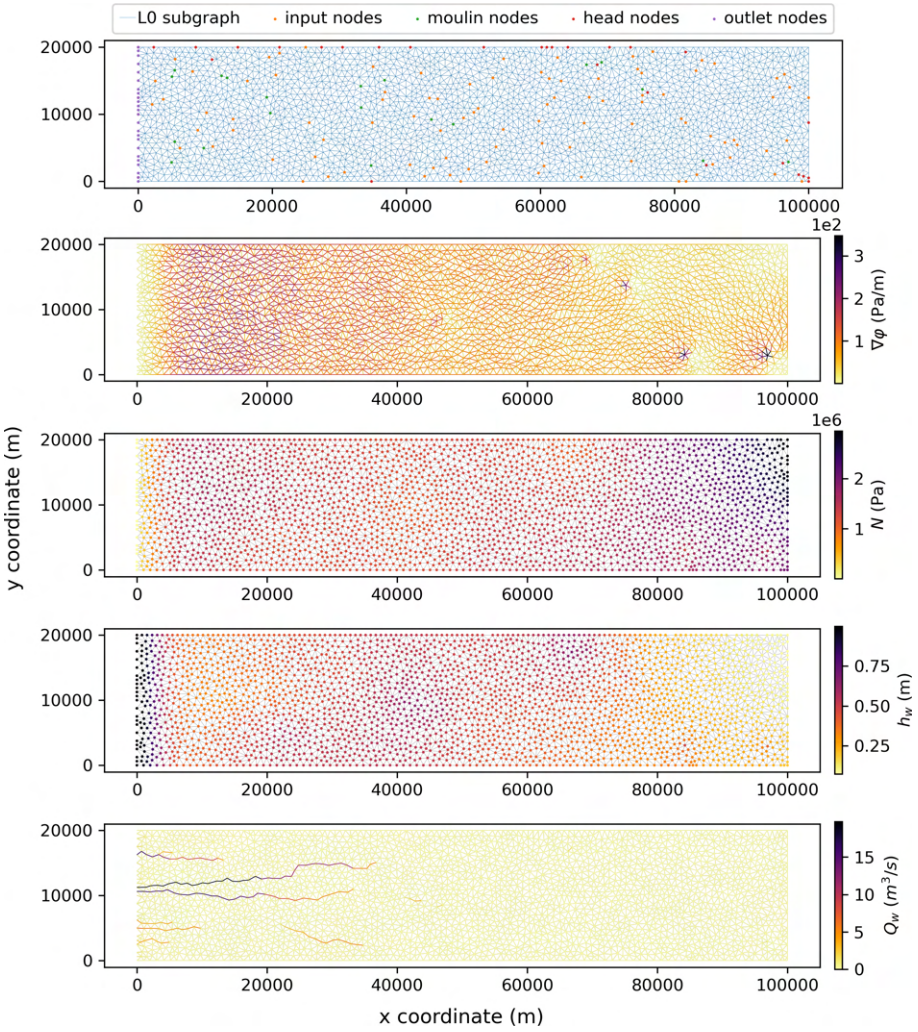


Figure S10. Graph representation of the model scenario B3 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.2.4 B4

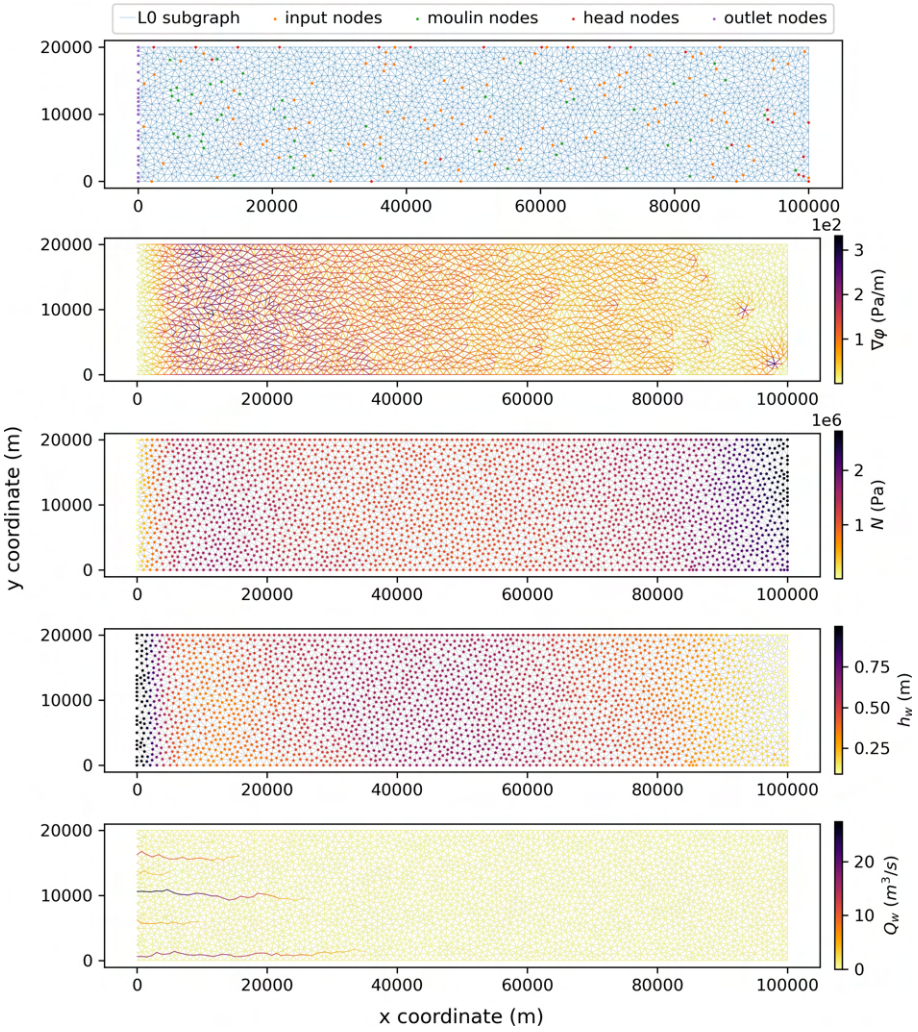


Figure S11. Graph representation of the model scenario B4 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.2.5 B5

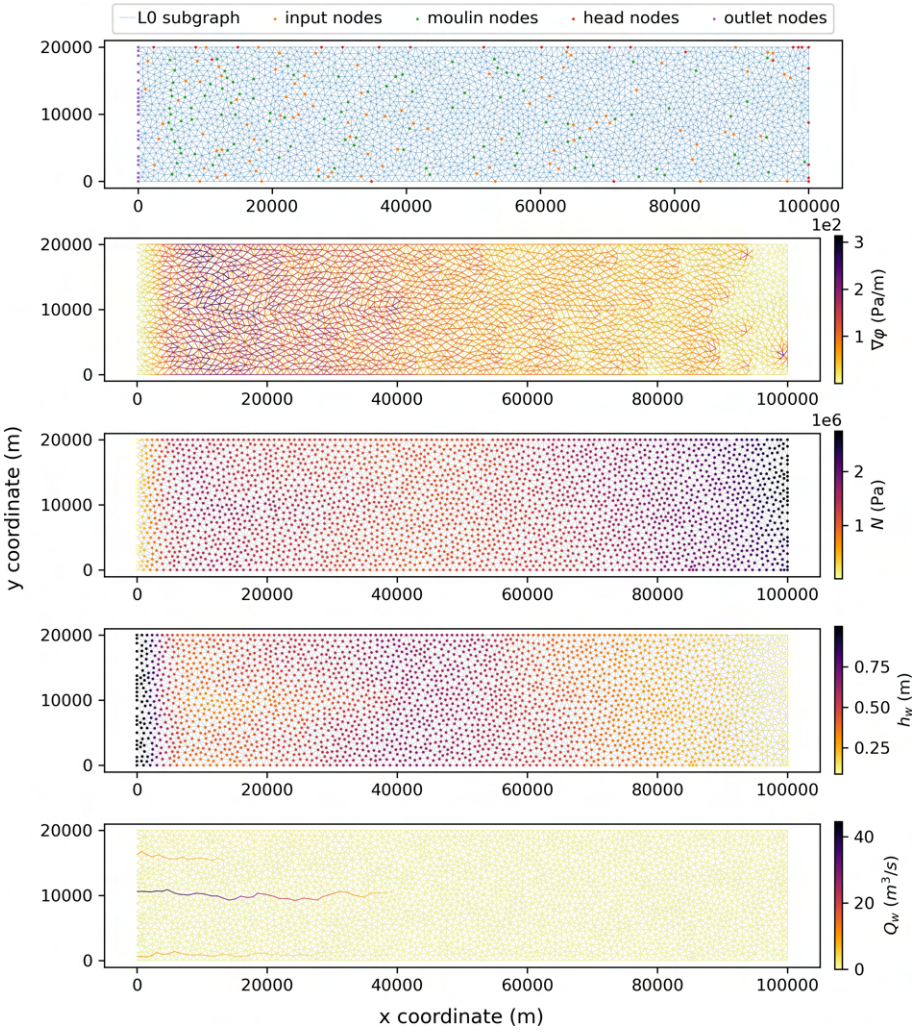


Figure S12. Graph representation of the model scenario B5 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.2.6 Edge-betweenness Centrality

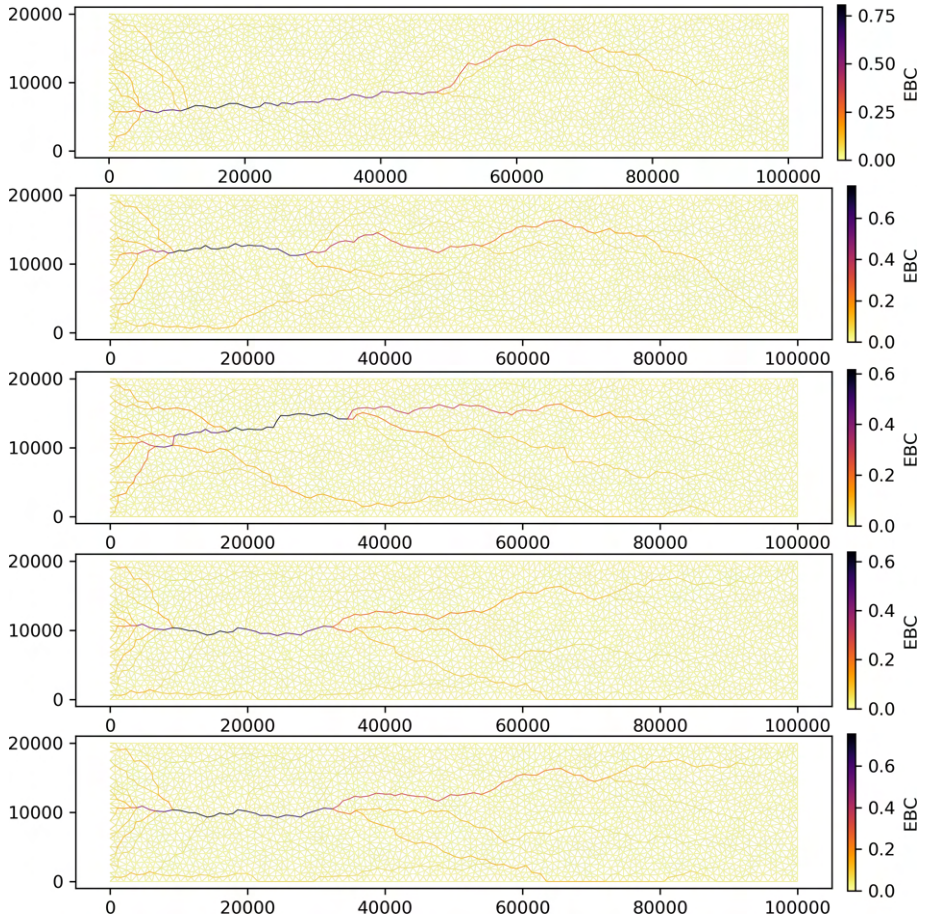


Figure S13. Edge-betweenness centrality (EBC) with increasing moulins a) B1 n =1 b) B2 n = 10 c) B3 n = 20 d) B4 n = 50 and e) B5 n = 100

1.2.7 L1 and L2 networks

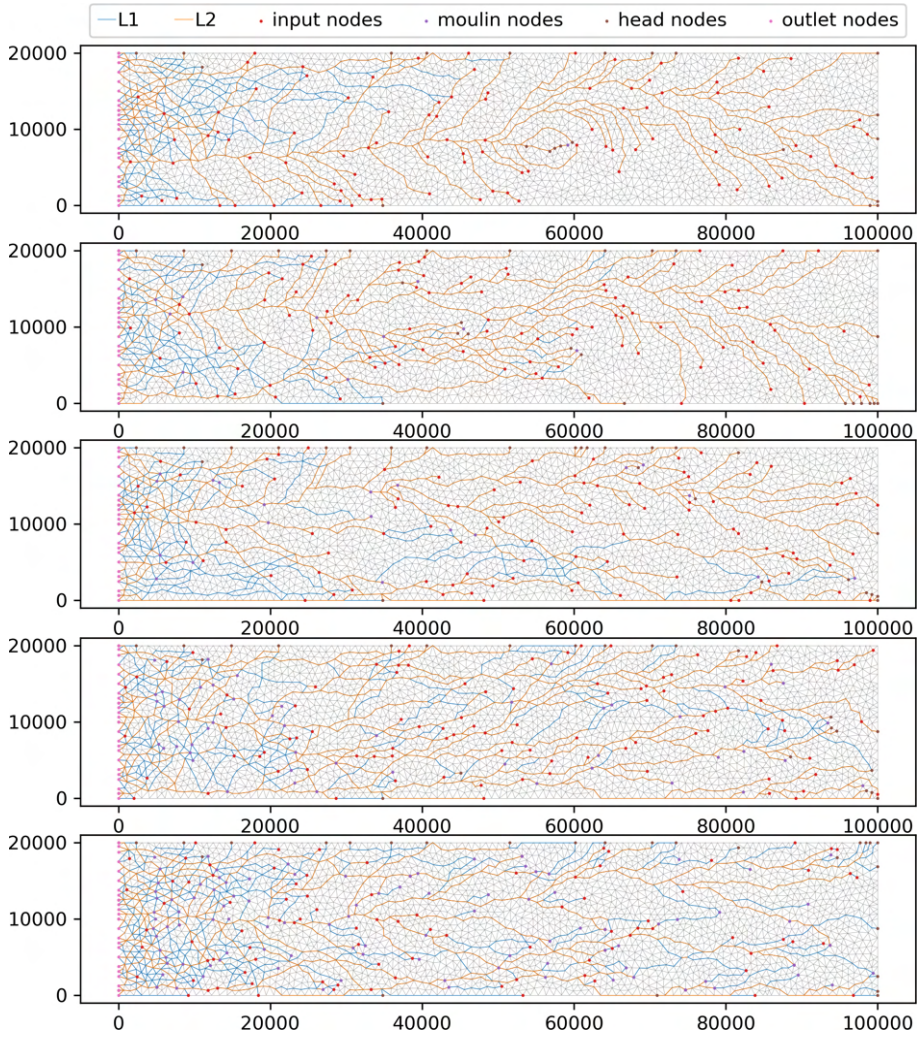


Figure S14. L1 and L2 networks for increasing moulins a) B1 n =1 b) B2 n = 10 c) B3 n = 20 d) B4 n = 50 and e) B5 n = 100

1.3 C-Series models

1.3.1 C series beginning and C0

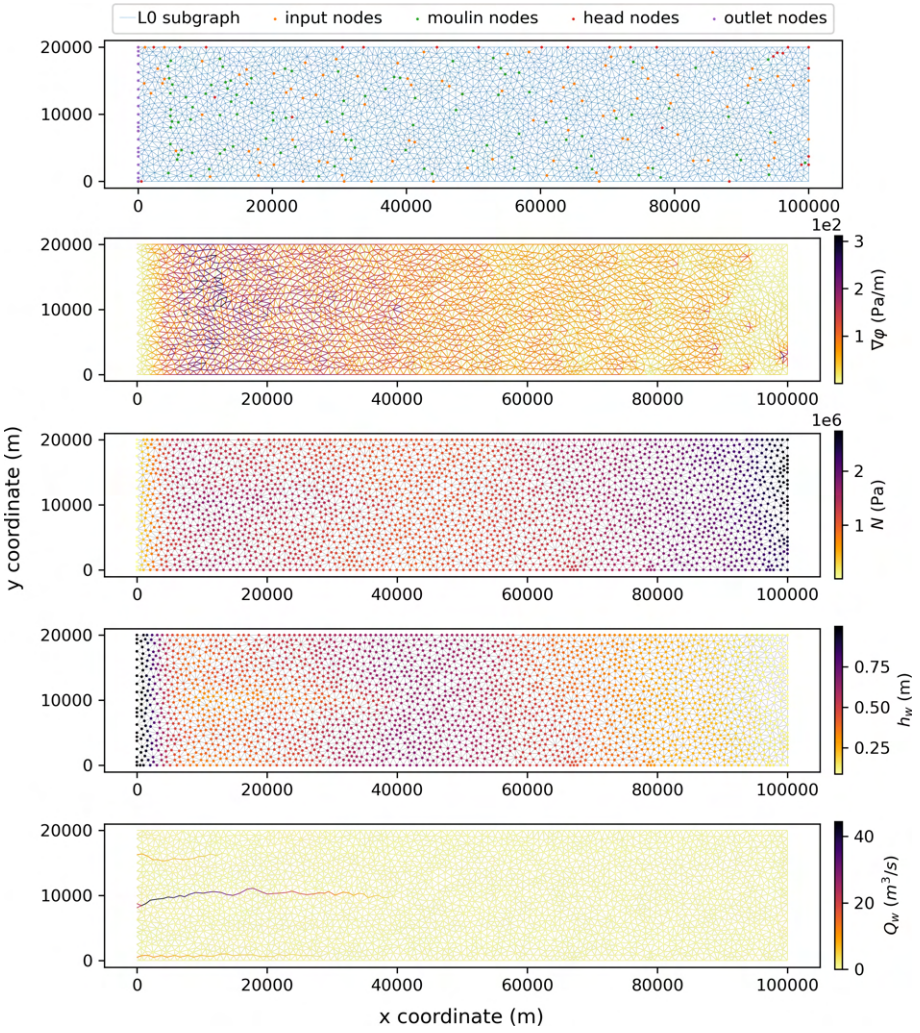


Figure S15. Graph representation of the model scenario C1 at timestep 0 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s). C0 has this configuration throughout

1.3.2 C1 end

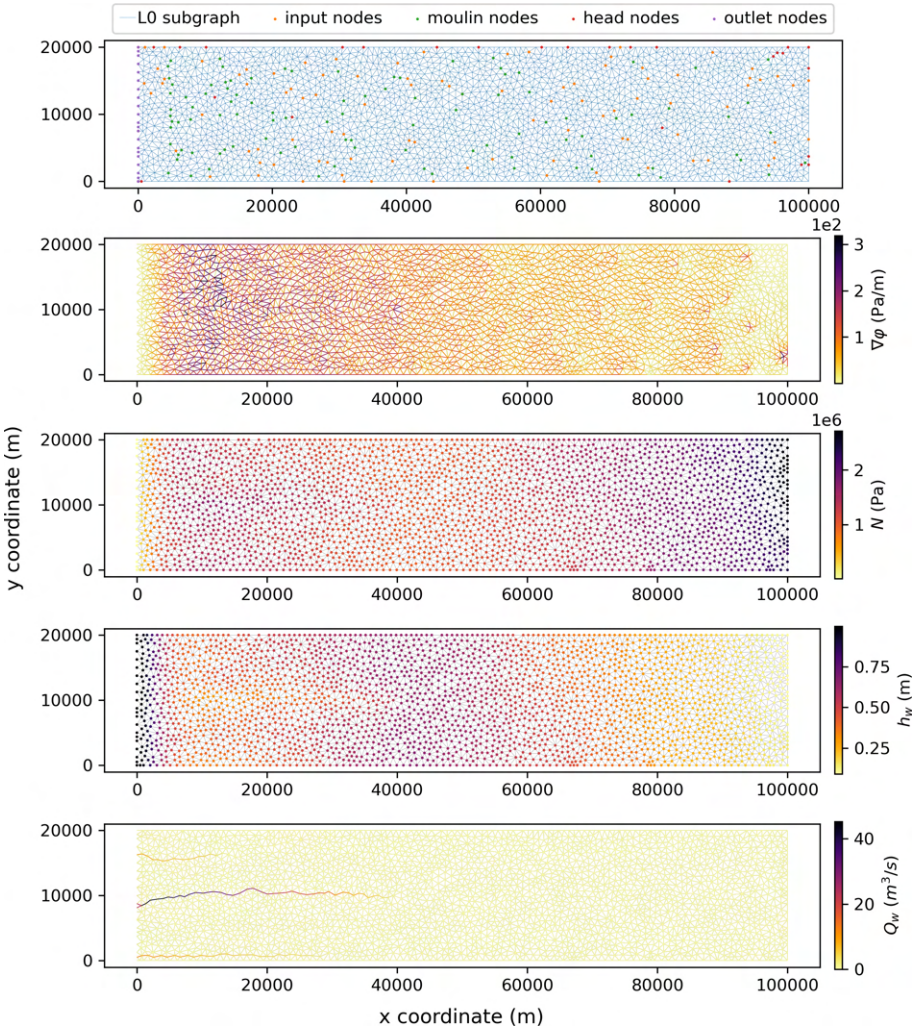


Figure S16. Graph representation of the model scenario C1 at the end of day 49 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.3.3 C2 end

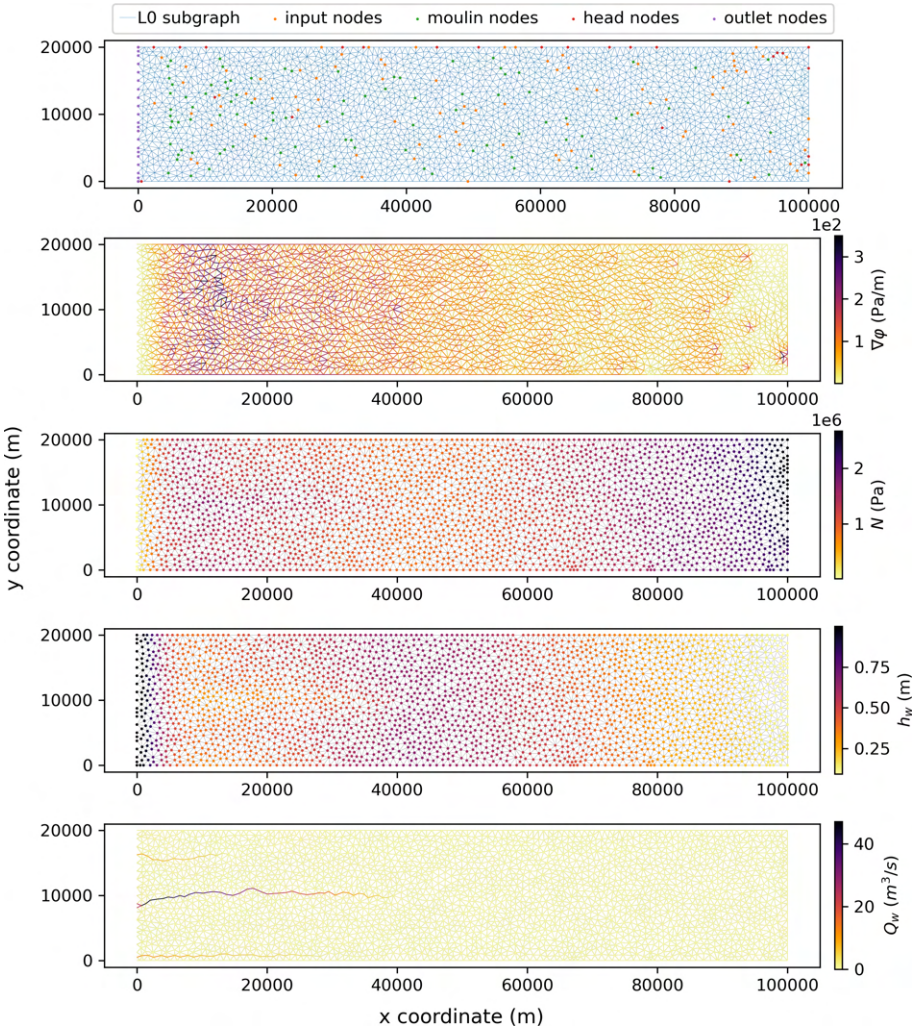


Figure S17. Graph representation of the model scenario C2 at the end of day 49 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.3.4 C3 end

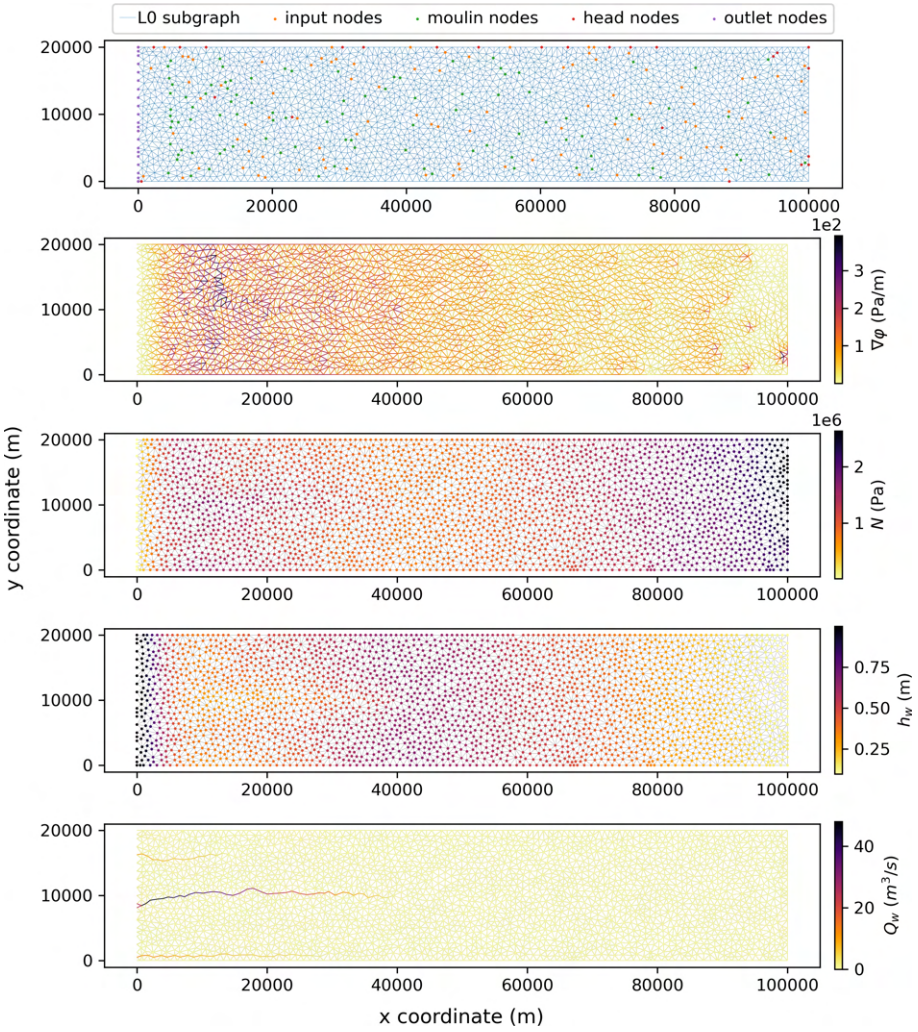


Figure S18. Graph representation of the model scenario C3 at the end of day 49 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.3.5 C4 end

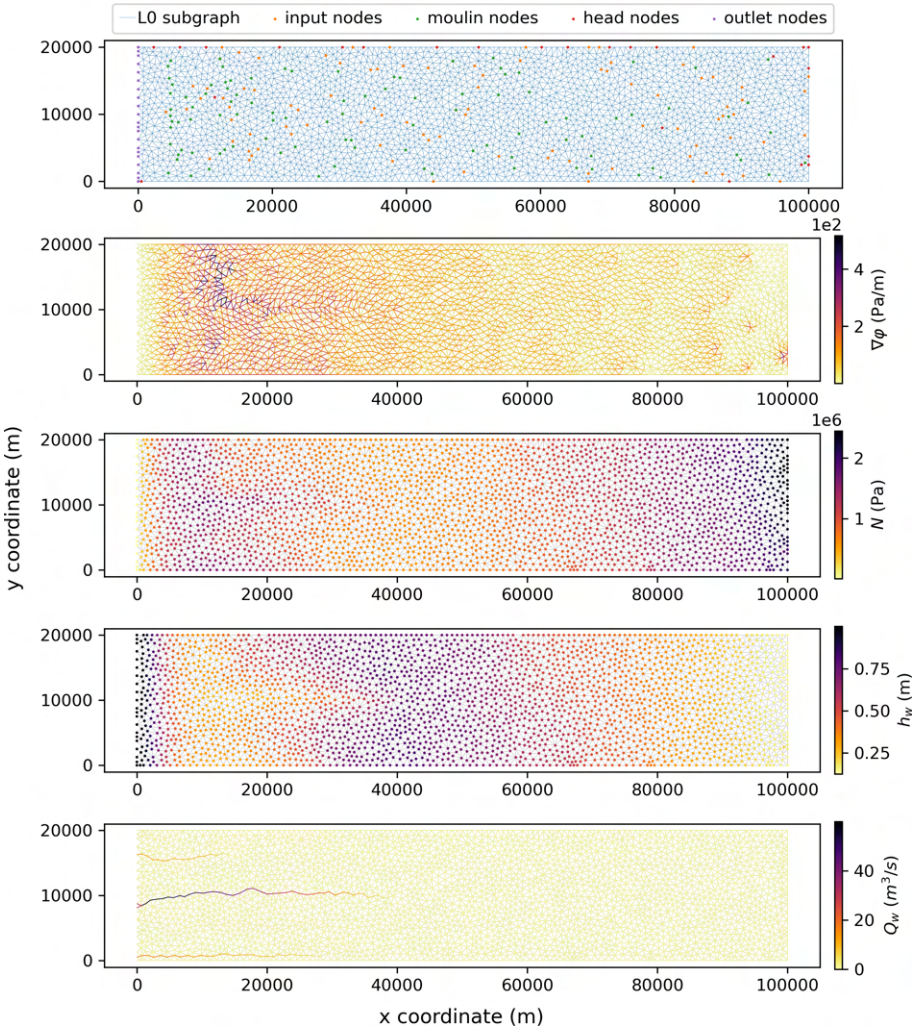


Figure S19. Graph representation of model scenario C4 at the end of day 49 showing a) network geometry, b) the hydraulic potential gradient (Pa/m) on edges c) effective pressure (Pa) on nodes d) thickness of distributed water flow 'sheet' (m) on nodes and e) the channelised water flux on edges (m^3/s)

1.3.6 Edge-betweenness Centrality

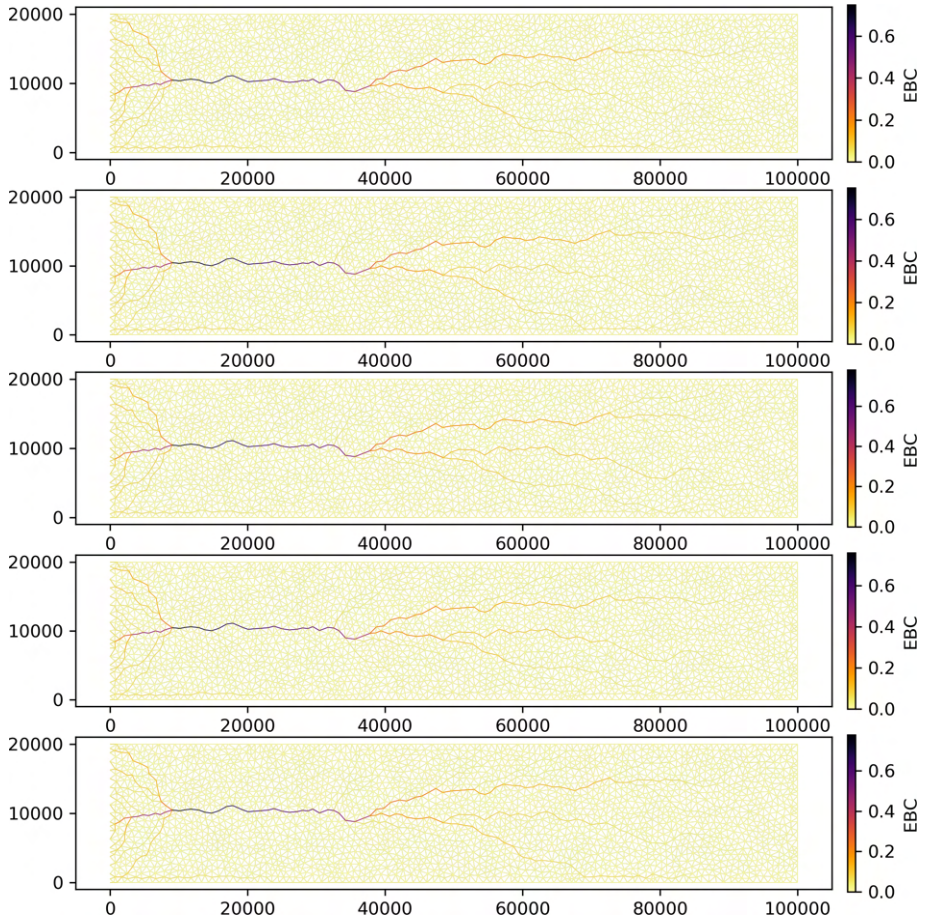


Figure S20. Edge-betweenness centrality (EBC) for a) C1 at timestep 0 b) C1 at timestep 1200 c) C2 at timestep 1200 d) C3 at timestep 1200 e) C4 at timestep 1200

1.3.7 L1 and L2 networks

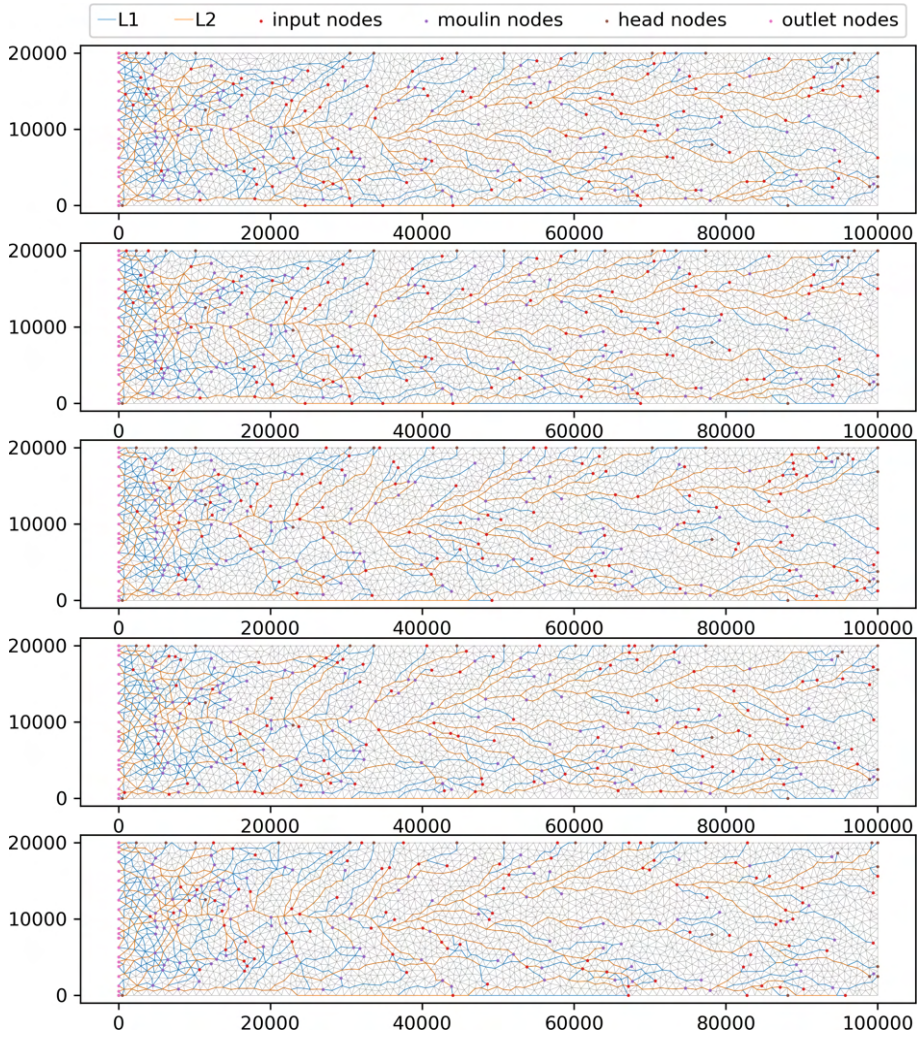


Figure S21. L1 and L2 networks for a) C1 at timestep 0 b) C1 at timestep 1200 c) C2 at timestep 1200 d) C3 at timestep 1200 e) C4 at timestep 1200

2 Experiment Sets

2.1 Experiment Set 1

2.1.1 A4 reference

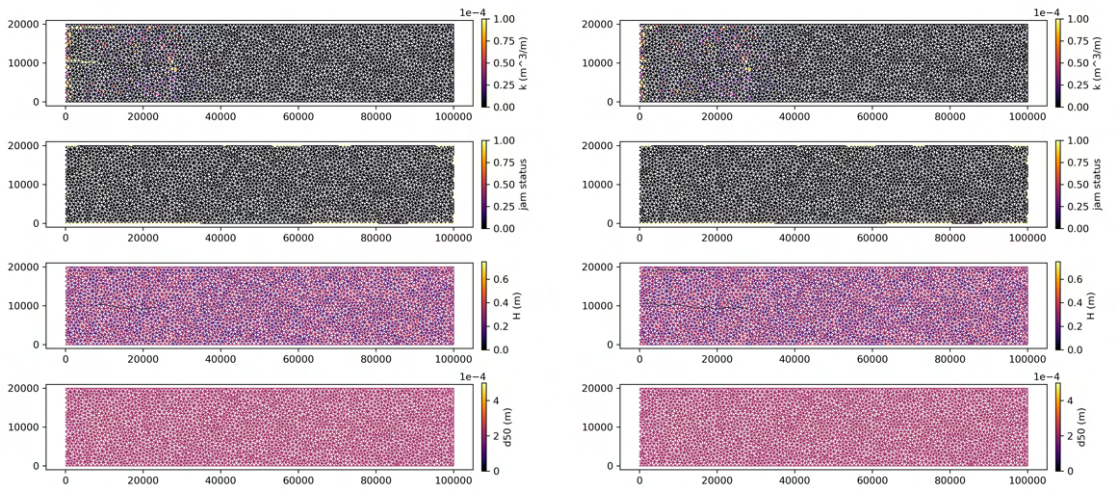


Figure S22. Results for the A4 reference model run at a) week 0 and b) week 25

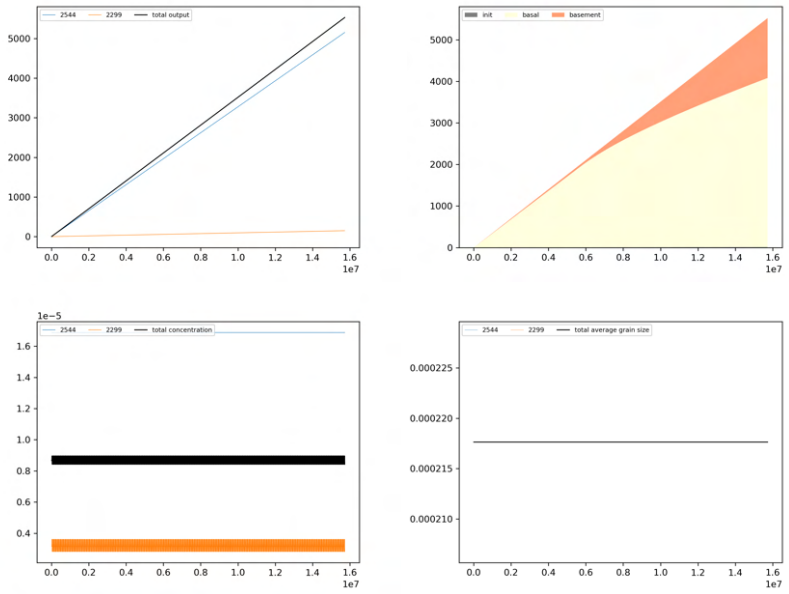


Figure S23. Outputs from the A4 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.2 A4 default

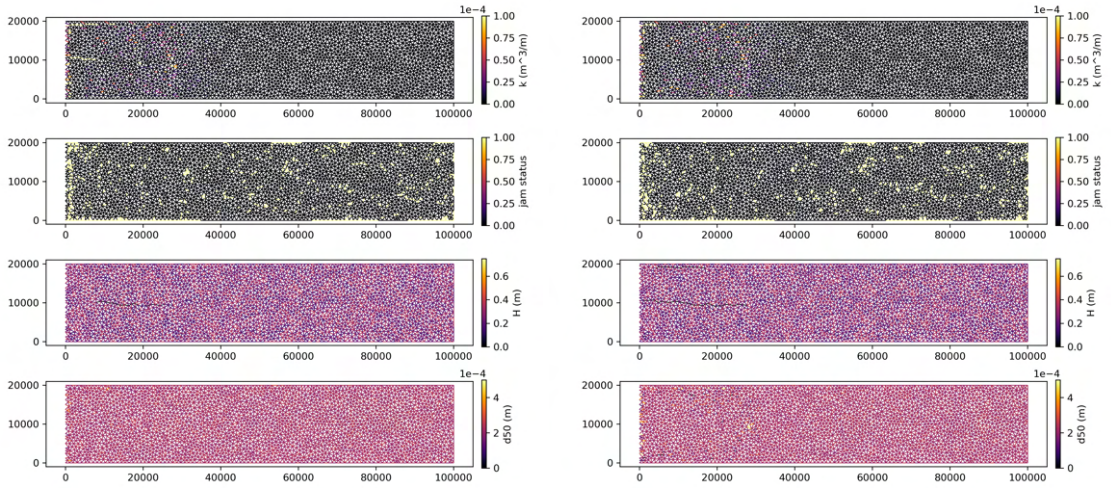


Figure S24. Results for the A4 default model run at a) week 0 and b) week 25

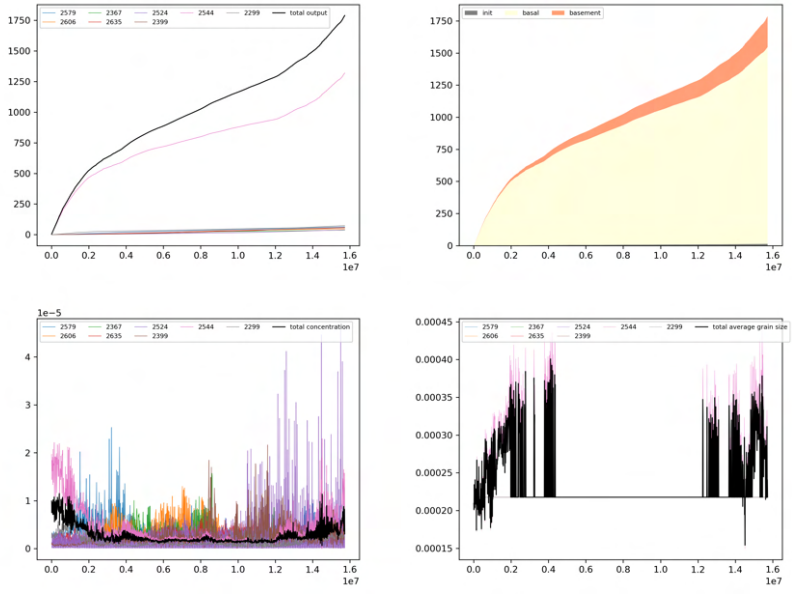


Figure S25. Outputs from the A4 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.3 A4 default rerun

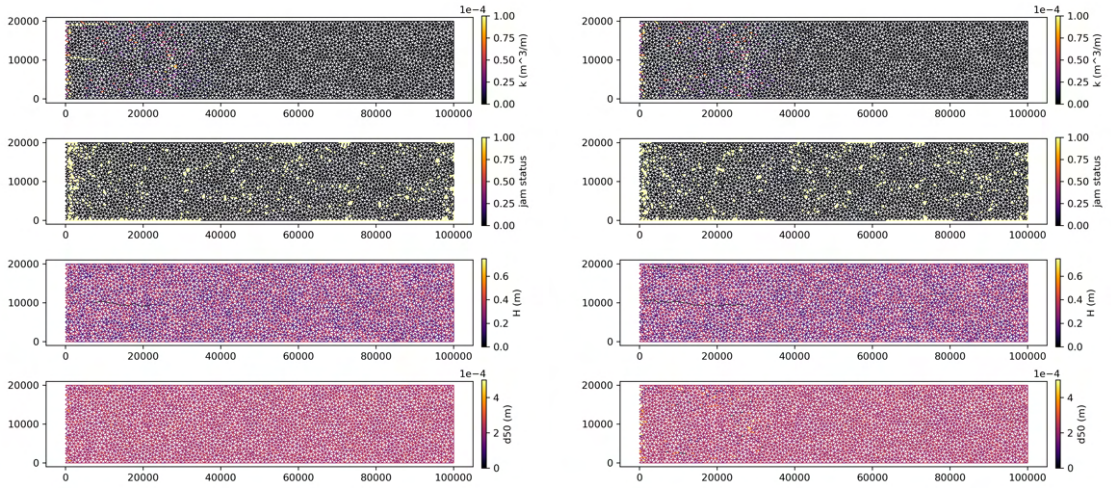


Figure S26. Results for the A4 default model rerun at a) week 0 and b) week 25

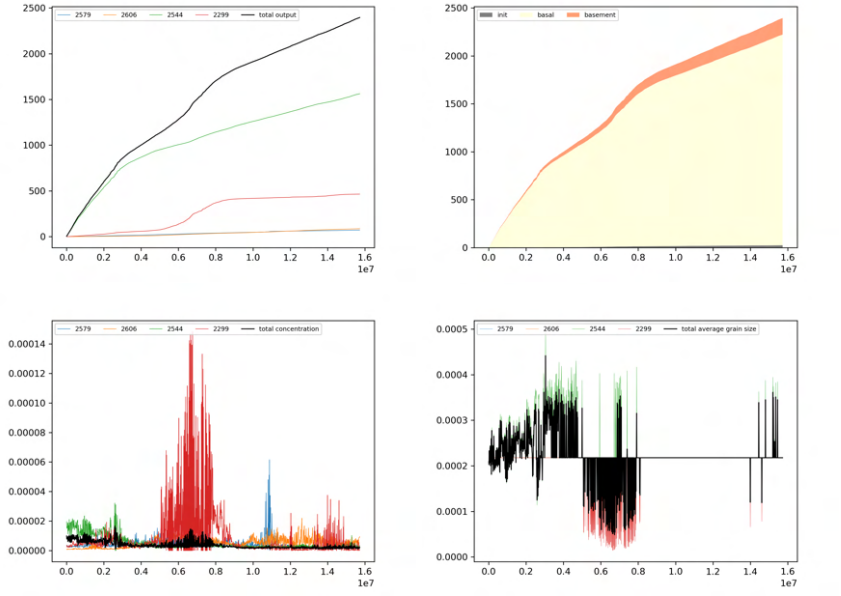


Figure S27. Outputs from the A4 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.4 A4D default

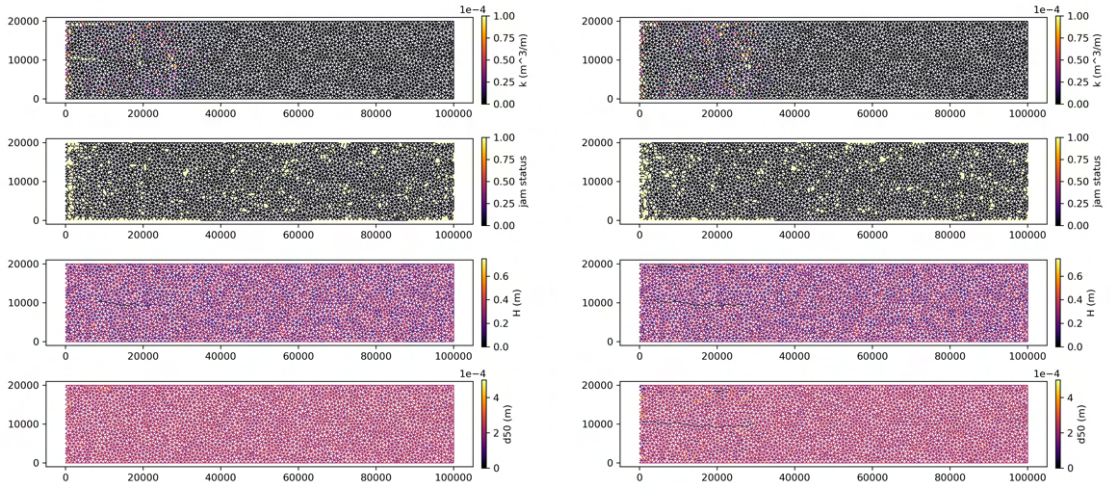


Figure S28. Results for the A4D default model run at a) week 0 and b) week 25

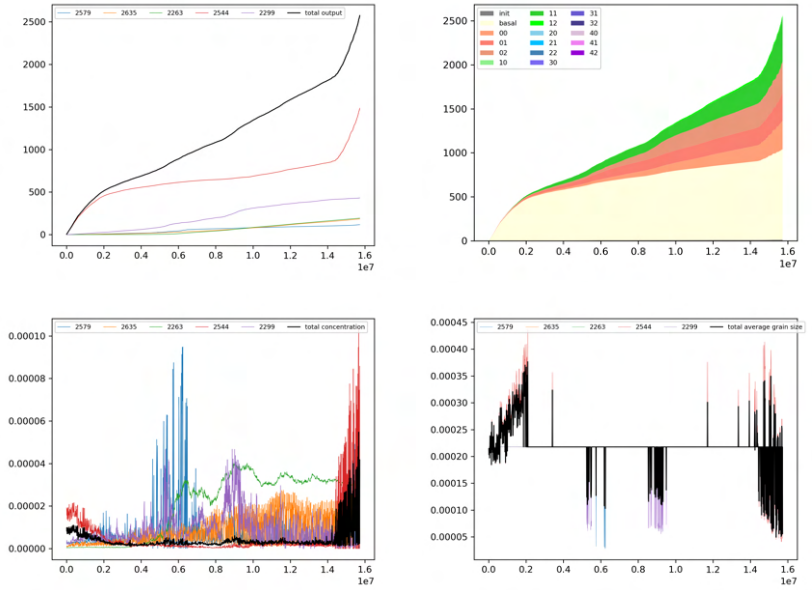
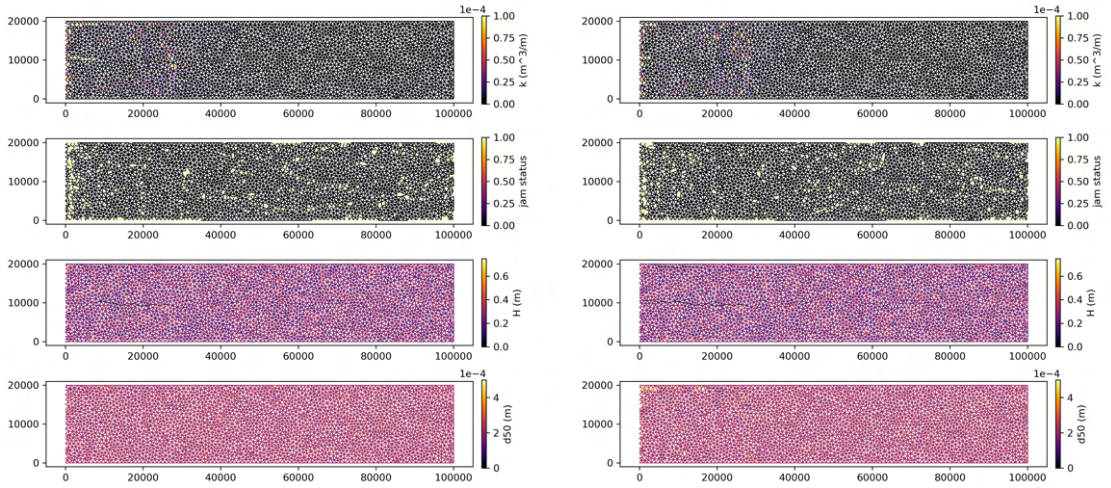


Figure S29. Outputs from the A4D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.5 A4D default rerun



90

Figure S30. Results for the A4D default model rerun at a) week 0 and b) week 25

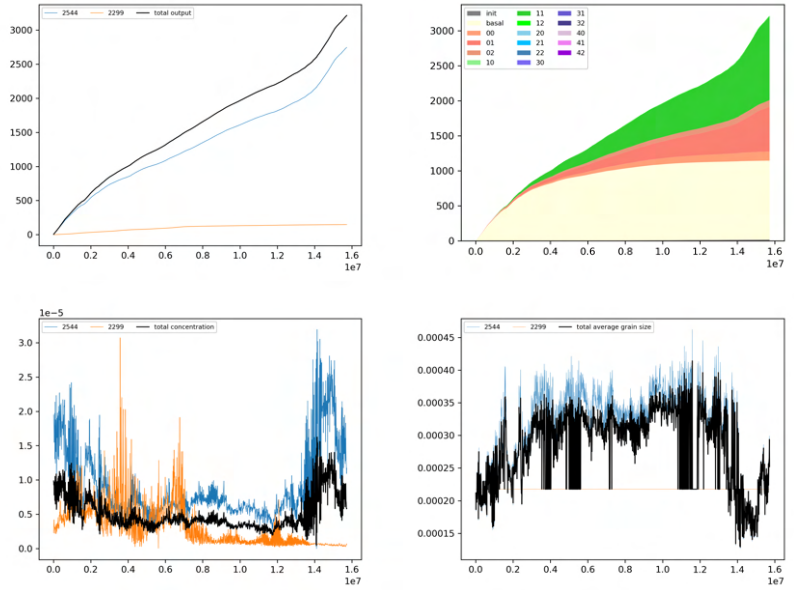


Figure S31. Outputs from the A4D default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.6 A5 reference

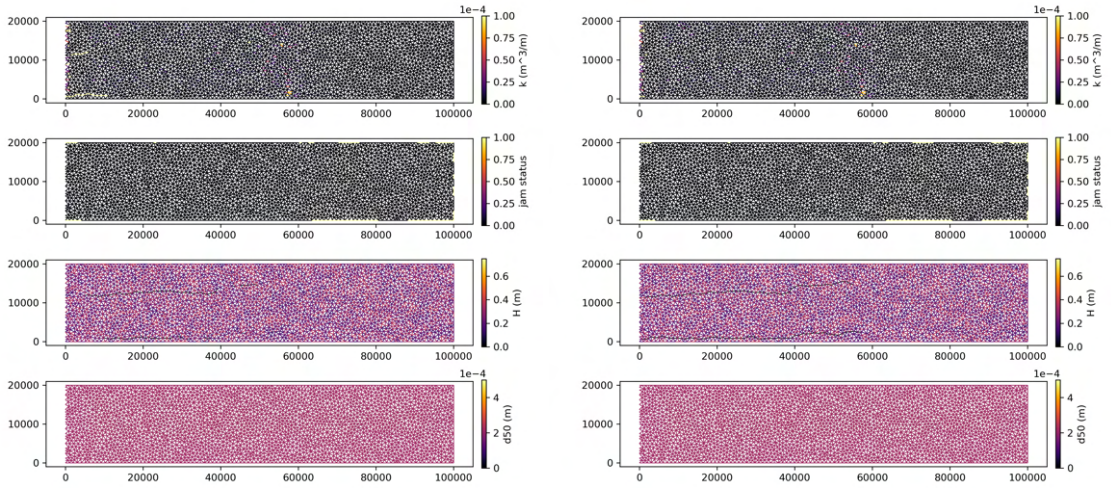


Figure S32. Results for the A5 reference model run at a) week 0 and b) week 25

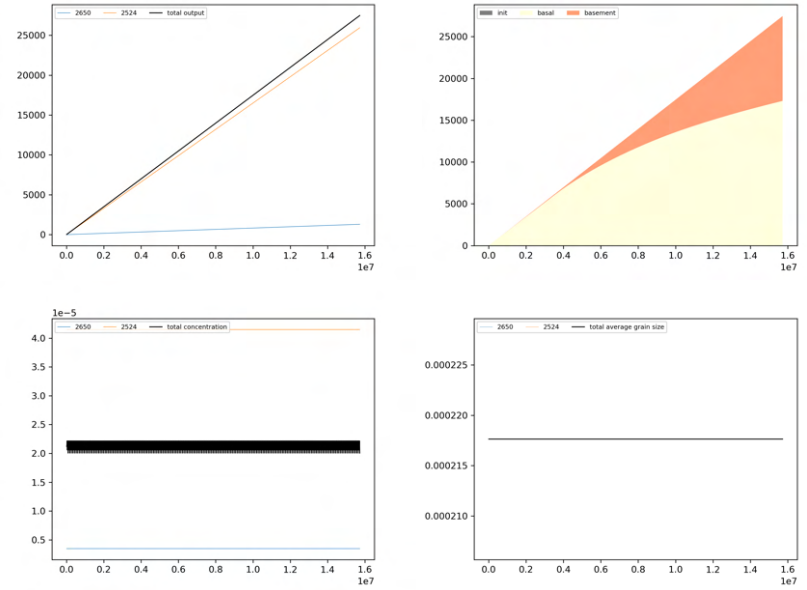


Figure S33. Outputs from the A5 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.7 A5 default

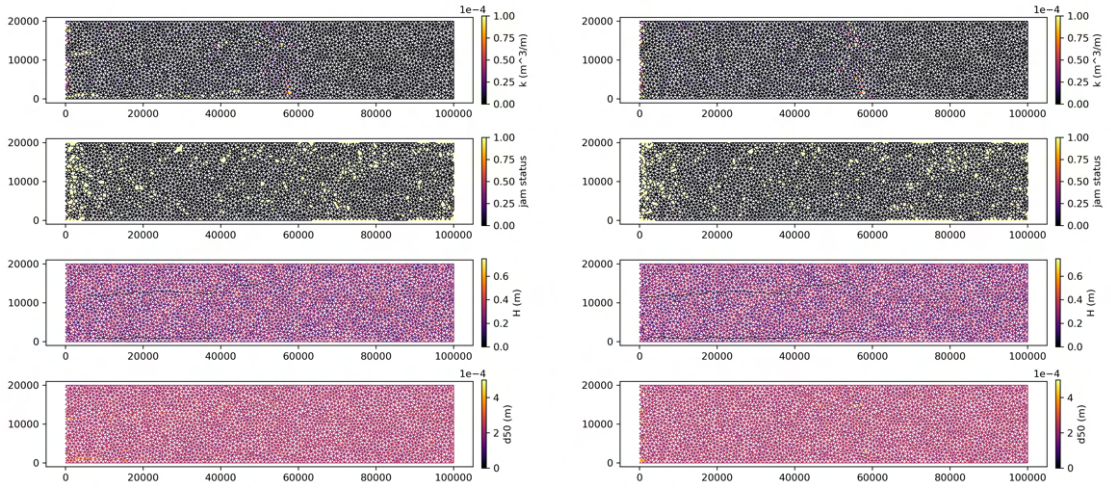


Figure S34. Results for the A5 default model run at a) week 0 and b) week 25

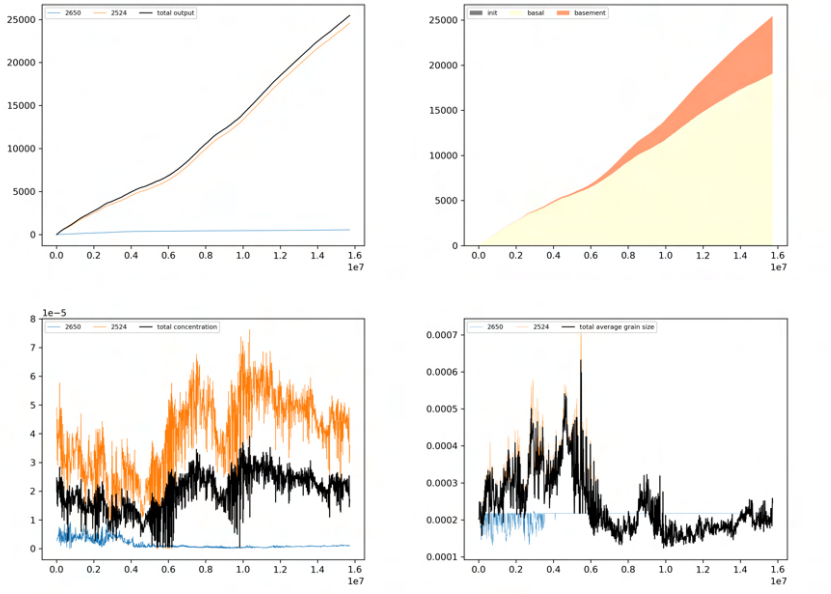


Figure S35. Outputs from the A5 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.8 A5 default rerun

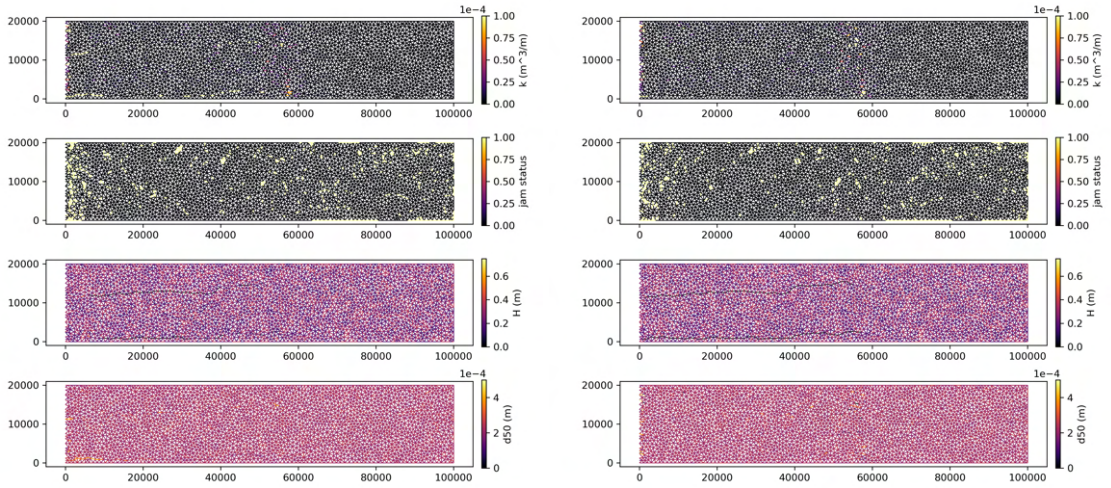


Figure S36. Results for the A5 default model rerun at a) week 0 and b) week 25

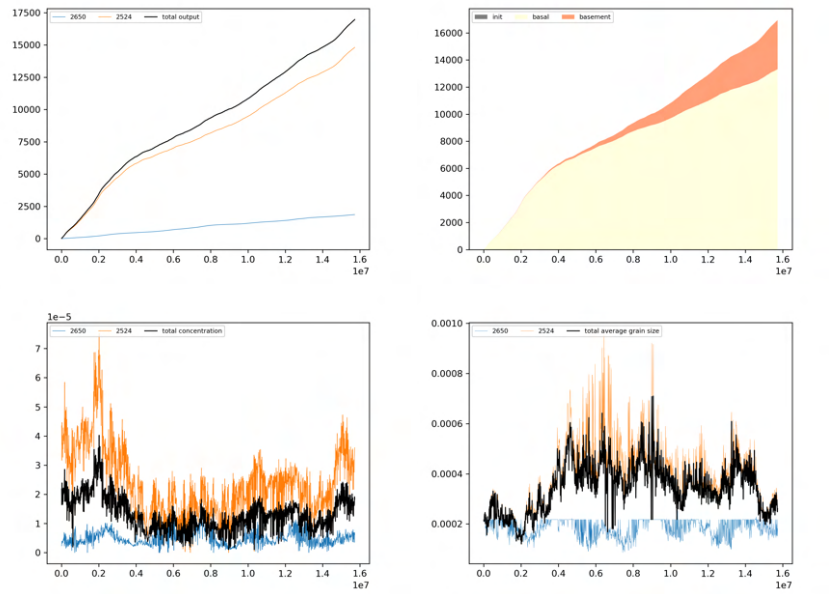


Figure S37. Outputs from the A5 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.9 A5D default

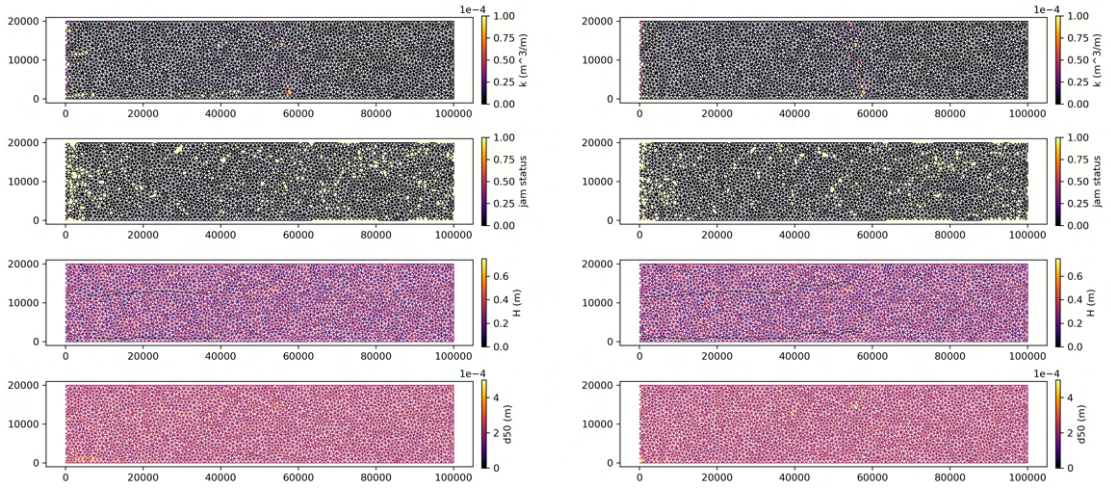


Figure S38. Results for the A5D default model run at a) week 0 and b) week 25

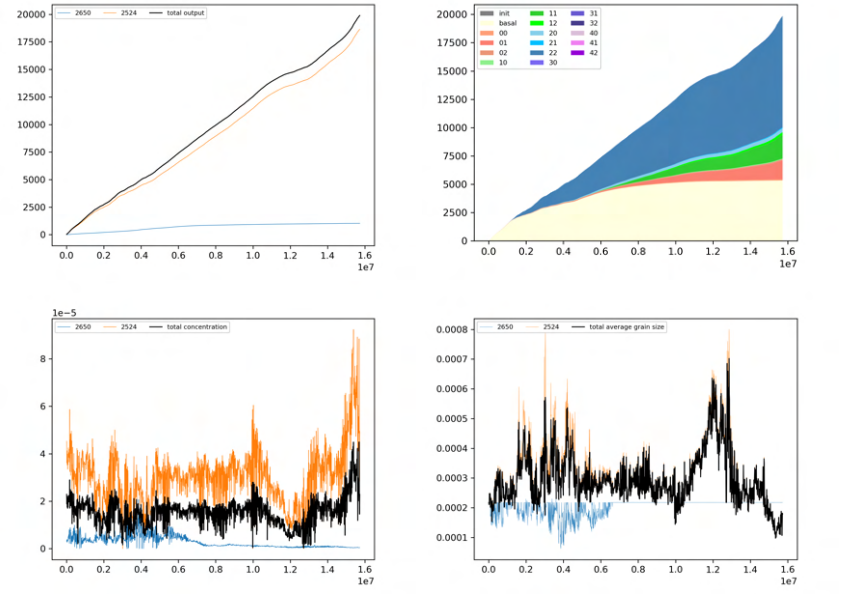


Figure S39. Outputs from the A5D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.10 A5D default rerun

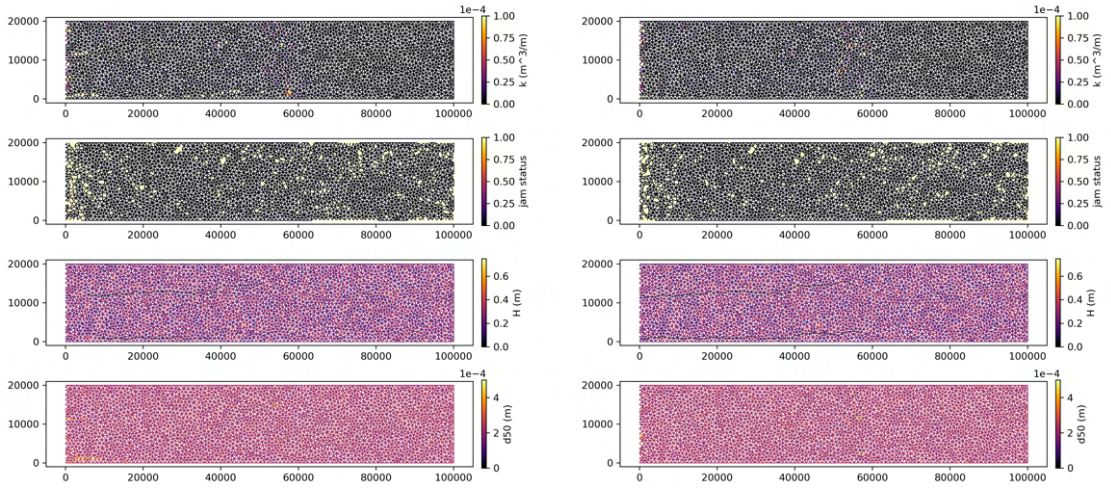


Figure S40. Results for the A5D default model rerun at a) week 0 and b) week 25

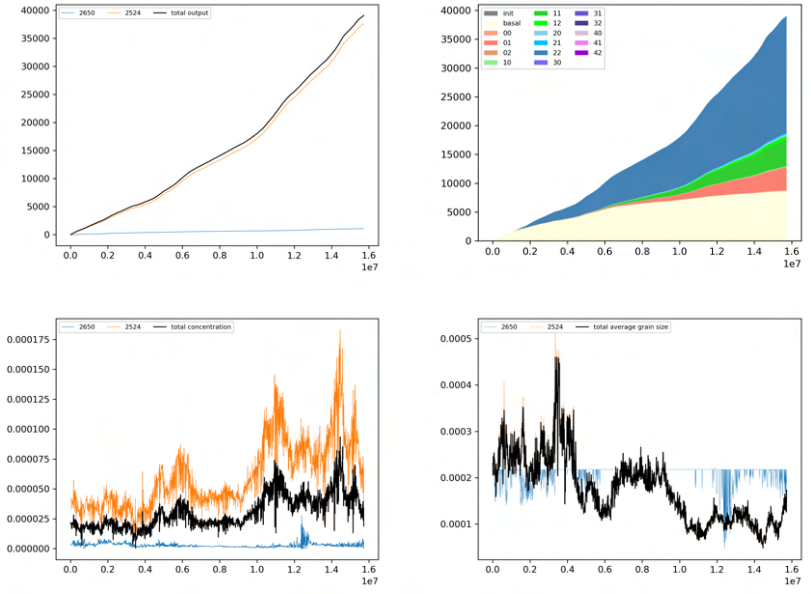


Figure S41. Outputs from the A5D default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.11 A7 reference

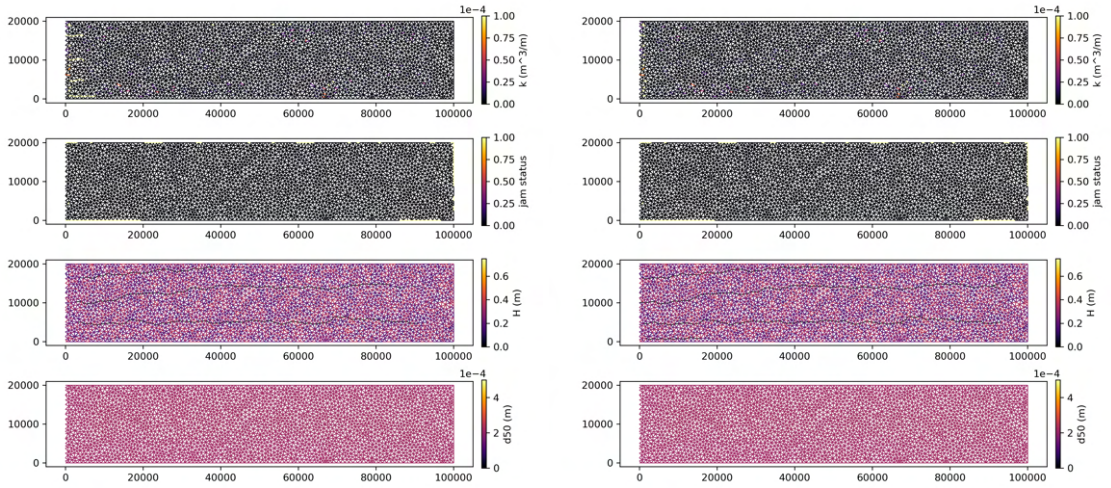


Figure S42. Results for the A7 reference model run at a) week 0 and b) week 25

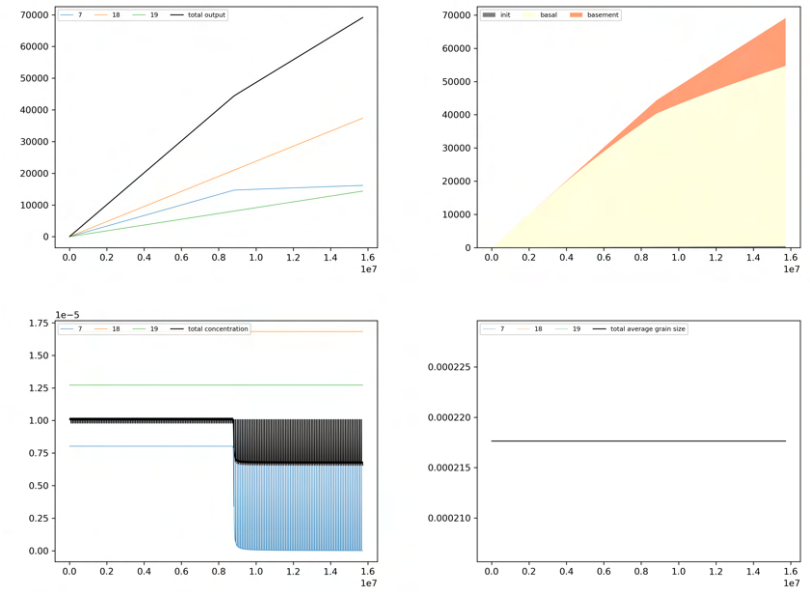


Figure S43. Outputs from the A7 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.12 A7 default

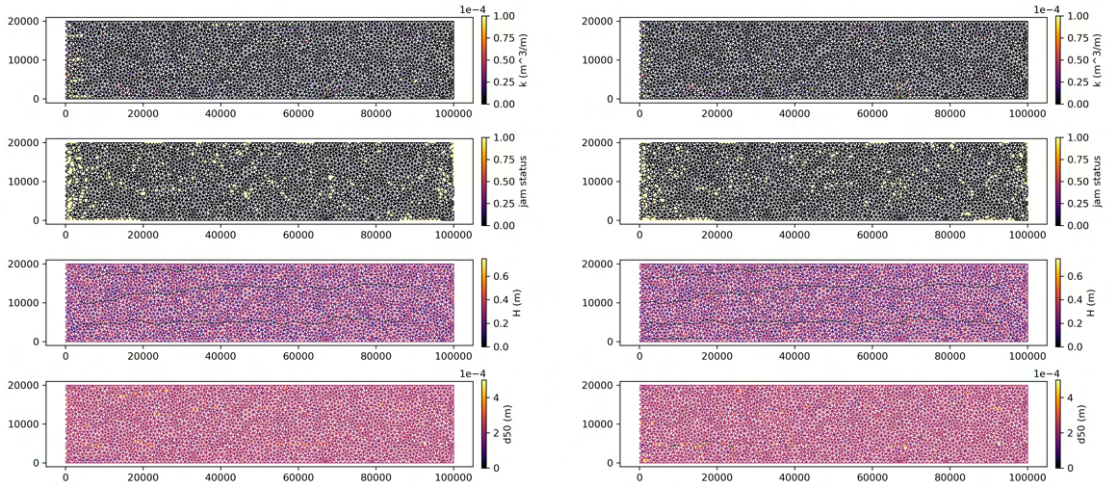
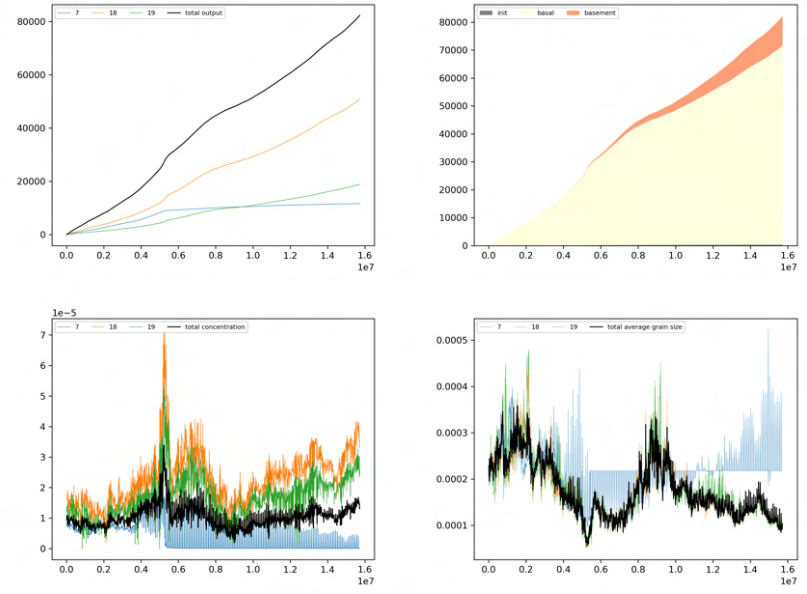


Figure S44. Results for the A7 default model run at a) week 0 and b) week 25



120

Figure S45. Outputs from the A7 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.13 A7 default rerun

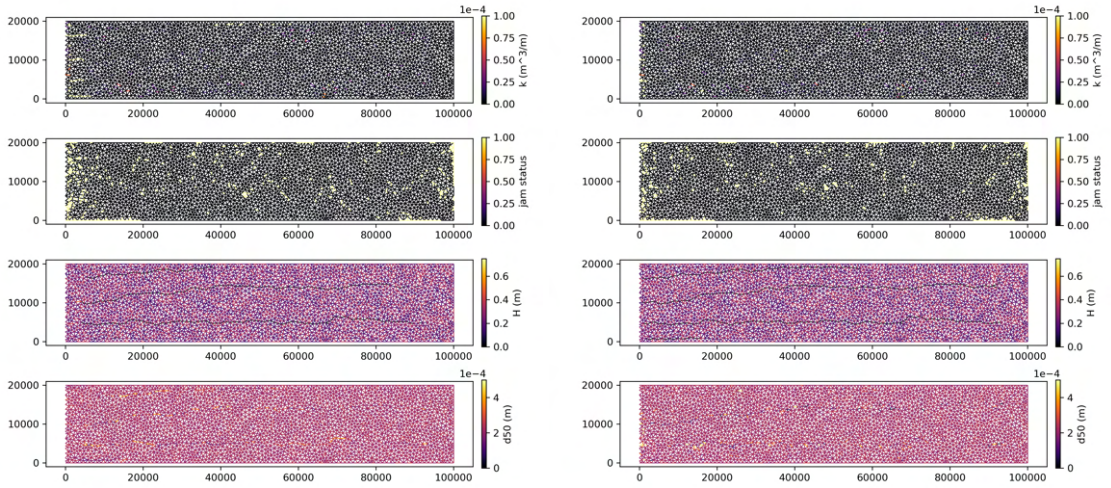


Figure S46. Results for the A7 default model rerun at a) week 0 and b) week 25

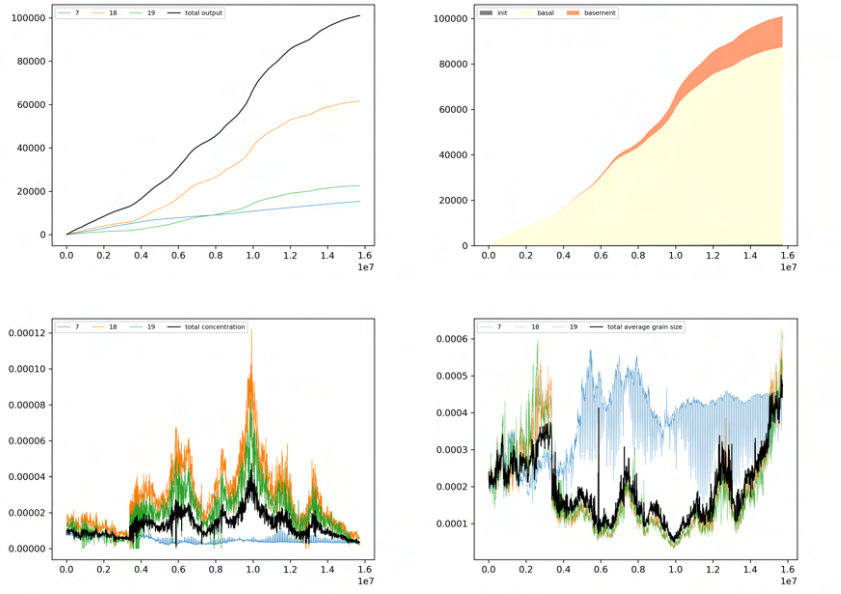


Figure S47. Outputs from the A7 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.14 A7D default

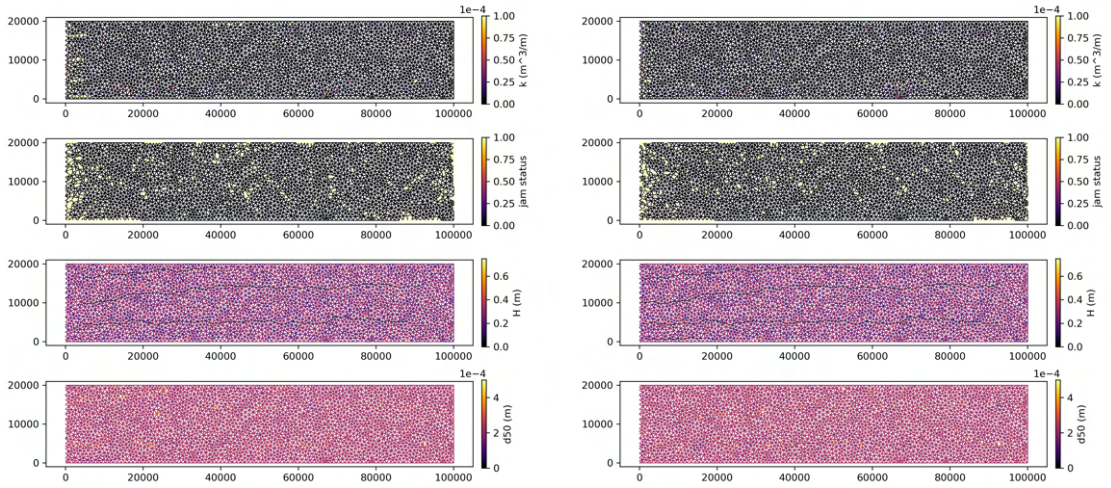


Figure S48. Results for the A7D default model run at a) week 0 and b) week 25

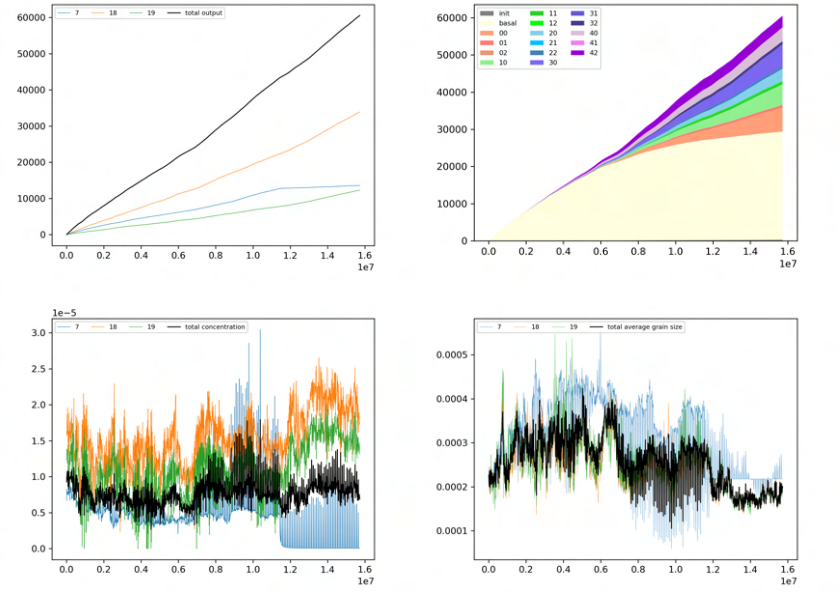


Figure S49. Outputs from the A7D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.15 A7D default rerun

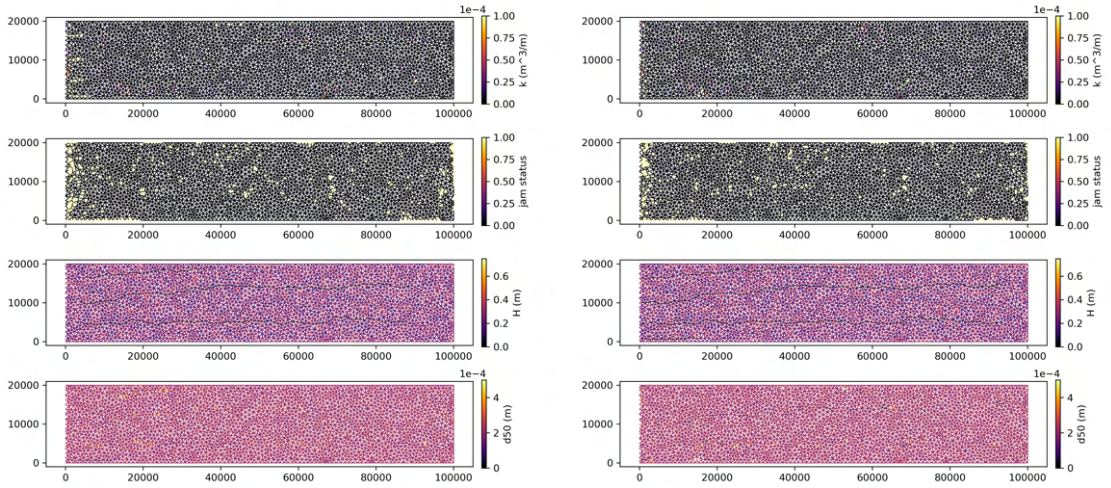


Figure S50. Results for the A7D default model rerun at a) week 0 and b) week 25

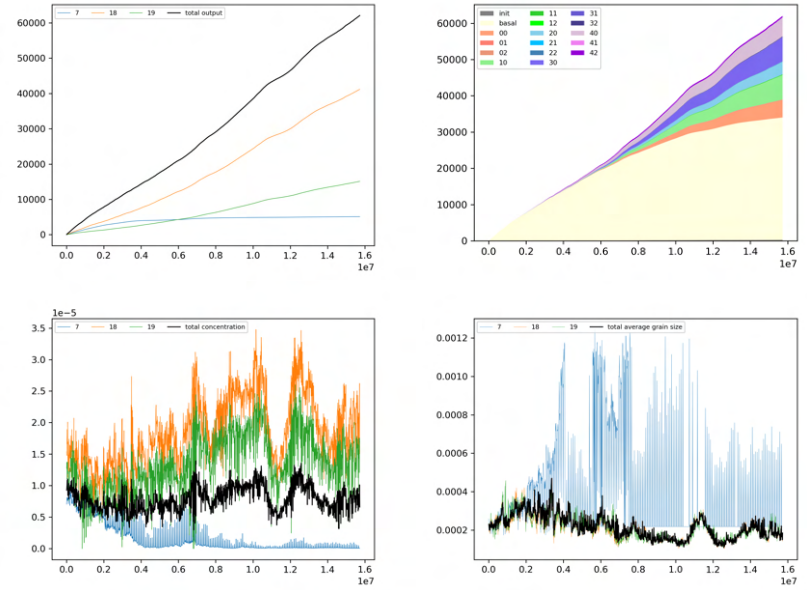


Figure S51. Outputs from the A7D default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.16 A8 reference

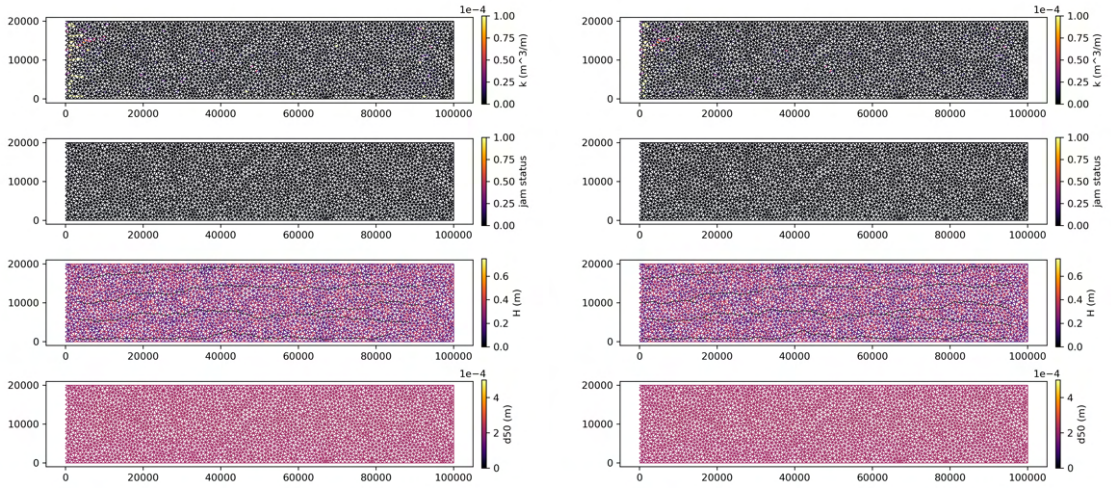


Figure S52. Results for the A8 reference model run at a) week 0 and b) week 25

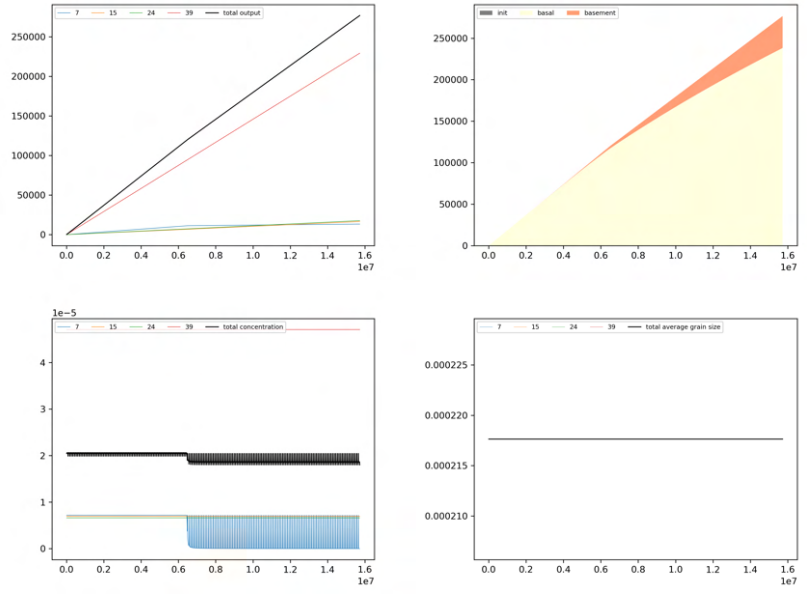


Figure S53. Outputs from the A8 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.17 A8 default

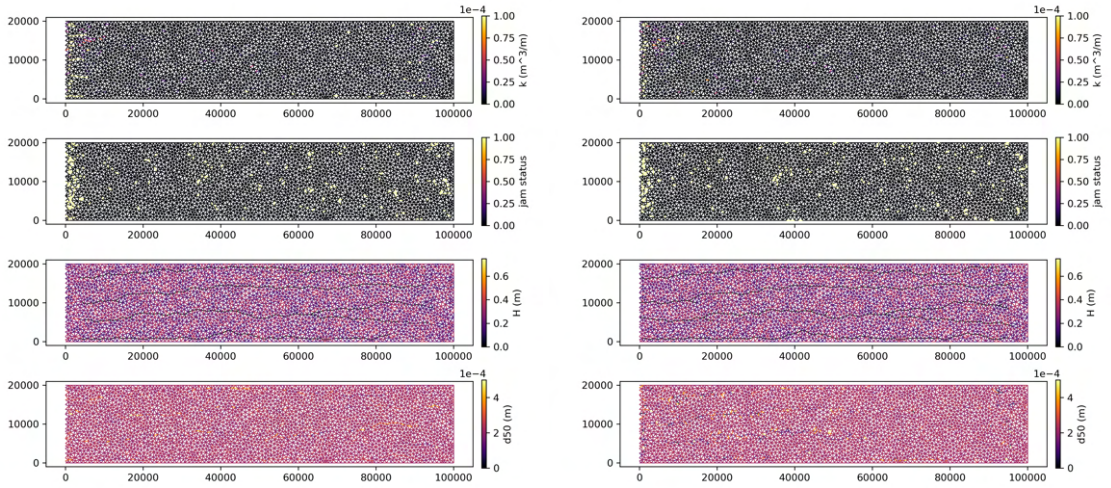


Figure S54. Results for the A8 default model run at a) week 0 and b) week 25

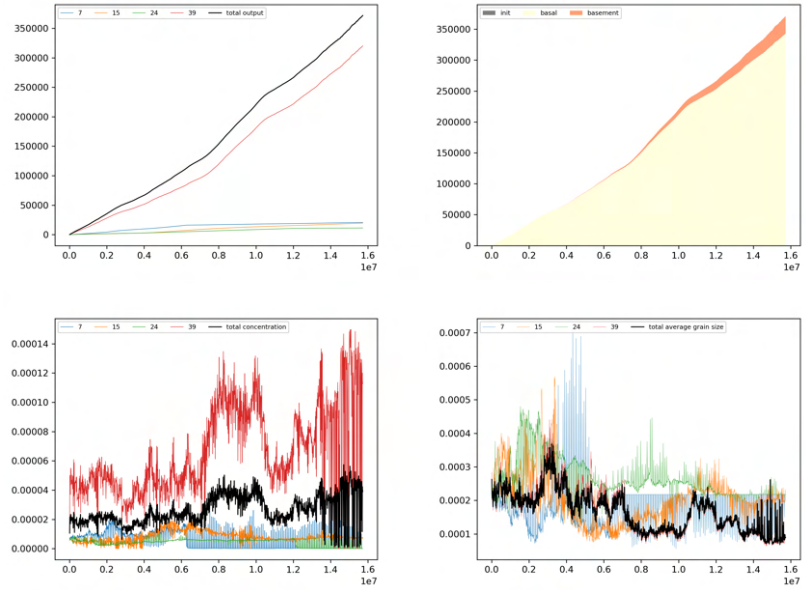


Figure S55. Outputs from the A8 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.18 A8 default rerun

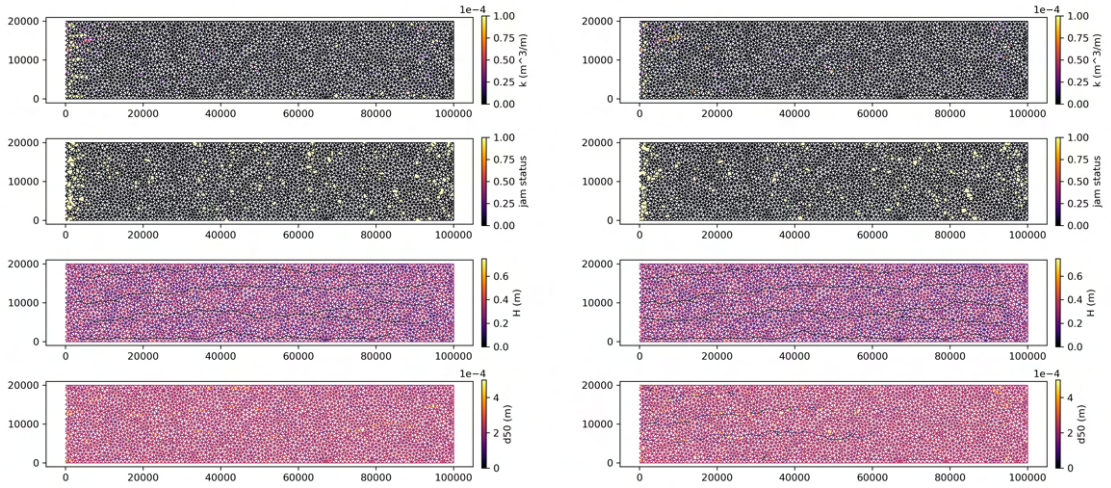


Figure S56. Results for the A8 default model rerun at a) week 0 and b) week 25

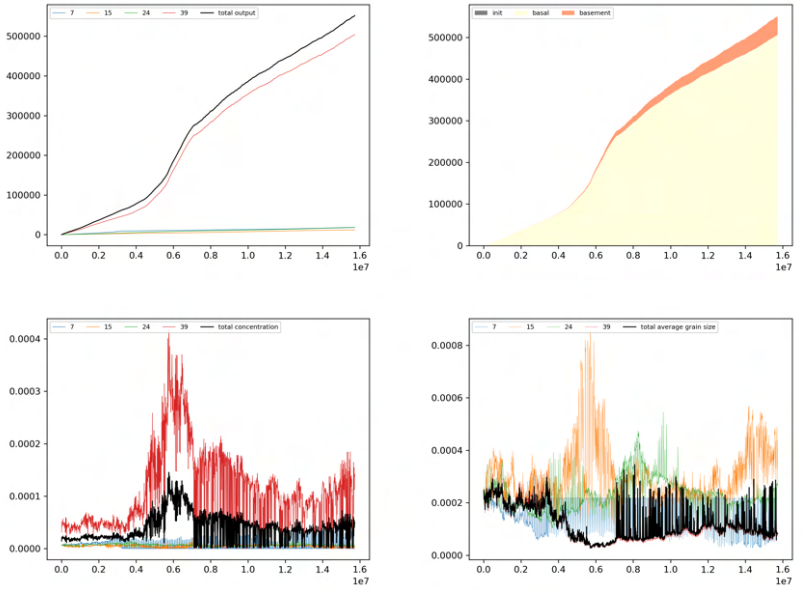


Figure S57. Outputs from the A8 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.19 A8D default

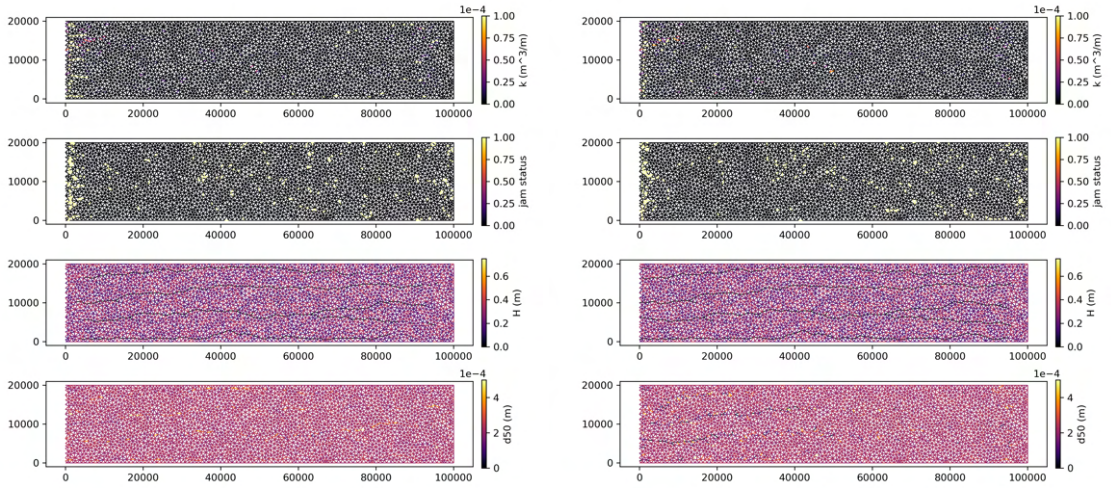


Figure S58. Results for the A8D default model run at a) week 0 and b) week 25

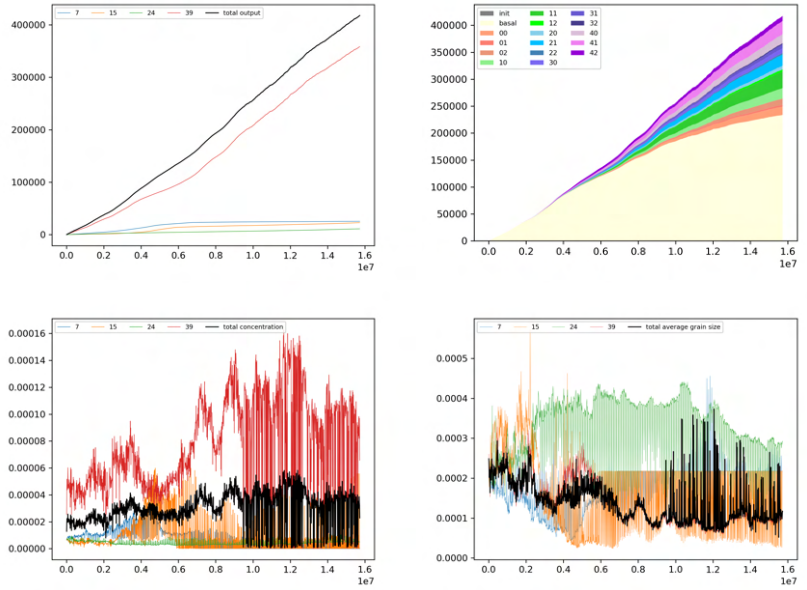


Figure S59. Outputs from the A8D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.20 A8D default rerun

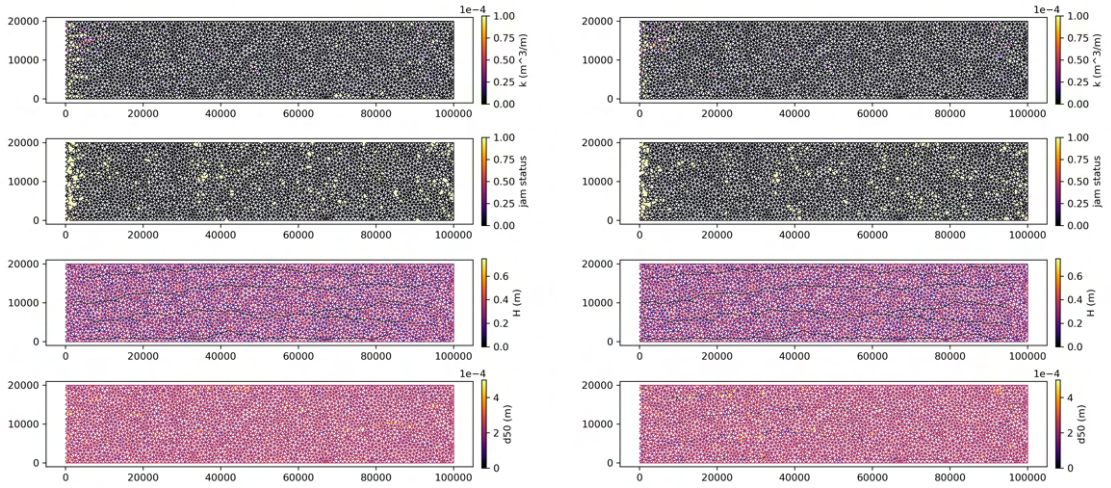


Figure S60. Results for the A8D default model rerun at a) week 0 and b) week 25

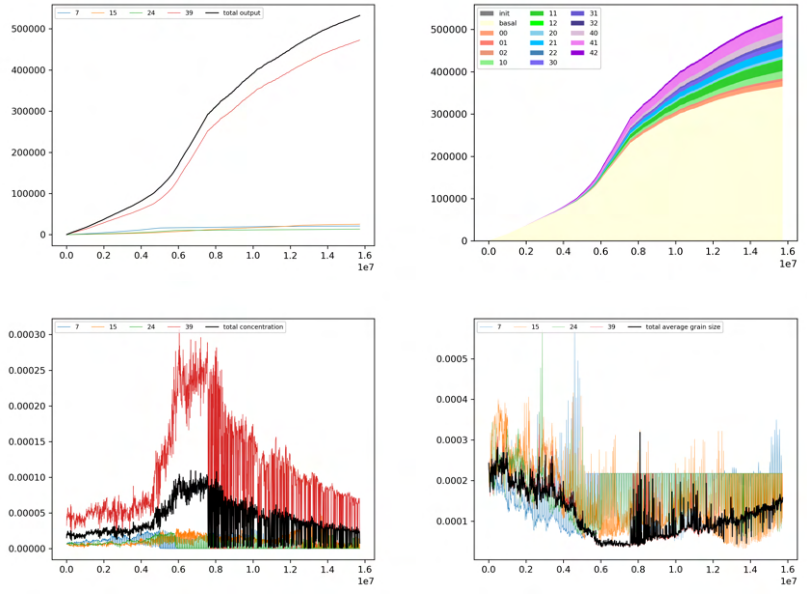


Figure S61. Outputs from the A8D default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.21 A6 reference

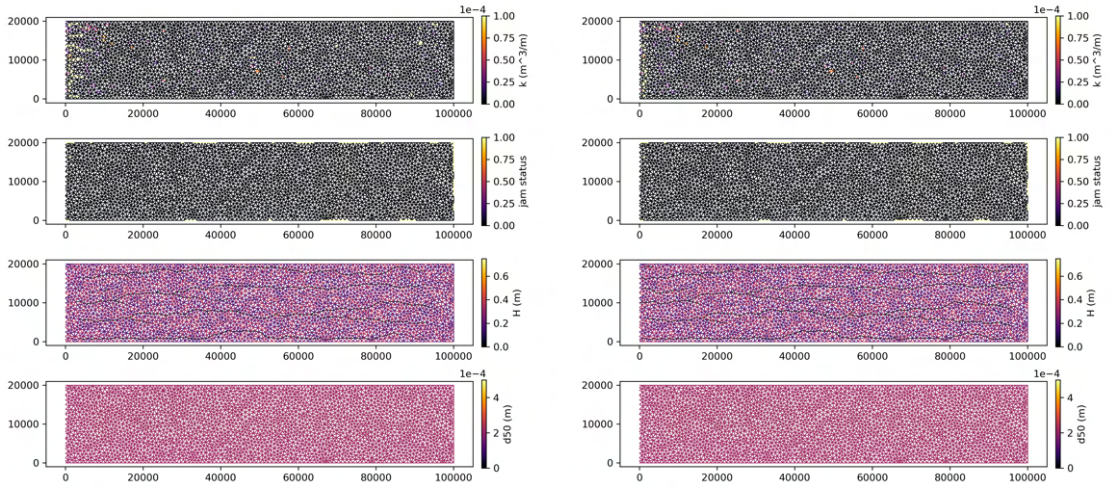


Figure S62. Results for the A6 reference model run at a) week 0 and b) week 25

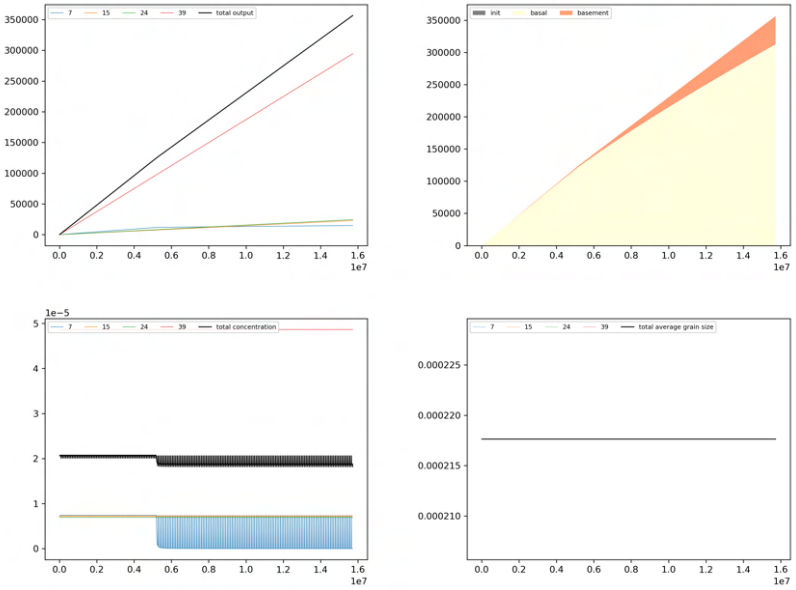


Figure S63. Outputs from the A6 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.22 A6 default

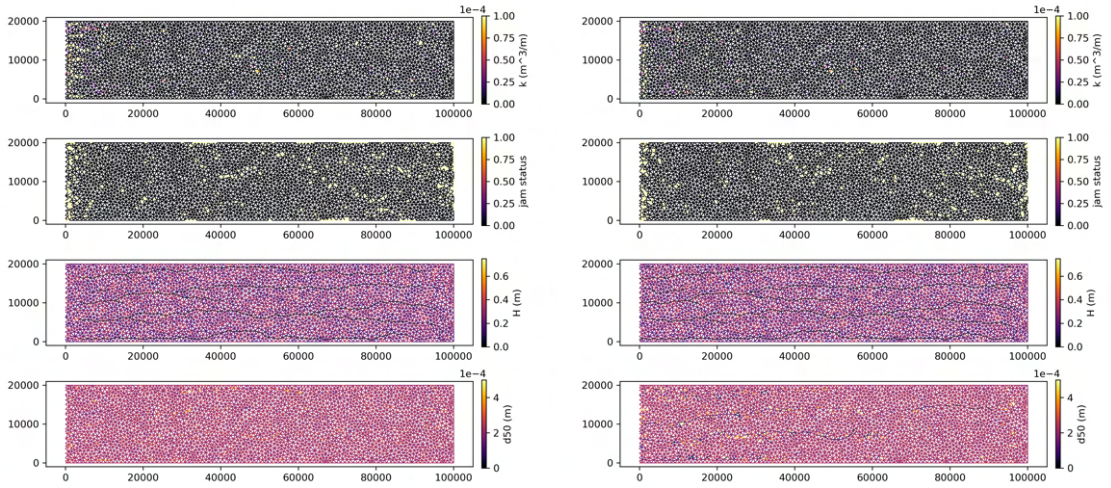


Figure S64. Results for the A6 default model run at a) week 0 and b) week 25

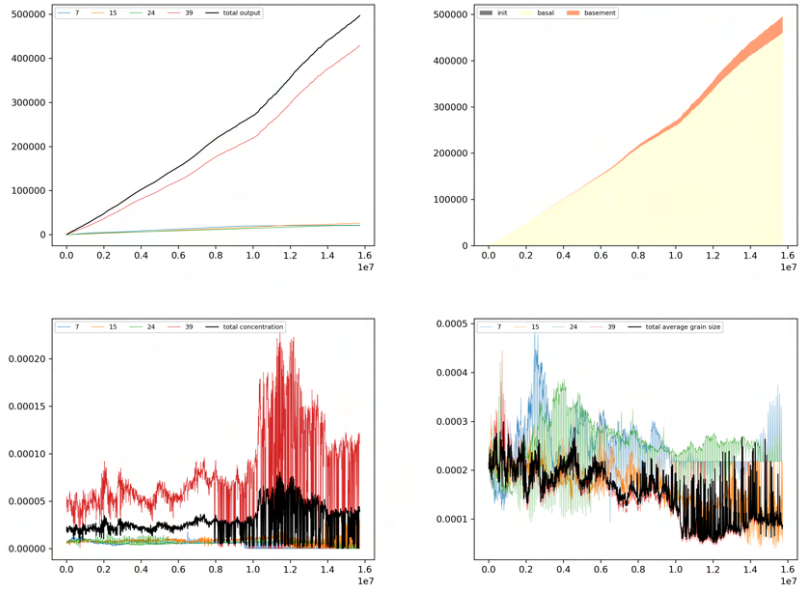


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Figure S65. Outputs from the A6 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.23 A6 default rerun

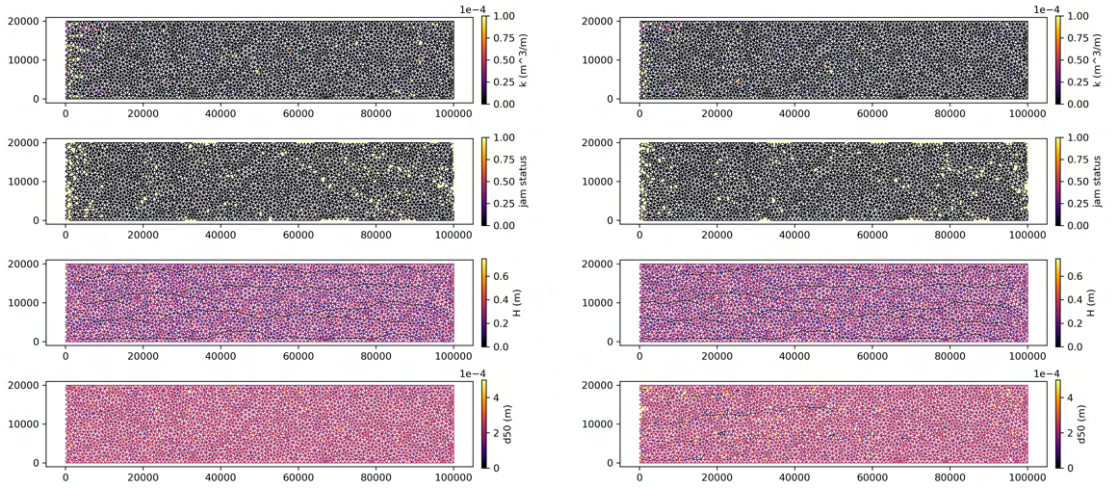

Figure S66. Results for the A6 default model rerun at a) week 0 and b) week 25

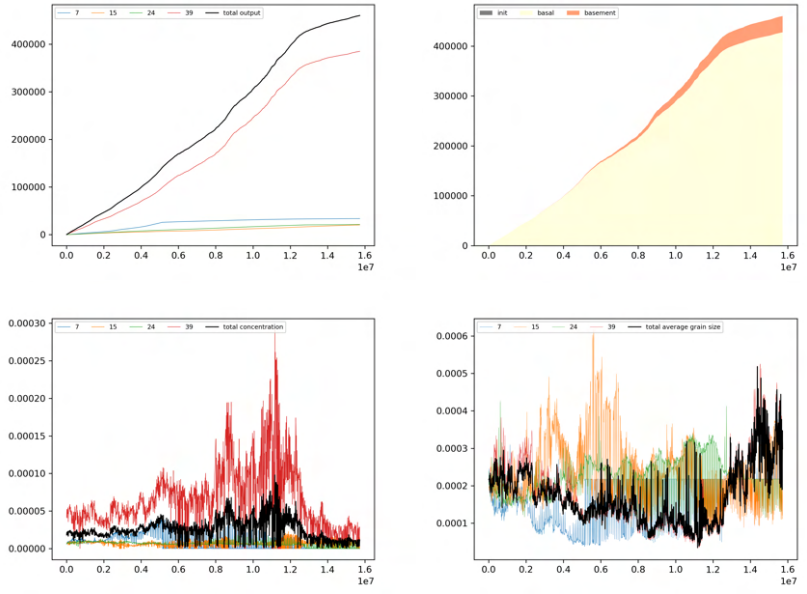

Figure S67. Outputs from the A6 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.24 A6D default

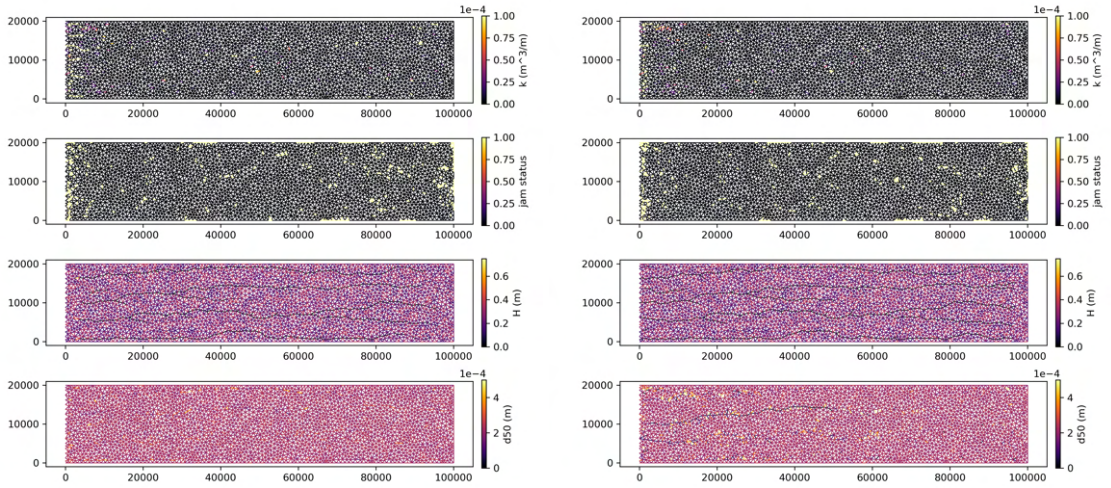

Figure S68. Results for the A6D default model run at a) week 0 and b) week 25

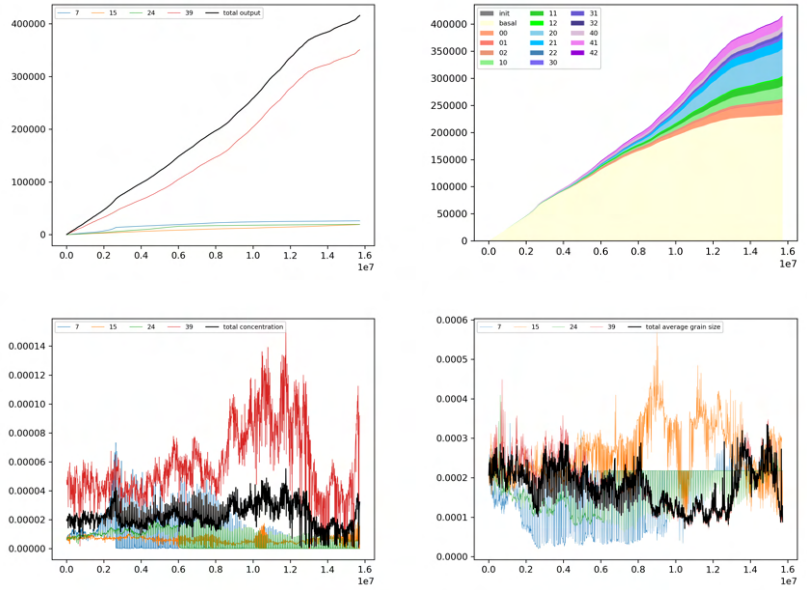

Figure S69. Outputs from the A6D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.1.25 A6D default rerun

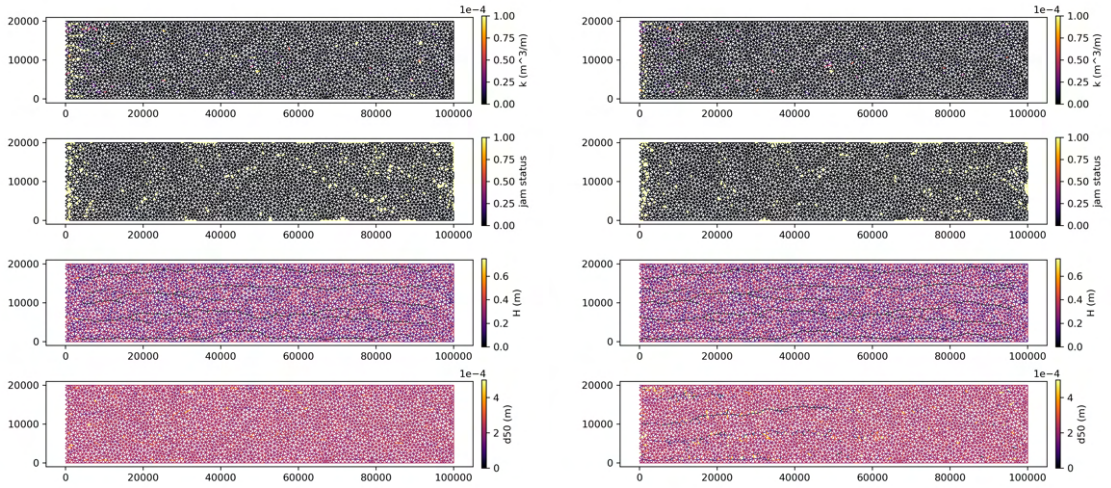

Figure S70. Results for the A6D default model rerun at a) week 0 and b) week 25

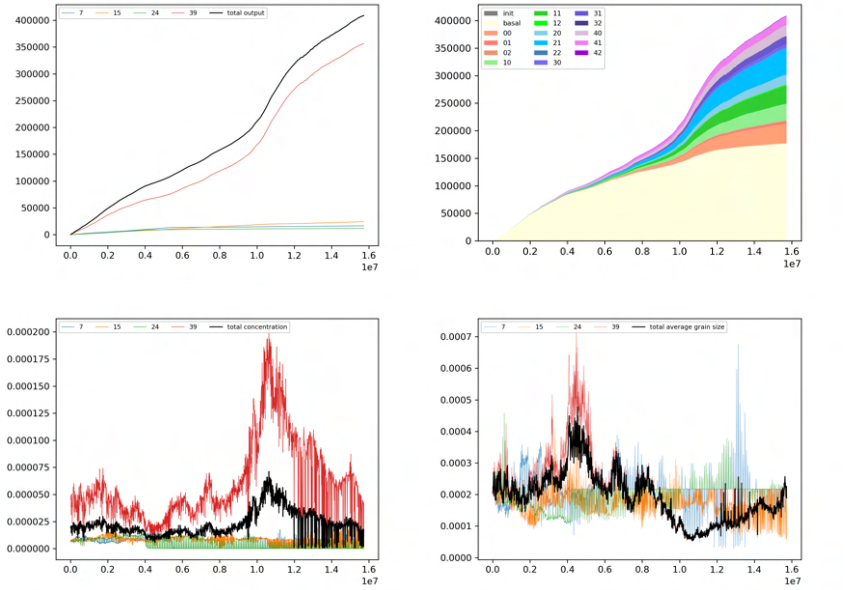

Figure S71. Outputs from the A6D default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2 Experiment Set 2

2.2.1 $\phi = 3.2$

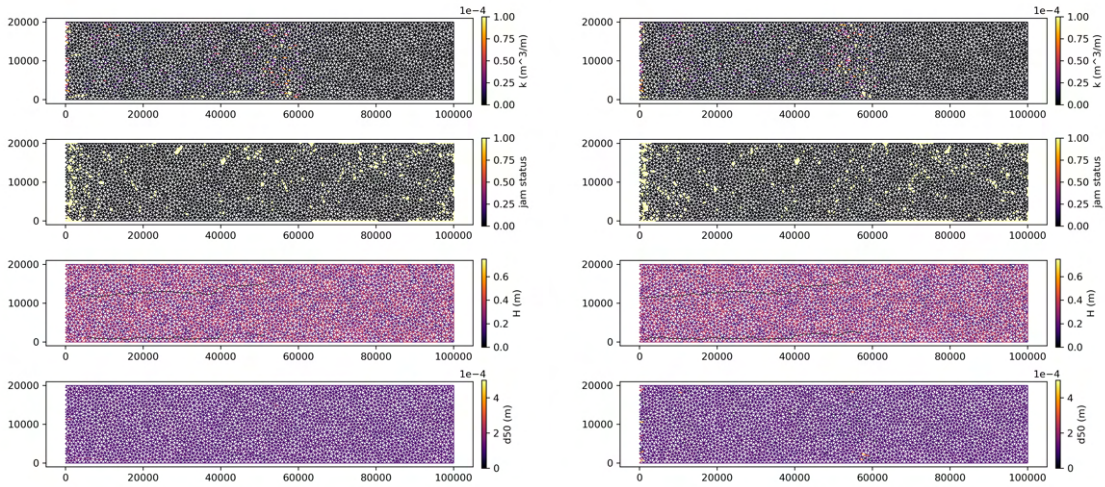

Figure S72. Results for the $\phi = 3.2$ model run at a) week 0 and b) week 25

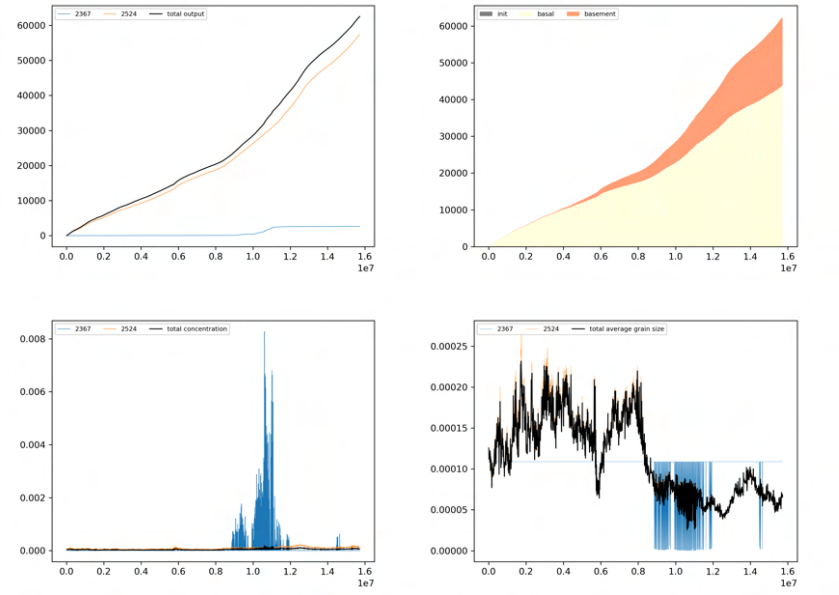

Figure S73. Outputs from the $\phi = 3.2$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize.In a, c and d numbers indicate outlet node IDs

2.2.2 $\phi = 1.2$

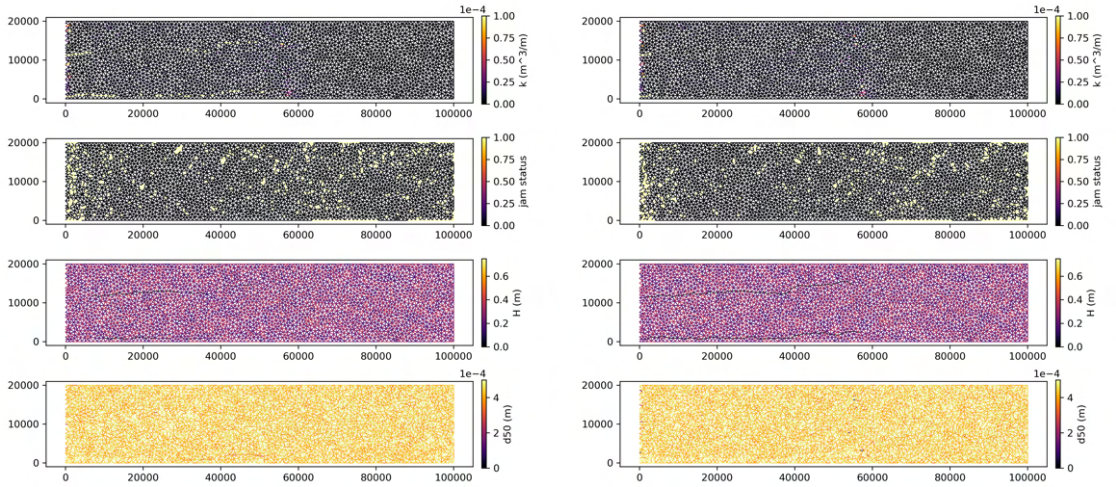

Figure S74. Results for the $\phi = 1.2$ model run at a) week 0 and b) week 25

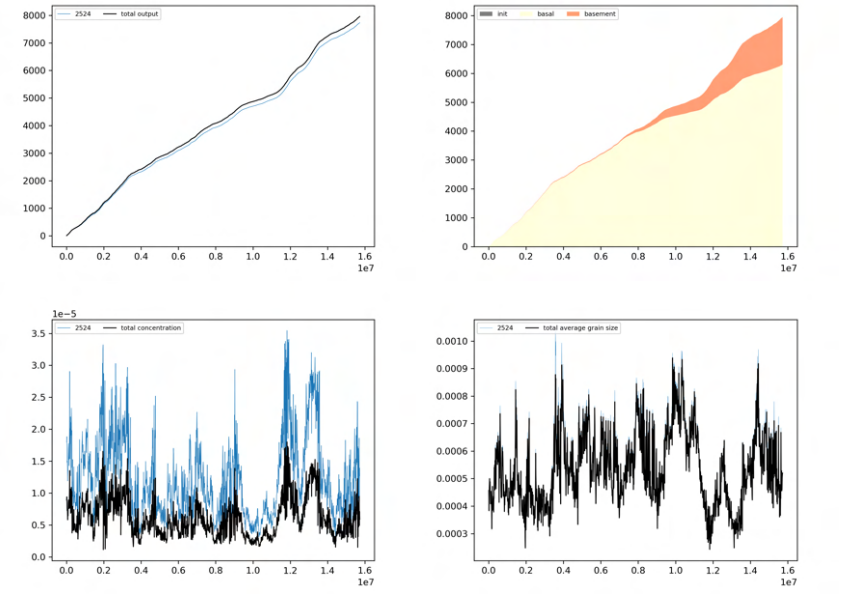

Figure S75. Outputs from the $\phi = 1.2$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize.In a, c and d numbers indicate outlet node IDs

2.2.3 $\varsigma = 1$

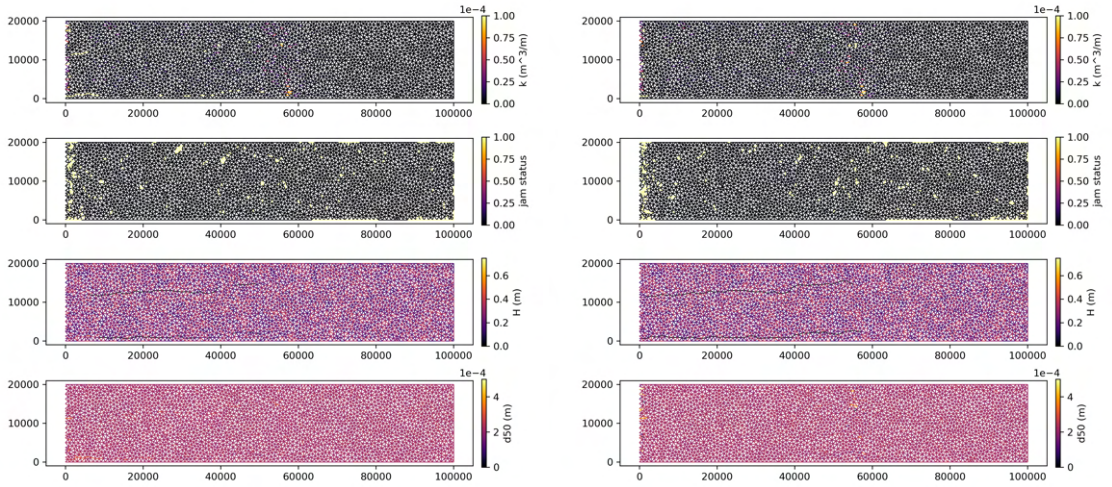

Figure S76. Results for the $\varsigma = 1$ model run at a) week 0 and b) week 25

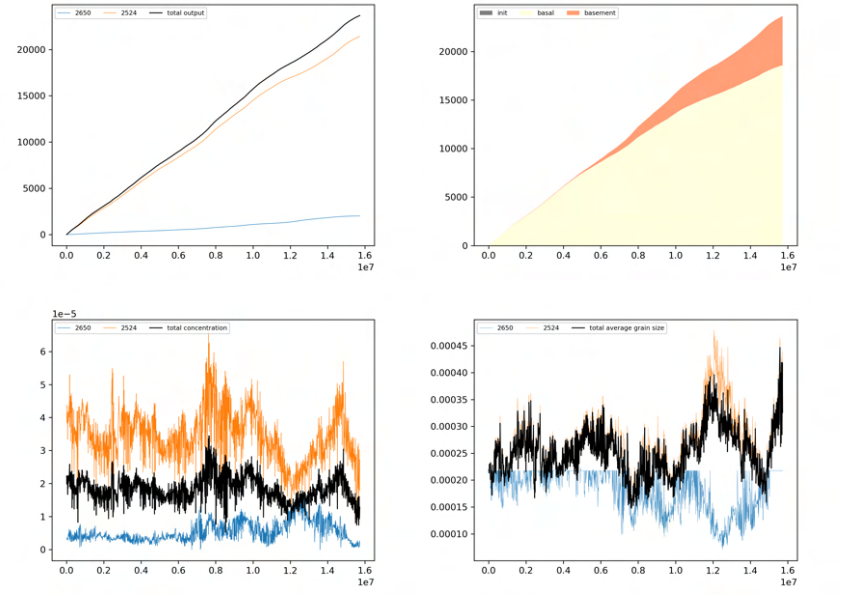

Figure S77. Outputs from the $\varsigma = 1$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize.In a, c and d numbers indicate outlet node IDs

2.2.4 $\varsigma = 2$

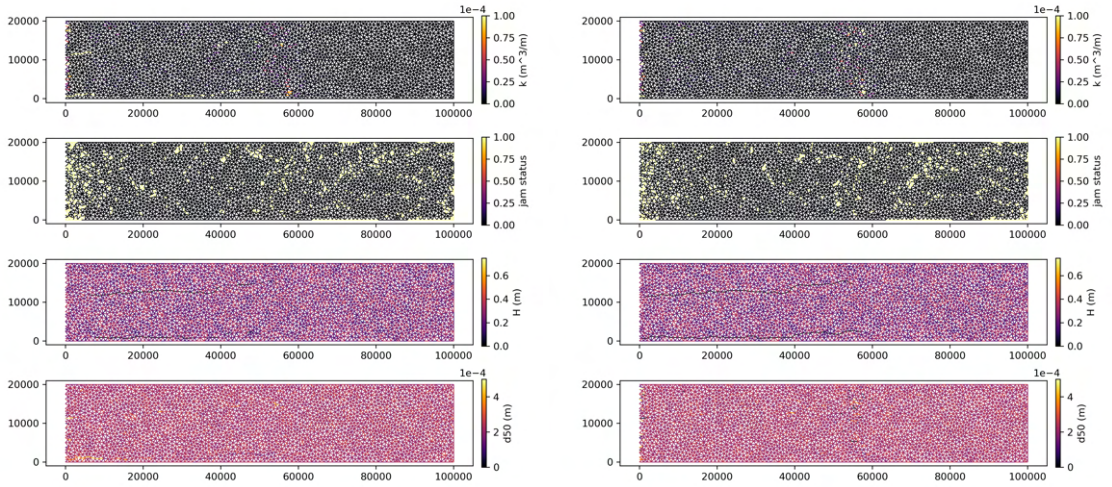

Figure S78. Results for the $\varsigma = 2$ model run at a) week 0 and b) week 25

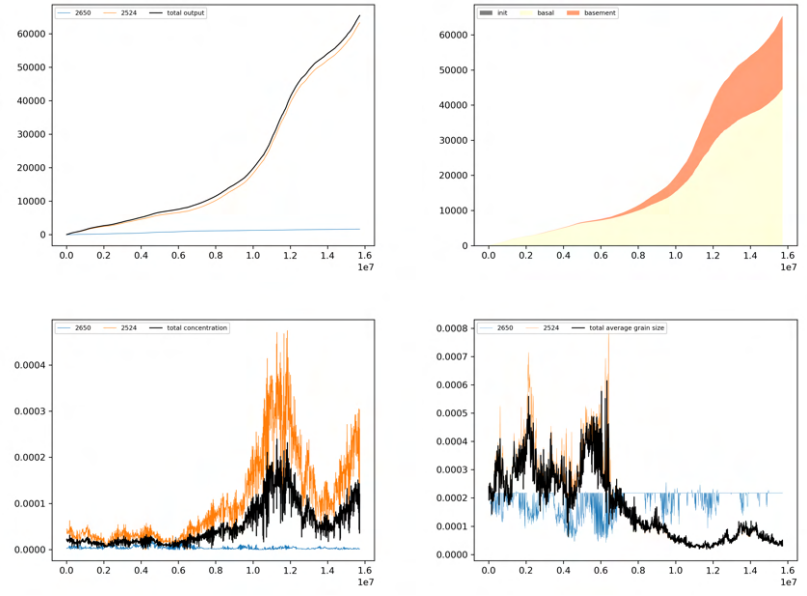

Figure S79. Outputs from the $\varsigma = 2$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.5 $\rho_s = 2550$

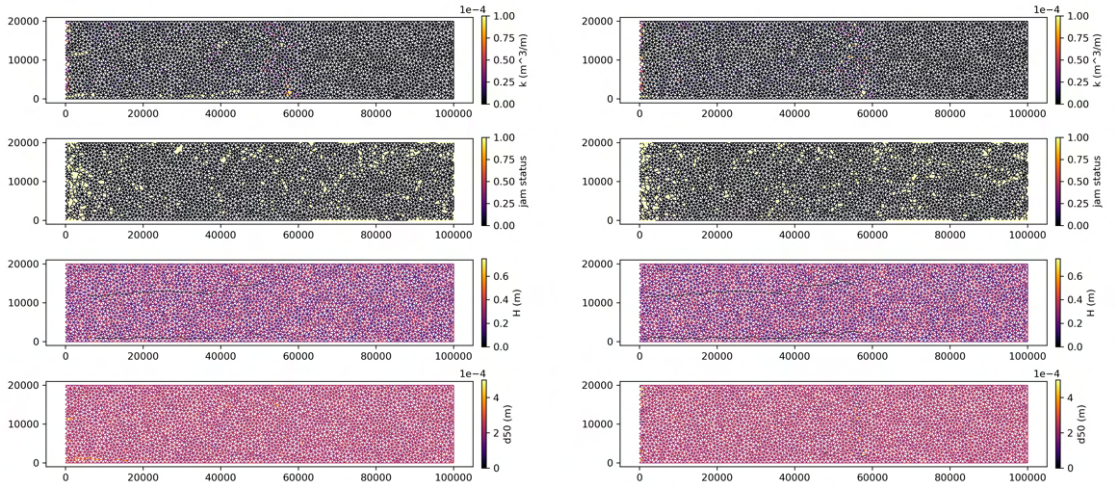

Figure S80. Results for the low grain density model run at a) week 0 and b) week 25

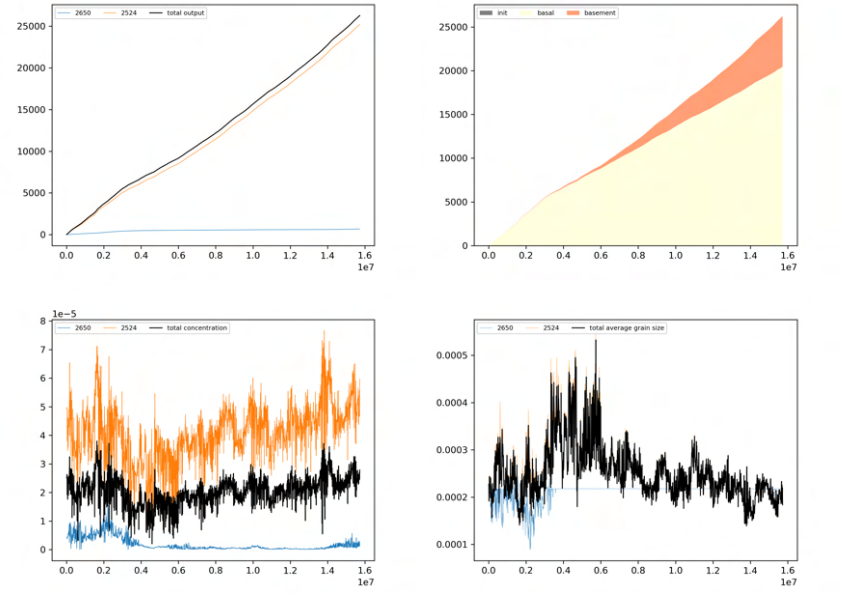

Figure S81. Outputs from the low grain density model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.6 $\rho_s = 2750$

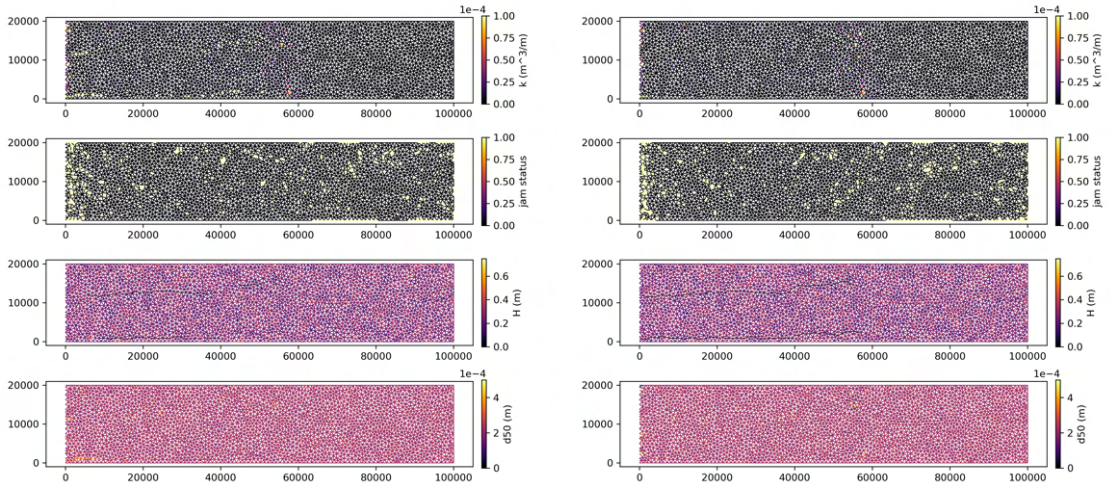

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Figure S82. Results for the high grain density model run at a) week 0 and b) week 25

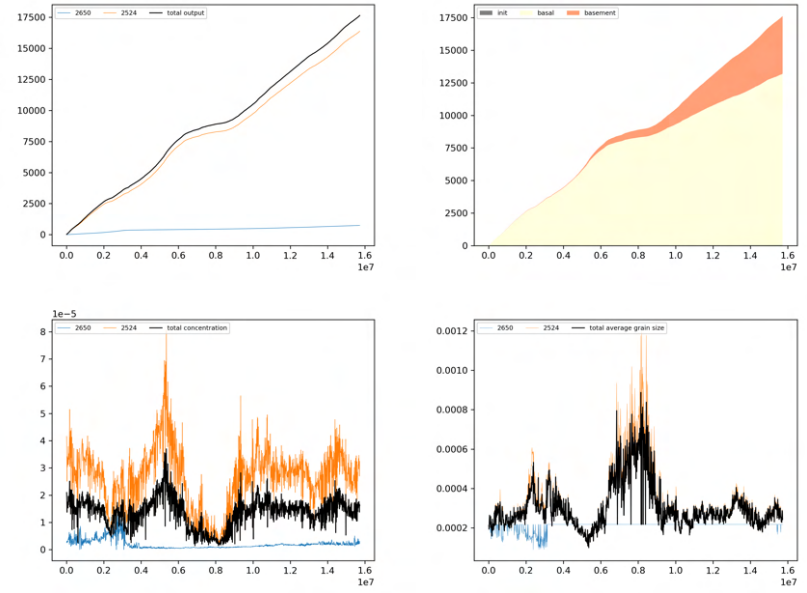


Figure S83. Outputs from the high grain density model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.7 $h_s = 0.05$

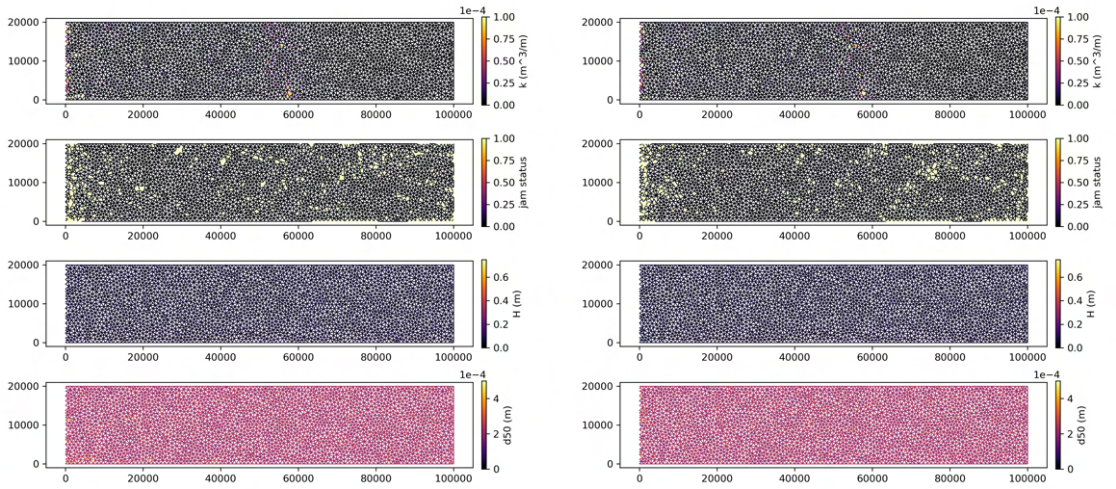


Figure S84. Results for the low sediment thickness model run at a) week 0 and b) week 25

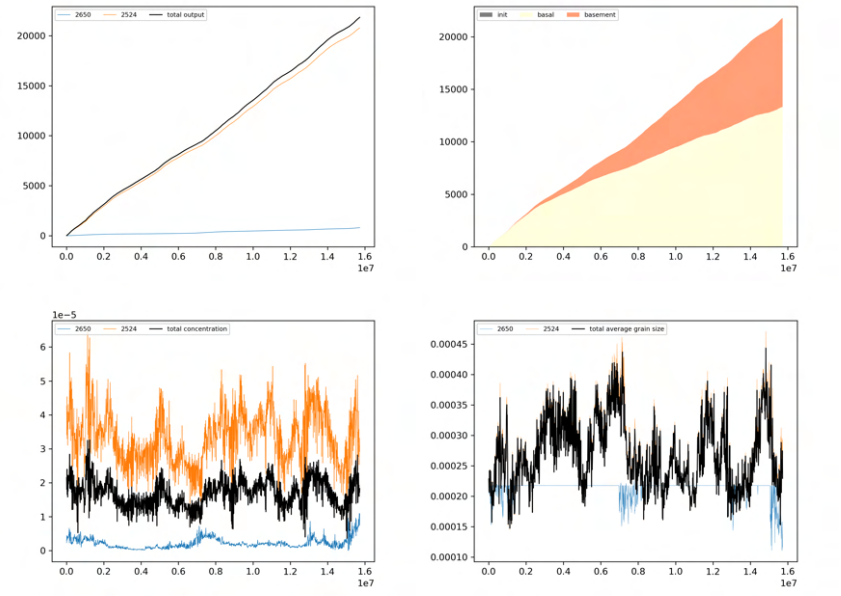


Figure S85. Outputs from the low sediment thickness model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.8 $h_s = 0.5$

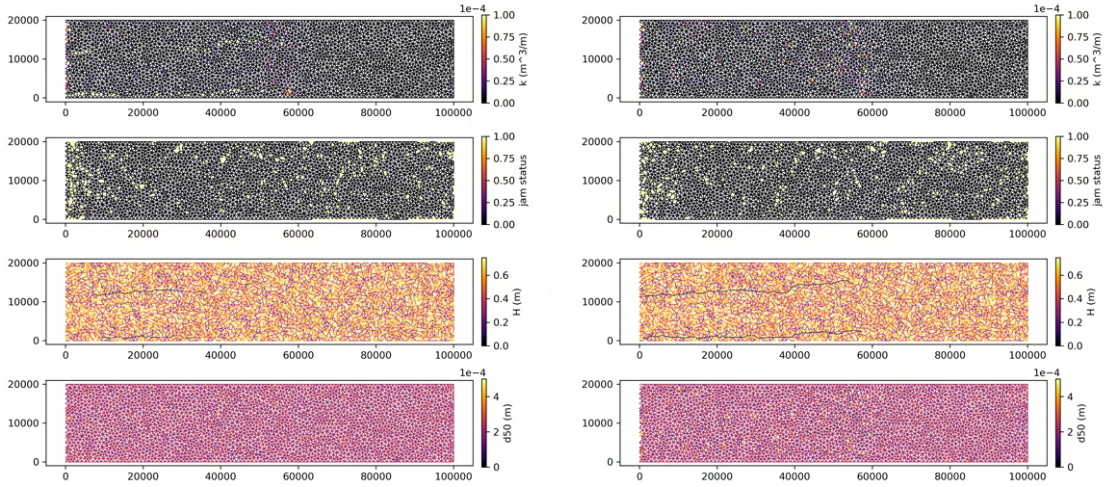


Figure S86. Results for the high sediment thickness model run at a) week 0 and b) week 25

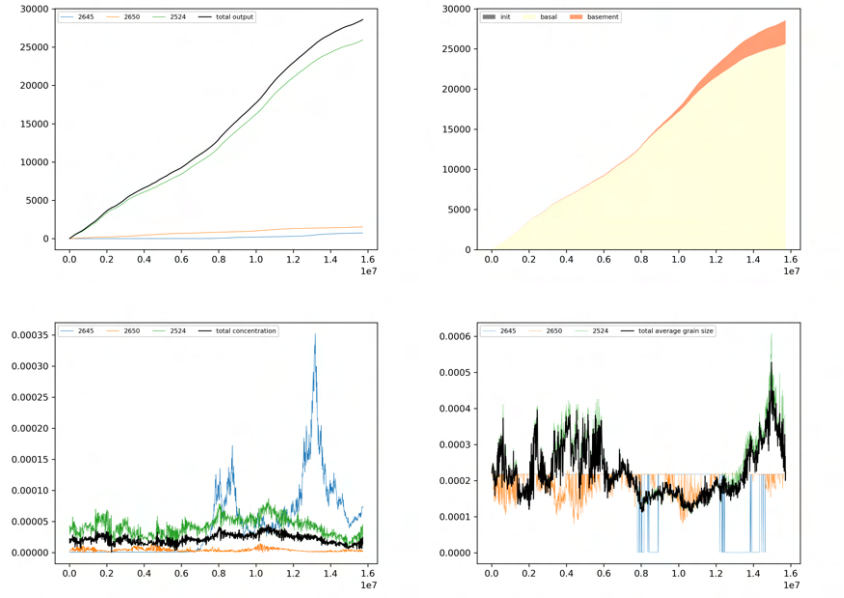


Figure S87. Outputs from the high sediment thickness model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.9 $\Delta\sigma = 0.005$

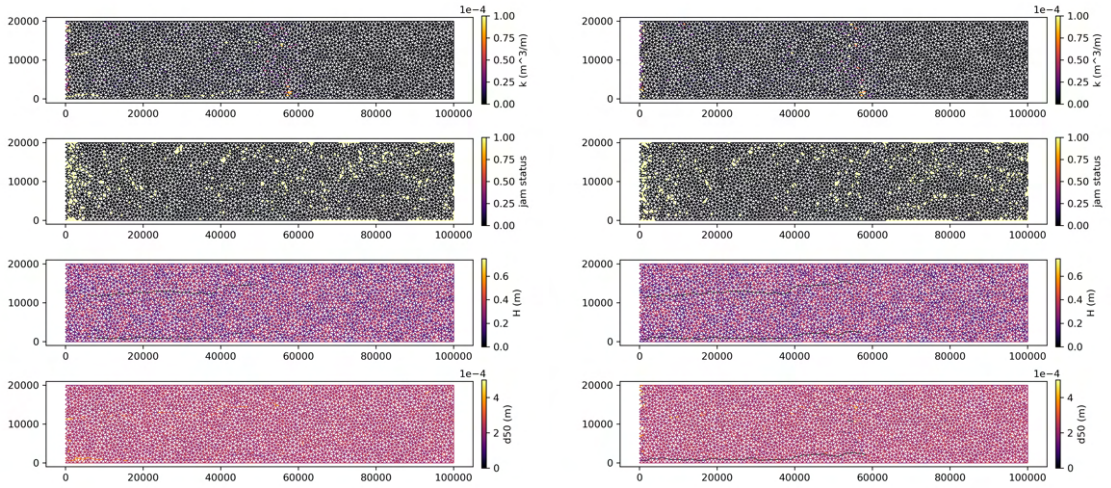


Figure S88. Results for the $\Delta\sigma = 0.005$ model run at a) week 0 and b) week 25

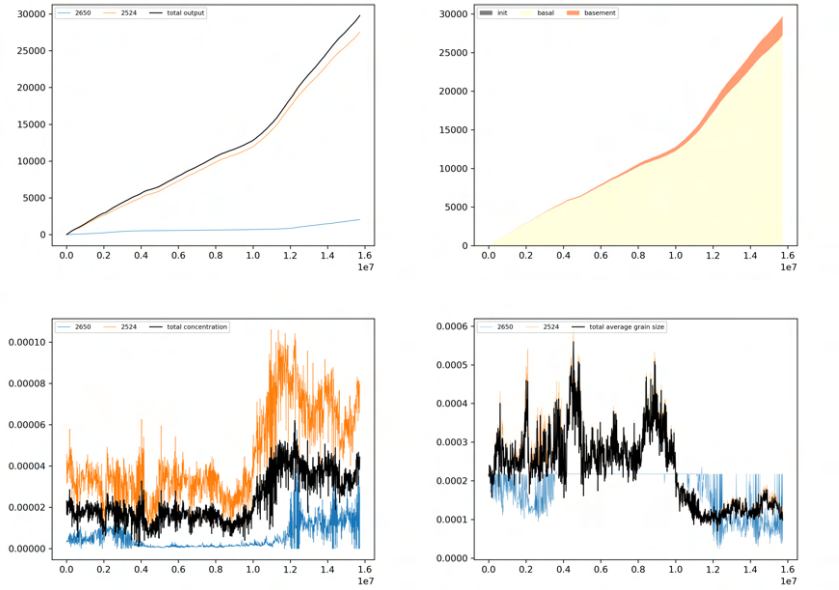


Figure S89. Outputs from the $\Delta\sigma = 0.005$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.10 $\Delta\sigma = 0.01$

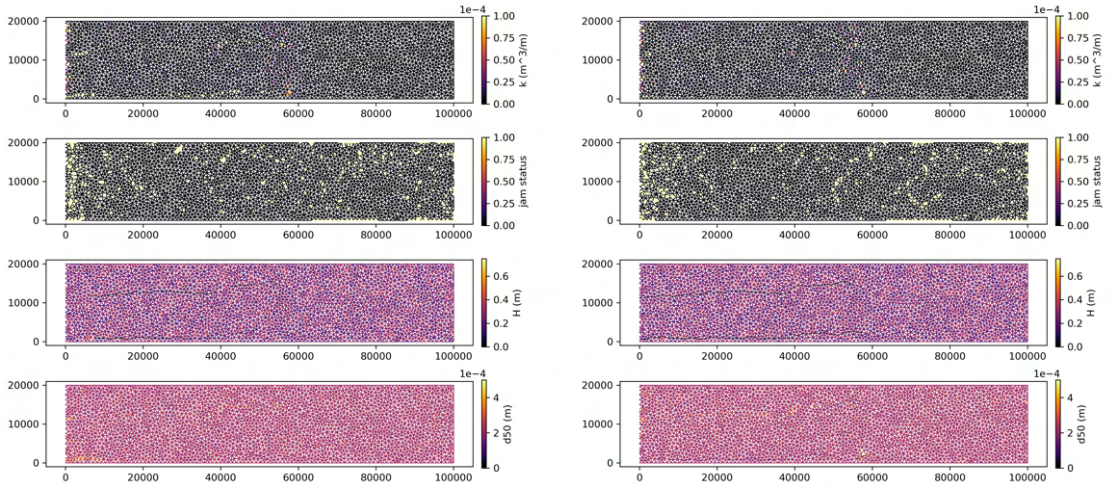


Figure S90. Results for the $\Delta\sigma = 100$ model run at a) week 0 and b) week 25

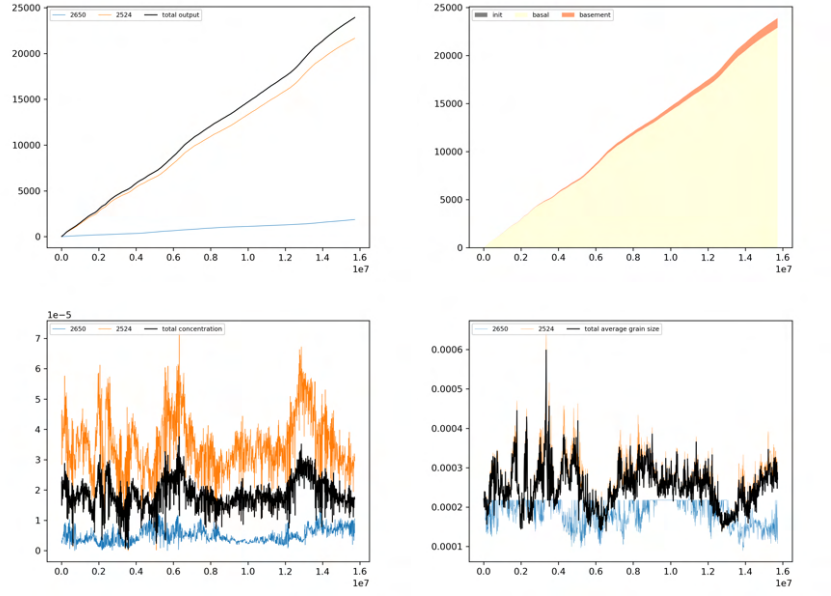
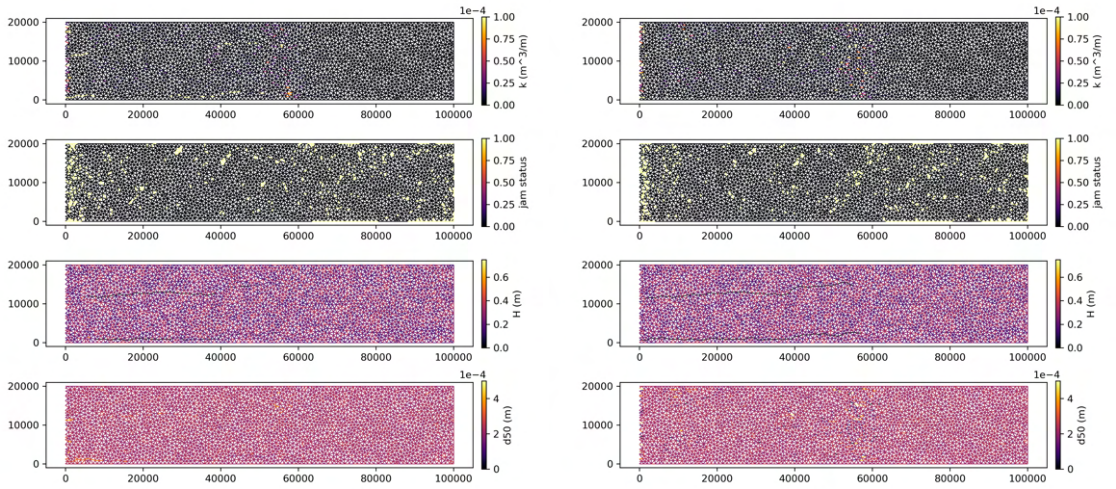


Figure S91. Outputs from the $\Delta\sigma = 0.01$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.11 Erosion scaling $\dot{e} = 1e^{-7}u_b^{2.02}$



215

Figure S92. Results for the $\dot{e} = 1e^{-7}u_b^{2.02}$ model run at a) week 0 and b) week 25

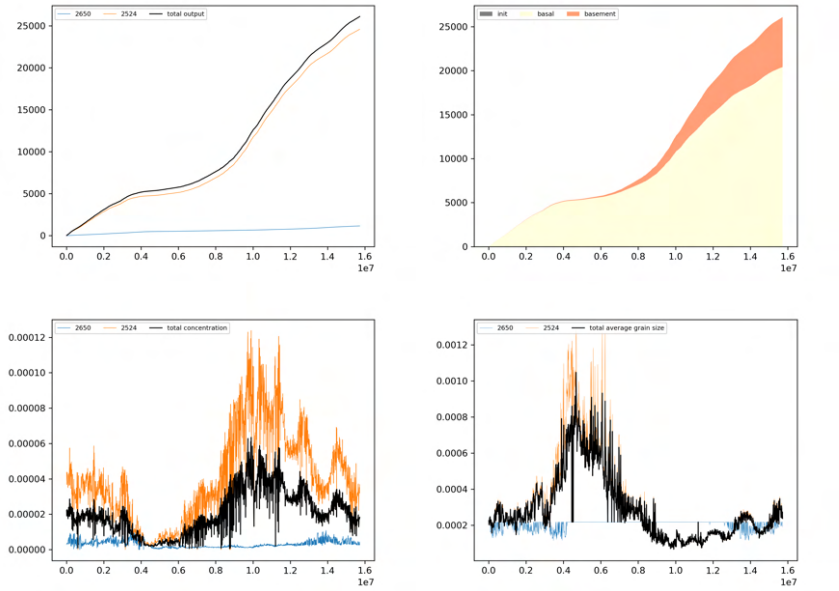


Figure S93. Outputs from the $\dot{e} = 1e^{-7}u_b^{2.02}$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.12 Erosion scaling $\dot{e} = 1e^{-4}u_b$

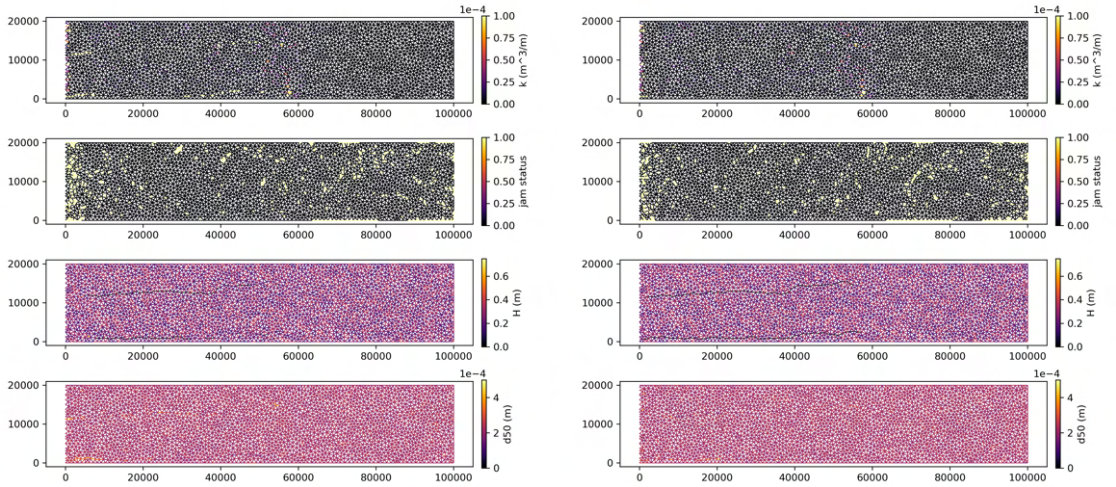


Figure S94. Results for the $\dot{e} = 1e^{-4}u_b$ model run at a) week 0 and b) week 25

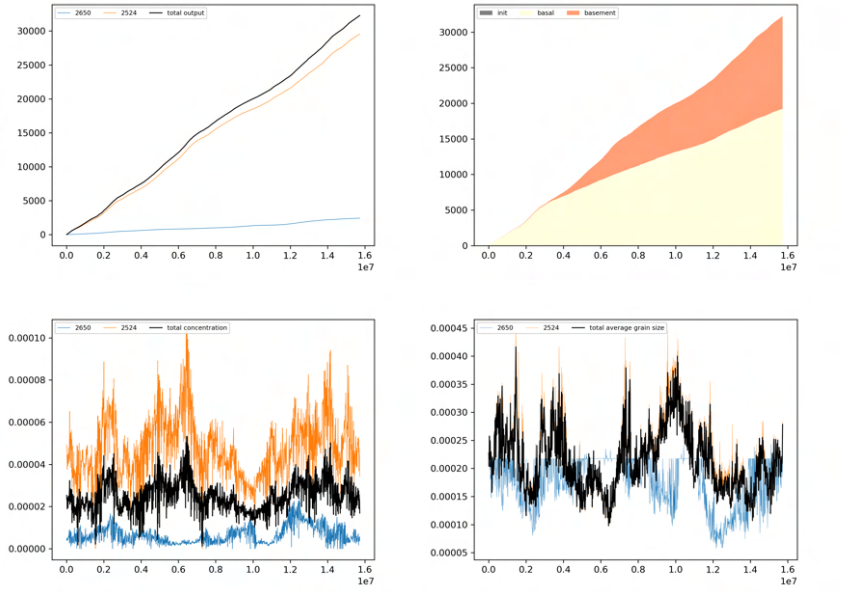


Figure S95. Outputs from the $\dot{e} = 1e^{-4}u_b$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.2.13 Erosion scaling $\dot{e} = 2e^{-4}u_b$

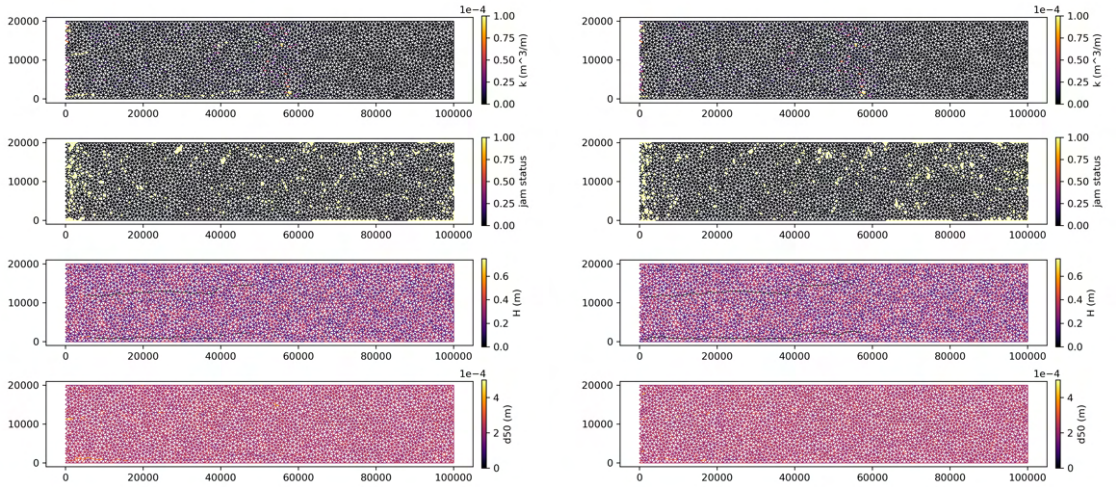


Figure S96. Results for the $\dot{e} = 2e^{-4}u_b$ model run at a) week 0 and b) week 25

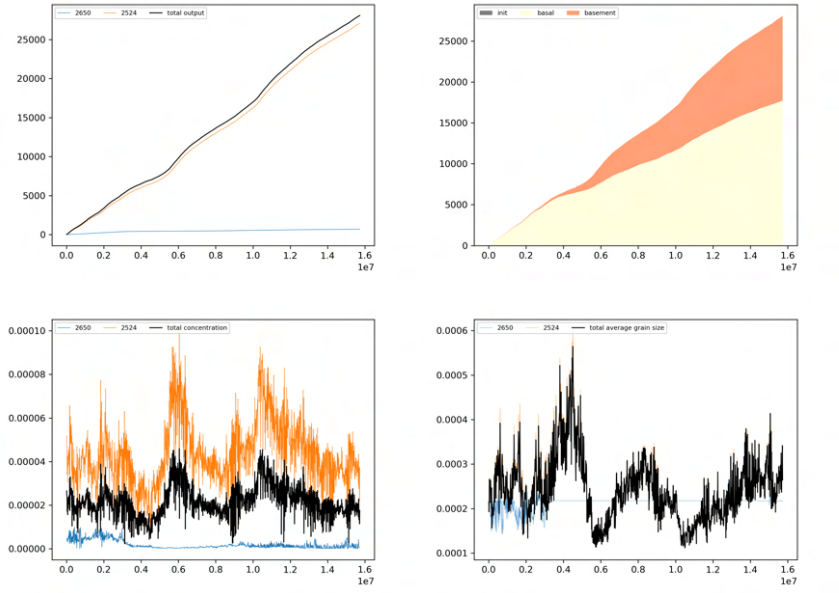


Figure S97. Outputs from the $\dot{e} = 2e^{-4}u_b$ model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3 Experiment Set 3

2.3.1 B1 reference

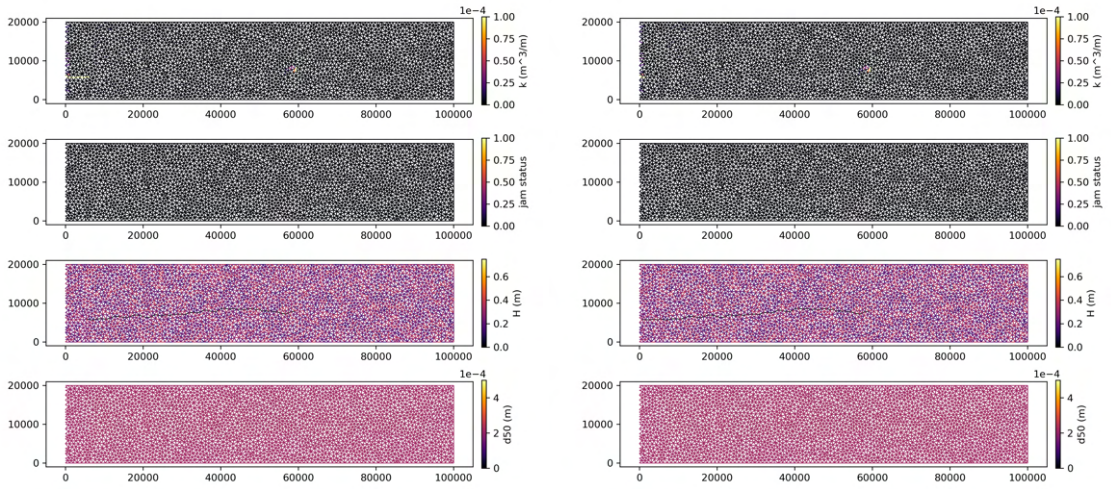


Figure S98. Results for the B1 reference model run at a) week 0 and b) week 25

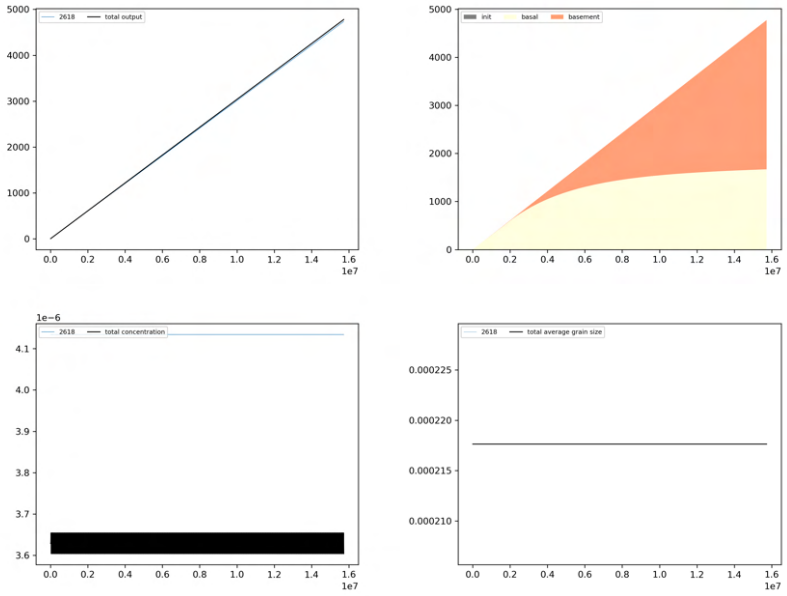


Figure S99. Outputs from the B1 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.2 B1 default

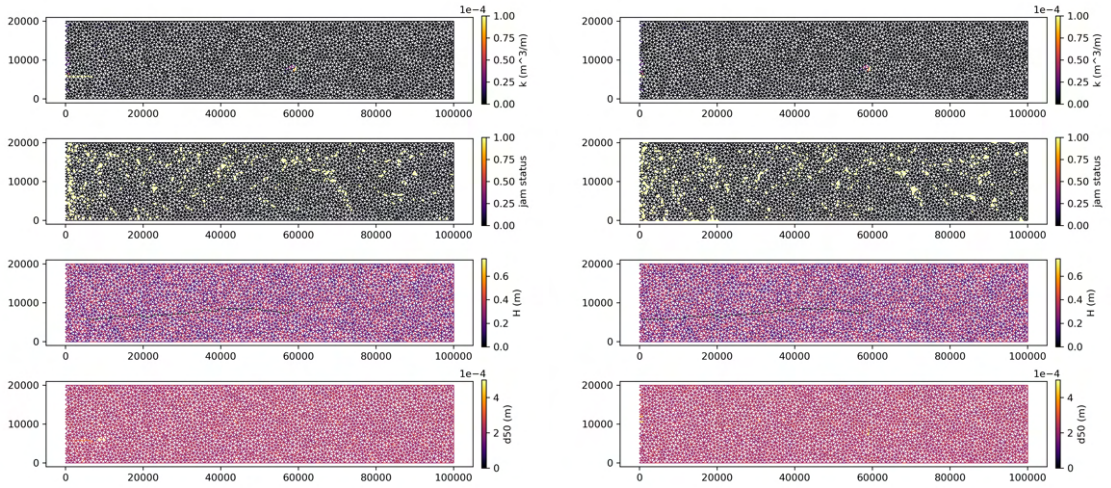


Figure S100. Results for the B1 default model run at a) week 0 and b) week 25

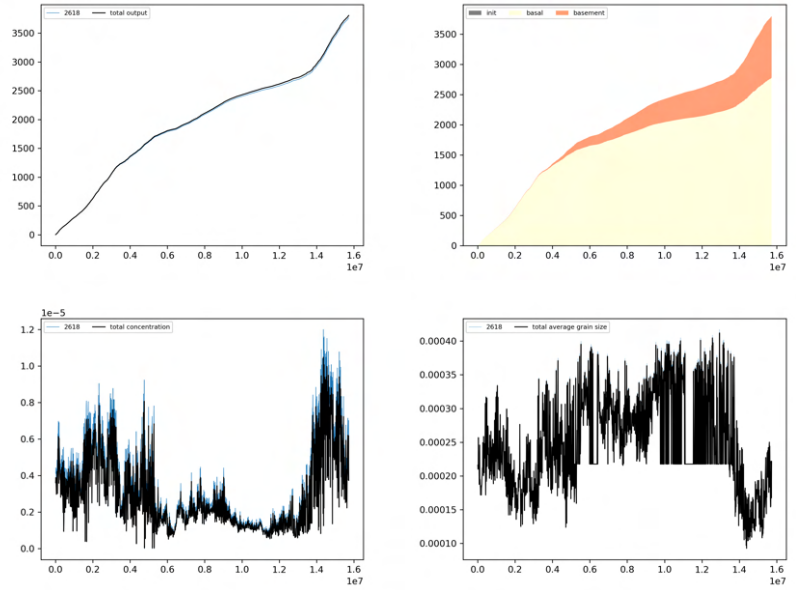


Figure S101. Outputs from the B1 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.3 B1 default rerun

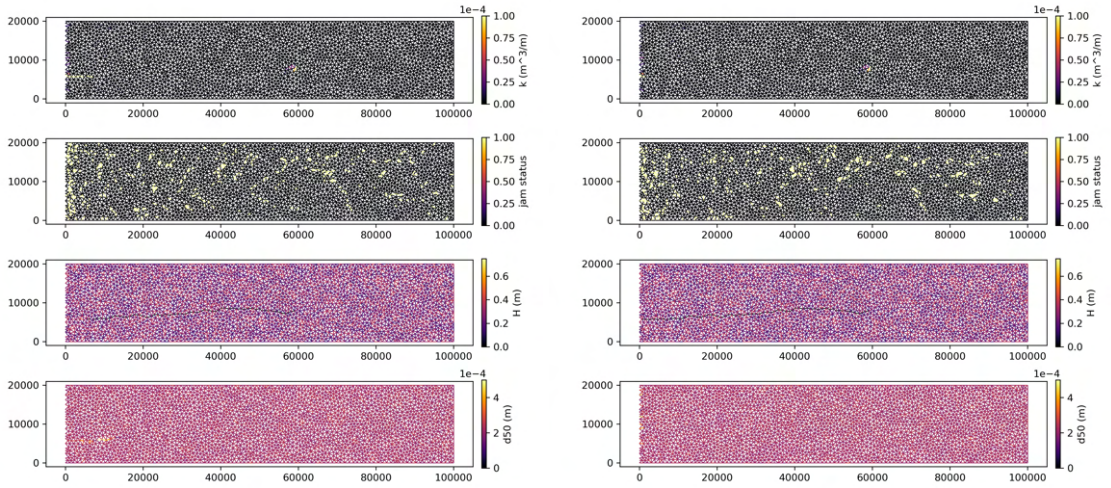


Figure S102. Results for the B1 default model rerun at a) week 0 and b) week 25

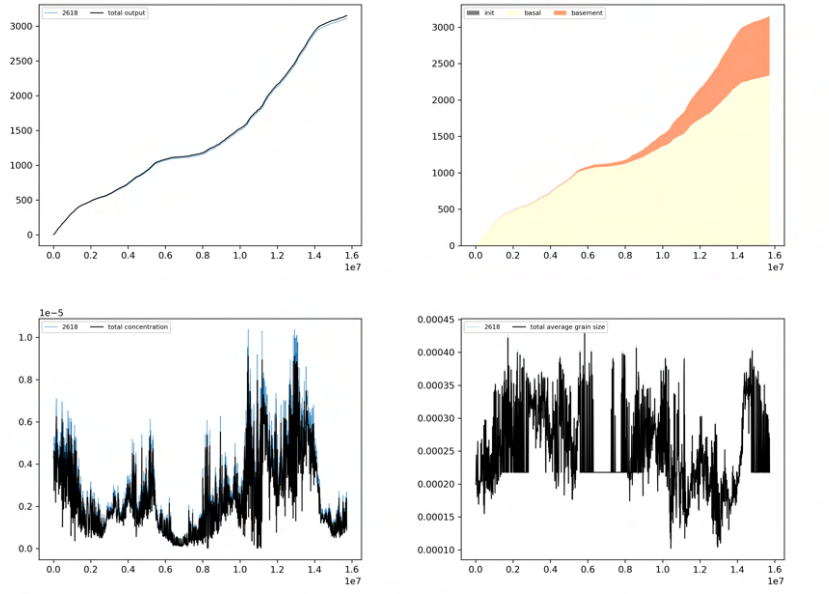
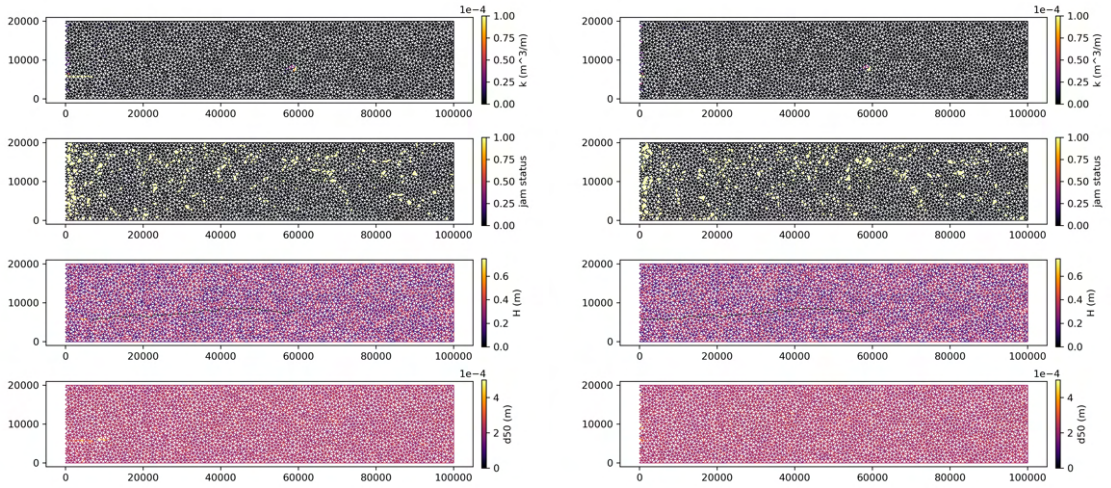


Figure S103. Outputs from the B1 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.4 B1D default



240

Figure S104. Results for the B1D default model run at a) week 0 and b) week 25

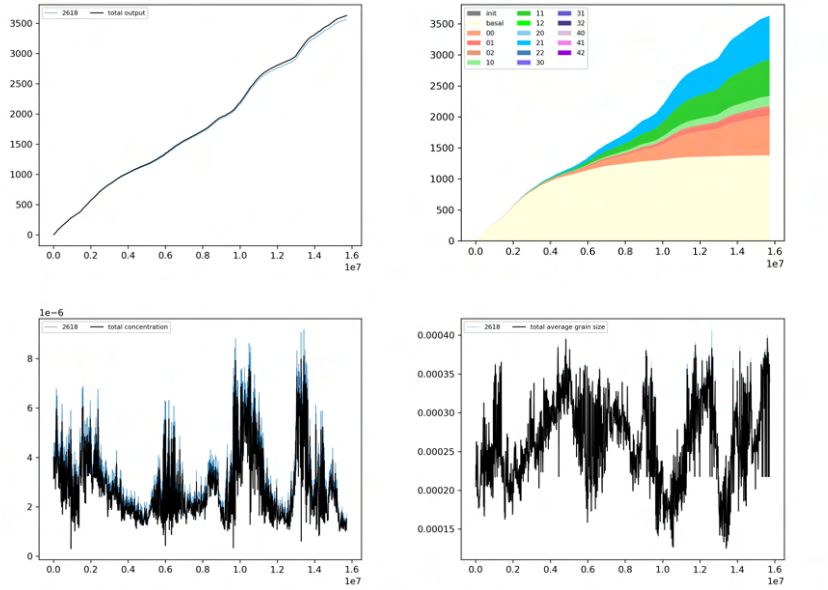


Figure S105. Outputs from the B1D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.5 B2 reference

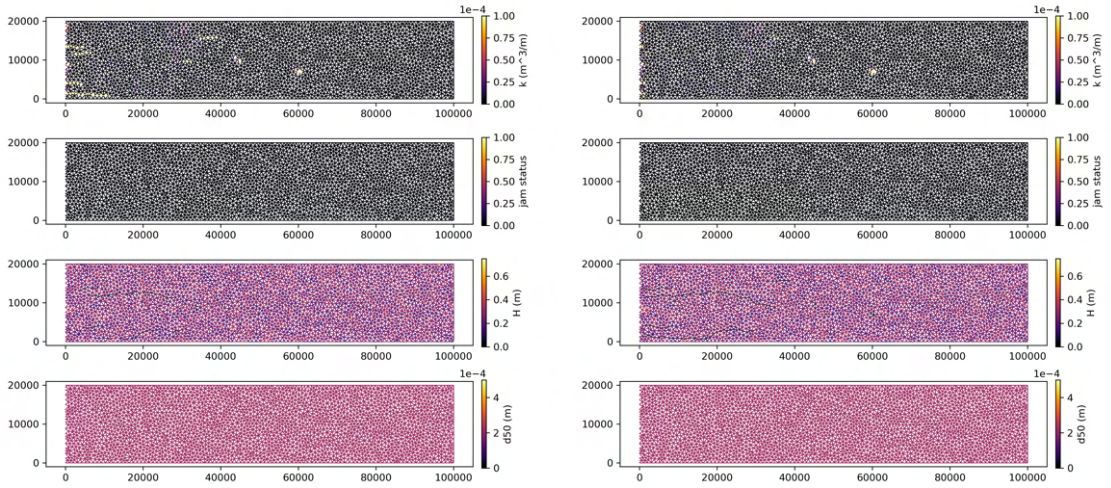


Figure S106. Results for the B2 reference model run at a) week 0 and b) week 25

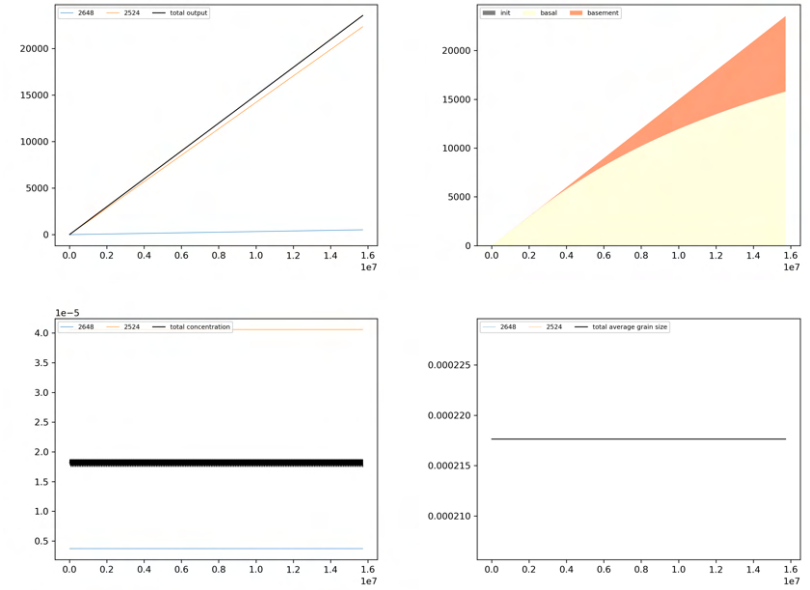


Figure S107. Outputs from the B2 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.6 B2 default

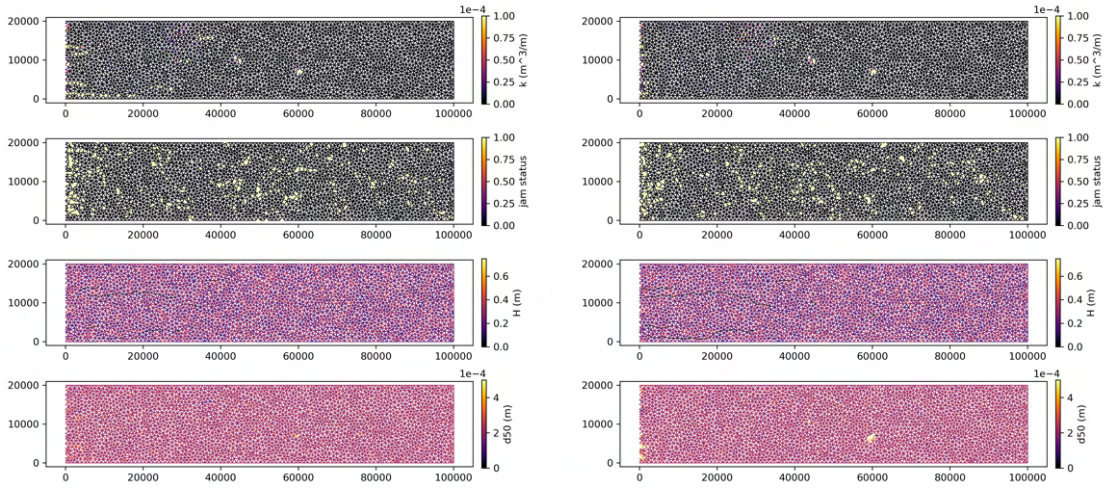


Figure S108. Results for the B2 default model run at a) week 0 and b) week 25

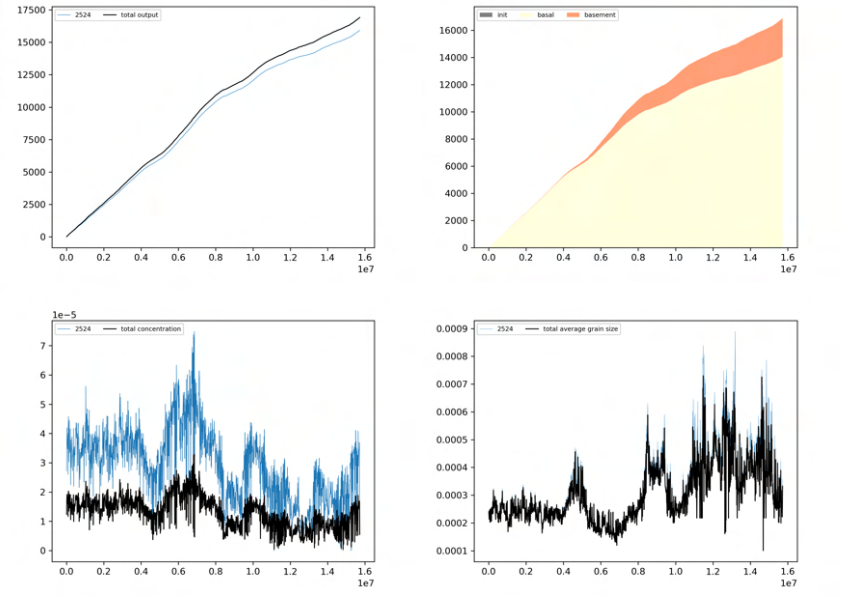


Figure S109. Outputs from the B2 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.7 B2 default rerun

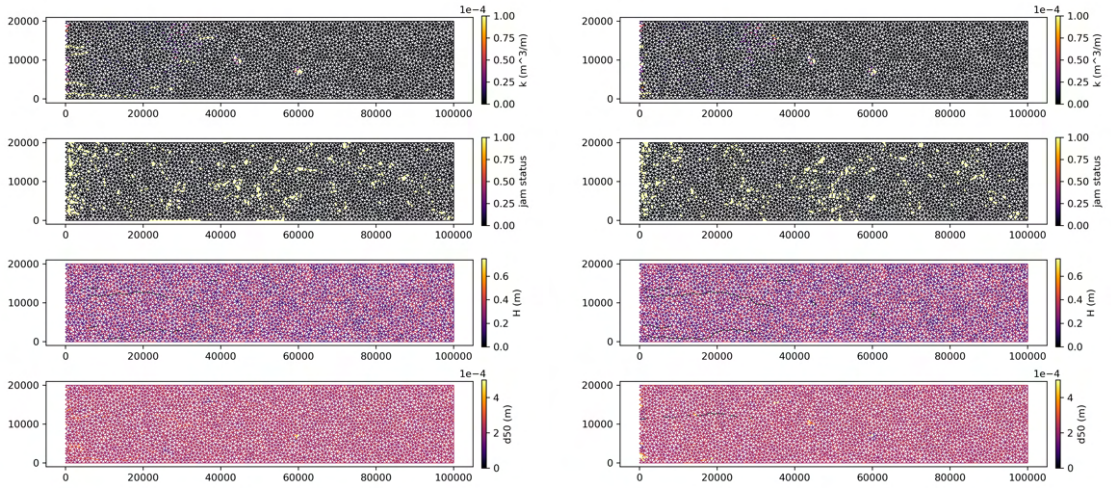


Figure S110. Results for the B2 default model rerun at a) week 0 and b) week 25

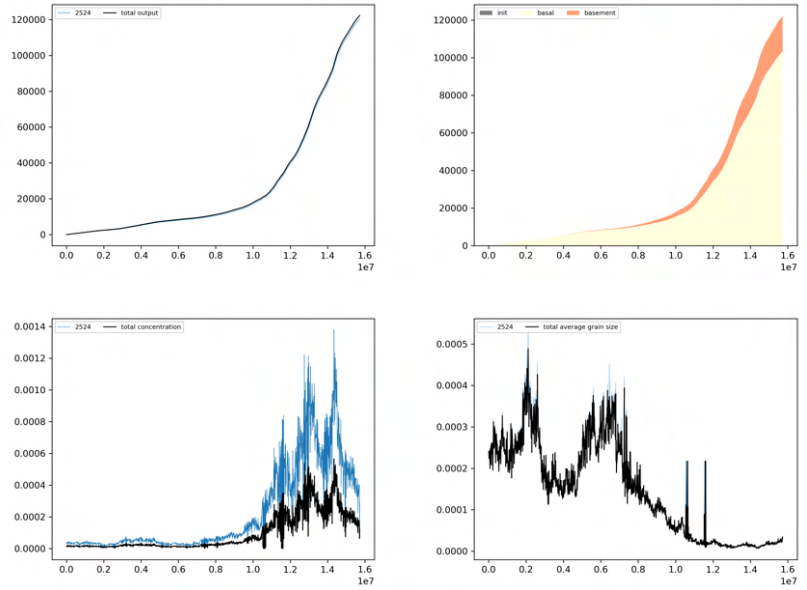


Figure S111. Outputs from the B2 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.8 B2D default

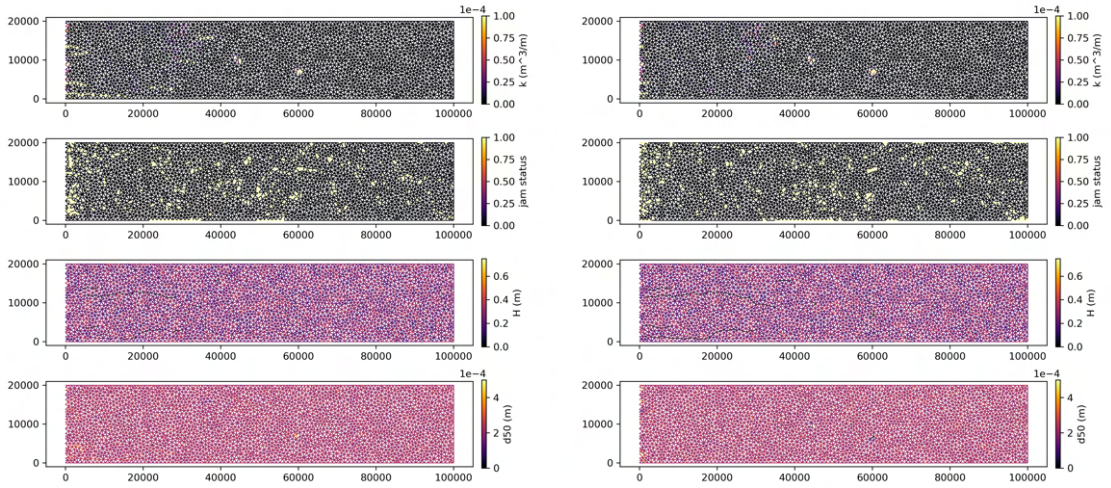


Figure S112. Results for the B2D default model run at a) week 0 and b) week 25

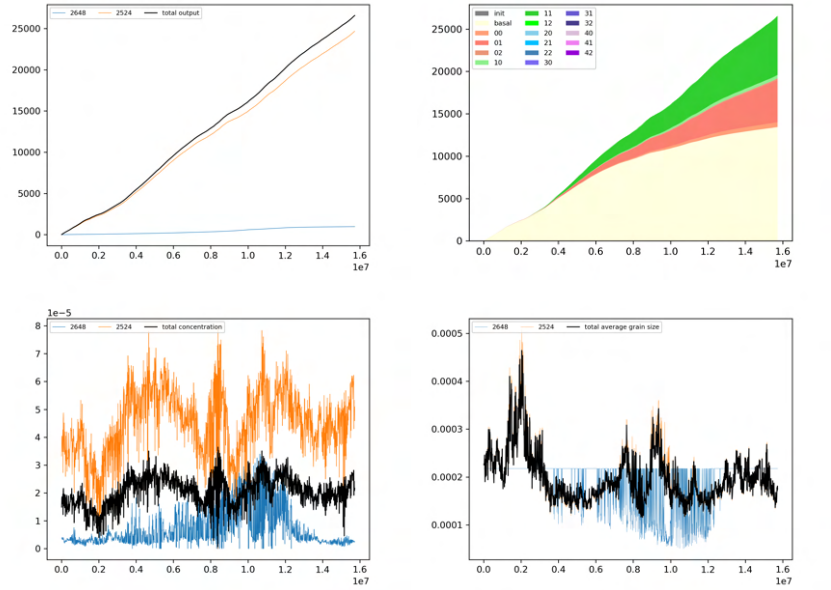


Figure S113. Outputs from the B2D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.9 B3 reference

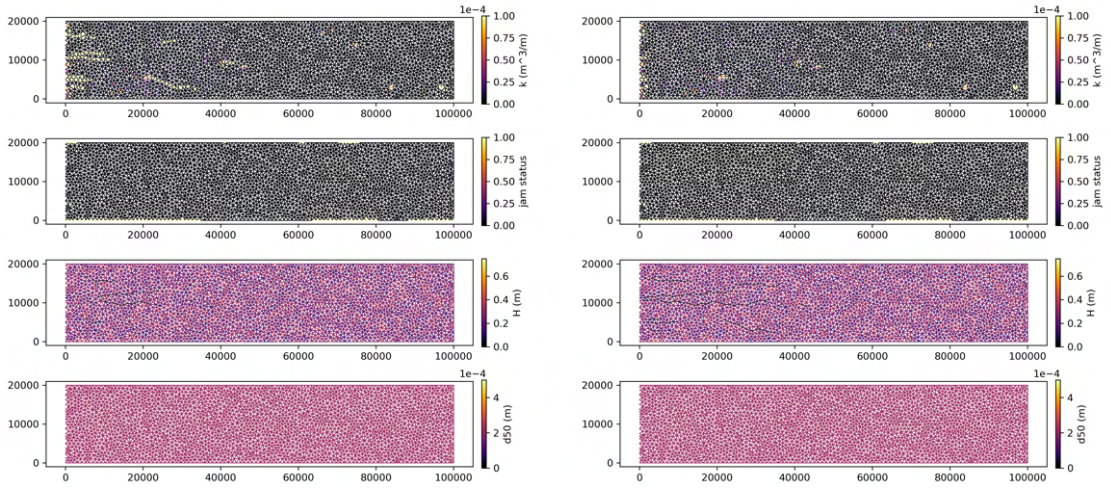


Figure S114. Results for the B3 reference model run at a) week 0 and b) week 25

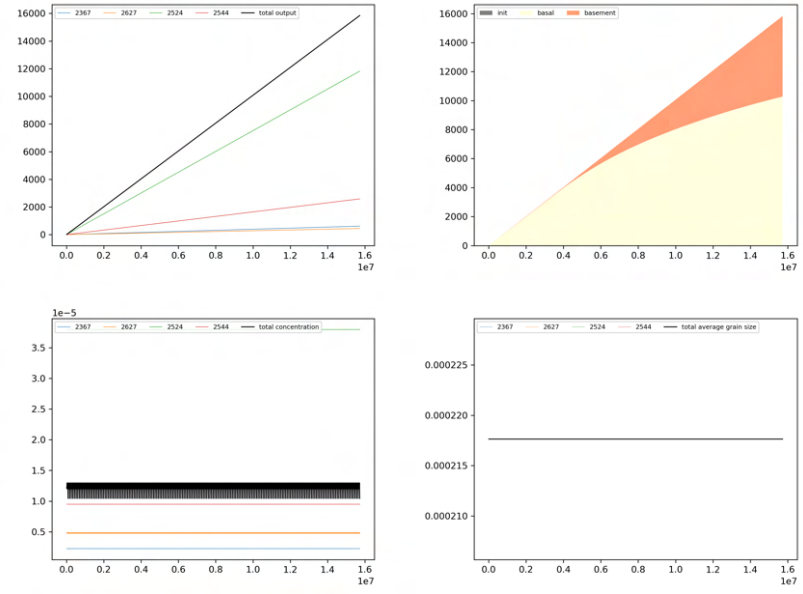


Figure S115. Outputs from the B3 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.10 B3 default

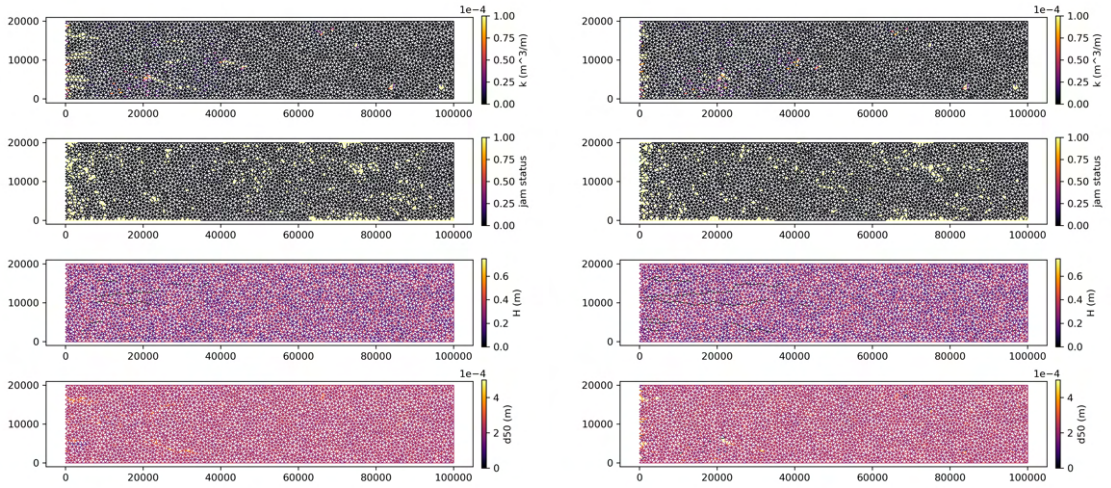


Figure S116. Results for the B3 default model run at a) week 0 and b) week 25

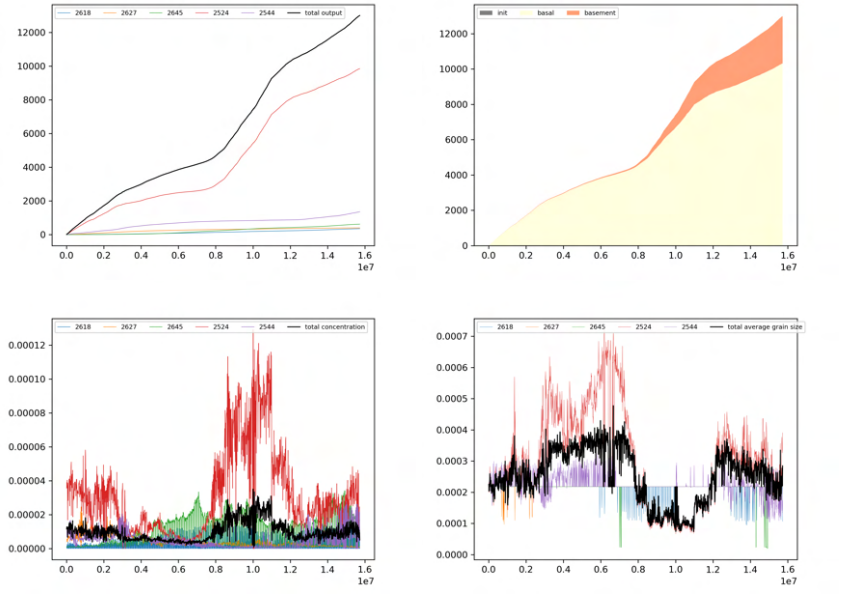


Figure S117. Outputs from the B3 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.11 B3 default rerun

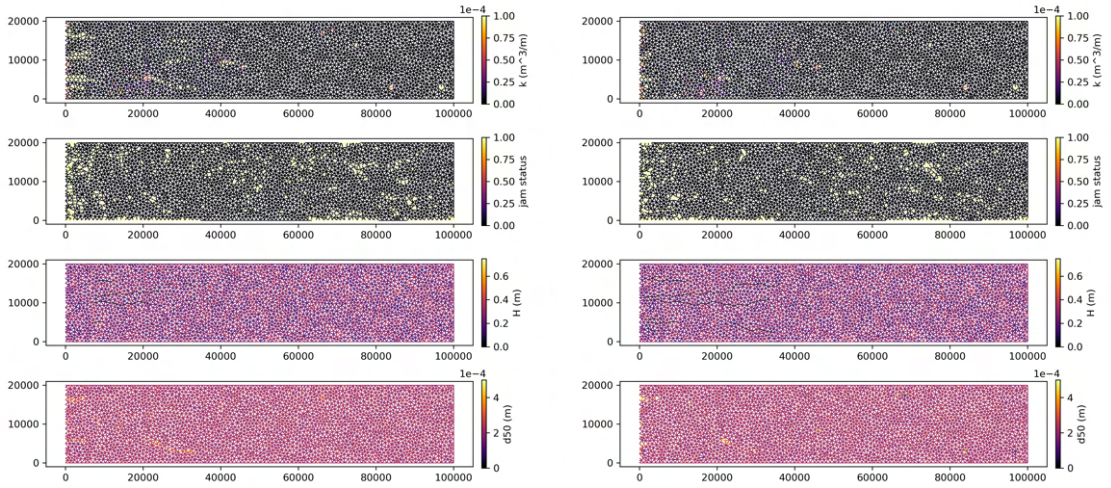


Figure S118. Results for the B3 default model rerun at a) week 0 and b) week 25

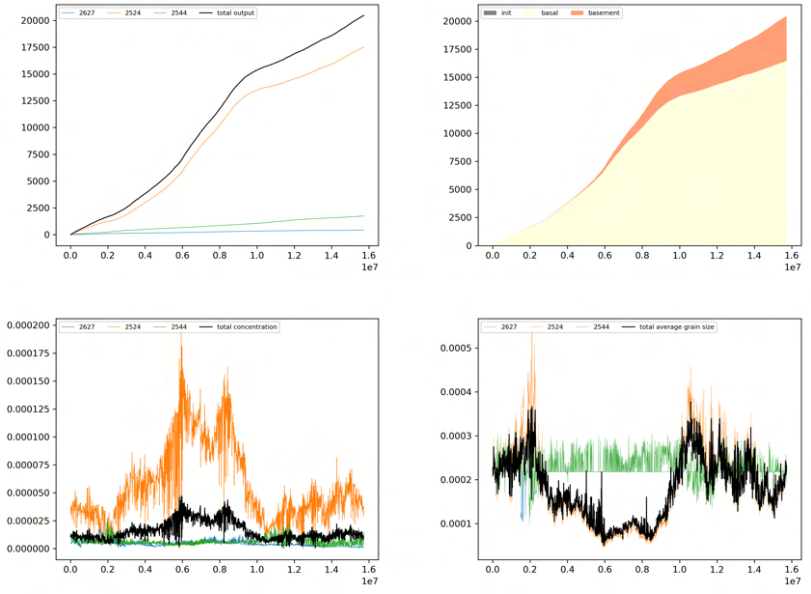


Figure S119. Outputs from the B3 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.12 B3D default

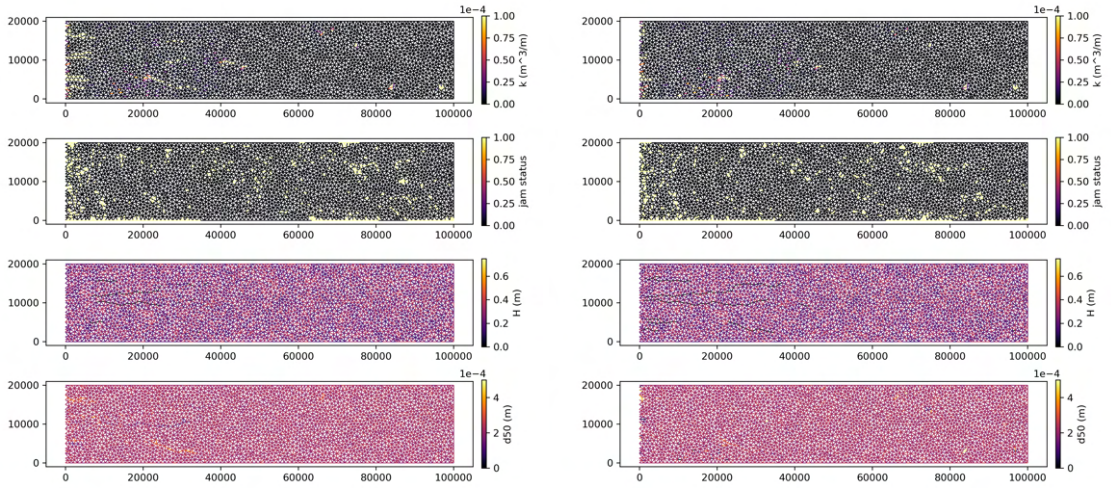


Figure S120. Results for the B3D default model run at a) week 0 and b) week 25

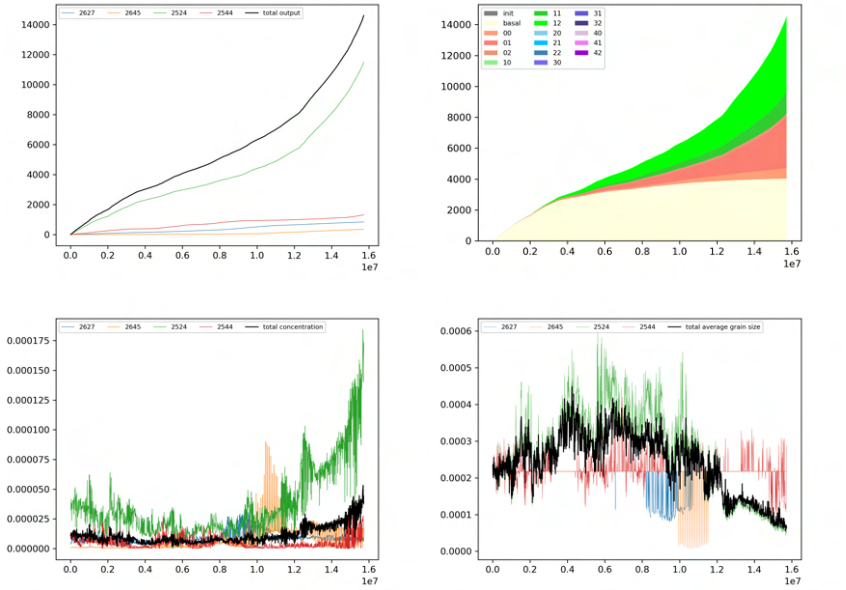


Figure S121. Outputs from the B3D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.13 B4 reference

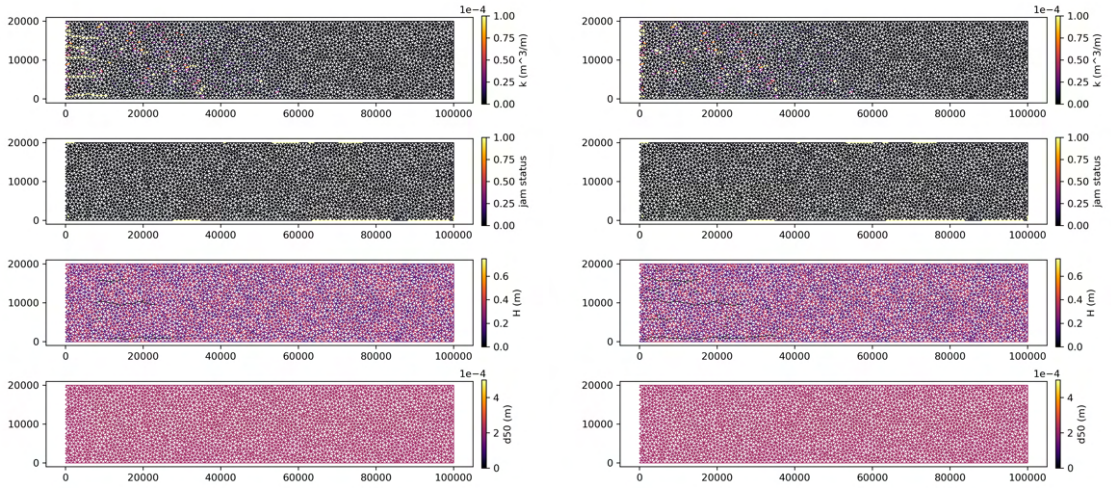


Figure S122. Results for the B4 reference model run at a) week 0 and b) week 25

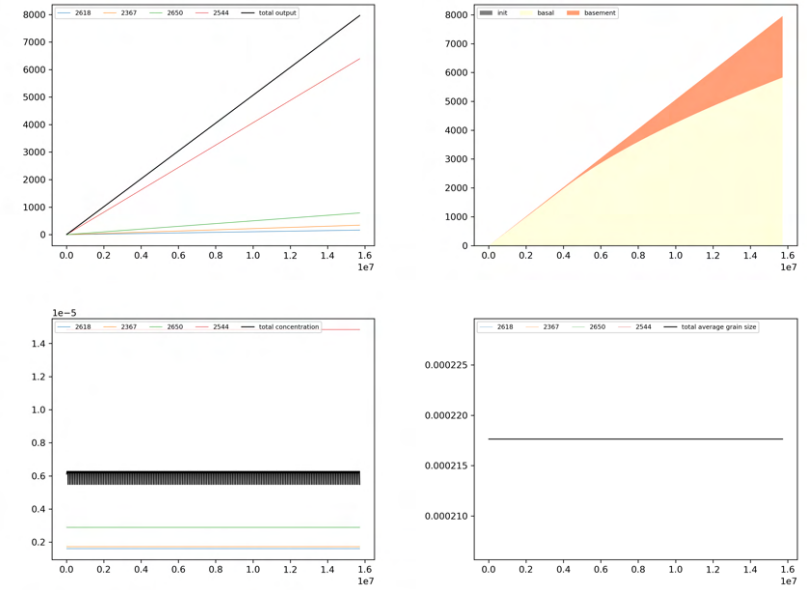
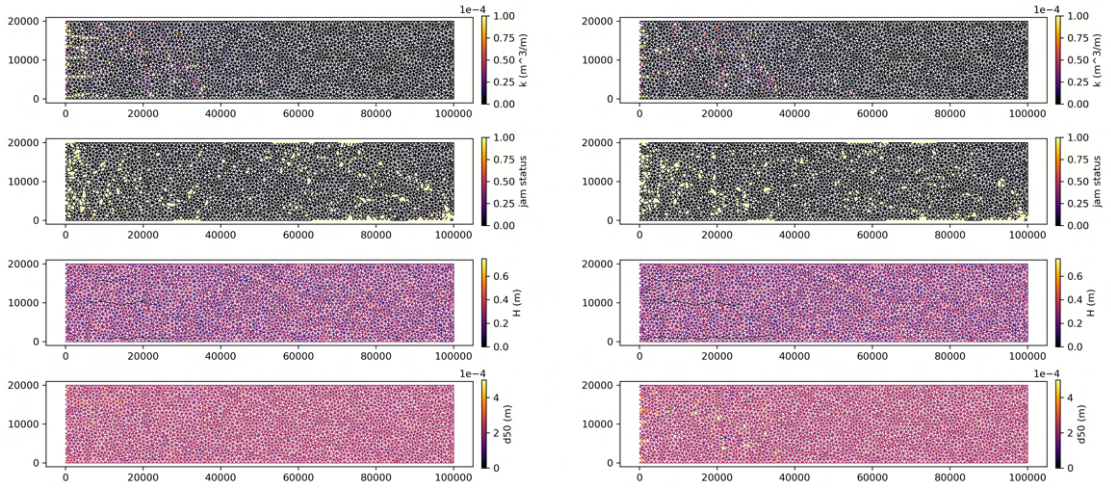


Figure S123. Outputs from the B4 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.14 B4 default



280

Figure S124. Results for the B4 default model run at a) week 0 and b) week 25

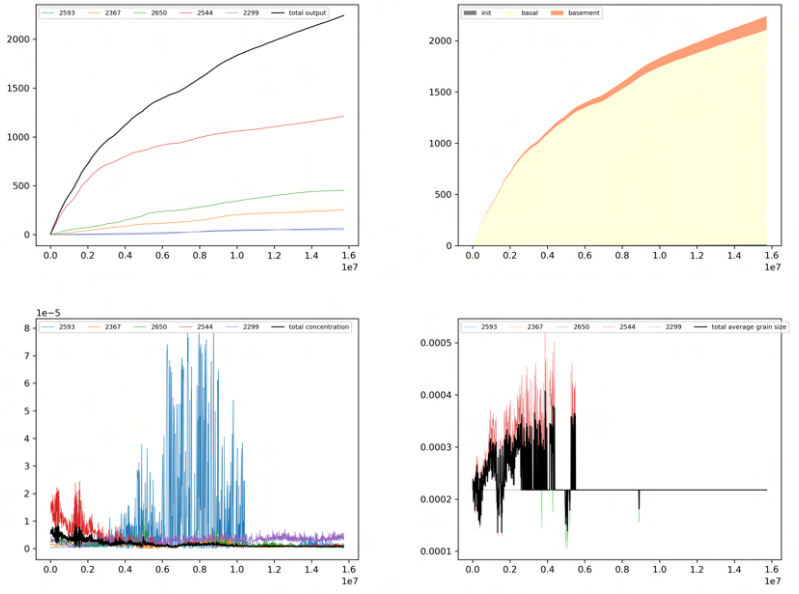


Figure S125. Outputs from the B4 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.15 B4 default rerun

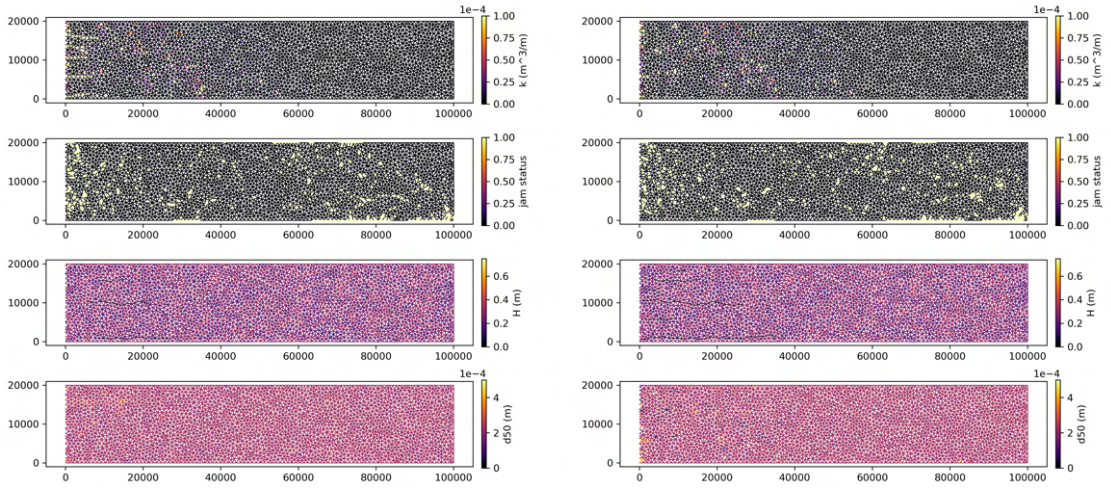


Figure S126. Results for the B4 default model rerun at a) week 0 and b) week 25

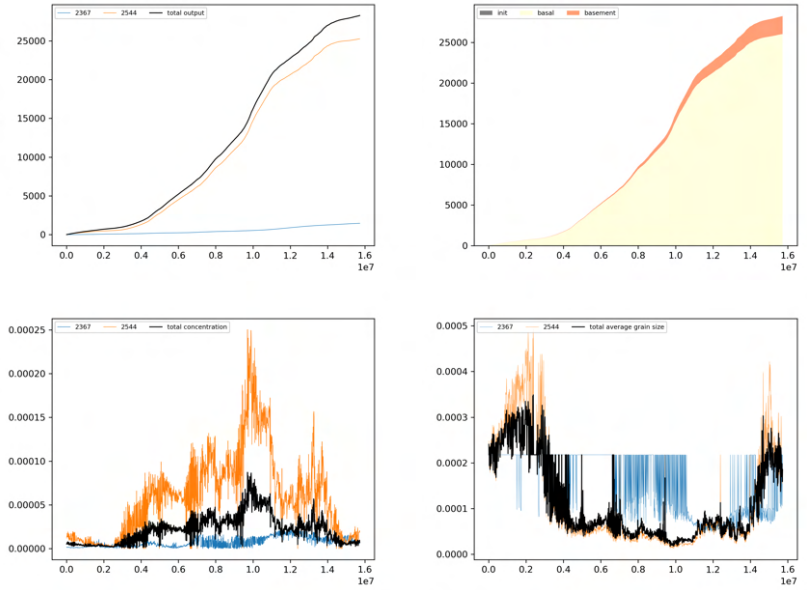


Figure S127. Outputs from the B4 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.16 B4D default

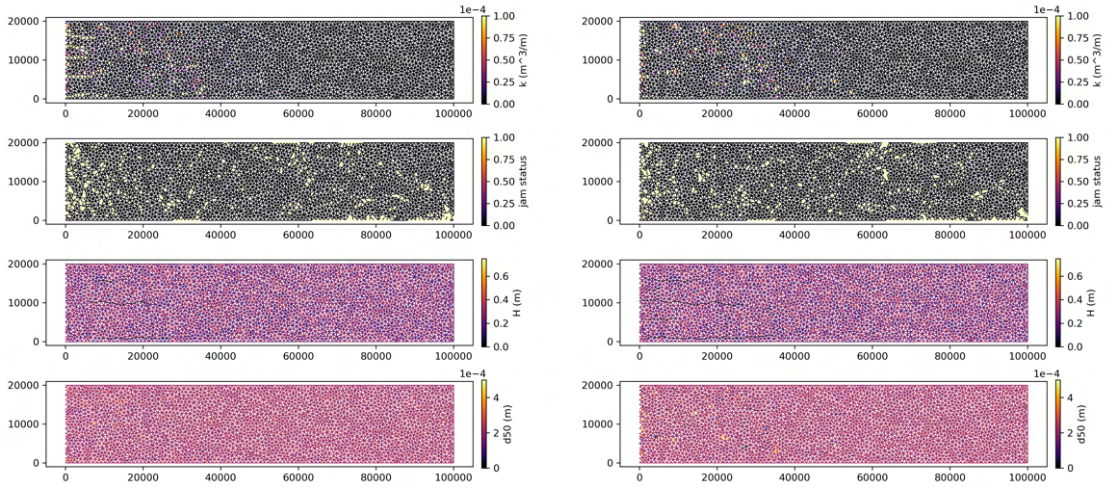


Figure S128. Results for the B4D default model run at a) week 0 and b) week 25

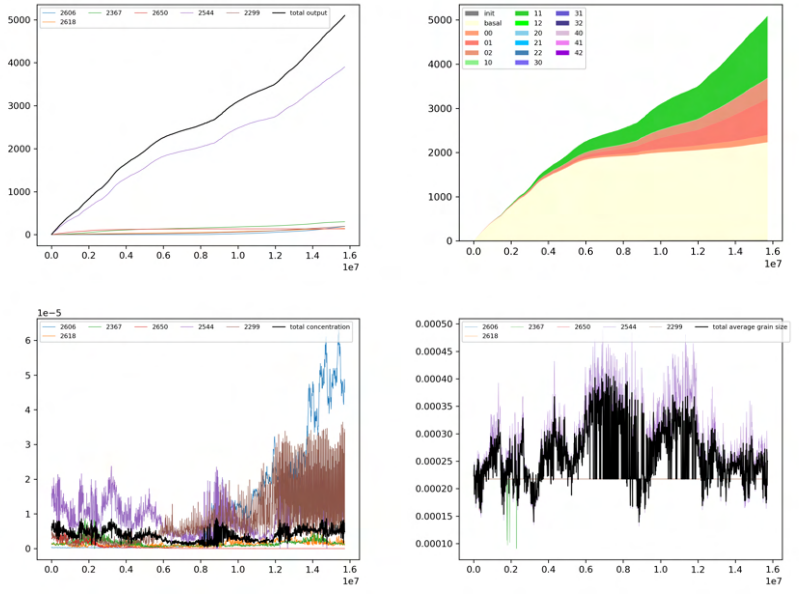


Figure S129. Outputs from the B4D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.17 B5 reference

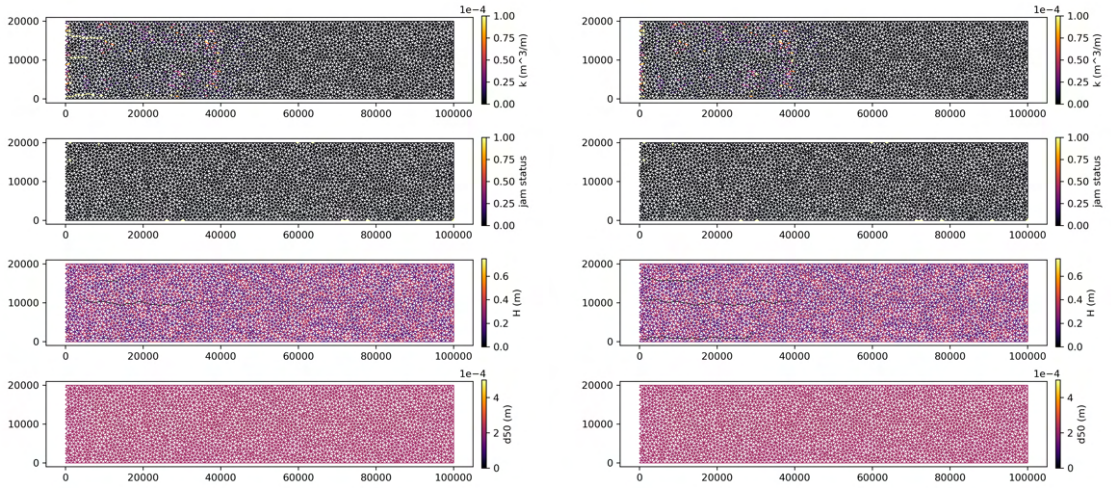


Figure S130. Results for the B5 reference model run at a) week 0 and b) week 25

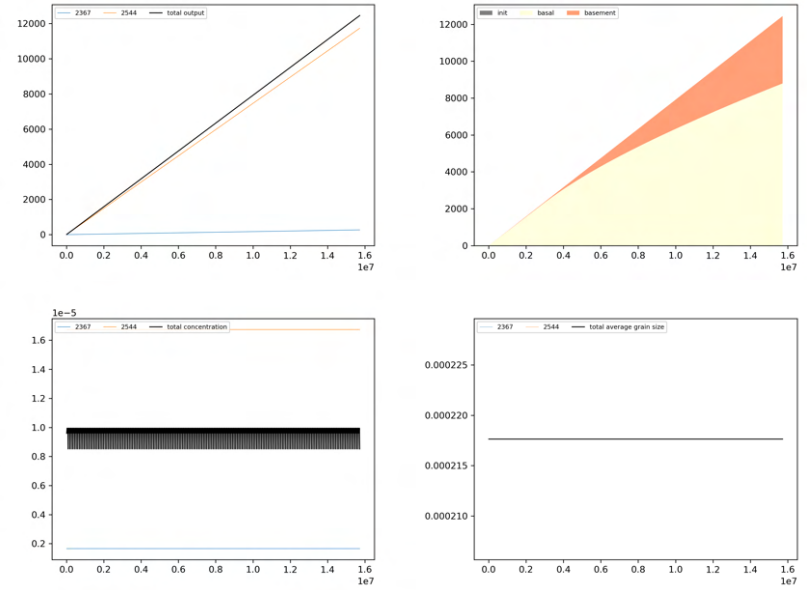


Figure S131. Outputs from the B5 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.18 B5 default

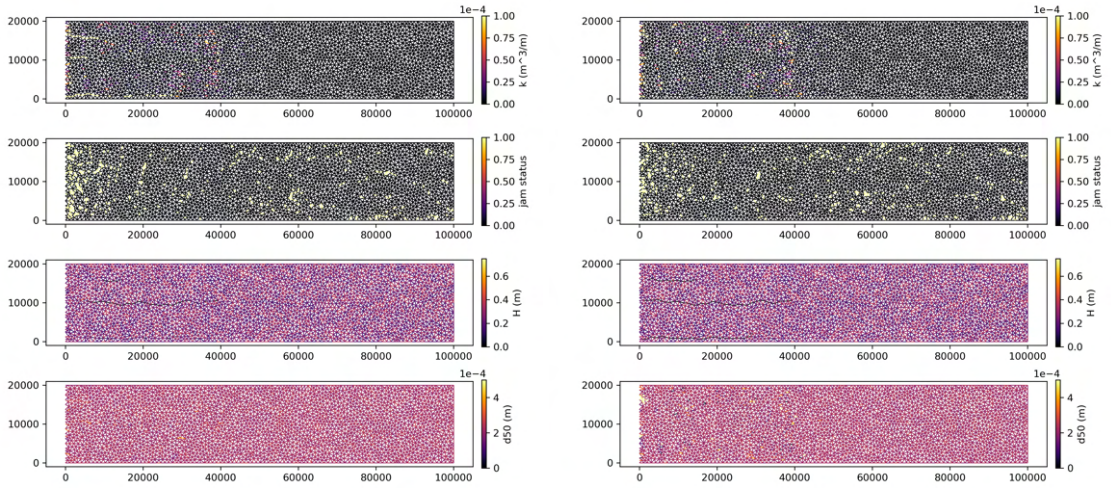


Figure S132. Results for the B5 default model run at a) week 0 and b) week 25

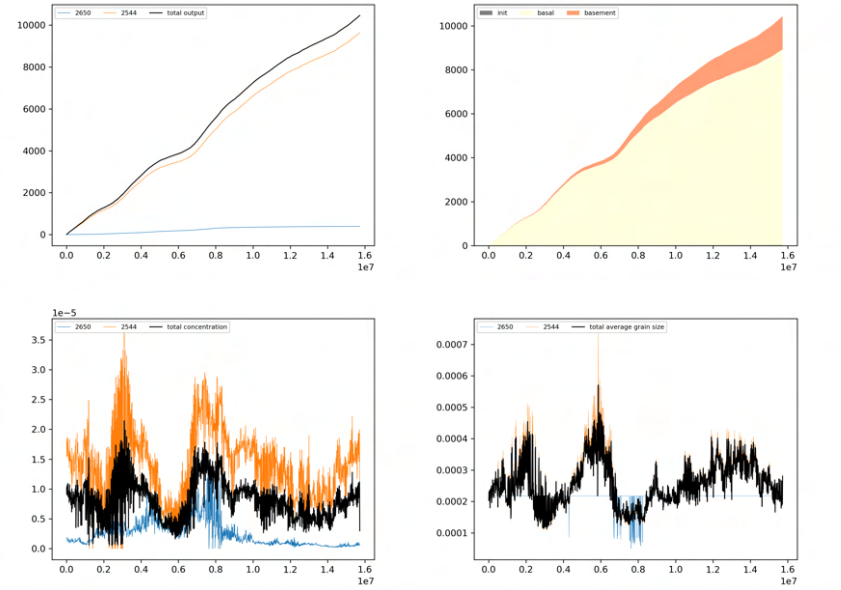
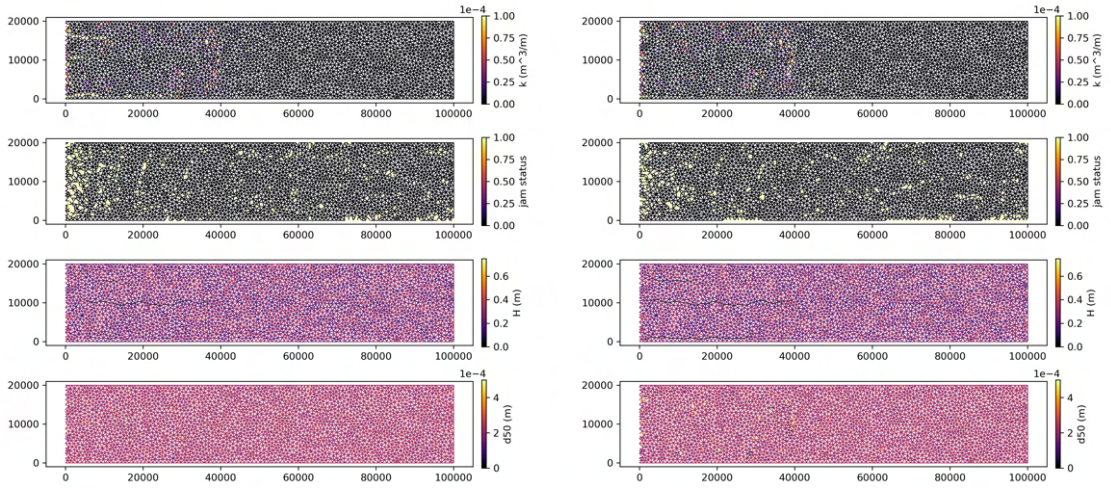


Figure S133. Outputs from the B5 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.19 B5 default rerun



300

Figure S134. Results for the B5 default model rerun at a) week 0 and b) week 25

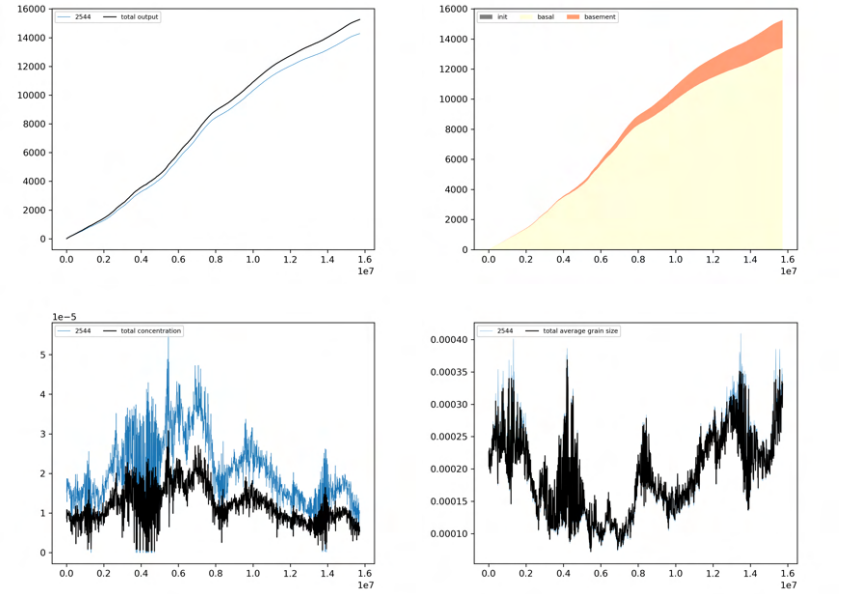


Figure S135. Outputs from the B5 default model rerun with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.3.20 B5D default

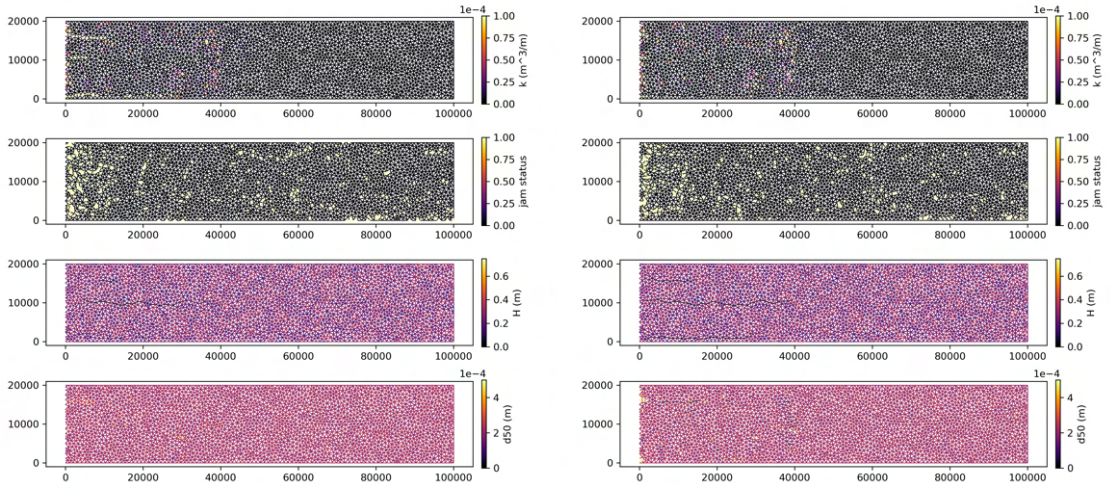


Figure S136. Results for the B5D default model run at a) week 0 and b) week 25

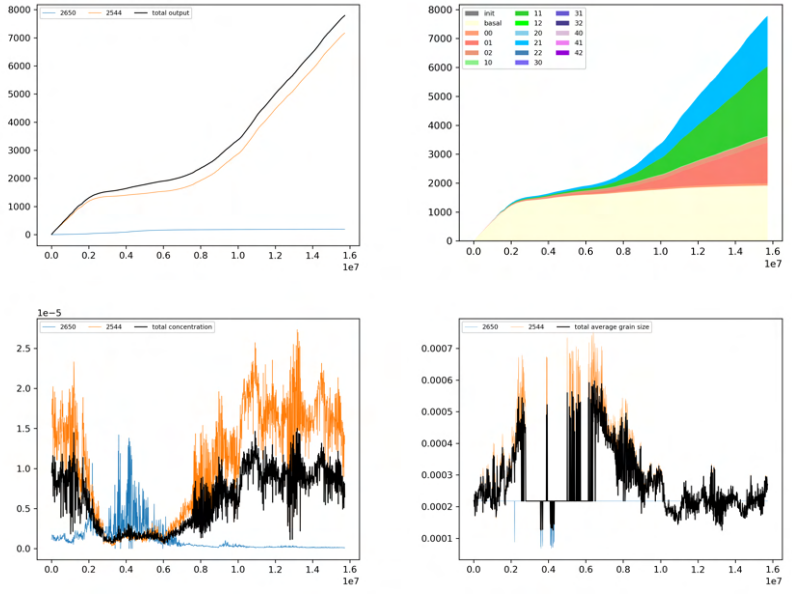


Figure S137. Outputs from the B5D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4 Experiment Set 4

2.4.1 C0 reference

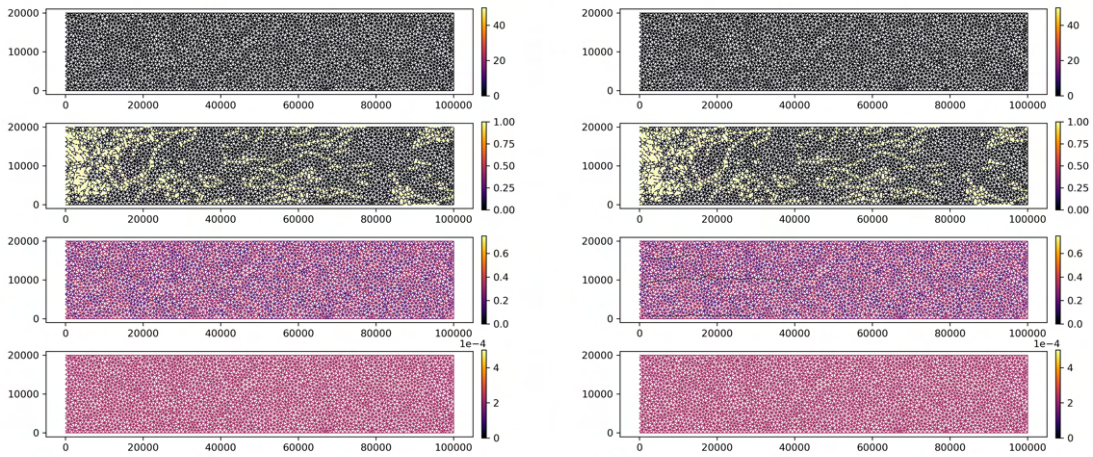


Figure S138. Results for the C0 reference model run at a) day 0 and b) day 49

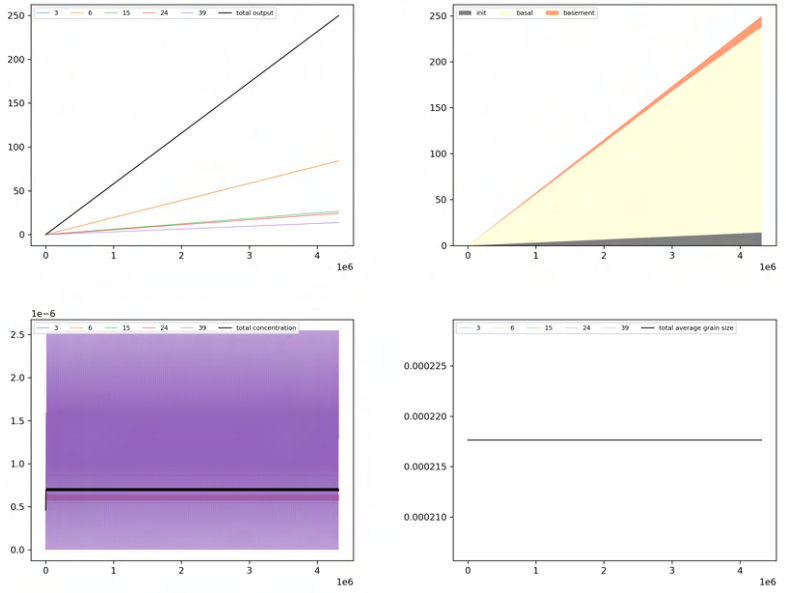


Figure S139. Outputs from the C0 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.2 C0 default

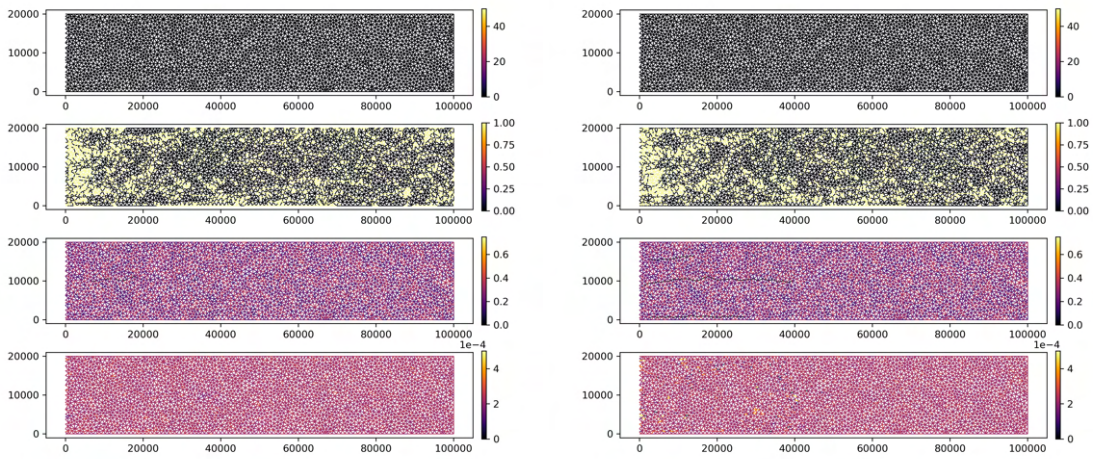


Figure S140. Results for the C0 default model run at a) day 0 and b) day 49

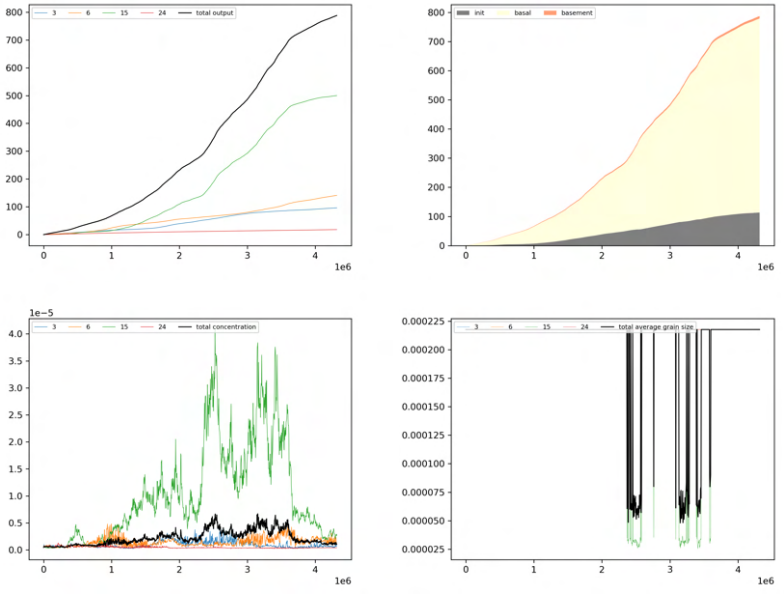


Figure S141. Outputs from the C0 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.3 C0D default

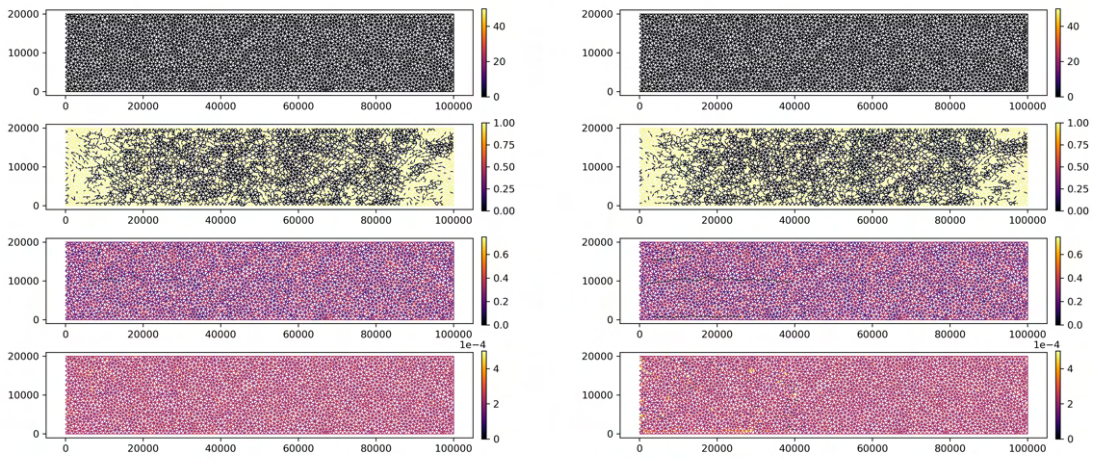


Figure S142. Results for the C0D default model run at a) day 0 and b) day 49

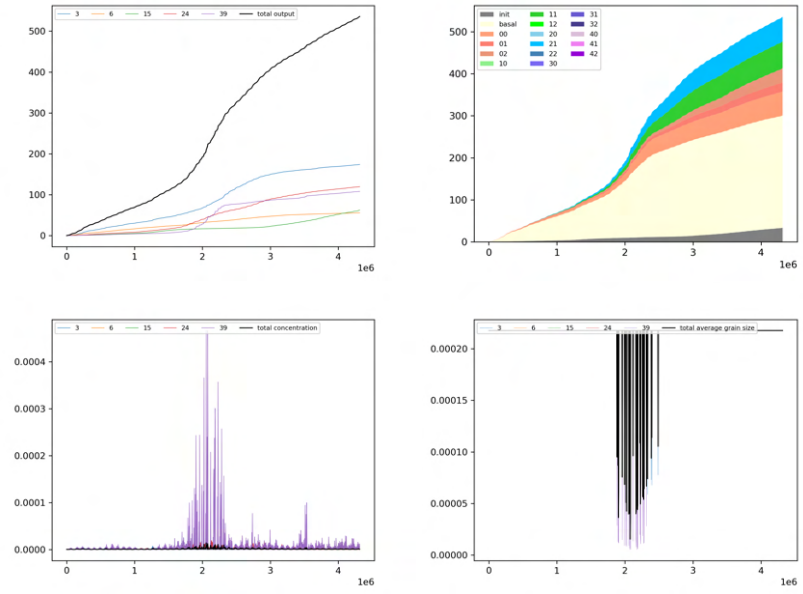


Figure S143. Outputs from the C0D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.4 C1 reference

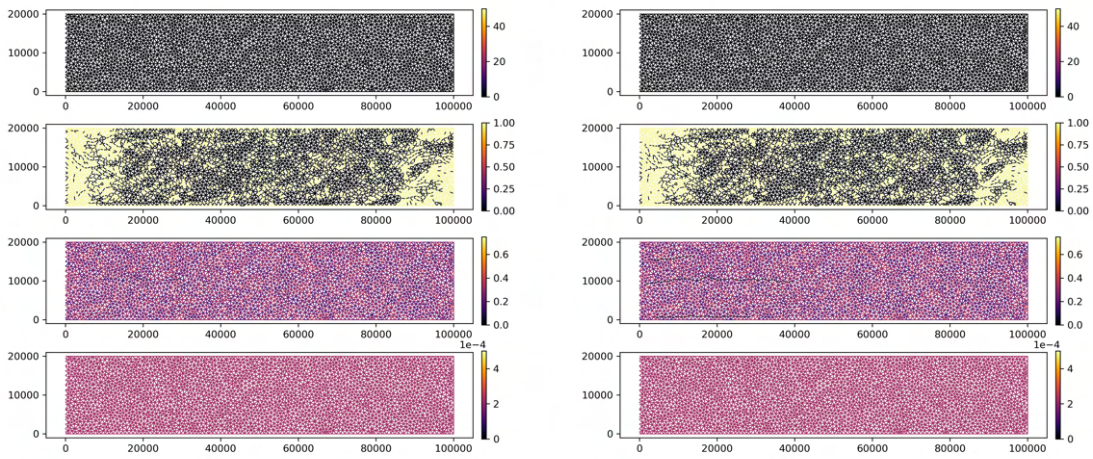


Figure S144. Results for the C1 reference model run at a) day 0 and b) day 49

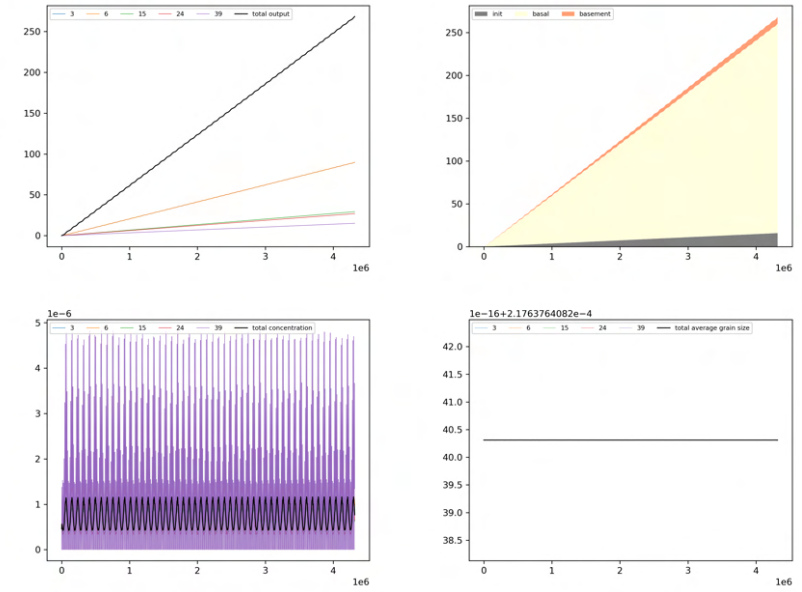


Figure S145. Outputs from the C1 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.5 C1 default

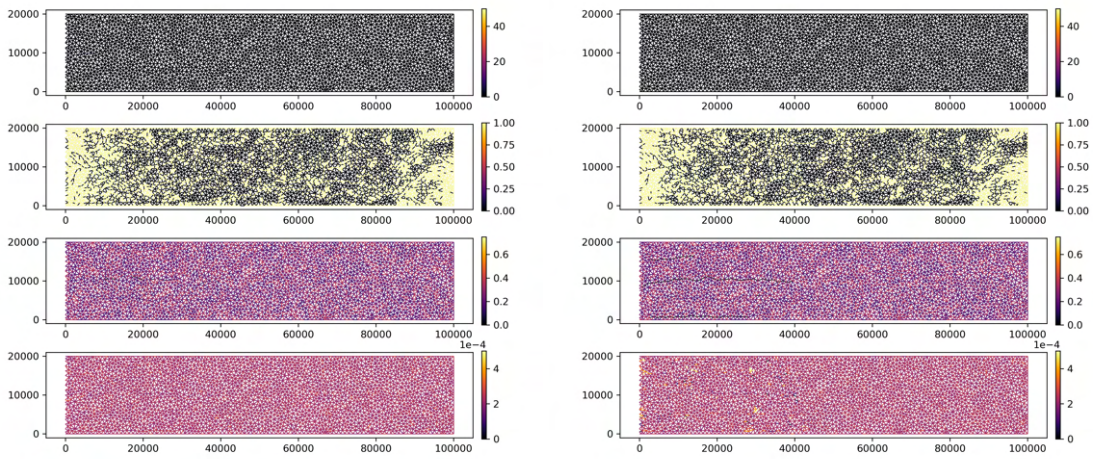


Figure S146. Results for the C1 default model run at a) day 0 and b) day 49

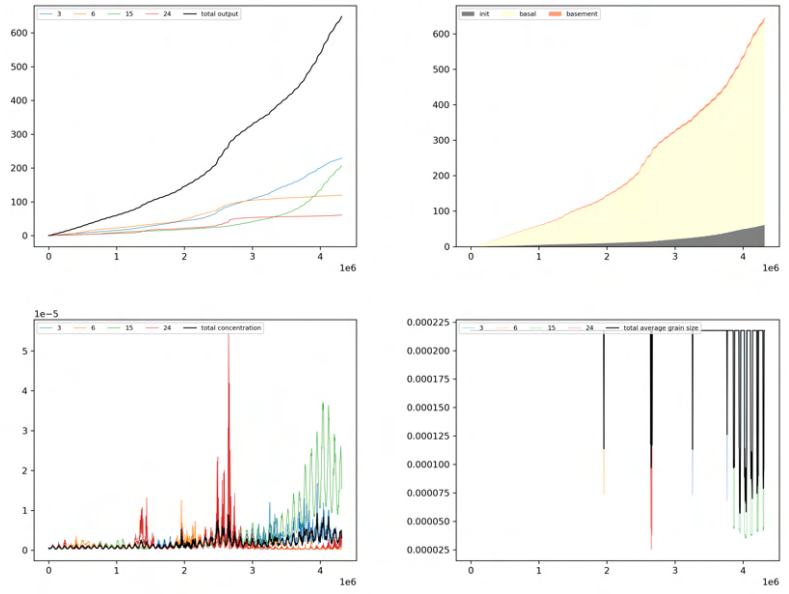


Figure S147. Outputs from the C1 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.6 C1D default

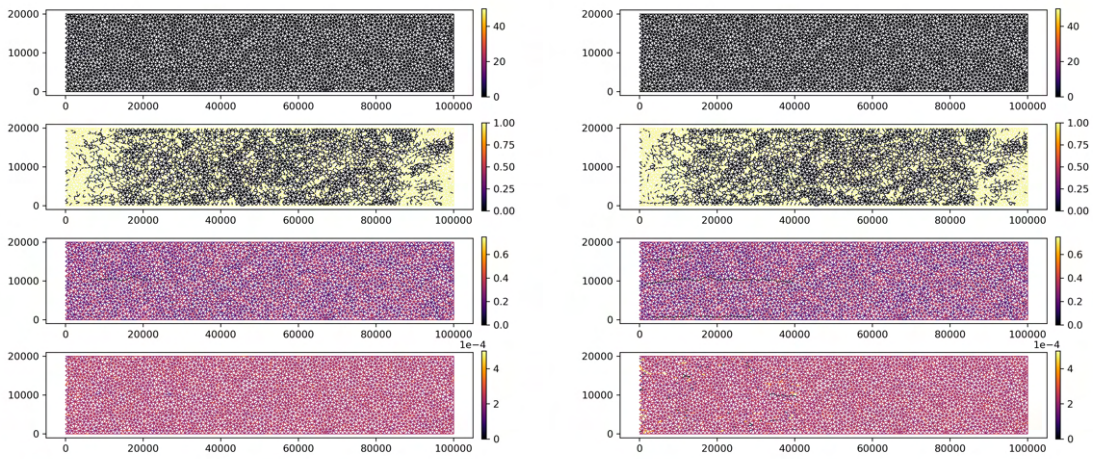


Figure S148. Results for the C1D default model run at a) day 0 and b) day 49

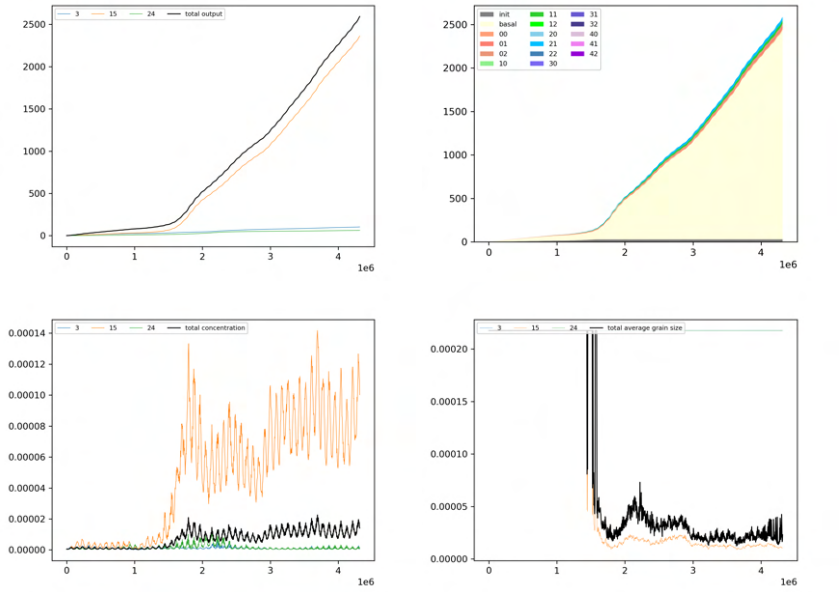


Figure S149. Outputs from the C1D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.7 C2 reference

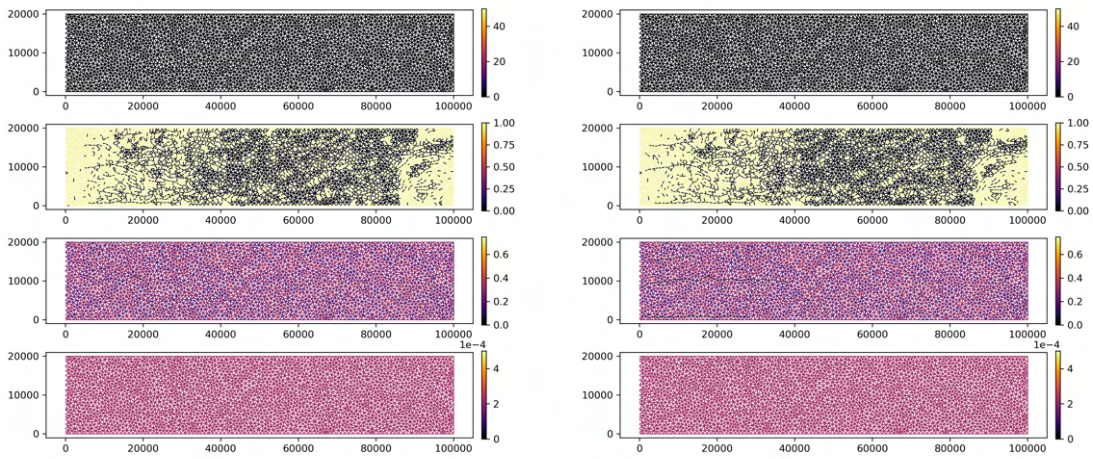


Figure S150. Results for the C2 reference model run at a) day 0 and b) day 49

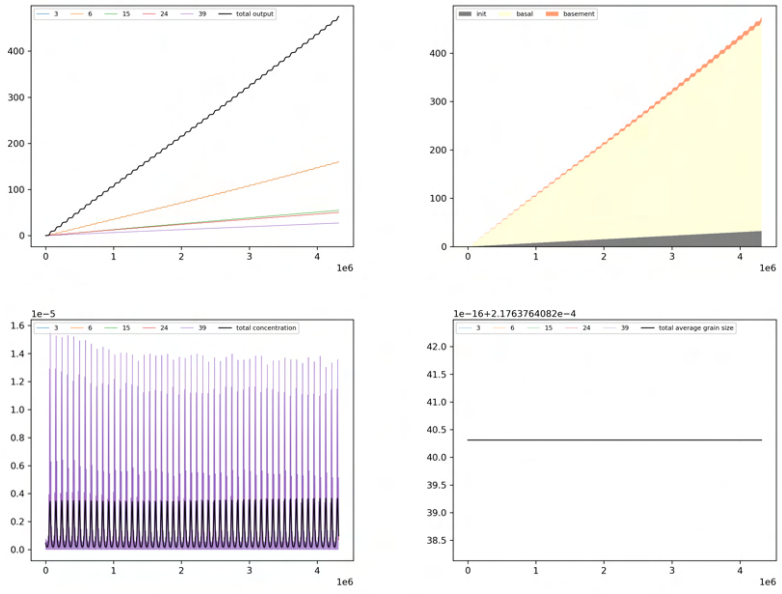


Figure S151. Outputs from the C2 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.8 C2 default

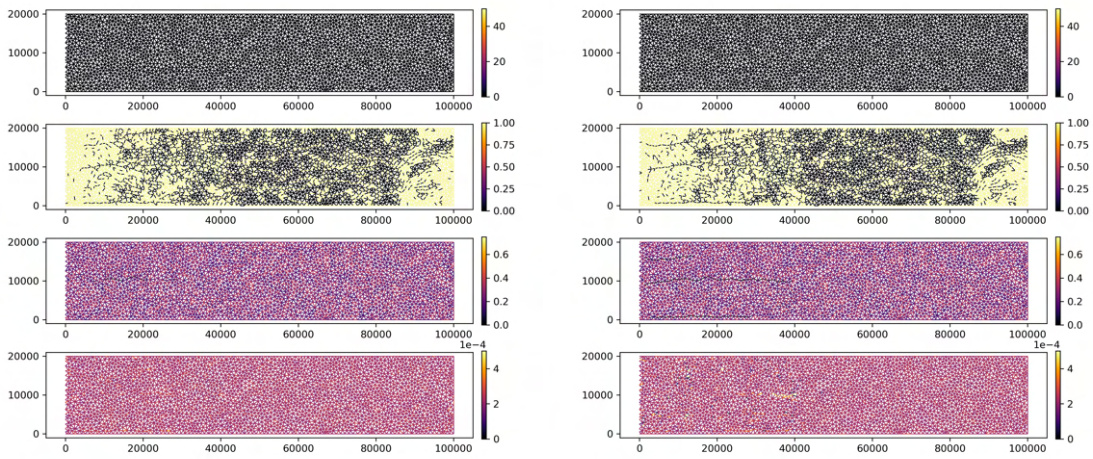


Figure S152. Results for the C2 default model run at a) day 0 and b) day 49

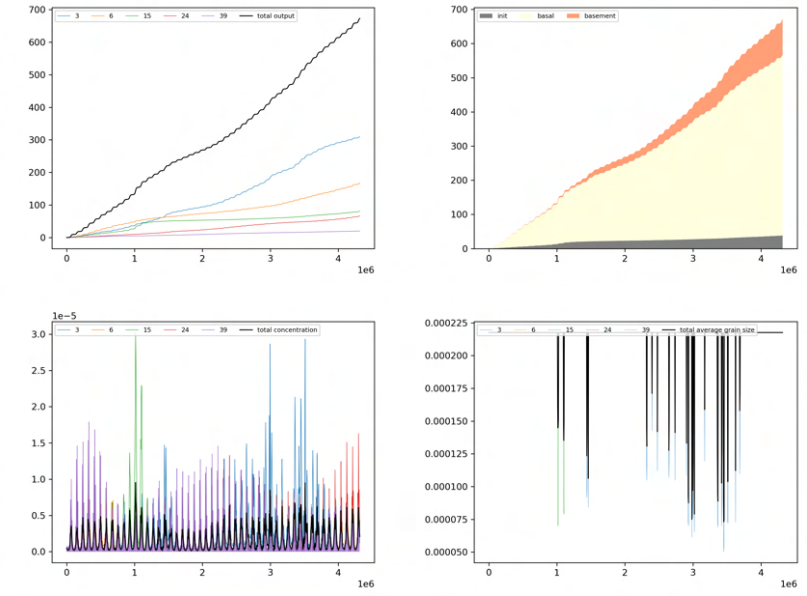


Figure S153. Outputs from the C2 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.9 C2D default

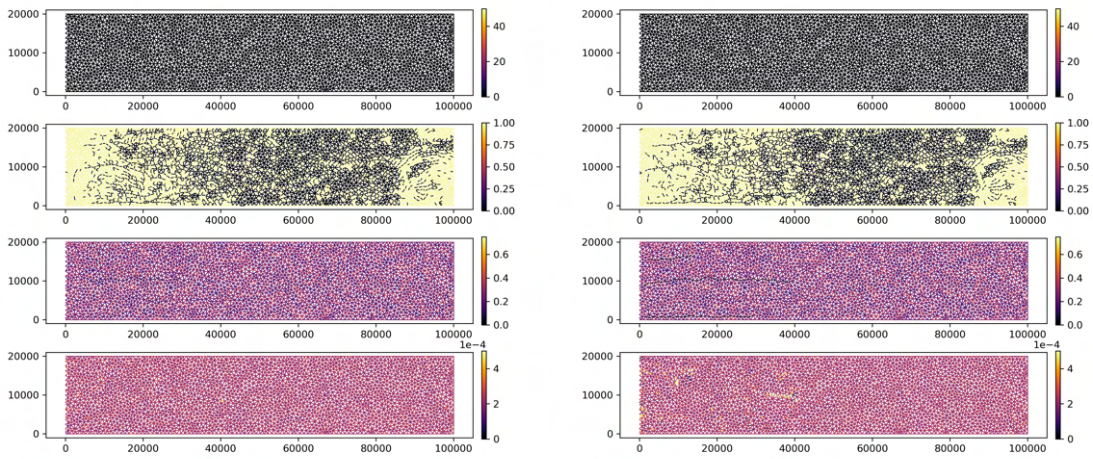


Figure S154. Results for the C2D default model run at a) day 0 and b) day 49

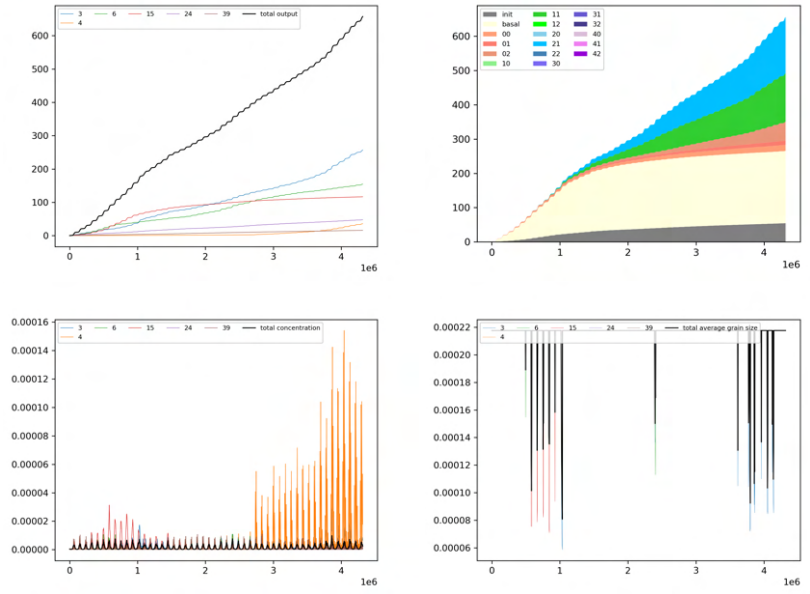
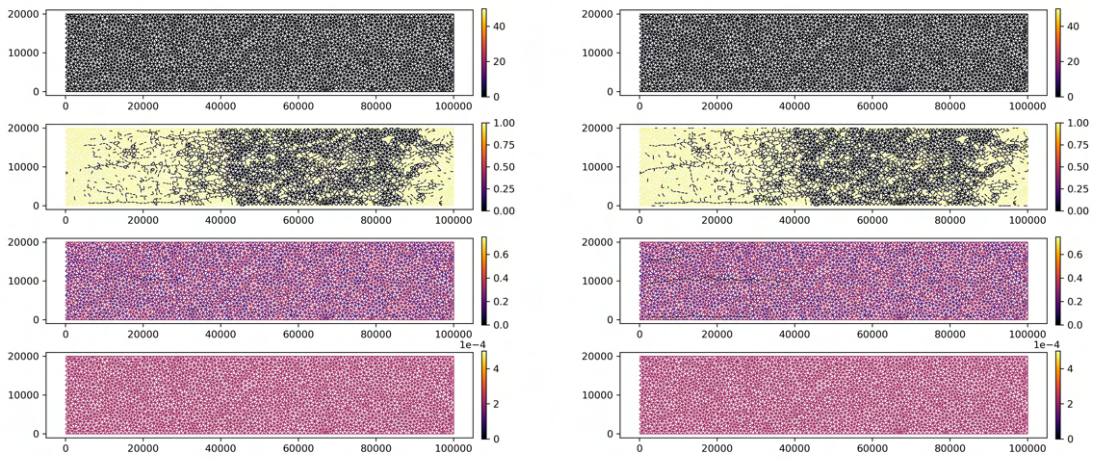


Figure S155. Outputs from the C2D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.10 C3 reference



345

Figure S156. Results for the C3 reference model run at a) day 0 and b) day 49

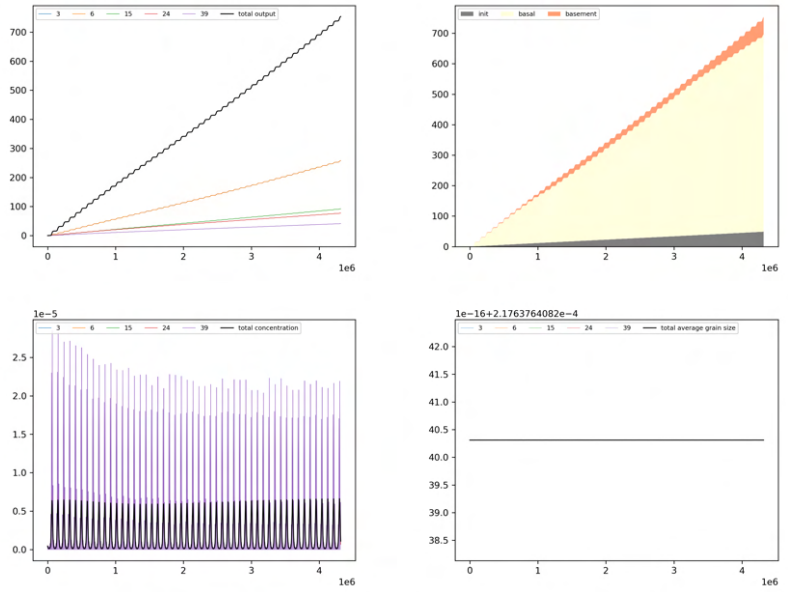


Figure S157. Outputs from the C3 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.11 C3 default

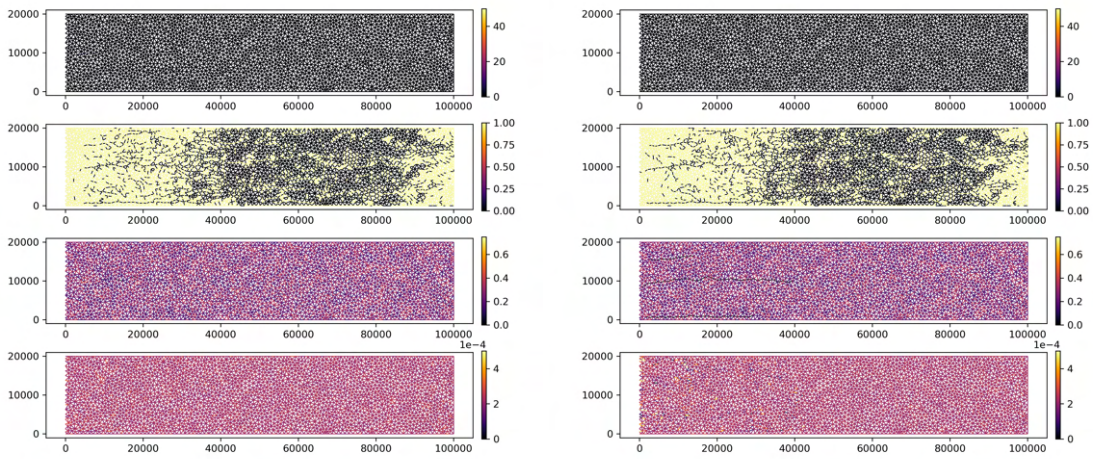


Figure S158. Results for the C3 default model run at a) day 0 and b) day 49

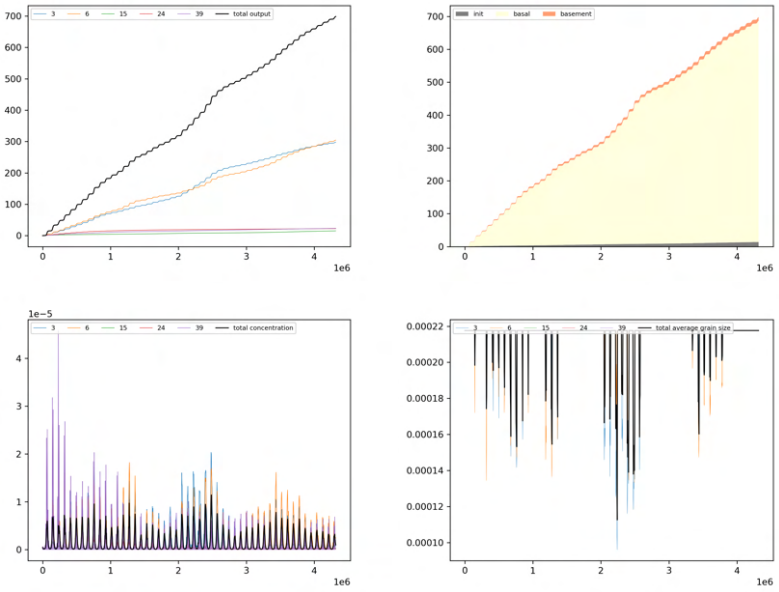


Figure S159. Outputs from the C3 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.12 C3D default

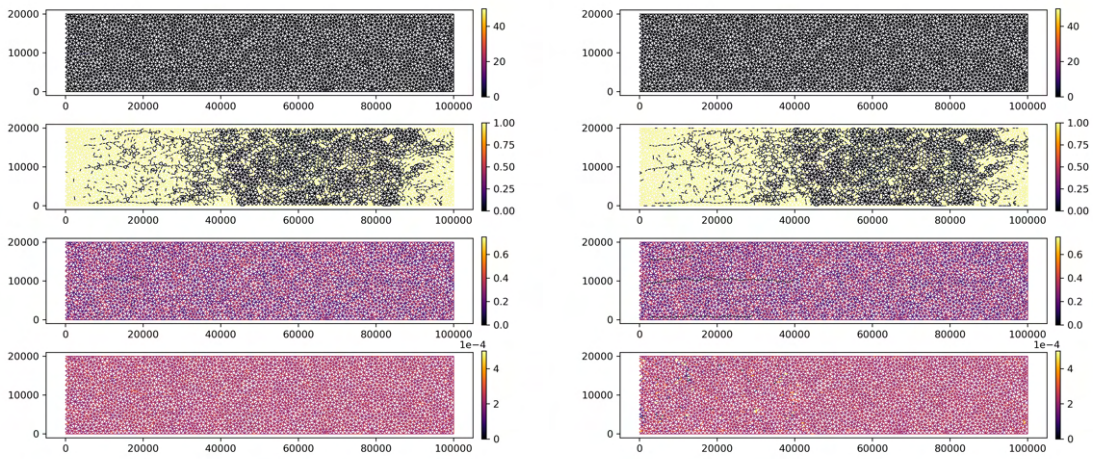


Figure S160. Results for the C3D default model run at a) day 0 and b) day 49

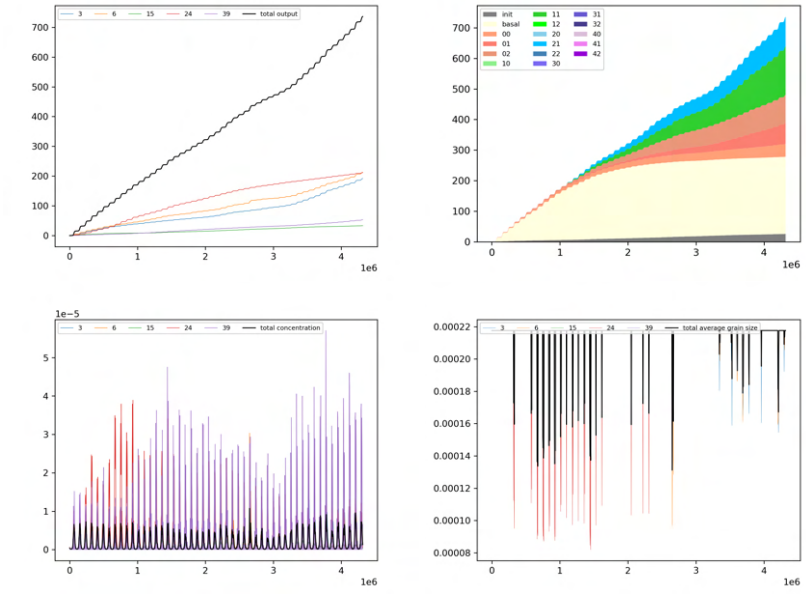


Figure S161. Outputs from the C3D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.13 C4 reference

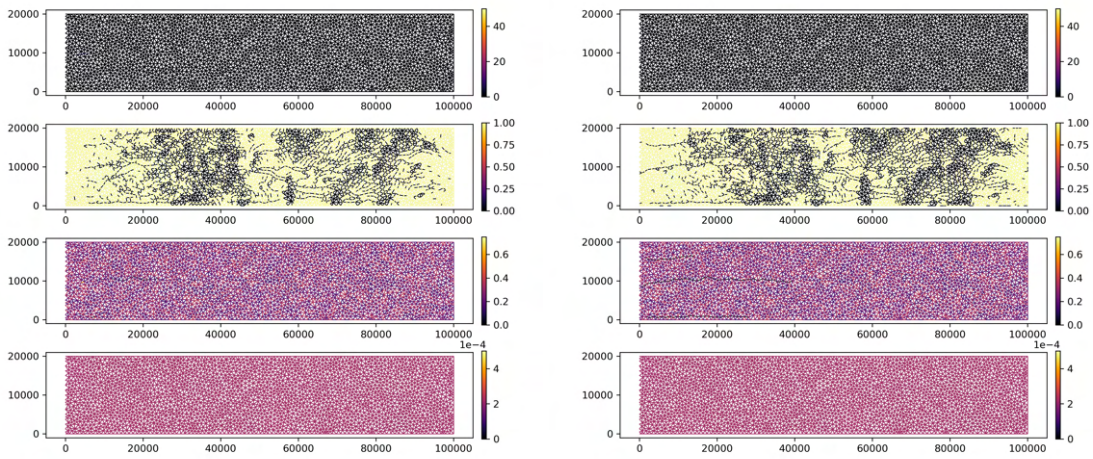


Figure S162. Results for the C4 reference model run at a) day 0 and b) day 49

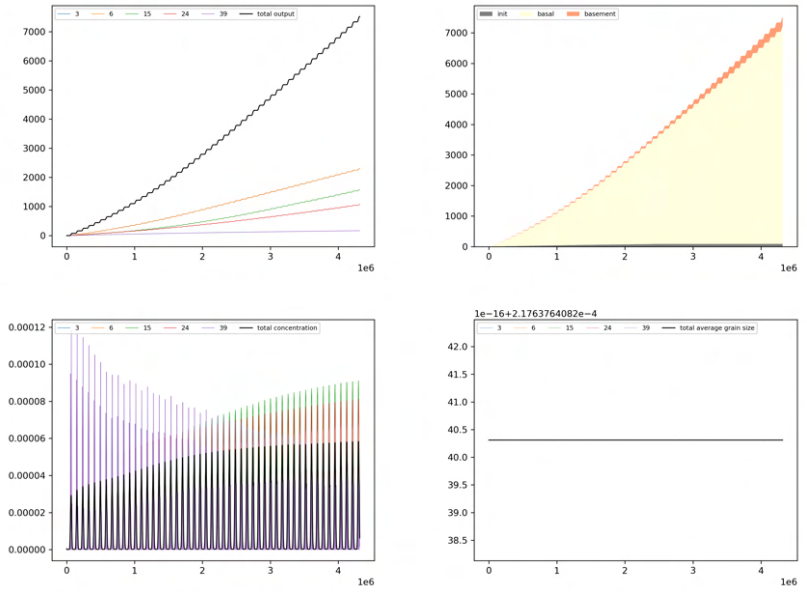


Figure S163. Outputs from the C4 reference model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.14 C4 default

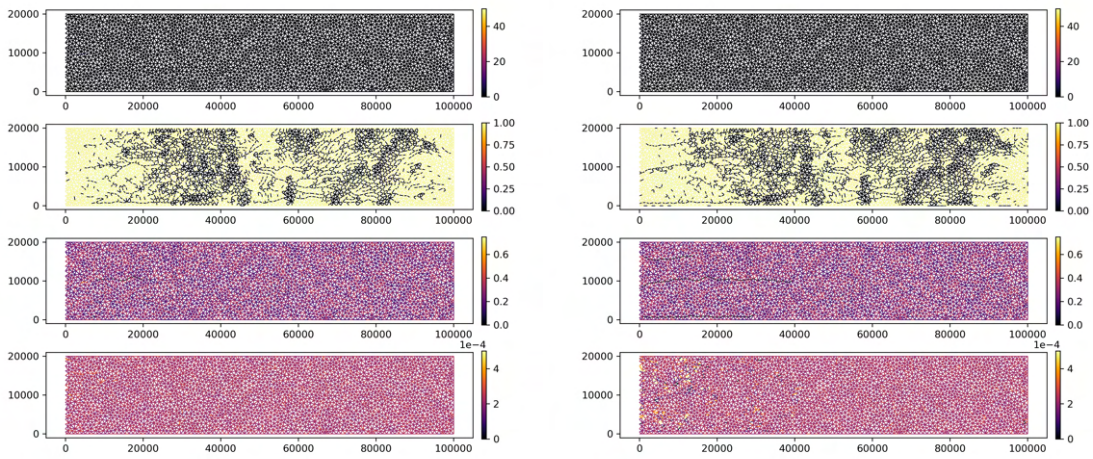


Figure S164. Results for the C4 default model run at a) day 0 and b) day 49

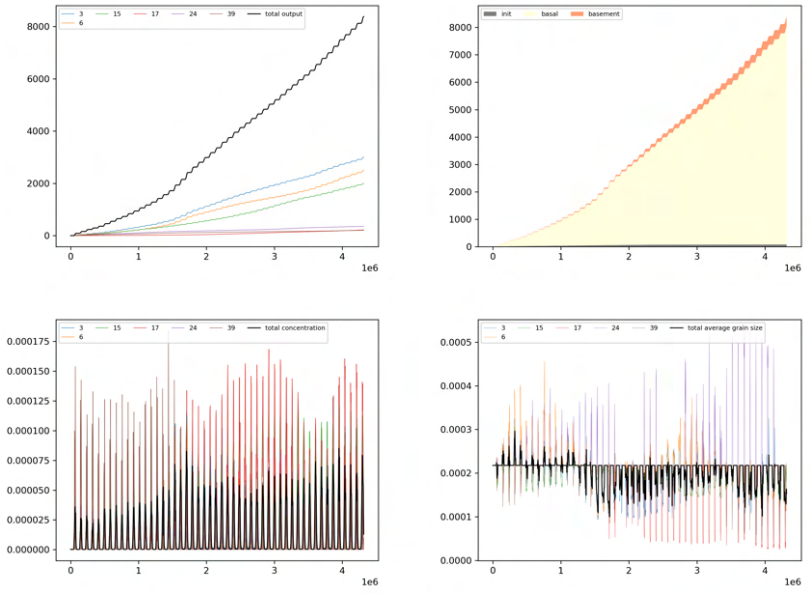


Figure S165. Outputs from the C4 default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs

2.4.15 C4D default

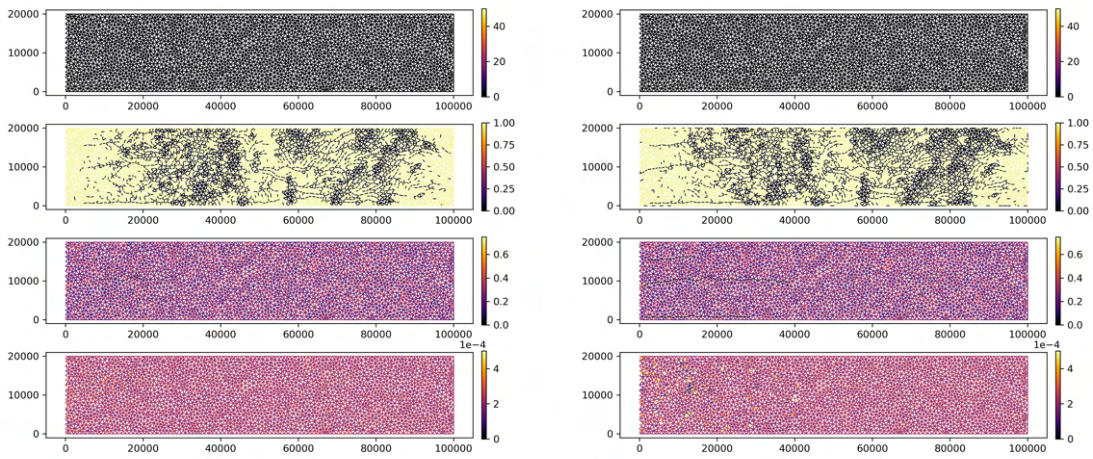


Figure S166. Results for the C4D default model run at a) day 0 and b) day 49

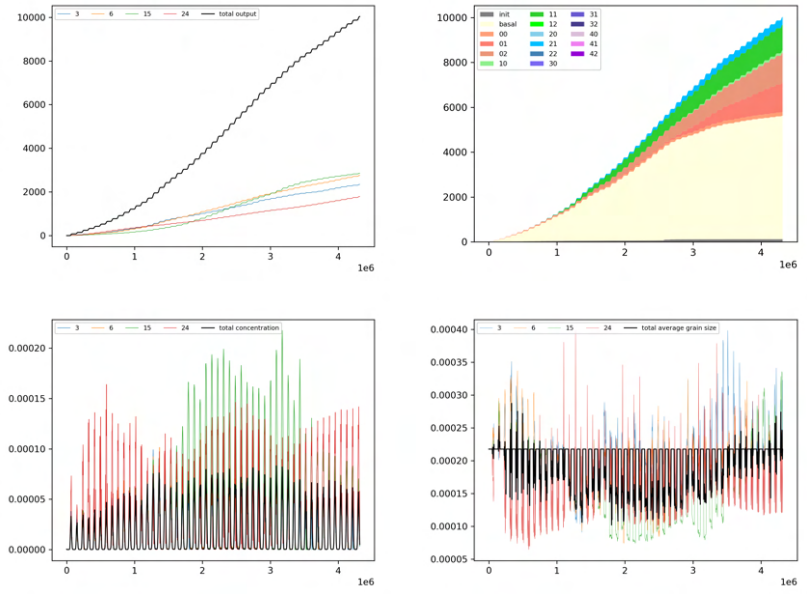


Figure S167. Outputs from the C4D default model run with a) volume flux b) detritus volume flux c) concentration d) grainsize. In a, c and d numbers indicate outlet node IDs