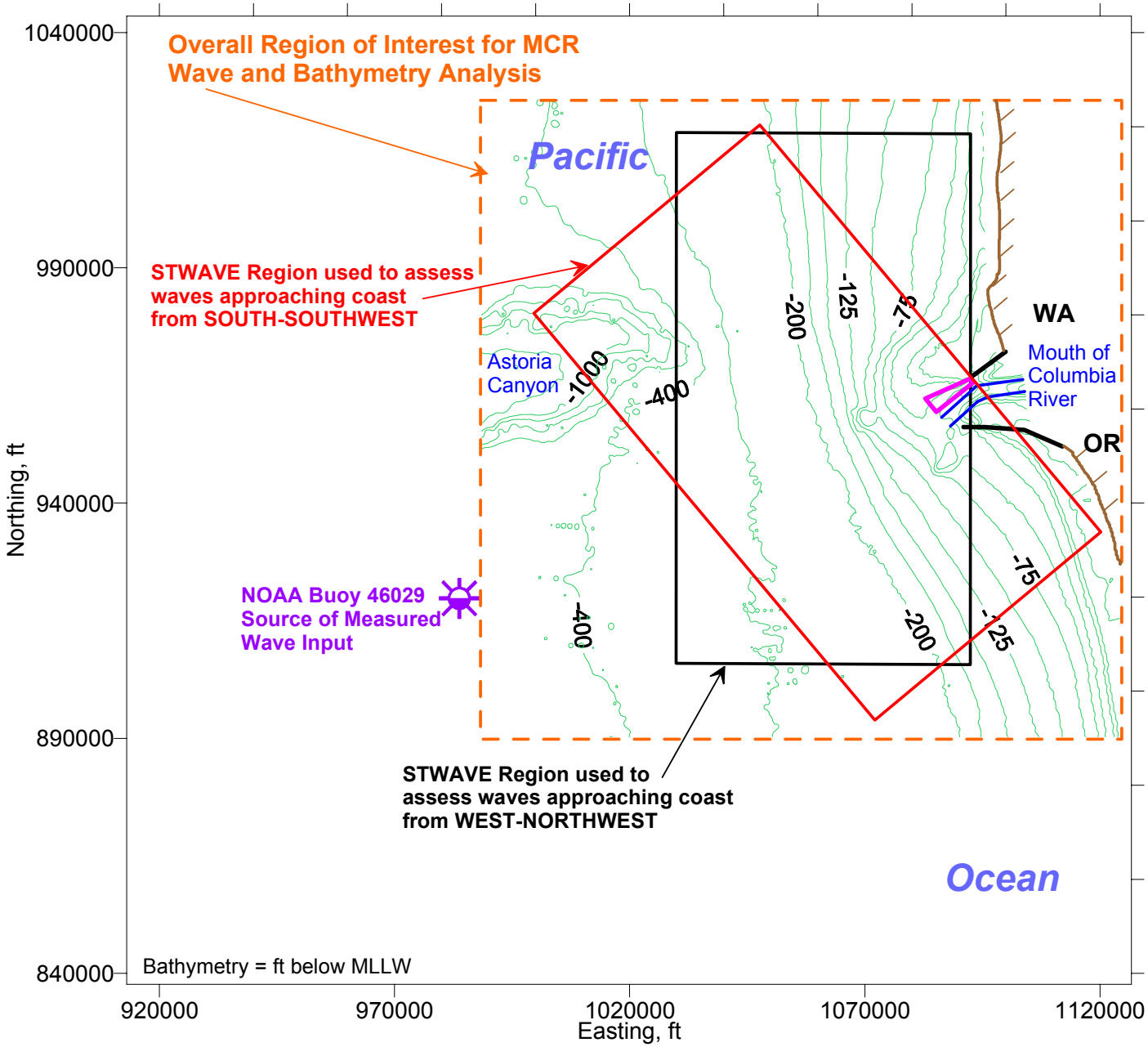


Figure B1. Offshore bathymetry at MCR. Black and Red boxes define the two domains for which wind-waves were simulated using the STWAVE model. Each STWAVE domain covers an area of 60 km x 20 km. Note the location of MCR jetties and the Shallow Water ODMDS (shown in purple). NOAA-NDBC buoy used as the data source for offshore wave data featured in this report.

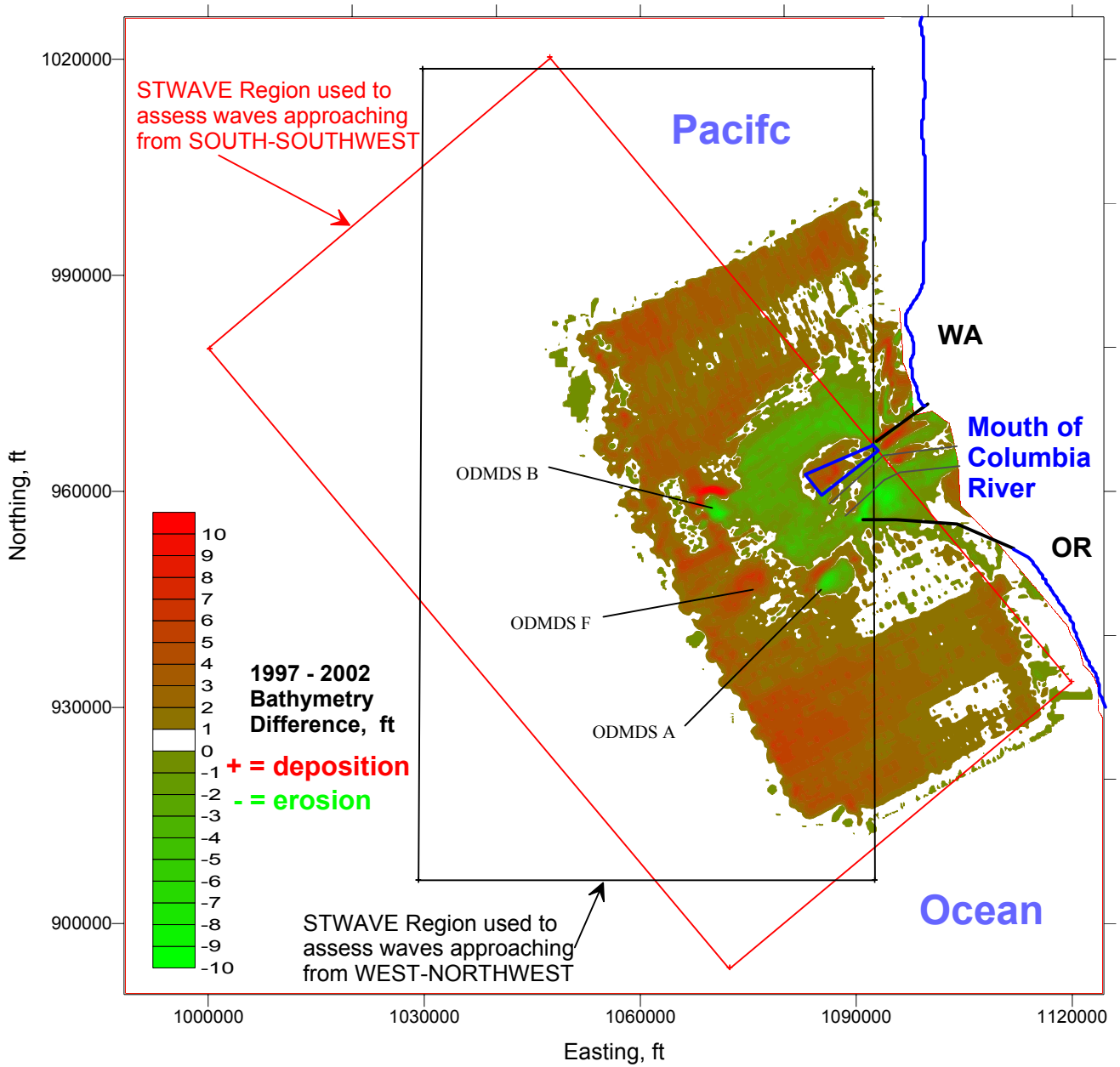


Figure B2. Bathymetry change offshore MCR during 1997 – 2002, derived by differencing of survey data. Significant erosion has occurred on Peacock and Clatsop Spits. Note the location of the SW ODMDS (blue box) and lack of seabed erosion near the site. Although ODMDS A and B have not been used since 1995(97), there has been significant movement of previously placed dredged material.

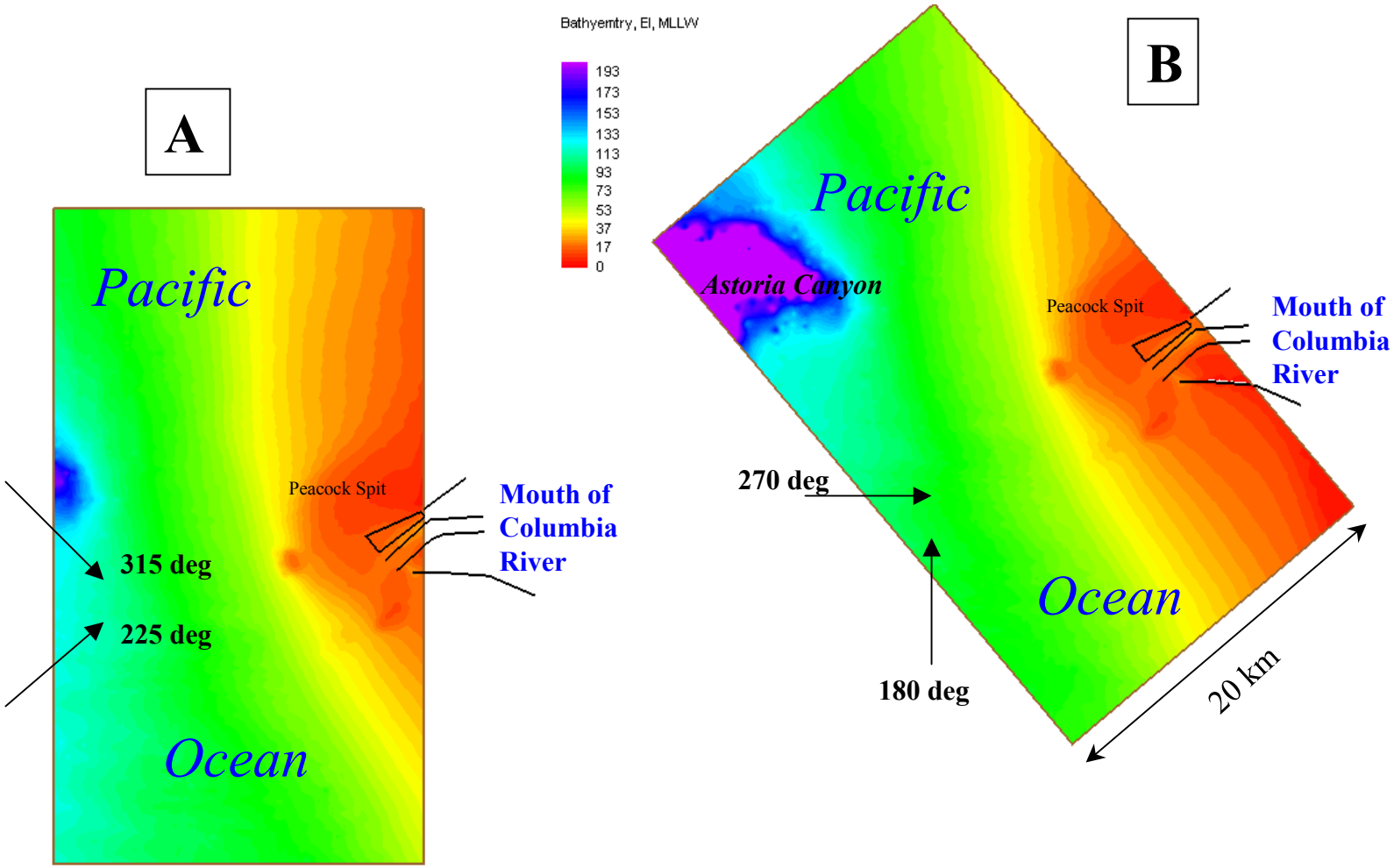


Figure B3. Two grid orientations that were used in the STWAVE model to simulate wind-wave transformation at MCR, data shown here is the 1997 offshore bathymetry at MCR. The grid shown in graphic **(A)** was used to to model waves approaching the coast from the **northwest (315 deg)-southwest (225 deg)**; corresponding to wave conditions as described in figures S6-S10. The grid shown in graphic **(B)** was used to to model waves approaching the coast from the **west (270 deg)-south (180 deg)**; corresponding to wave conditions as described in figures S1-S5.

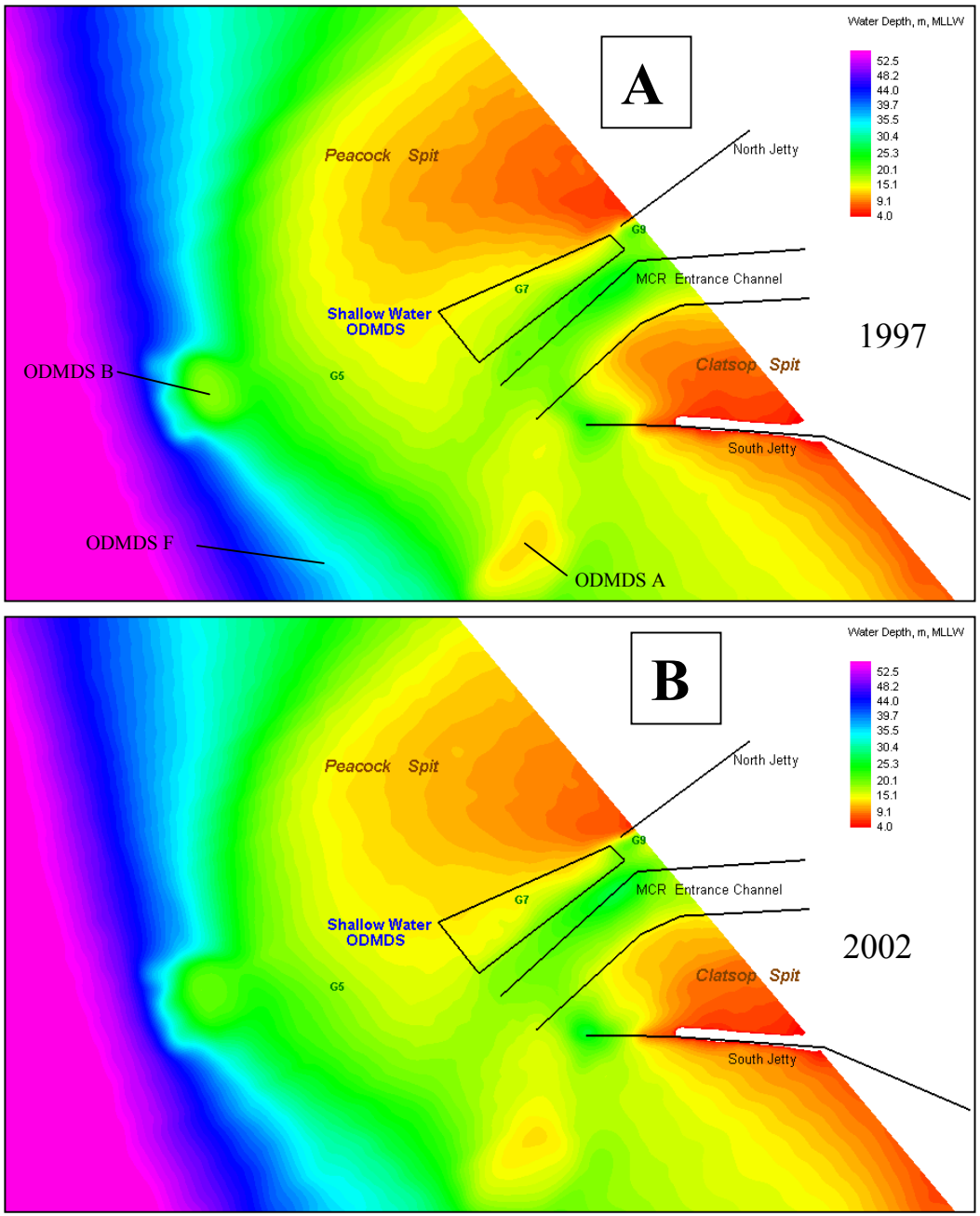


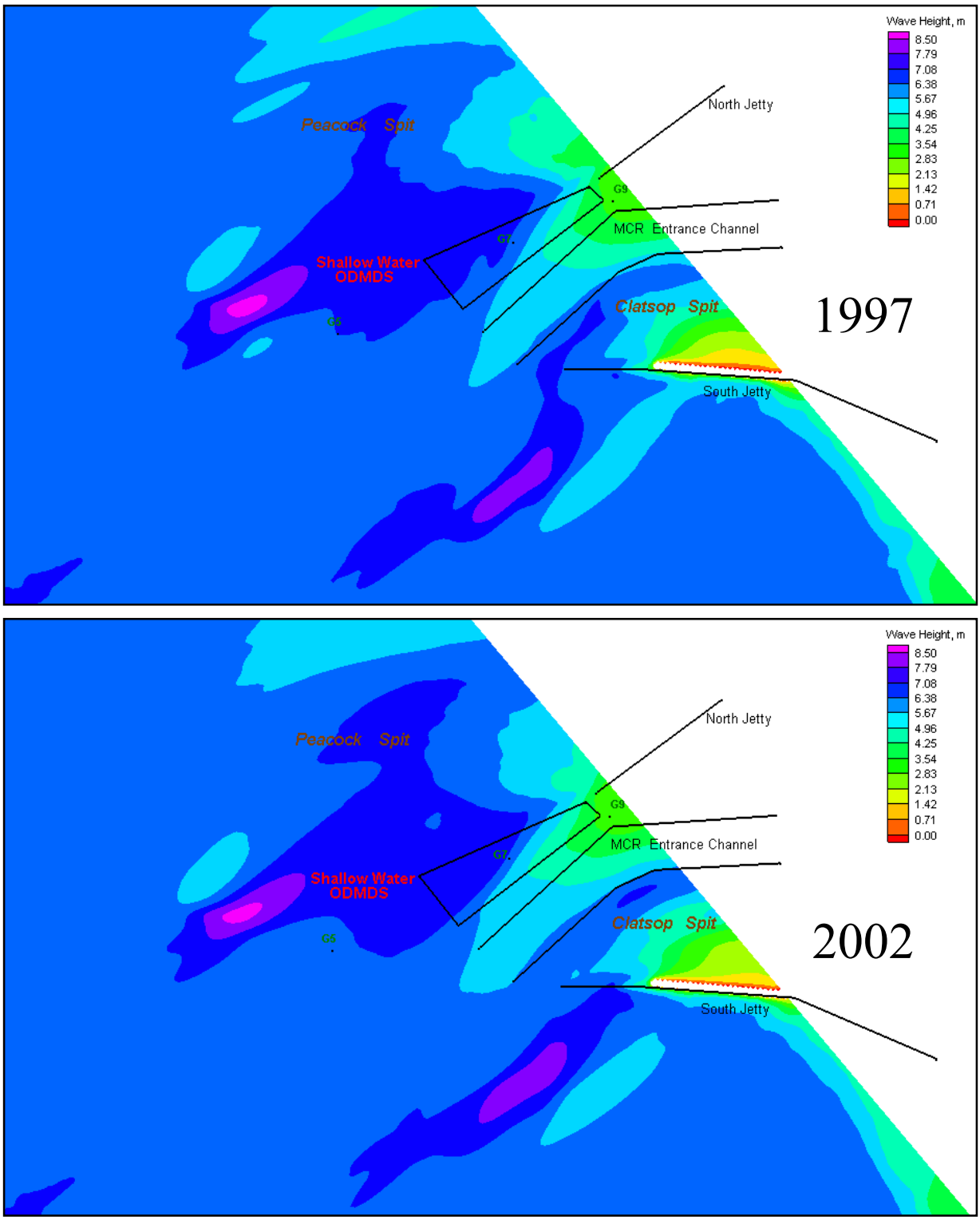
Figure B4. Close-up view of MCR bathymetry as described within the STWAVE model.

The model domain orientation shown was used to assess waves approaching the coast from the **west (270 deg)-south (180 deg)**; corresponding to wave conditions as described in figures S1-S5.

Graphic (A) shows the bathymetry for 1997, graphic (B) shows the 2002 bathymetry conditions. Note the seabed change that had occurred at peacock Spit, Clatsop Spit, and ODMDSs.

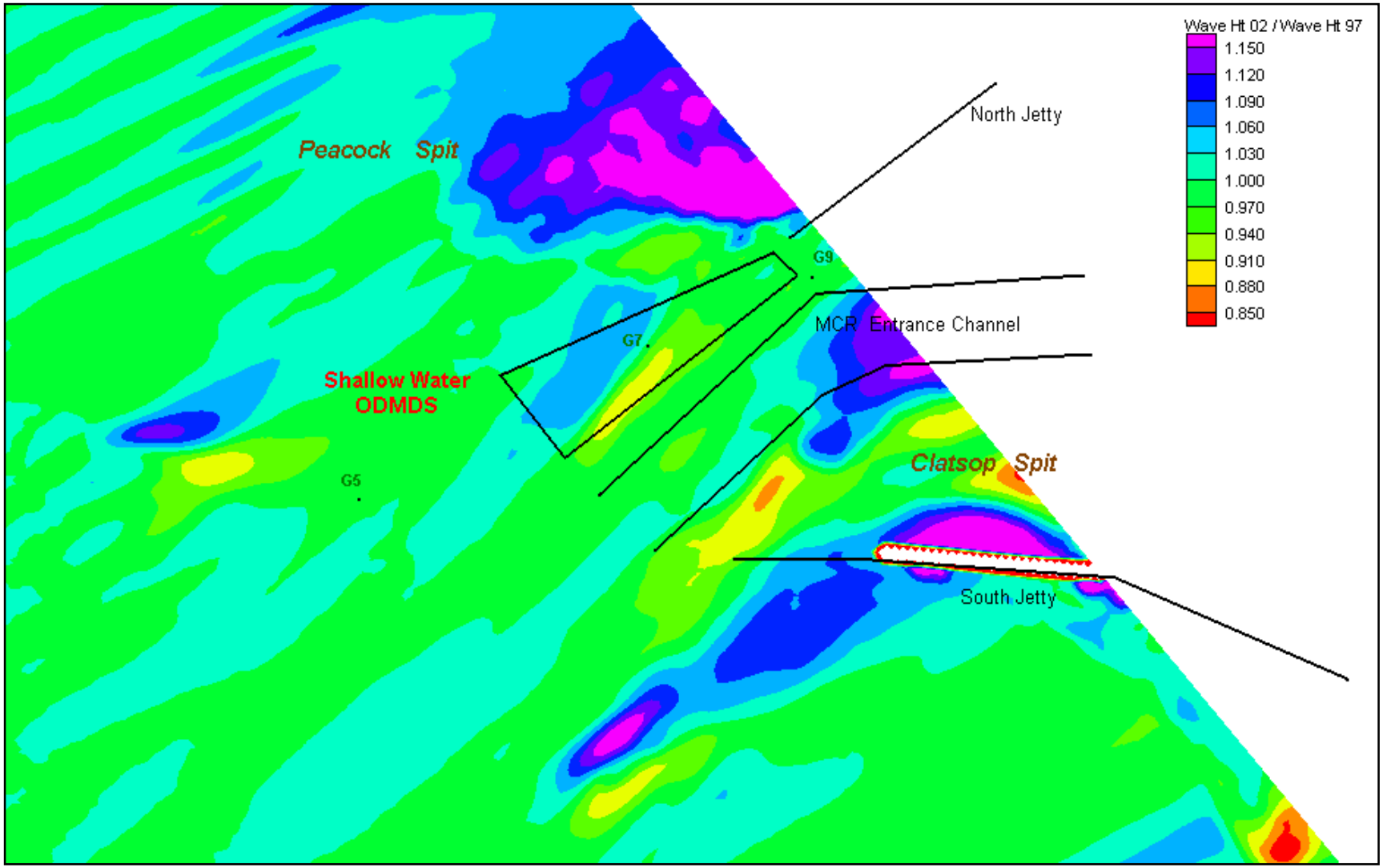
South-Southwest Wave Scenarios to Assess Wave Effects Due to Bathymetry Change during 1997 – 2002

Corresponding to wave conditions shown in figures S1-S5



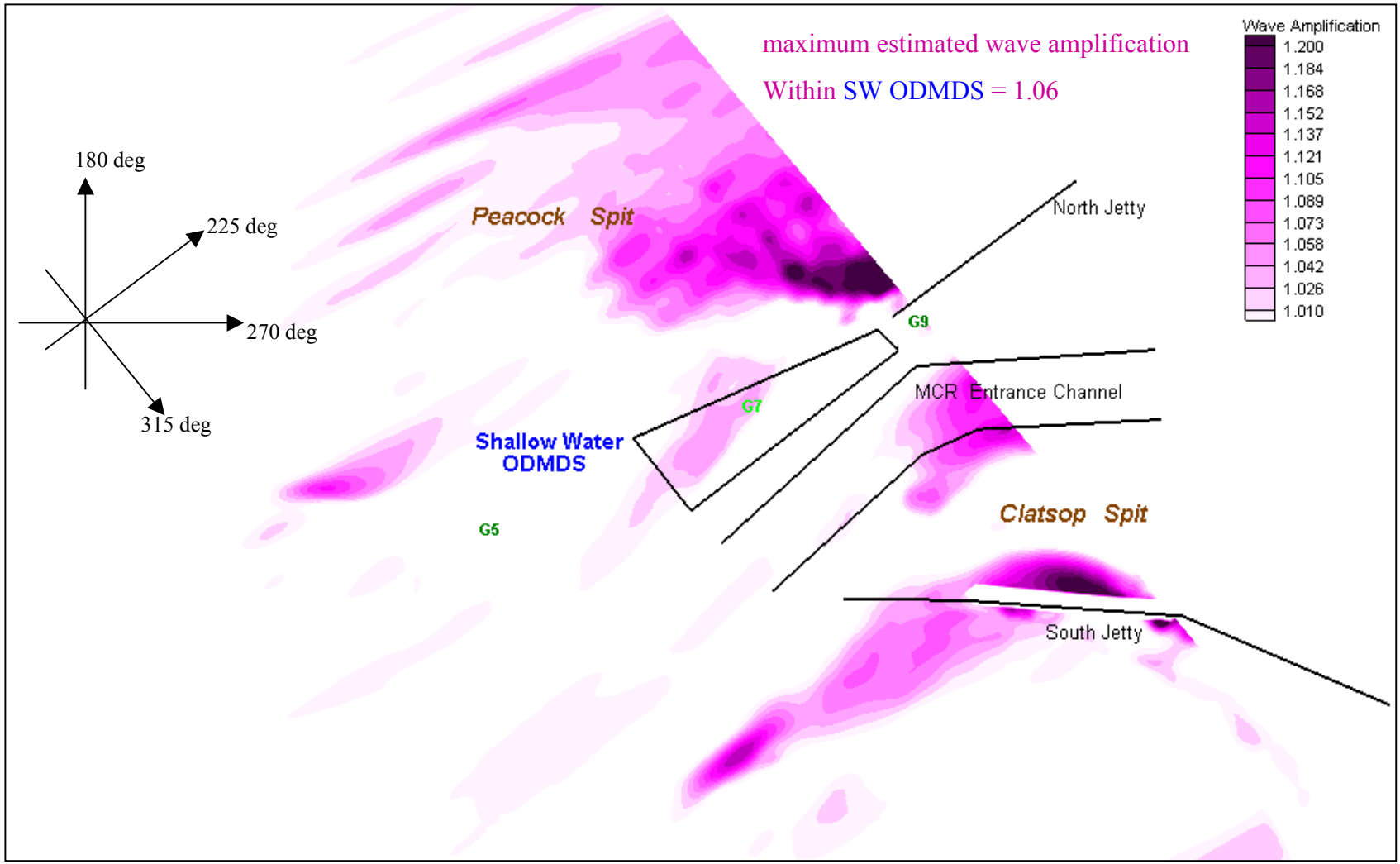
Offshore wave conditions (figure S1) for <u>Winter Storm</u>: Ht= 6.48 m, Tp=12.5 sec, Dir =225 deg, Wind=13.8 m/s @ 180 deg

Figure B5 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



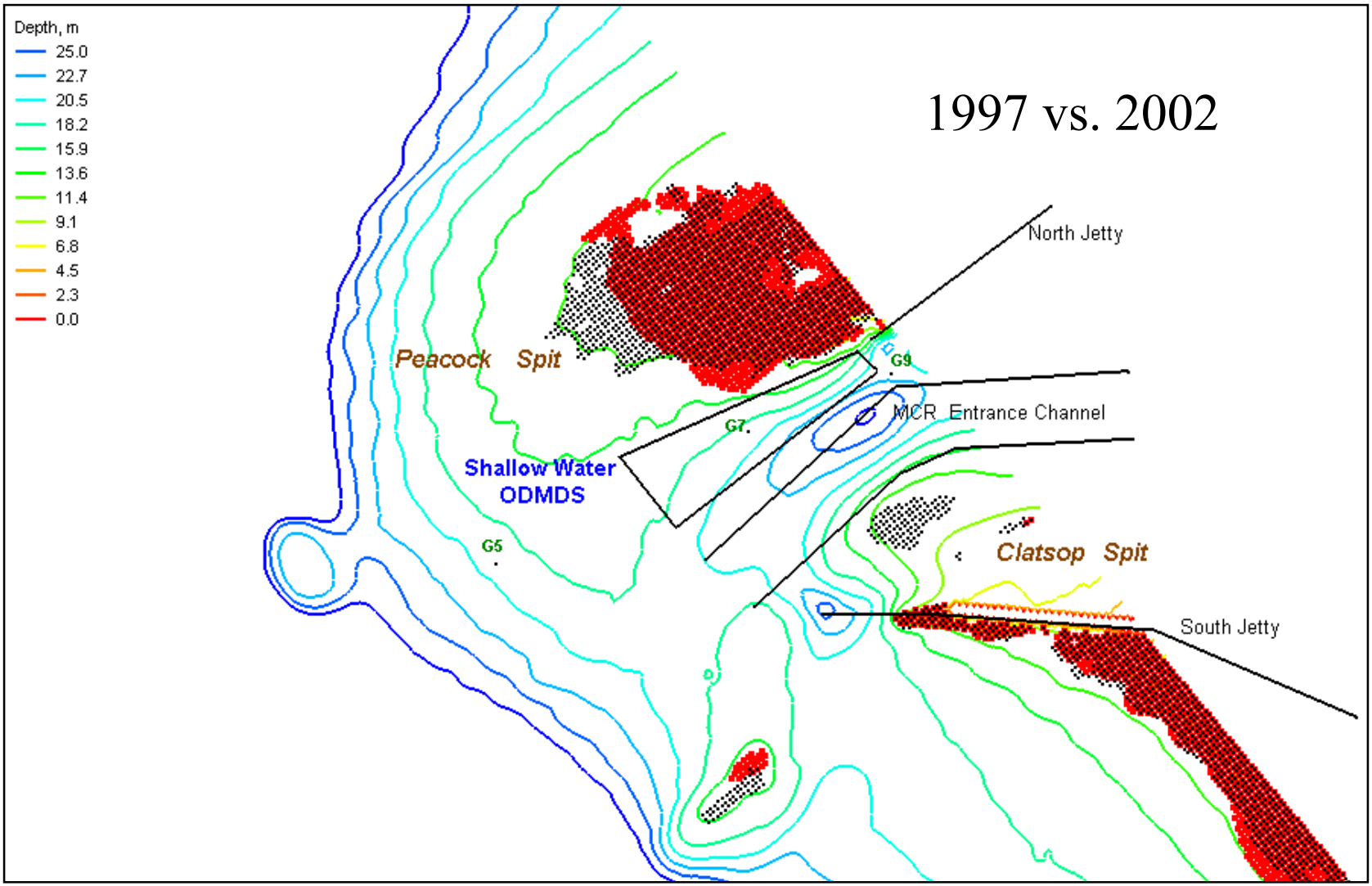
Winter Storm: Avg. wave height = 6.48 m, Peak wave period =12.5 sec, Avg. wave direction = SW (225 deg), Wind=13.8 m/s @ S (180 deg)

Figure B6. Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



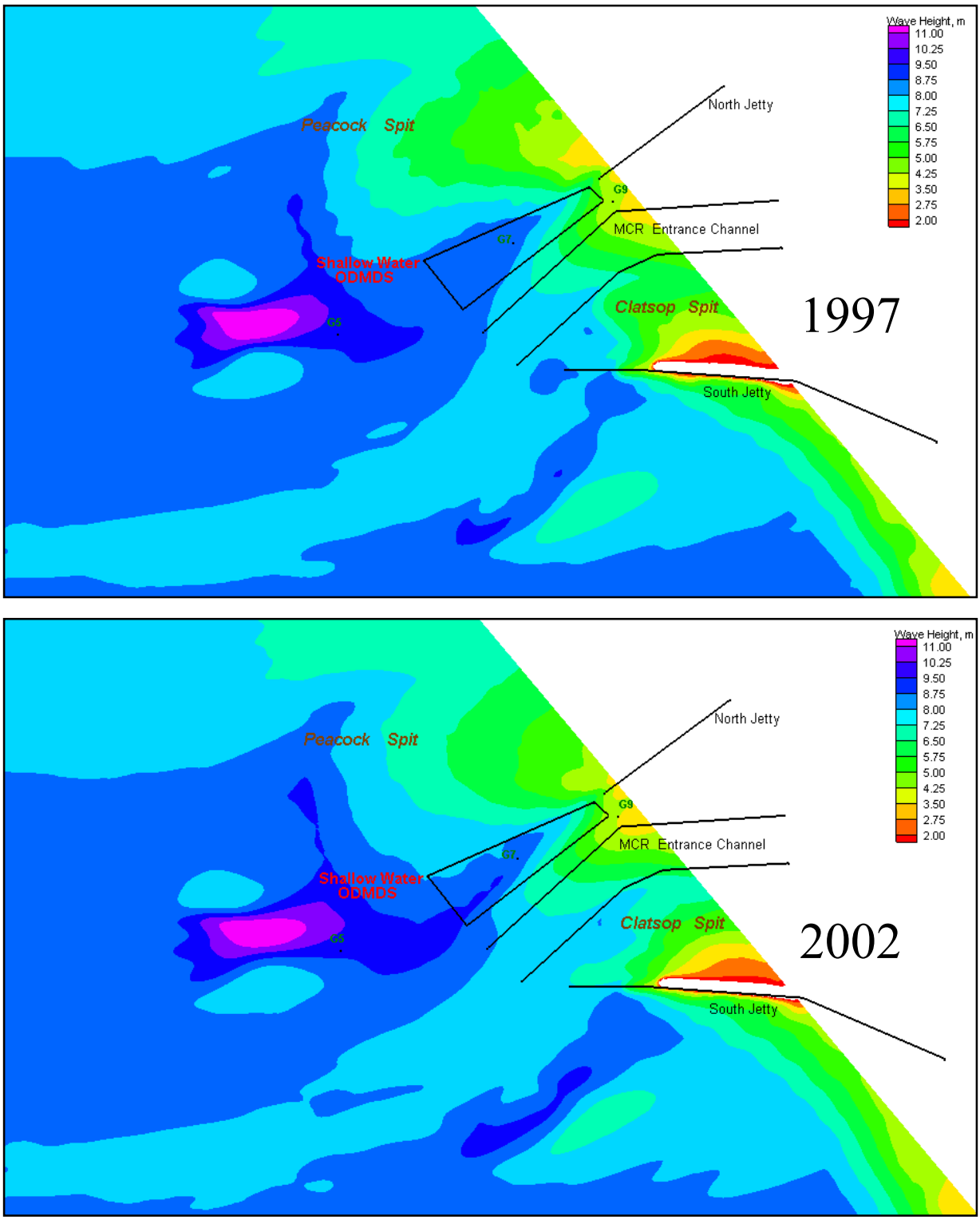
Offshore wave conditions (figure S1) for Winter Storm: Ht= 6.48 m, Tp=12.5 sec, Dir =225 deg, Wind=13.8 m/s @ 180 deg

Figure B7 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



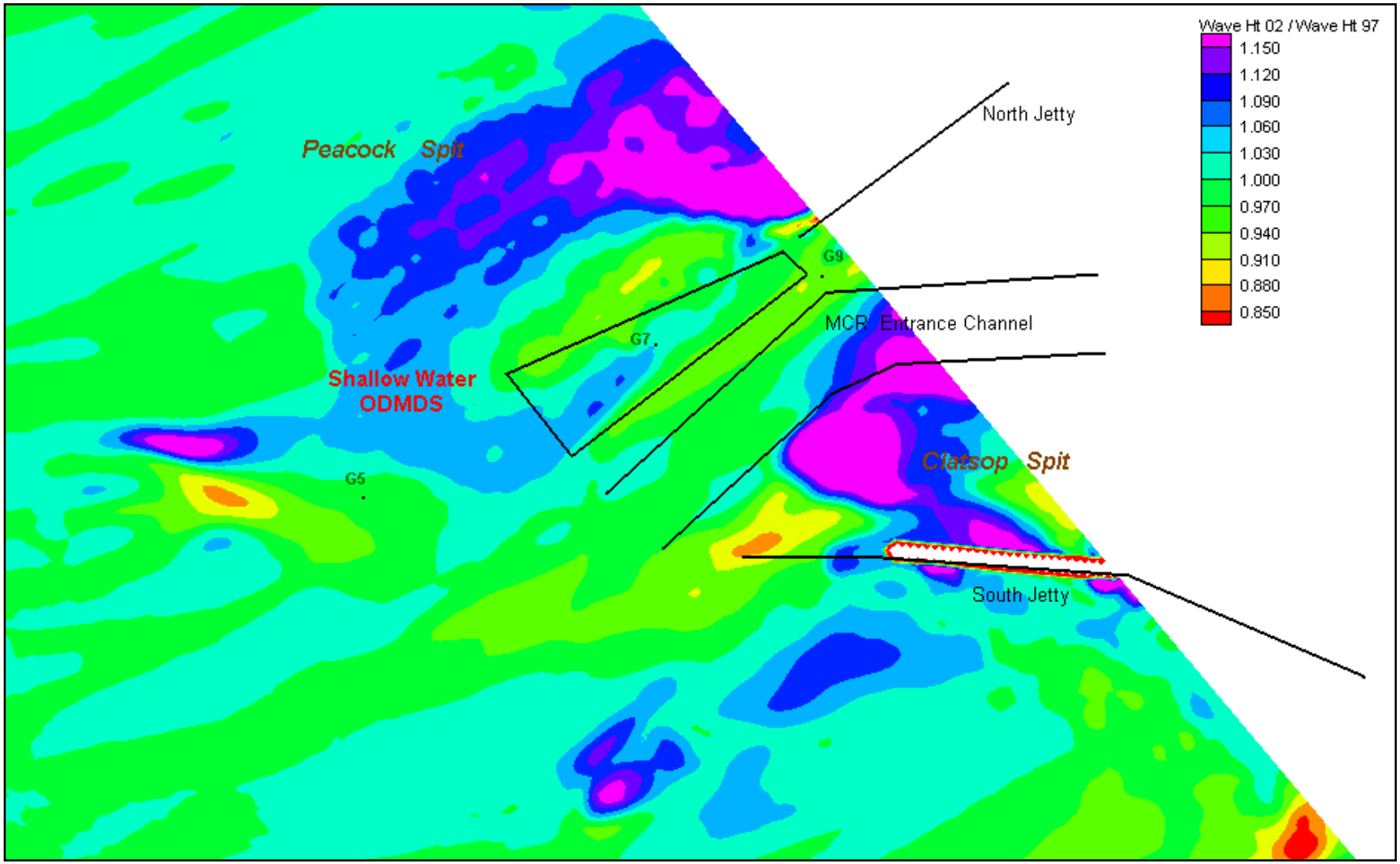
Winter Storm: Avg. wave height = 6.48 m, Peak wave period =12.5 sec, Avg. wave direction = SW (225 deg), Wind=13.8 m/s @ S (180 deg)

Figure B8. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.



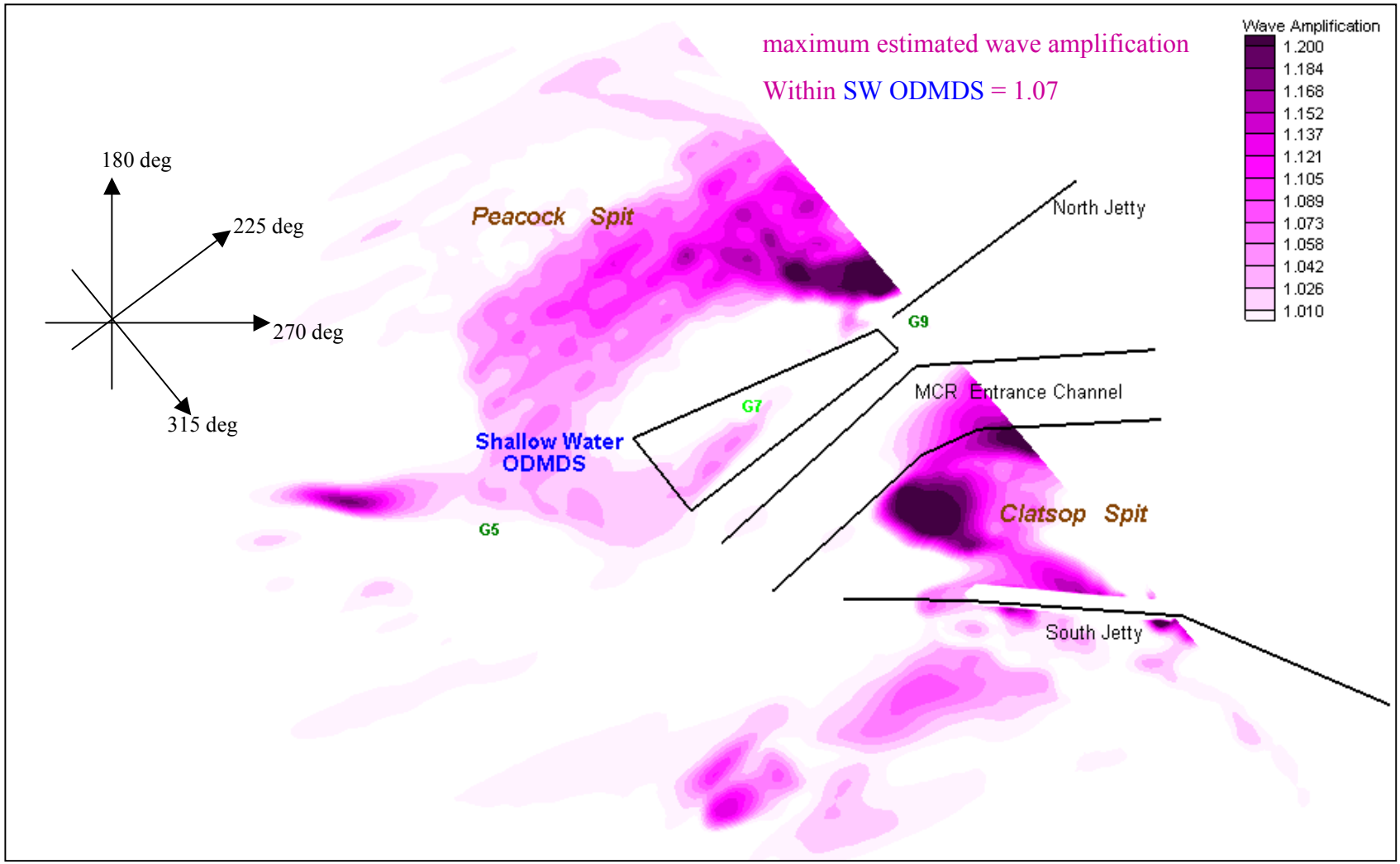
Offshore wave conditions (figure S2) for <u>Winter Storm</u>: Ht = 8.34 m, Tp=16.7 sec, Dir =260 deg, Wind=14.2 m/s @ 192 deg

Figure B9 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



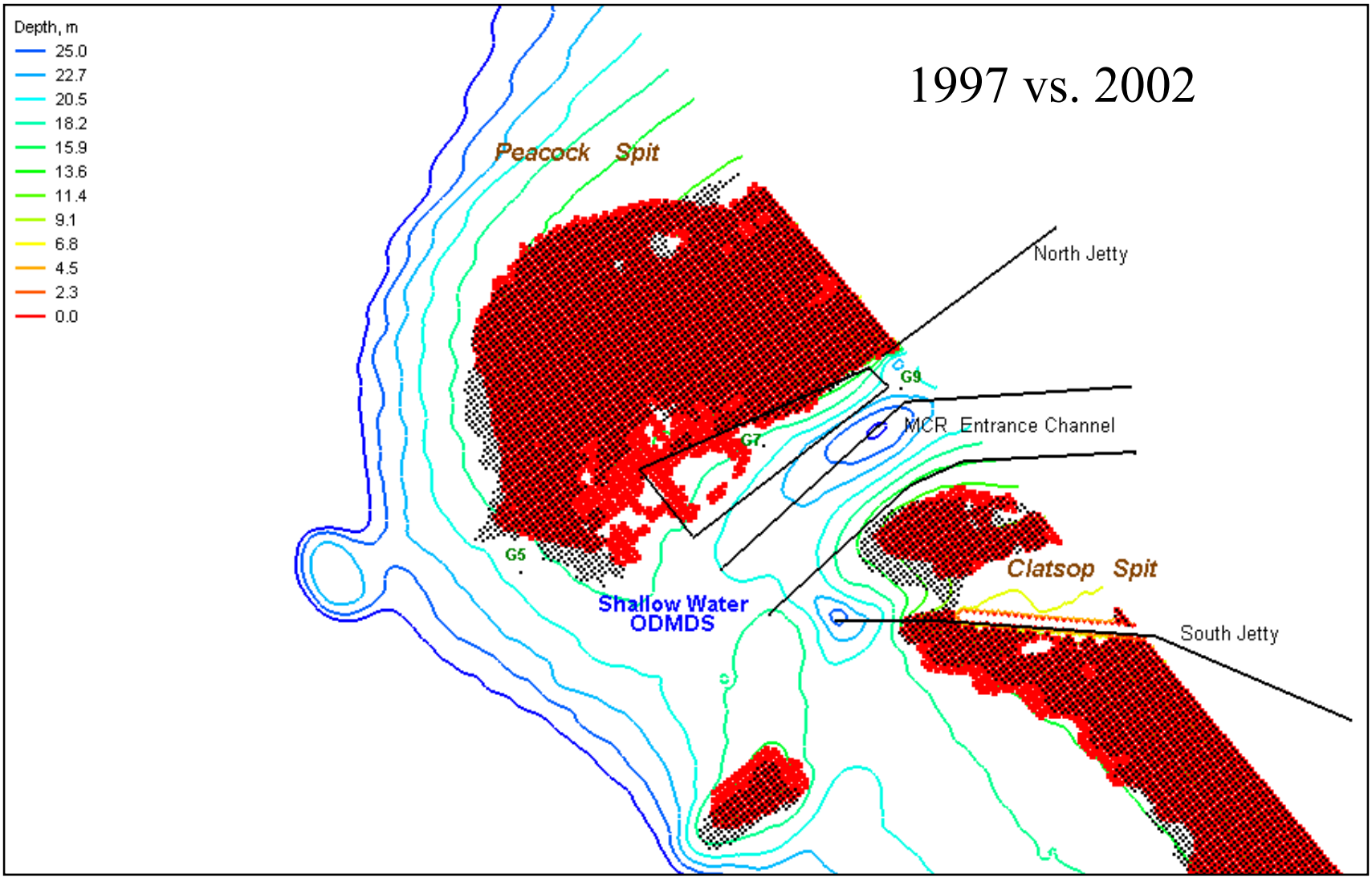
Winter Storm: Avg. wave height = 8.34 m, Peak wave period=16.7 sec, Avg. wave direction =W (260 deg), Wind=14.2 m/s @ S (192 deg)

Figure B 10 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



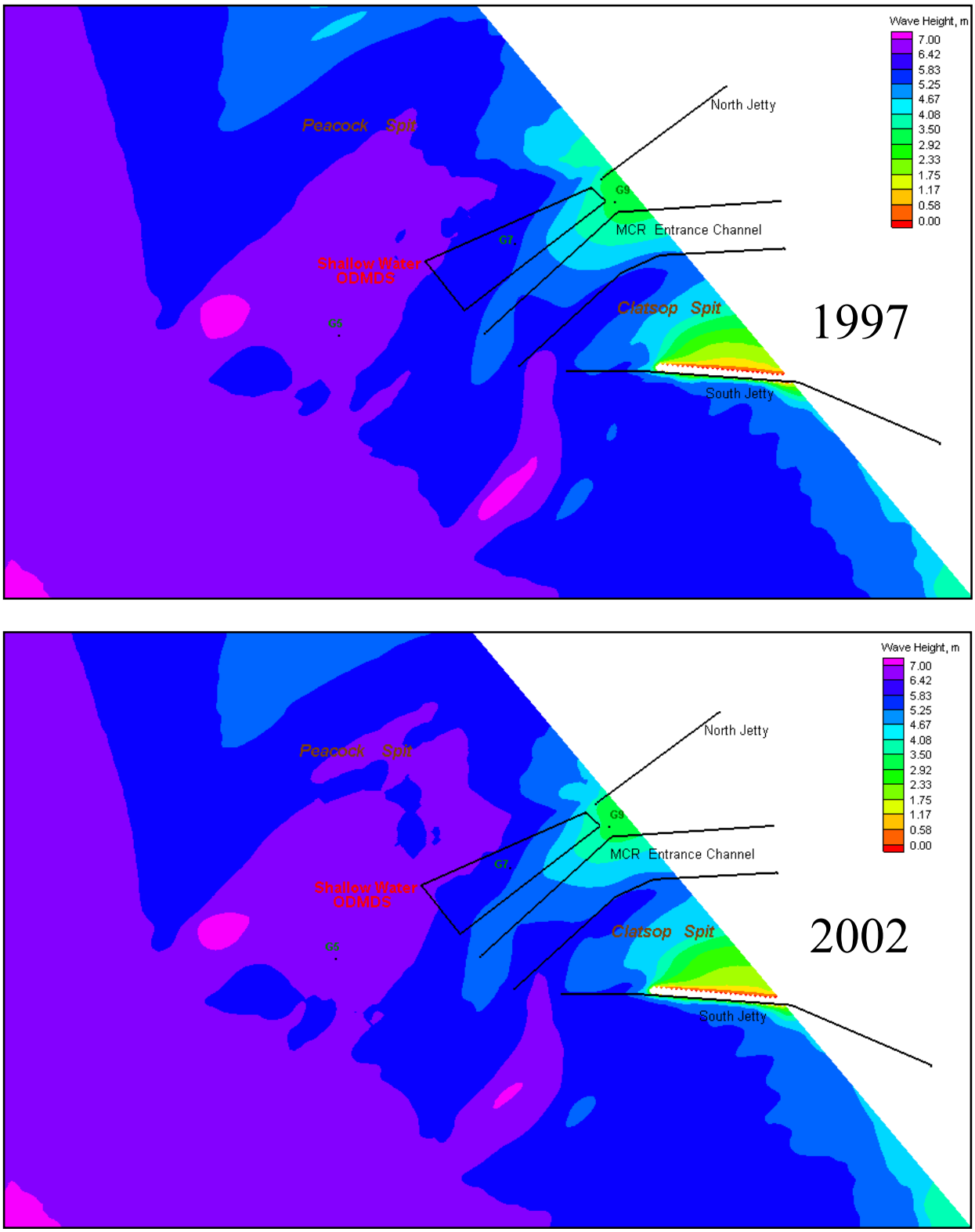
Offshore wave conditions (figure S2) for Winter Storm: Ht = 8.34 m, Tp=16.7 sec, Dir =260 deg, Wind=14.2 m/s @ 192 deg

Figure B11 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



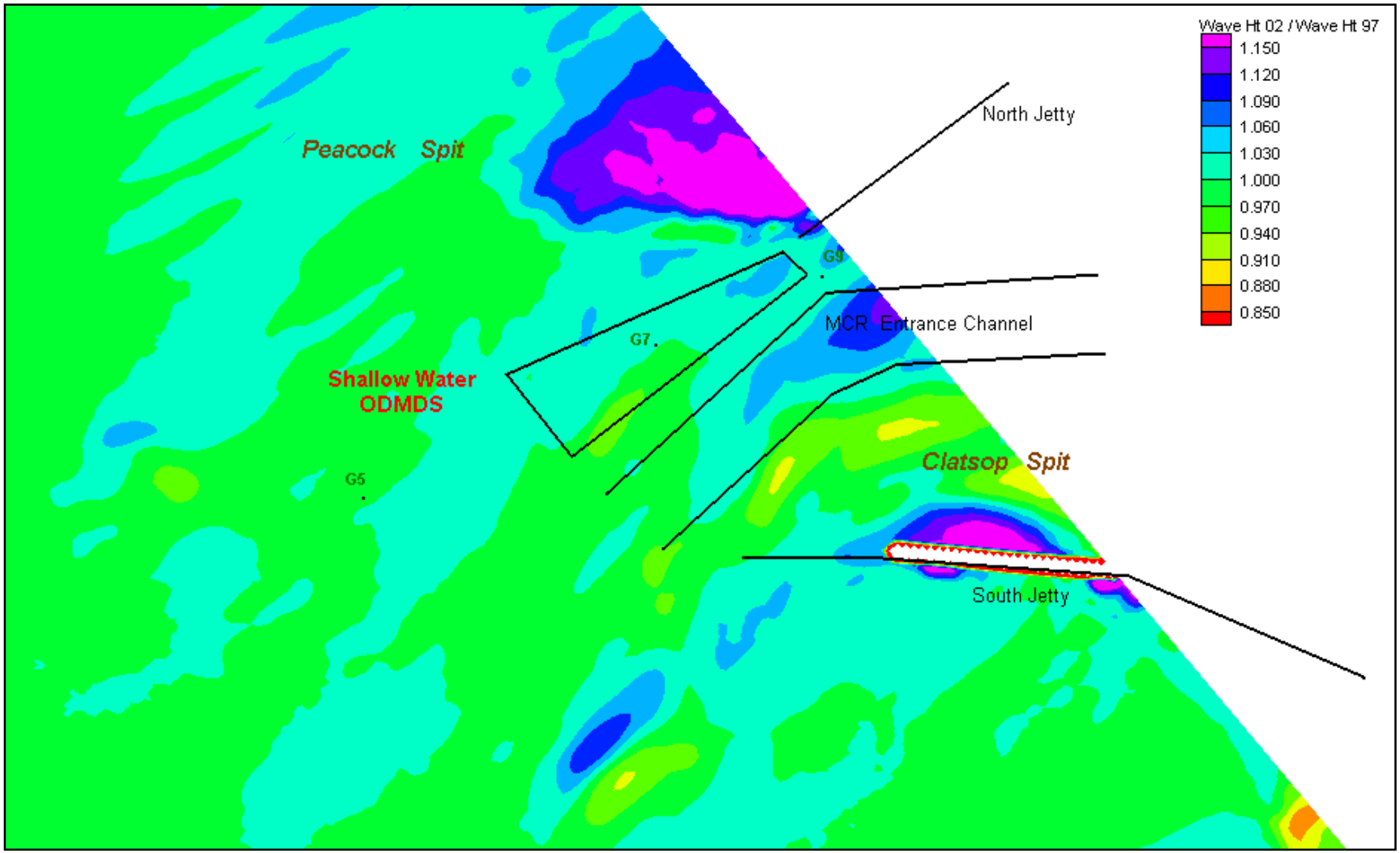
Winter Storm: Avg. wave height = 8.34 m, Peak wave period=16.7 sec, Avg. wave direction =W (260 deg), Wind=14.2 m/s @ S (192 deg)

Figure B12. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.



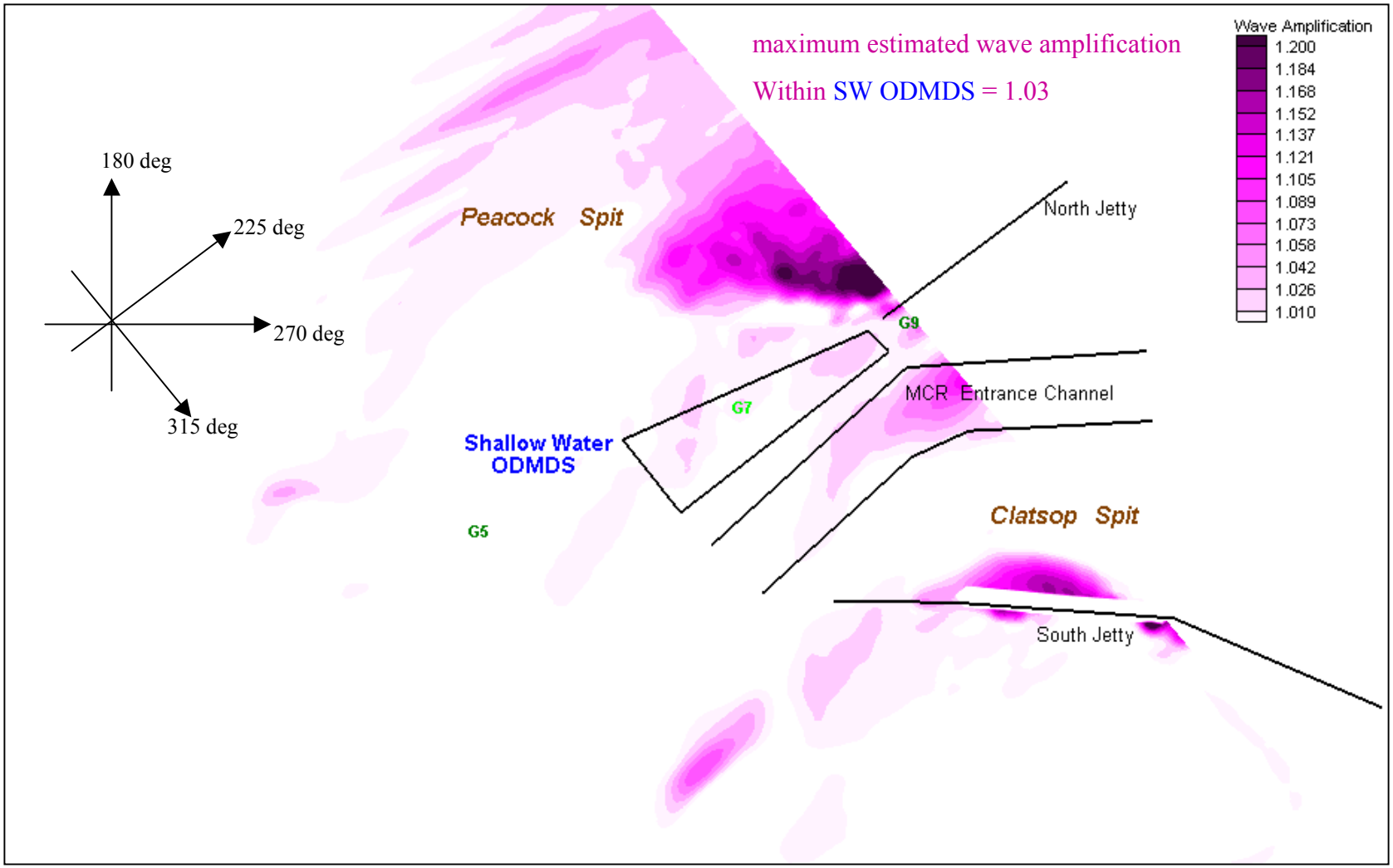
Offshore wave conditions (figure S3) for <u>Winter Storm</u>: Ht = 6.78 m, Tp=10.5 sec, Dir =210 deg, Wind=14.8 m/s @ 190 deg

Figure B13. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



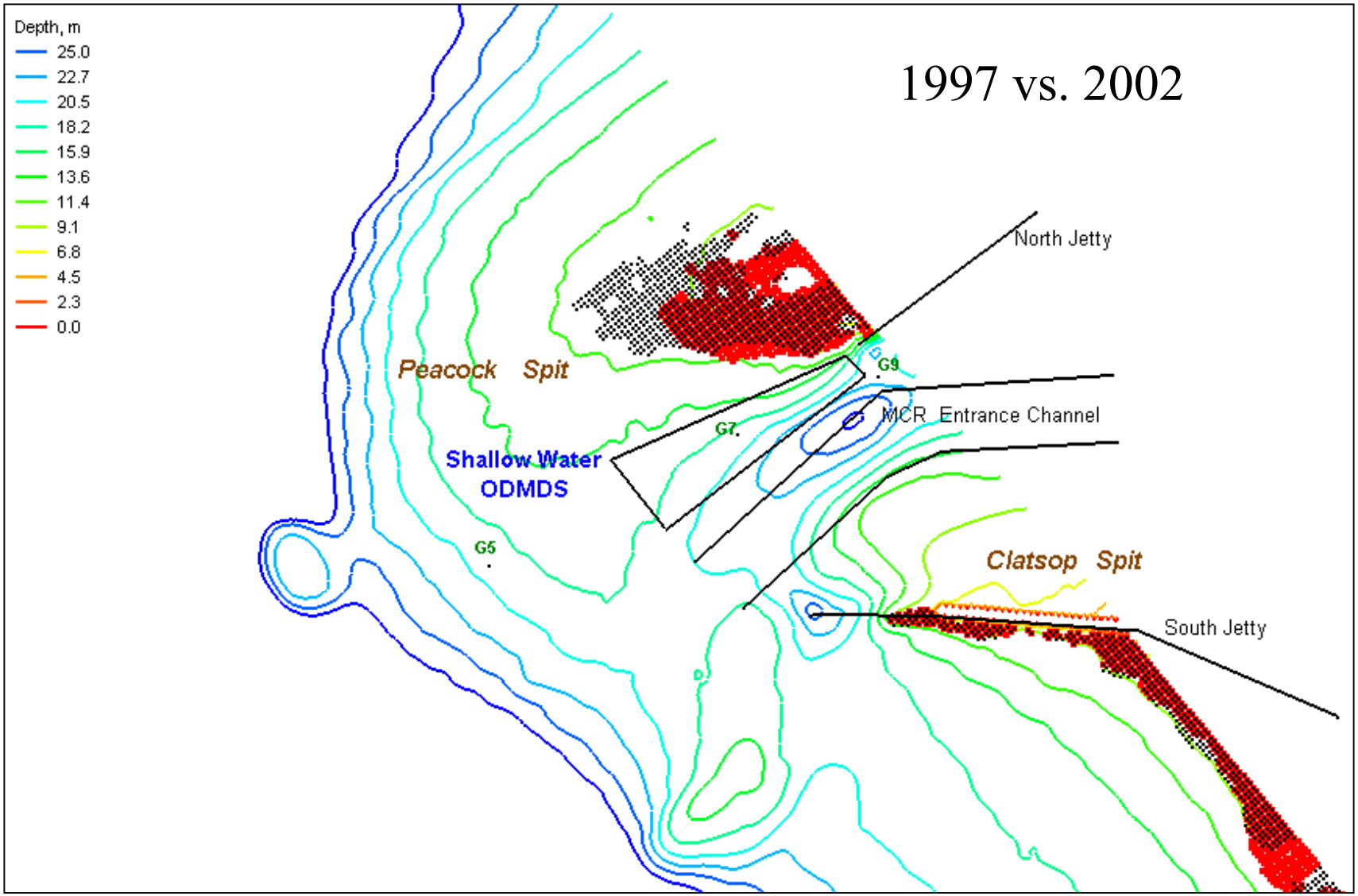
Winter Storm: Avg. wave height = 6.78 m, Peak wave period =10.5 sec, Avg. wave direction=SW (210 deg), Wind=13.8 m/s @ S (180 deg)

Figure B14. Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



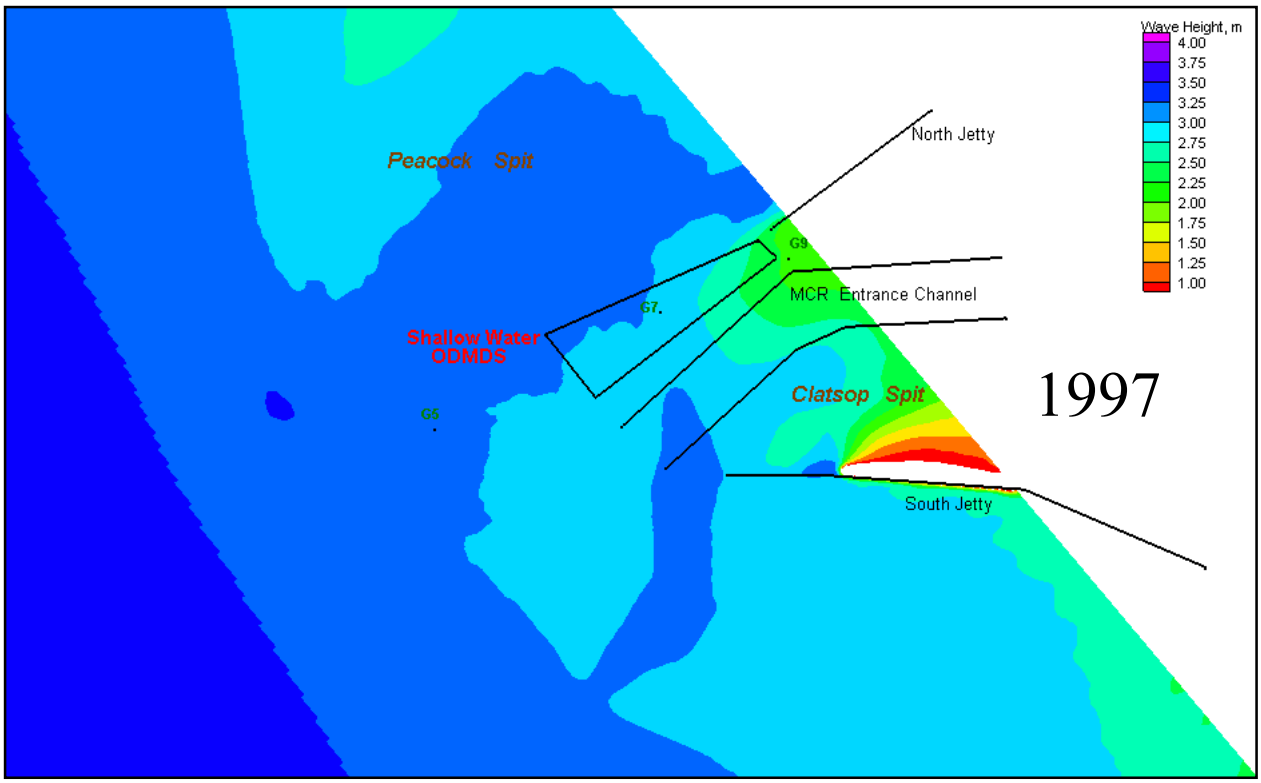
Offshore wave conditions (figure S3) for Winter Storm: Ht = 6.78 m, Tp=10.5 sec, Dir =210 deg, Wind=14.8 m/s @ 190 deg

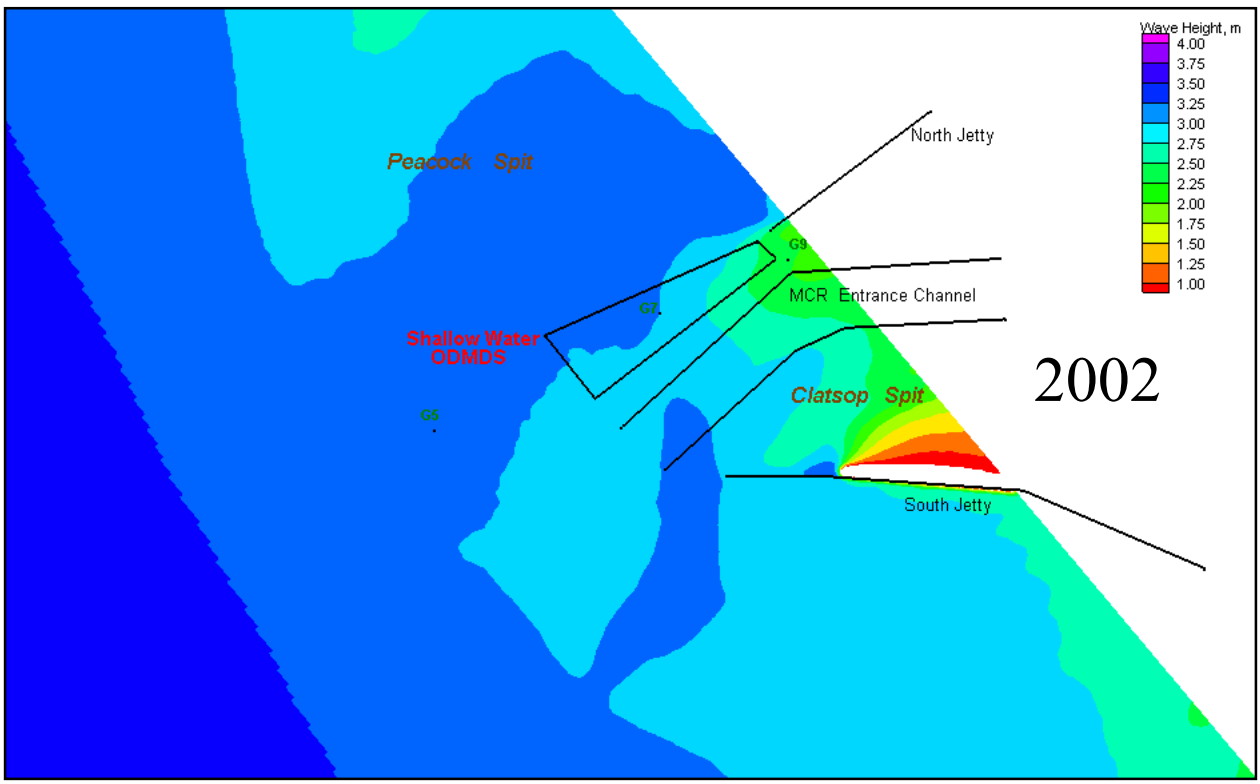
Figure B15 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.78 m, Peak wave period =10.5 sec, Avg. wave direction=SW (210 deg), Wind=13.8 m/s @ S (180 deg)

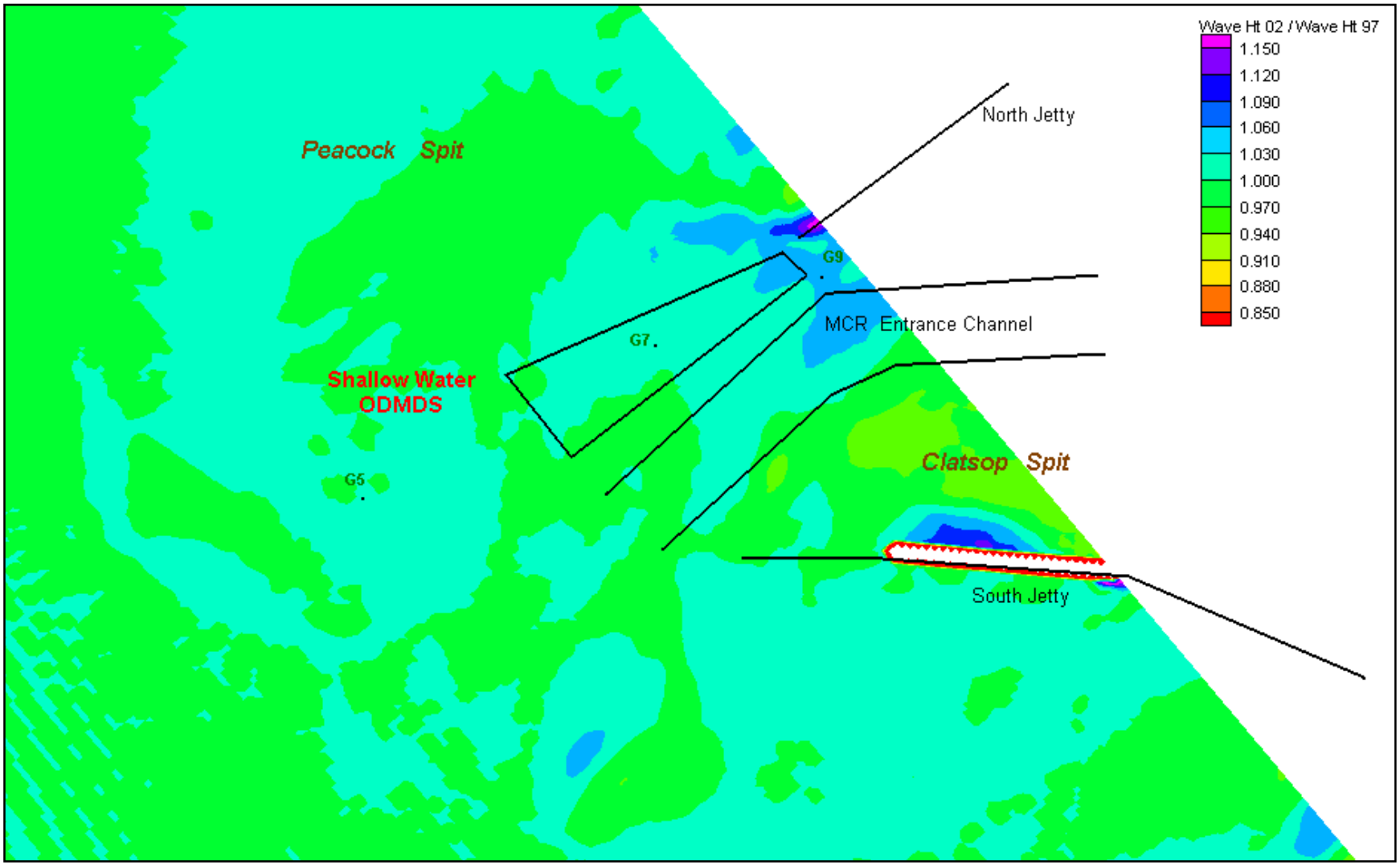
Figure B16. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.





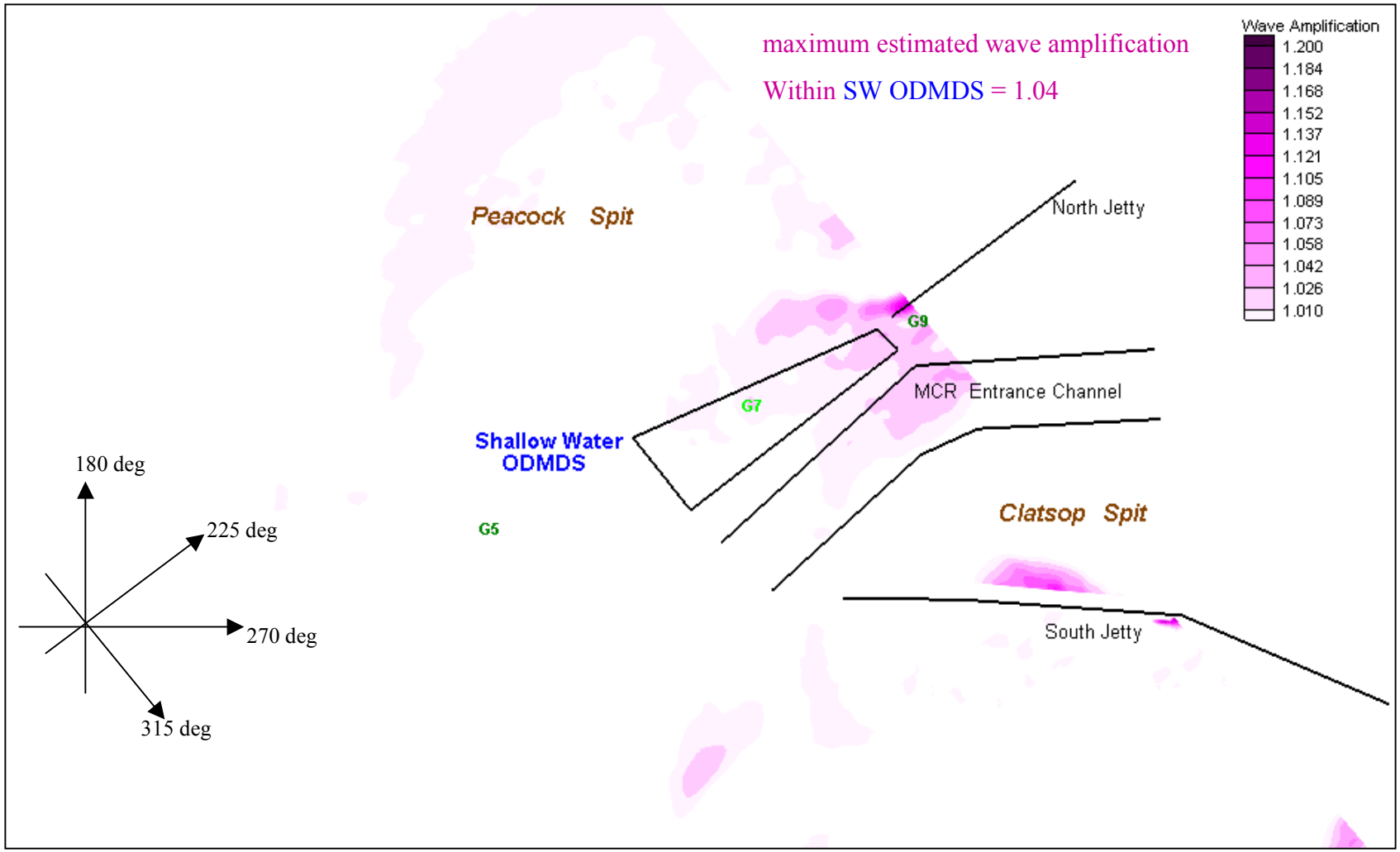
Offshore wave conditions (figure S4) for <u>Summer Storm</u>: Ht = 3.56 m, Tp=7.7 sec, Dir =200 deg, Wind=10.6 m/s @ 178 deg

Figure B17. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



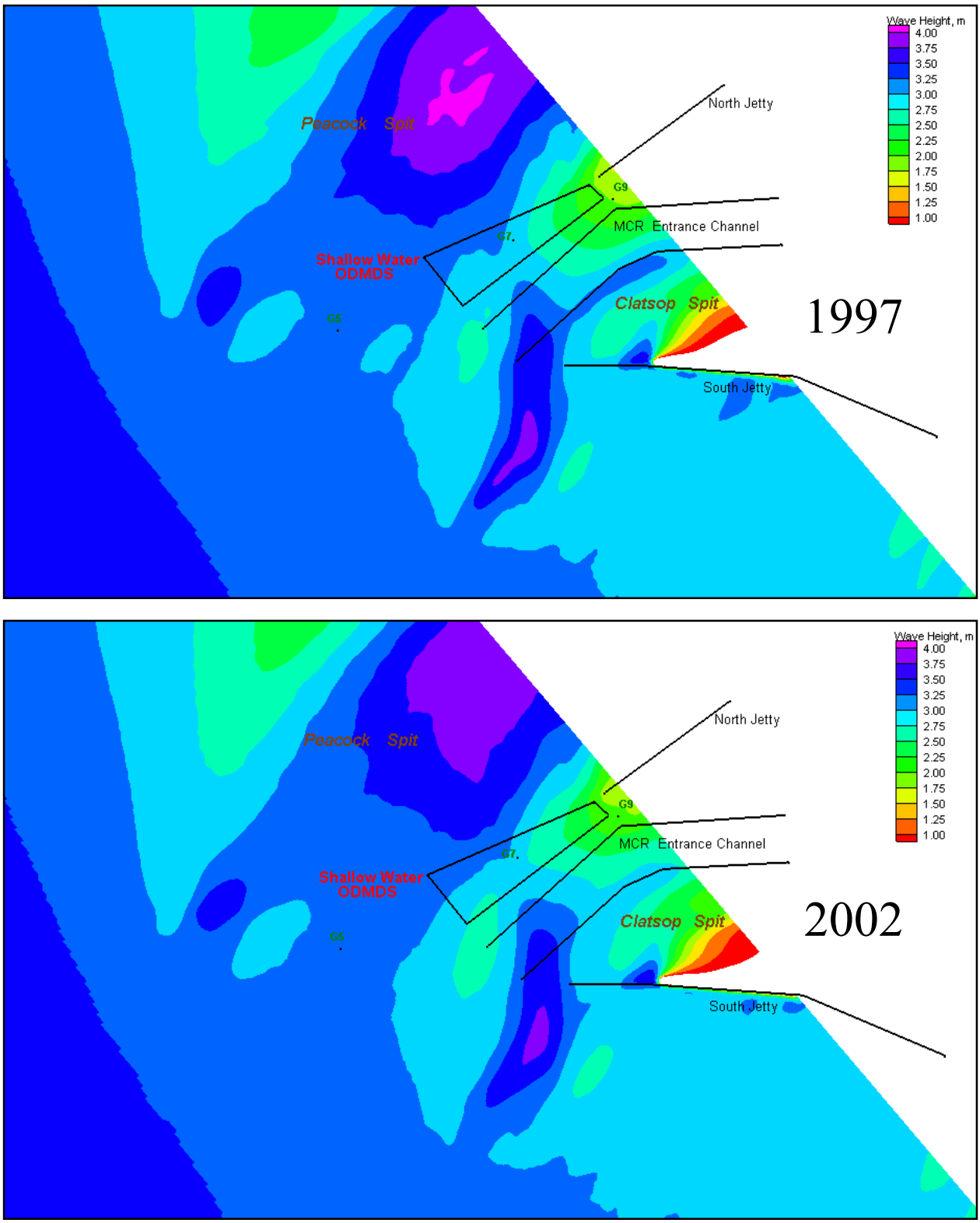
Summer Storm: Avg. wave height = 3.56 m, Peak wave period=7.7 sec, Avg. wave direction = SSW (200 deg), Wind=10.6 m/s @ S (178 deg)

Figure B18 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



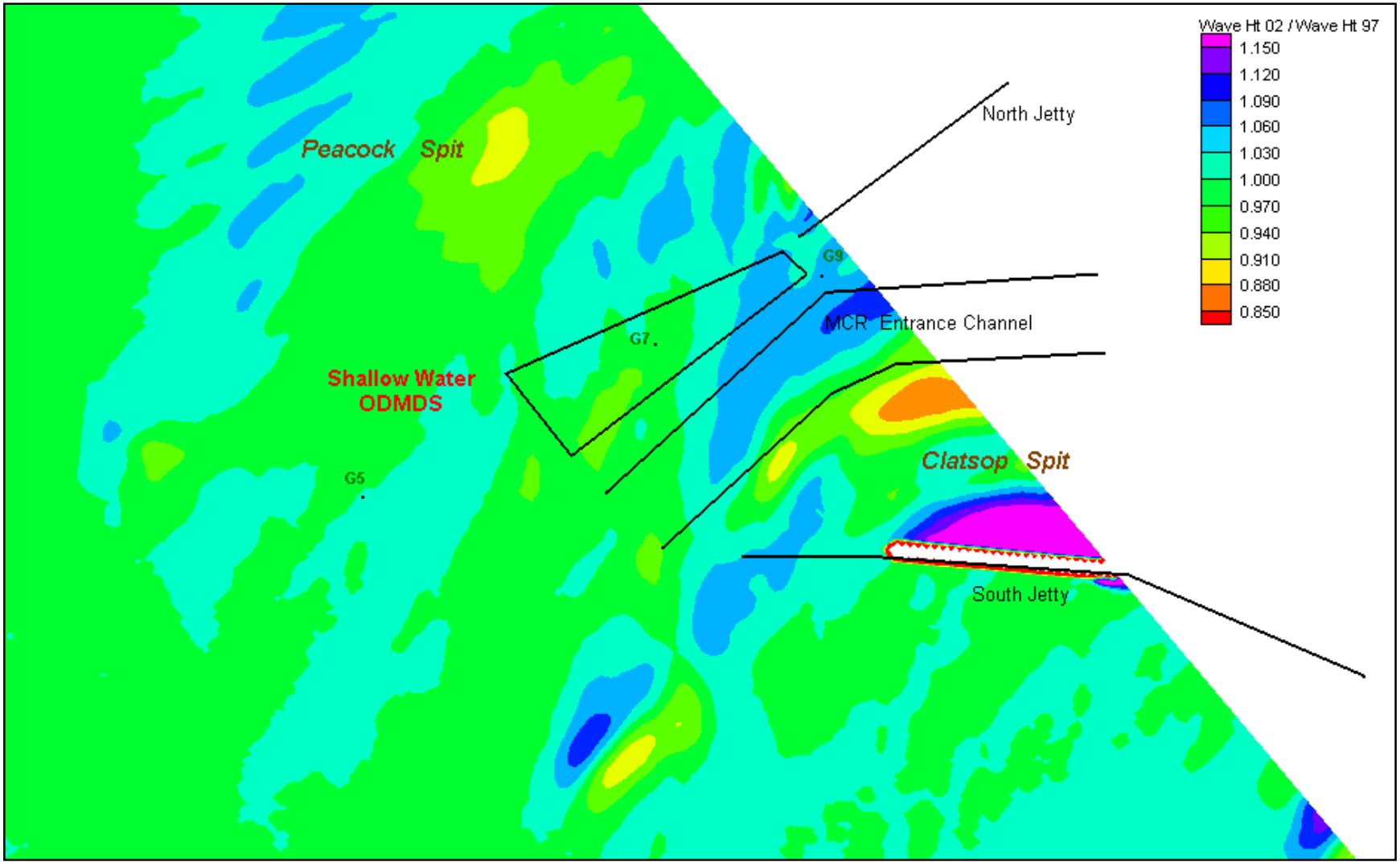
Offshore wave conditions (figure S4) for Summer Storm: Ht = 3.56 m, Tp=7.7 sec, Dir =200 deg, Wind=10.6 m/s @ 178 deg

Figure B19. Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



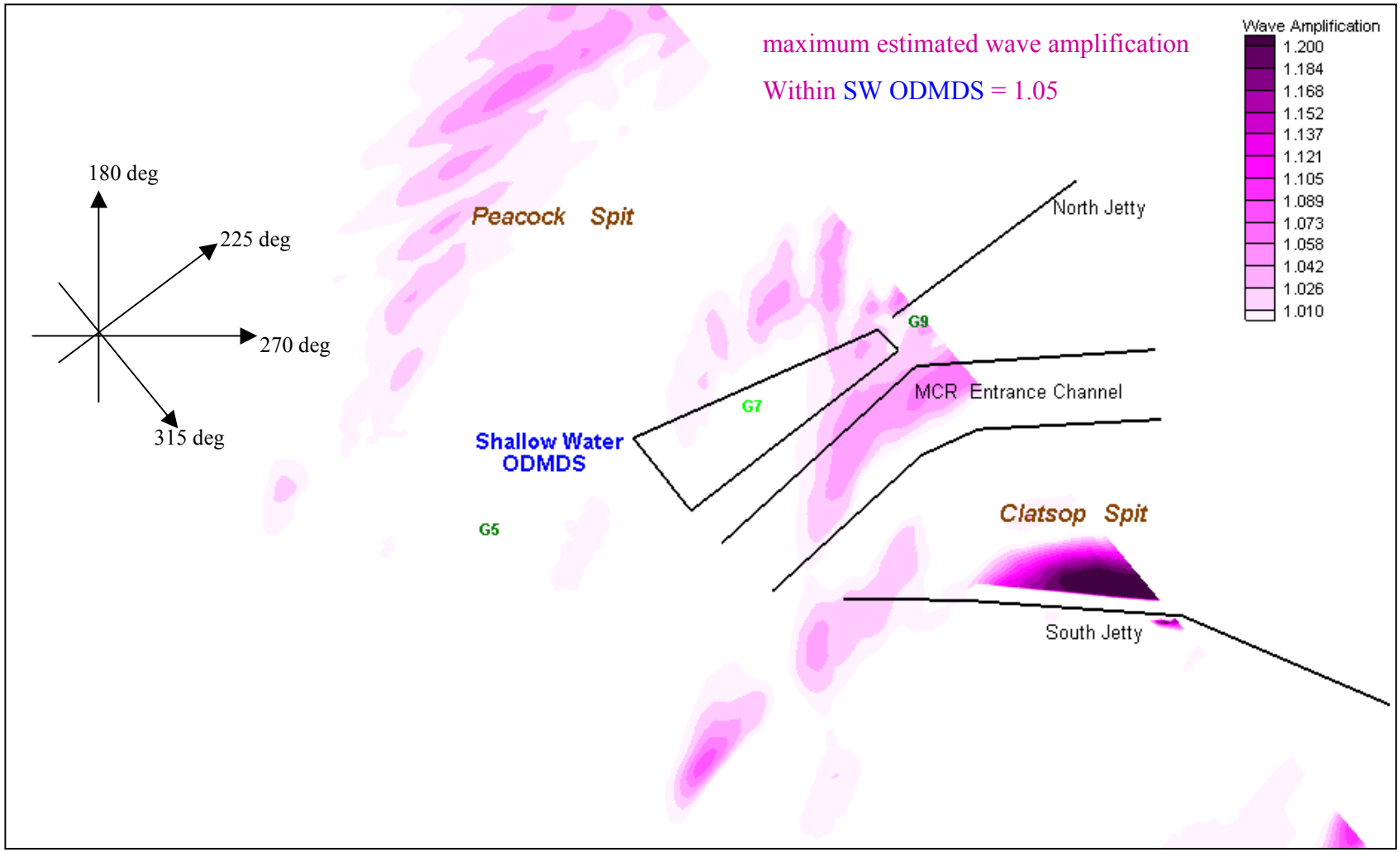
Offshore wave conditions (figure S5) for <u>Summer Storm</u>: Ht = 3.51 m, Tp=10.5 sec, Dir =175 deg, Wind=8.8 m/s @ 165 deg

Figure B21 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



Summer Storm: Avg. wave height = 3.51 m, Peak wave period=10.5 sec, Avg. wave direction = S (175 deg), Wind=8.8 m/s @ SE (165 deg)

Figure B22 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

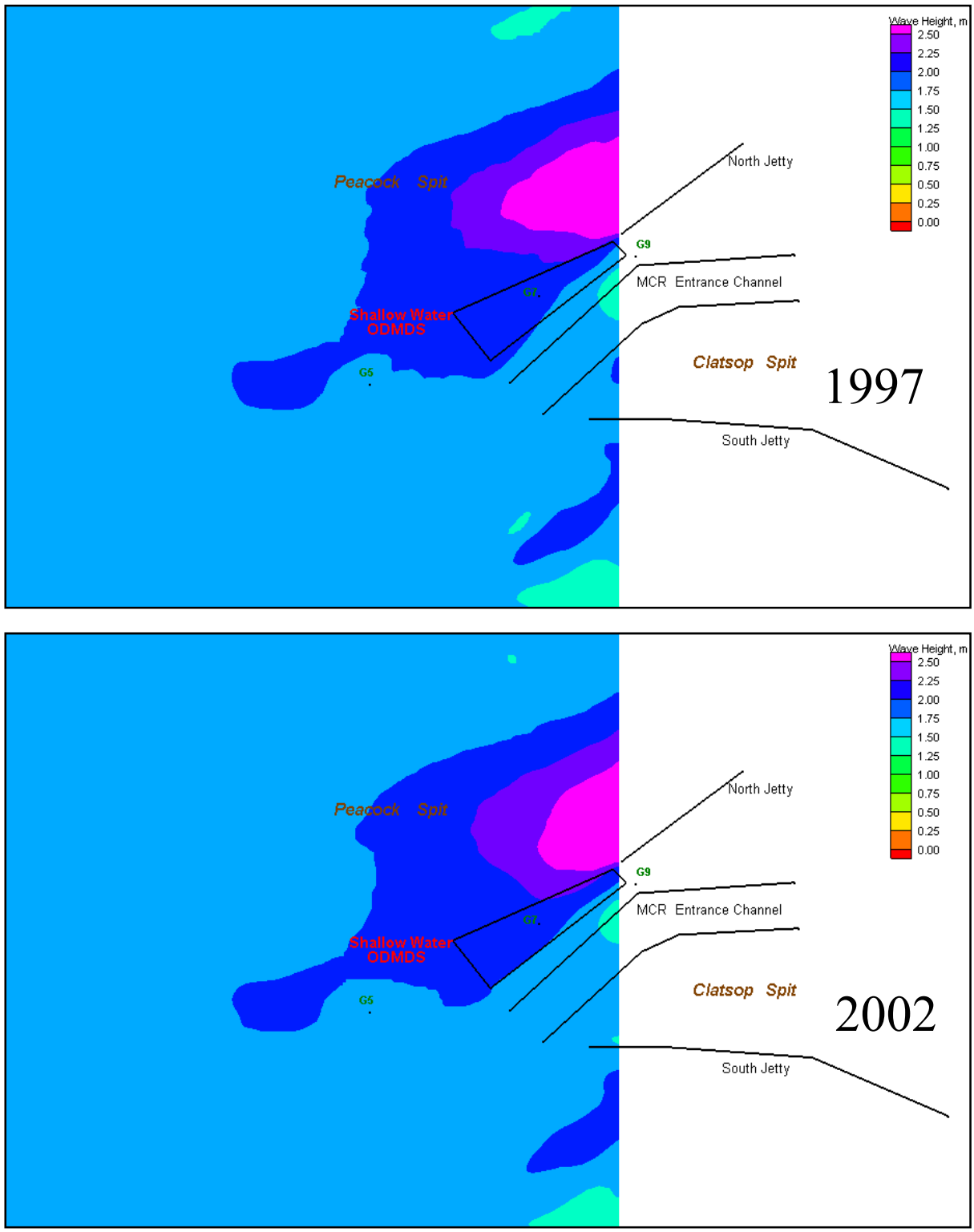


Offshore wave conditions (figure S5) for Summer Storm: Ht = 3.51 m, Tp=10.5 sec, Dir =175 deg, Wind=8.8 m/s @ 165 deg

Figure B23 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.

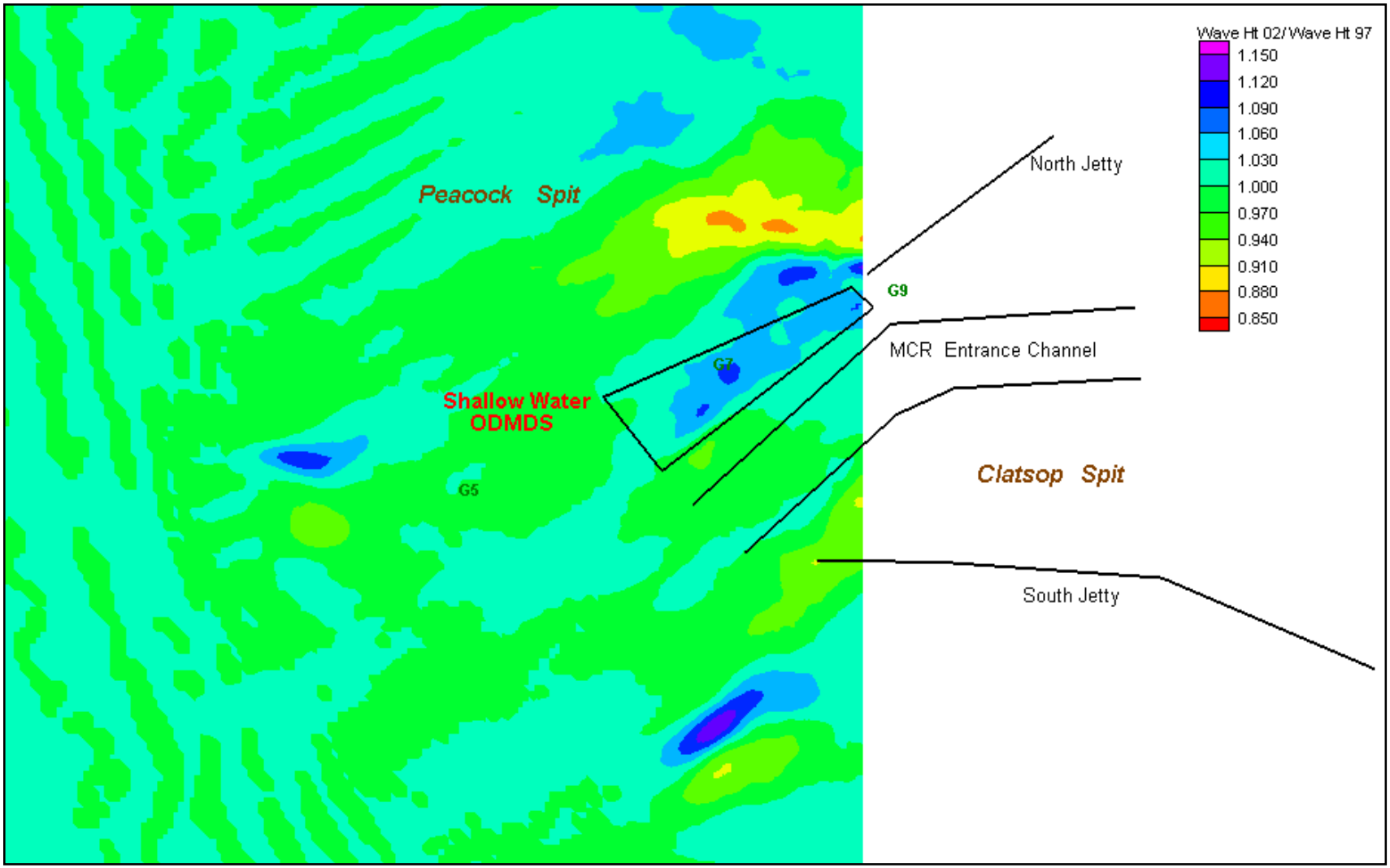
West-Northwest Wave Scenarios to Assess Wave Effects Due to Bathymetry Change during 1997 – 2002

Corresponding to wave conditions shown in figures S6-S10



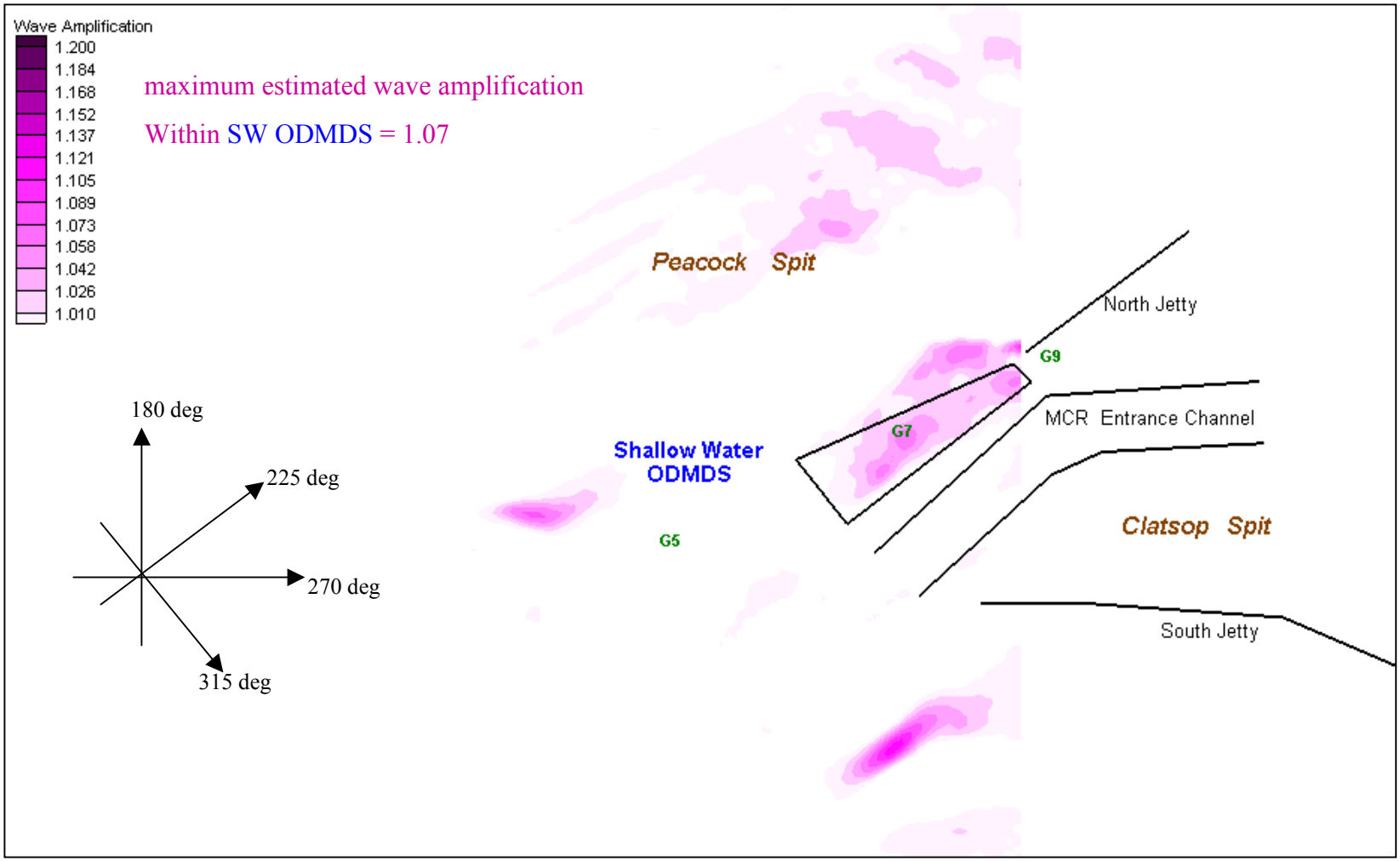
Offshore wave conditions (figure S6) for Summer Swell: Ht = 1.79 m, Tp=11.0 sec, Dir =275 deg, Wind=5.9 m/s @ 329 deg

Figure B25 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



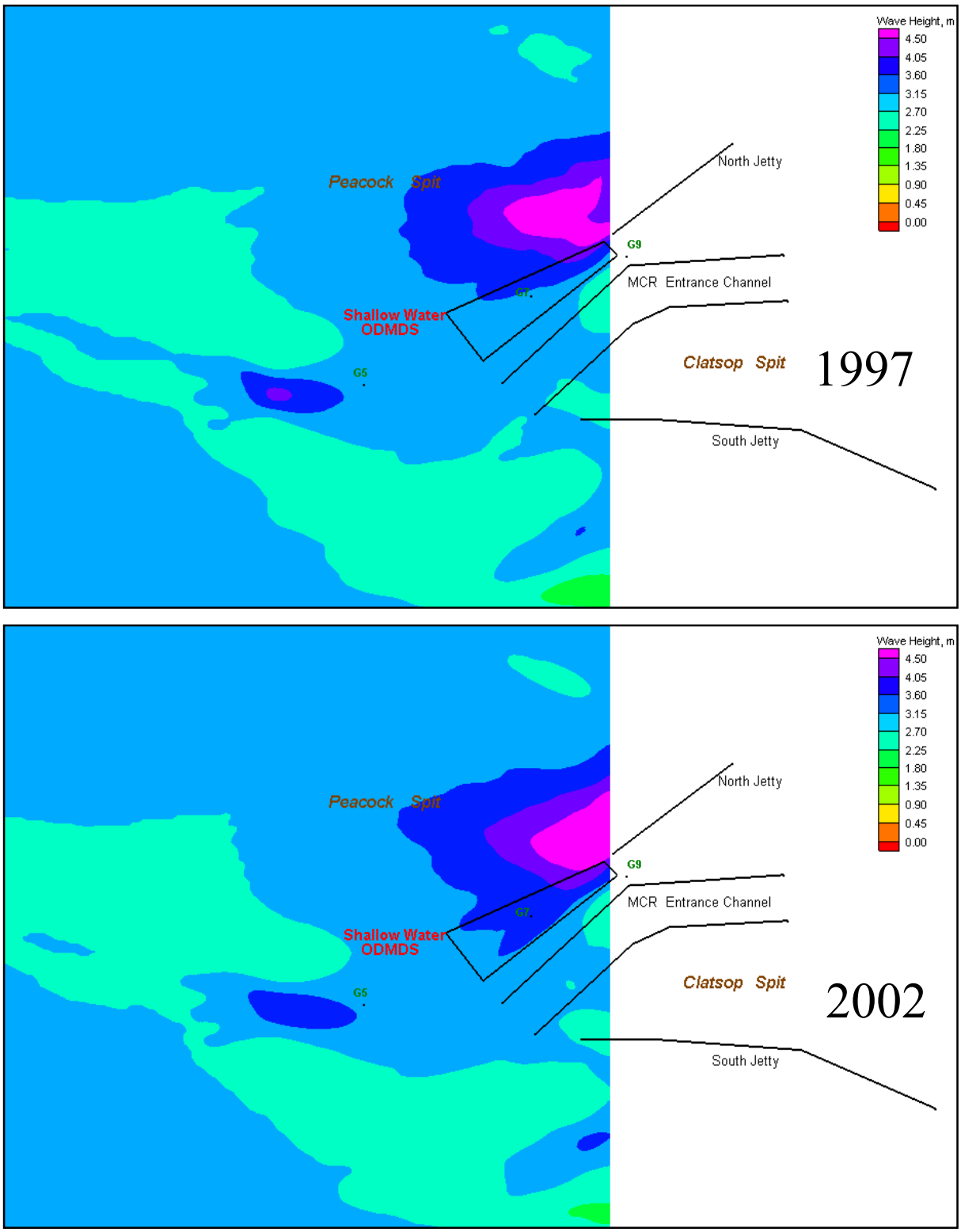
Summer Swell: Avg. wave height = 1.79 m, Peak wave period =11.0 sec, Avg. wave direction = W (275 deg), Wind=5.9 m/s @ NW (329 deg)

Figure B26 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



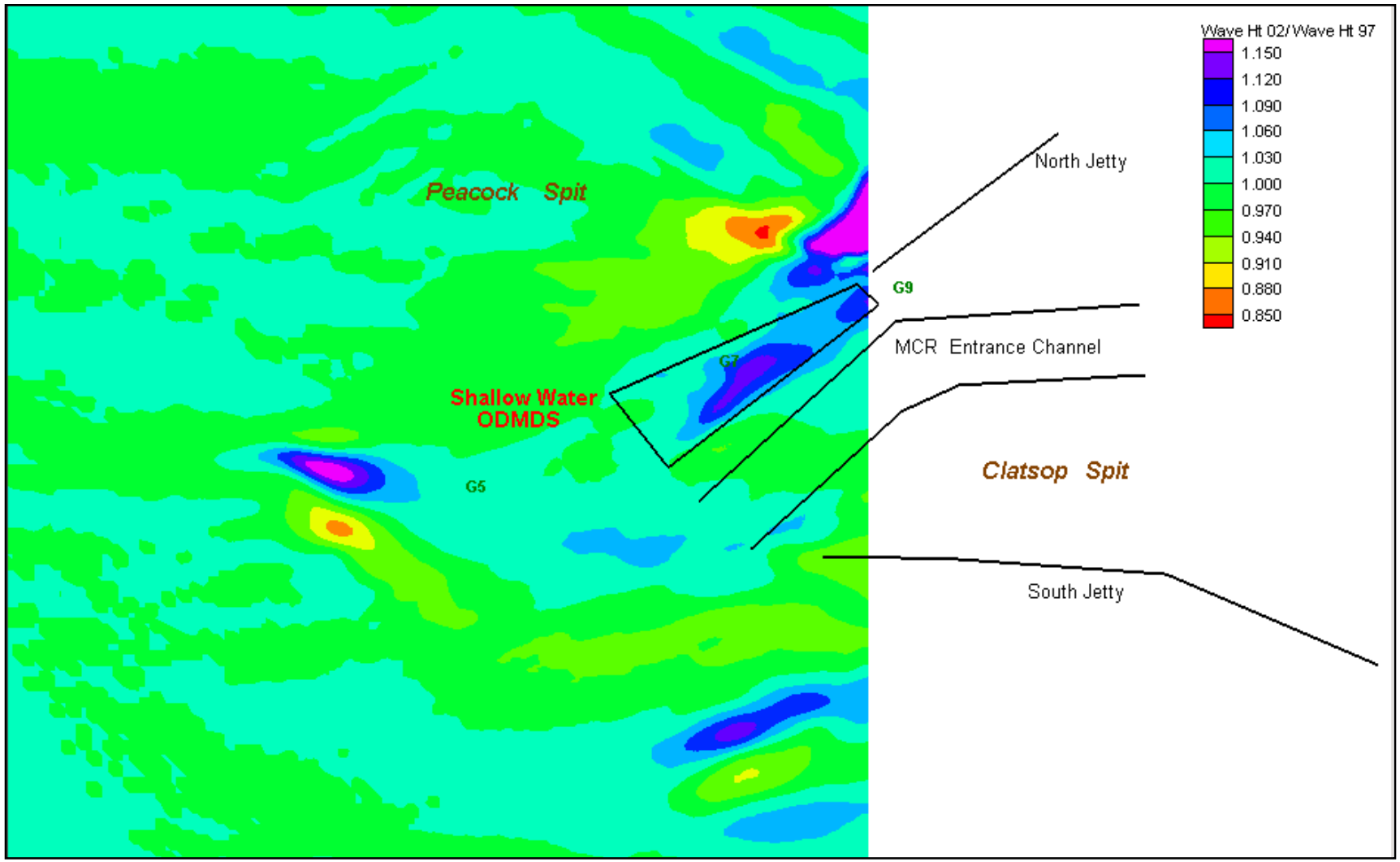
Offshore wave conditions (figure S6) for Summer Swell: Ht = 1.79 m, Tp=11.0 sec, Dir =275 deg, Wind=5.9 m/s @ 329 deg

Figure B27 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



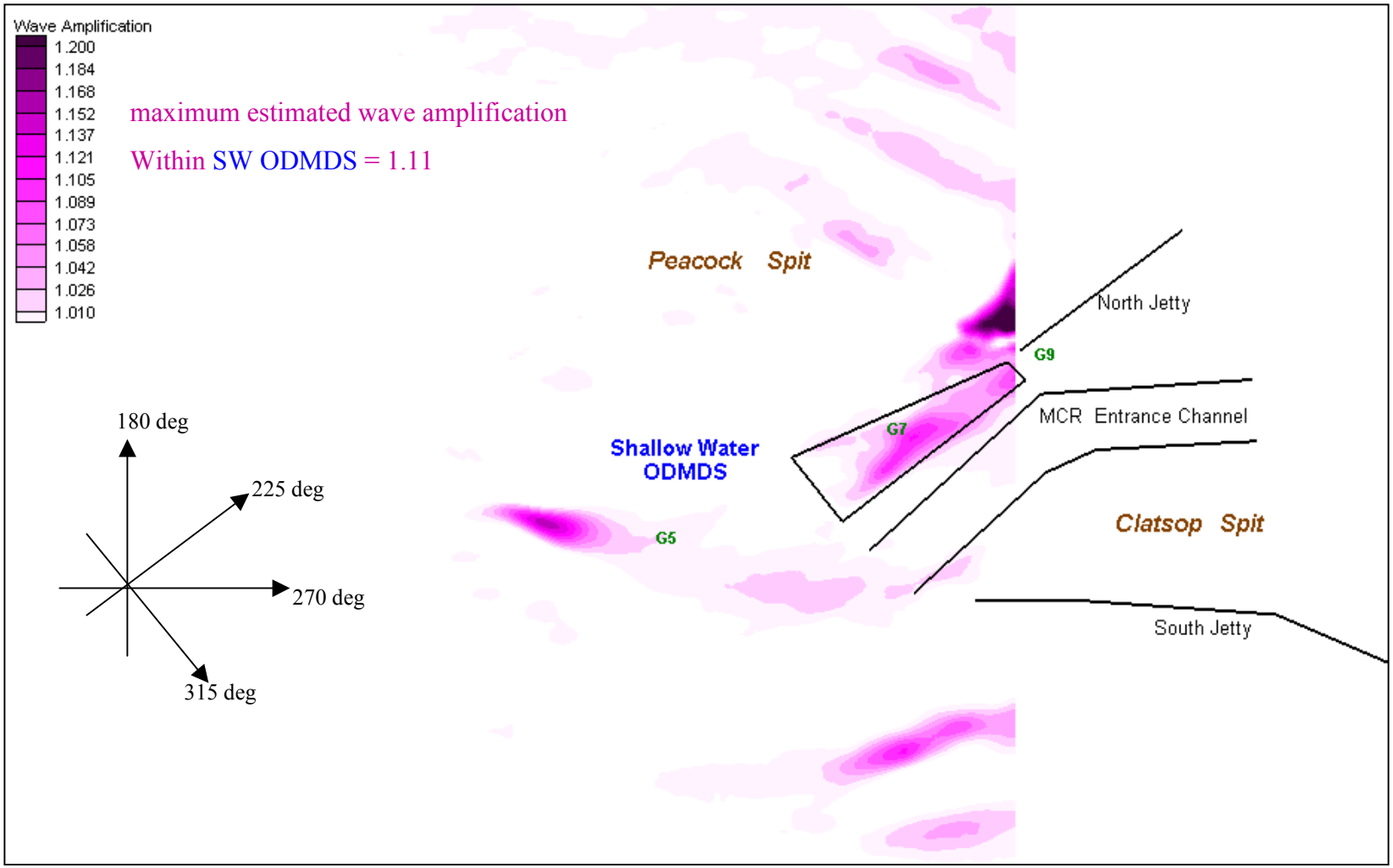
Offshore wave conditions (figure S7) for <u>Winter Swell</u>: Ht = 2.85 m, Tp=16.7 sec, Dir =280 deg, Wind=4.8 m/s @ 158 deg

Figure B29. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



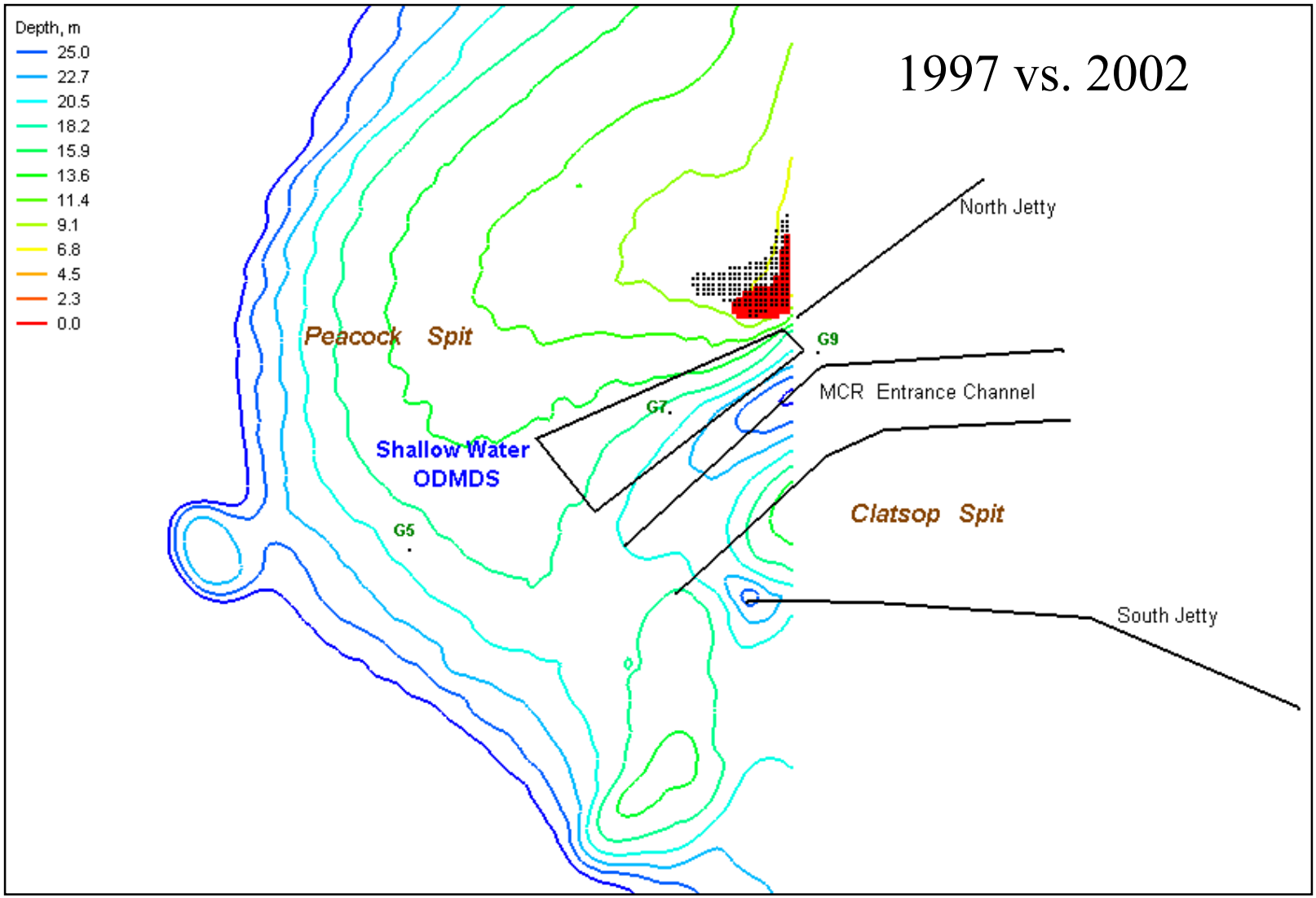
Winter Swell: Avg. wave height = 2.85 m, peak wave period=16.7 sec, Avg. wave direction = W (280 deg), Wind=4.8 m/s @ SE (158 deg)

Figure B30 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



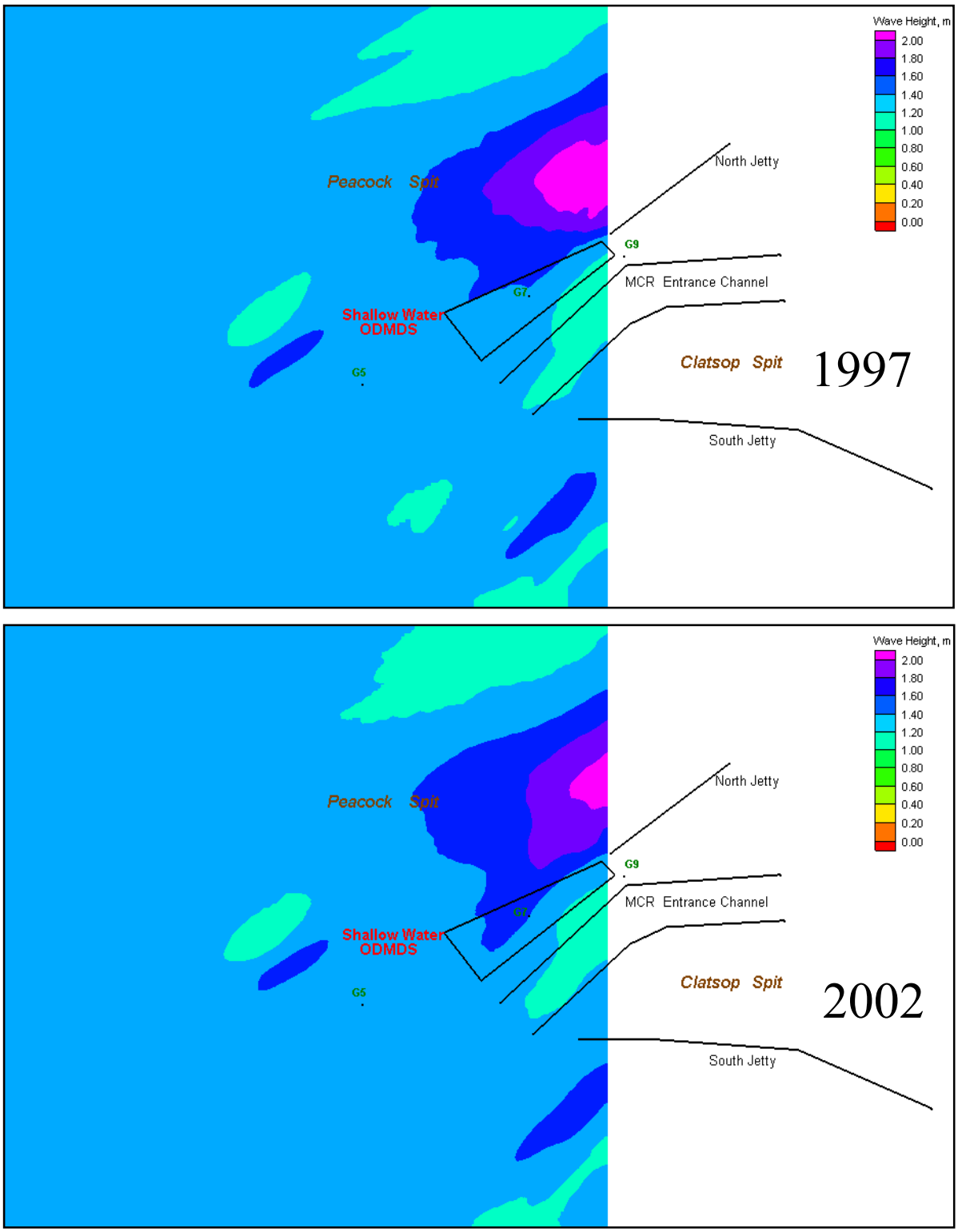
Offshore wave conditions (figure S7) for Winter Swell: Ht = 2.85 m, Tp=16.7 sec, Dir =280 deg, Wind=4.8 m/s @ 158 deg

Figure B31 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



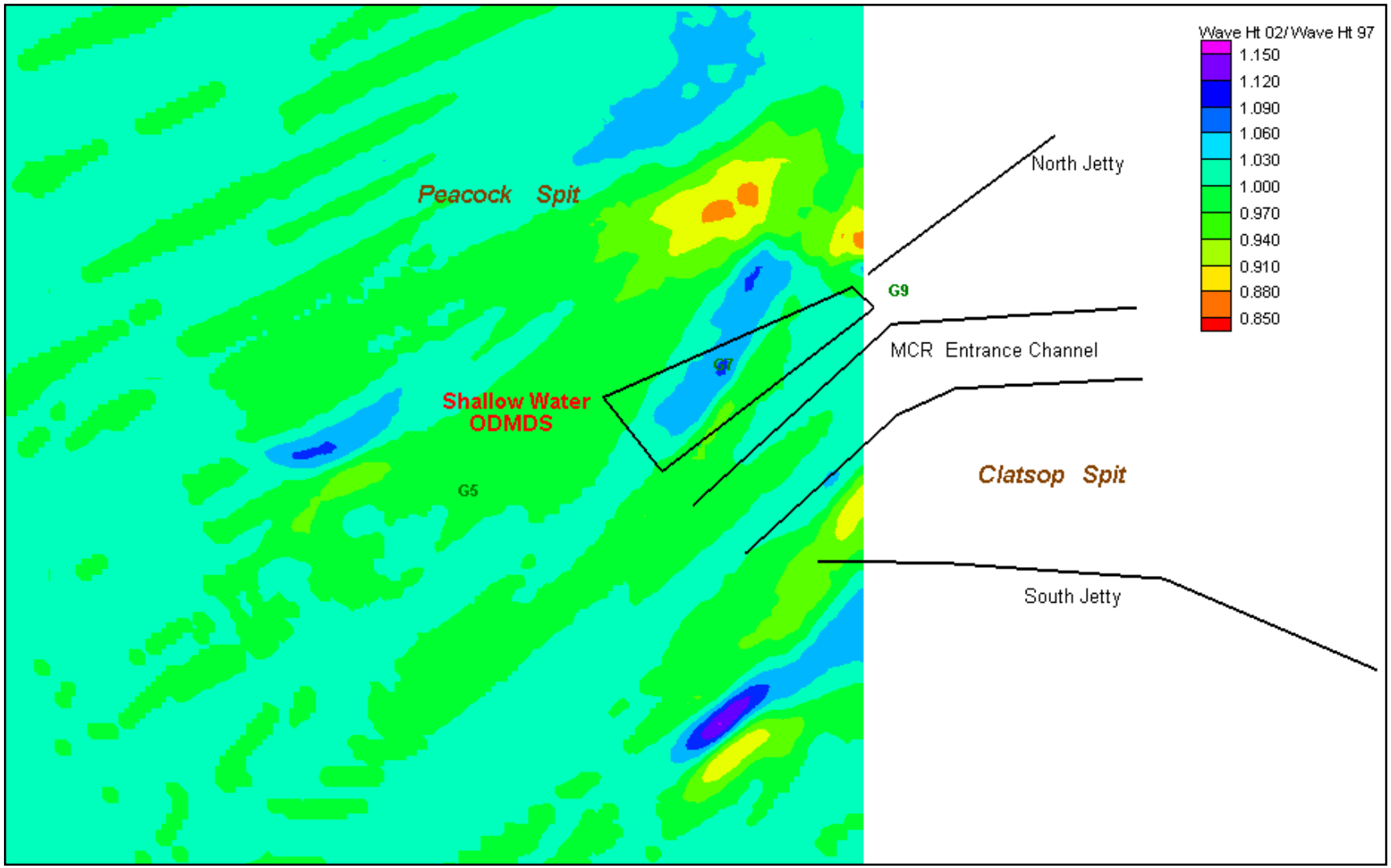
Winter Swell: Avg. wave height = 2.85 m, peak wave period=16.7 sec, Avg. wave direction = W (280 deg), Wind=4.8 m/s @ SE (158 deg)

Figure B28. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.



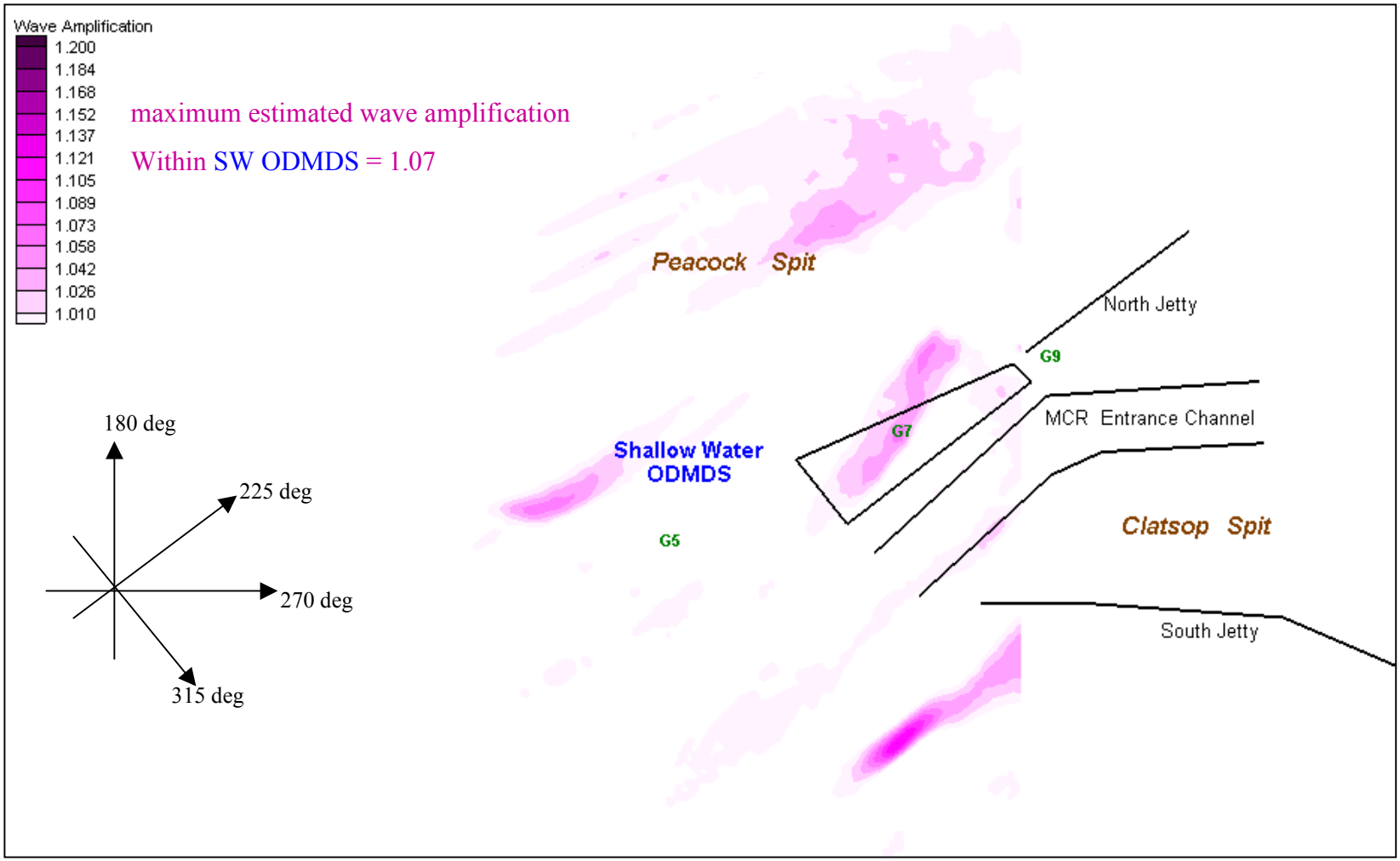
Offshore wave conditions (figure S8) for Summer Swell: Ht = 1.29 m, Tp=16.7 sec, Dir =225 deg, Wind=5.4 m/s @ 316 deg

Figure B33 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



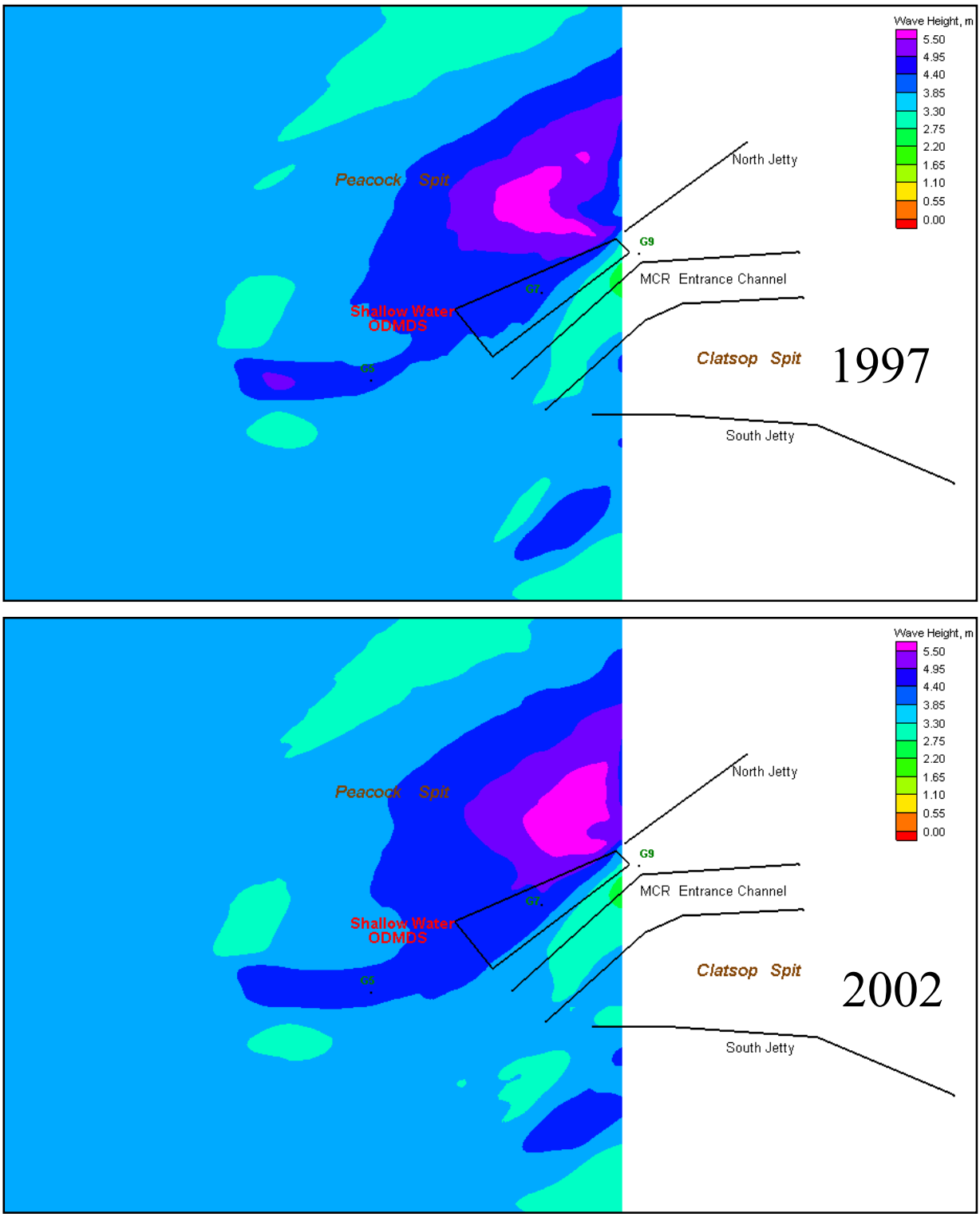
Summer Swell: Avg. wave height = 1.29 m, peak wave period=16.7 sec, Avg. Wave direction =SW (225 deg), Wind=5.4 m/s @ NW (316 deg)

Figure B34 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



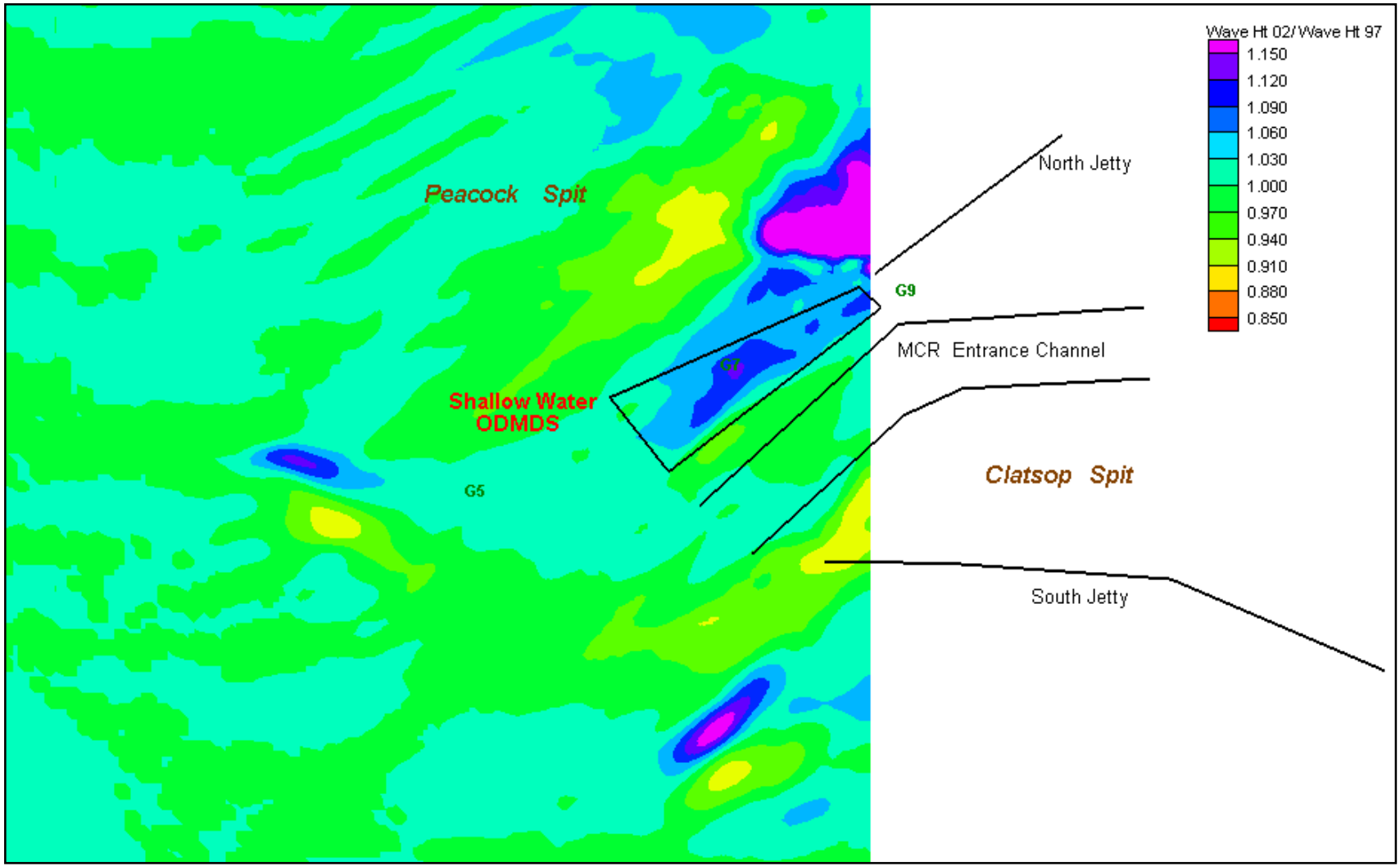
Offshore wave conditions (figure S8) for Summer Swell: Ht = 1.29 m, Tp=16.7 sec, Dir =225 deg, Wind=5.4 m/s @ 316 deg

Figure B35 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



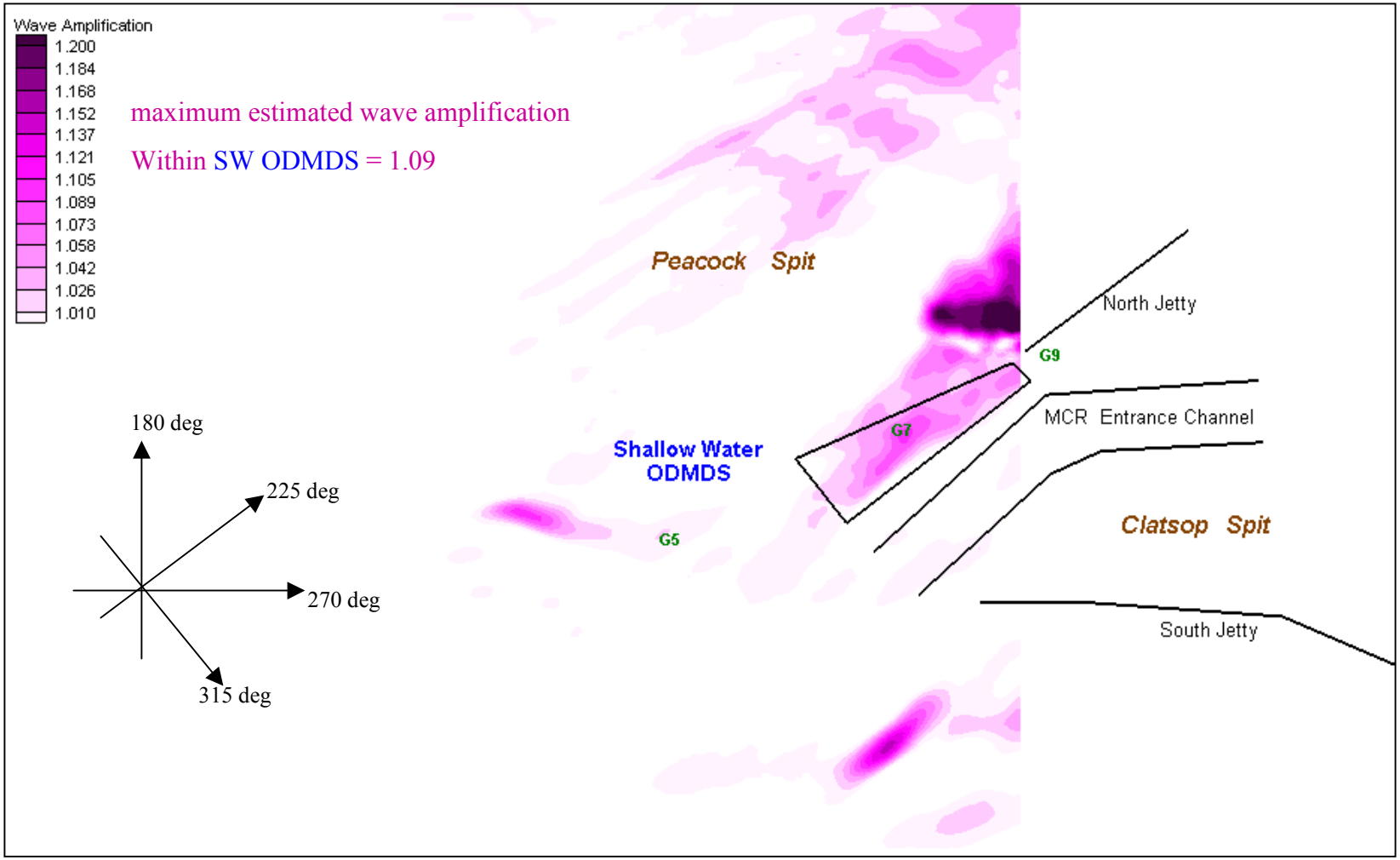
Offshore wave conditions (figure S9) for Winter Swell: Ht = 3.75 m, Tp=16.7 sec, Dir =275 deg, Wind=6.9 m/s @ 108 deg

Figure B37. STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



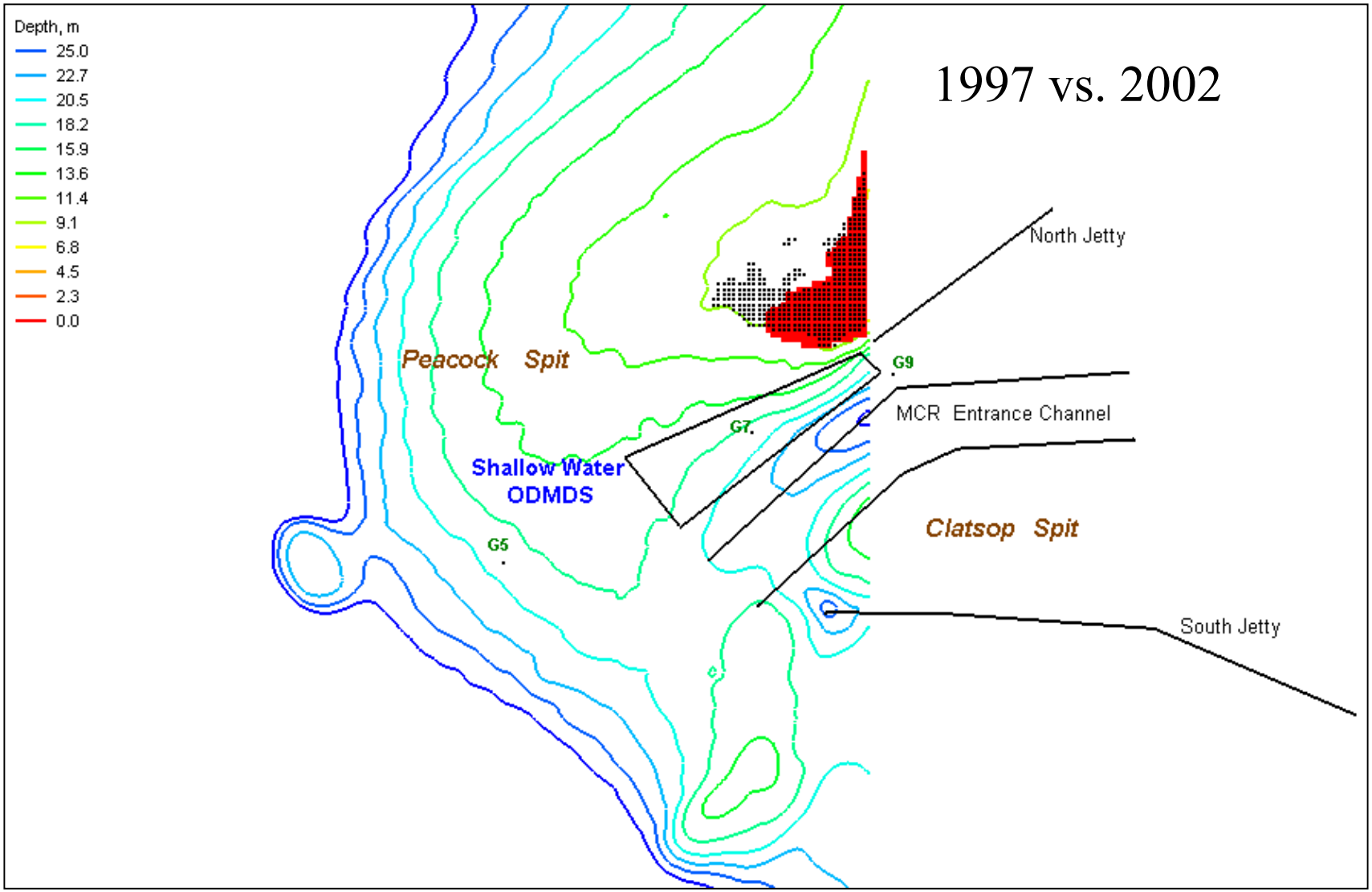
Winter Swell: Avg. wave height= 3.75 m, peak wave period =16.7 sec, Avg. wave direction =W (275 deg), Wind=6.9 m/s @ E (108 deg)

Figure B38 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



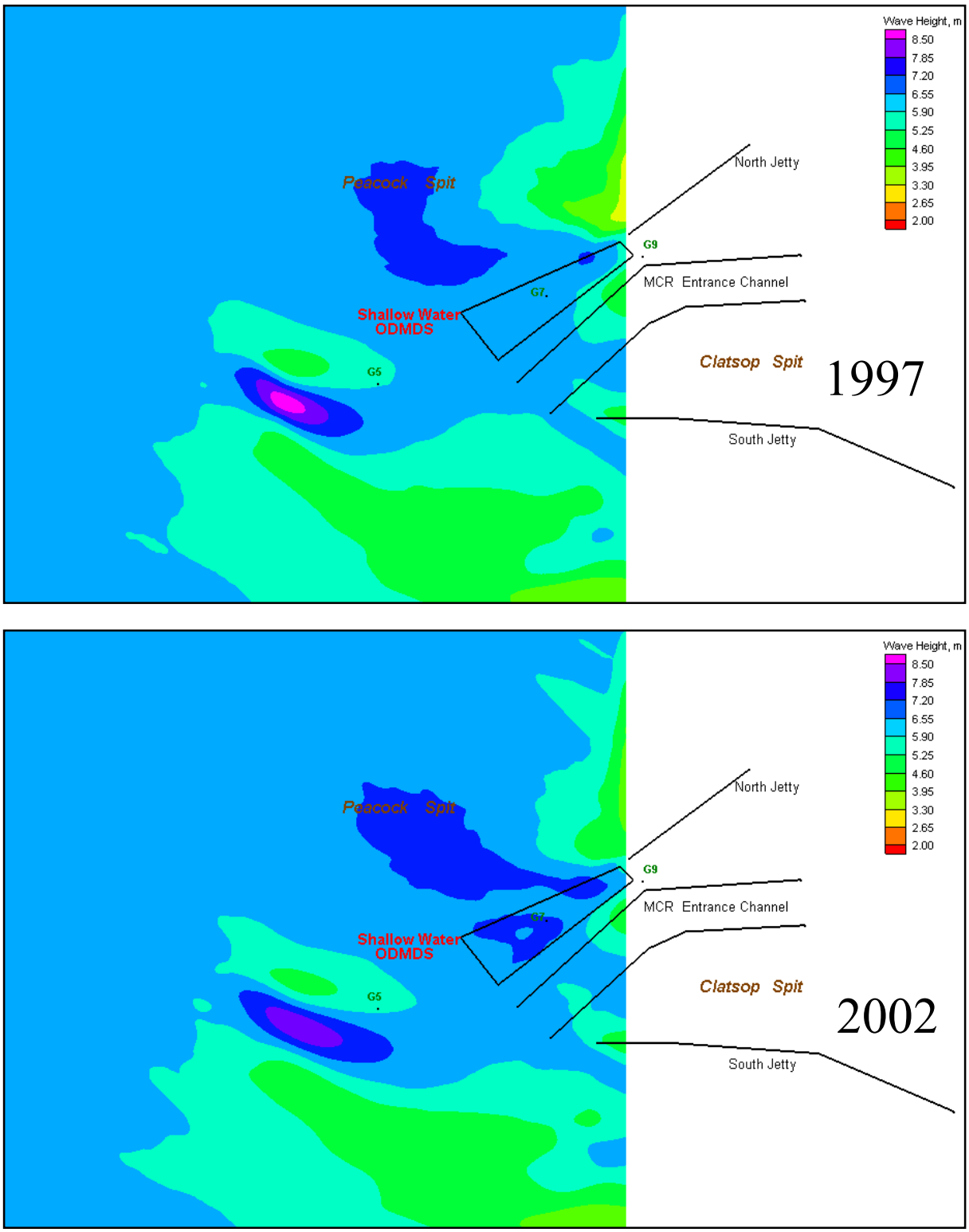
Offshore wave conditions (figure S9) for Winter Swell: Ht = 3.75 m, Tp=16.7 sec, Dir =275 deg, Wind=6.9 m/s @ 108 deg

Figure B39 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



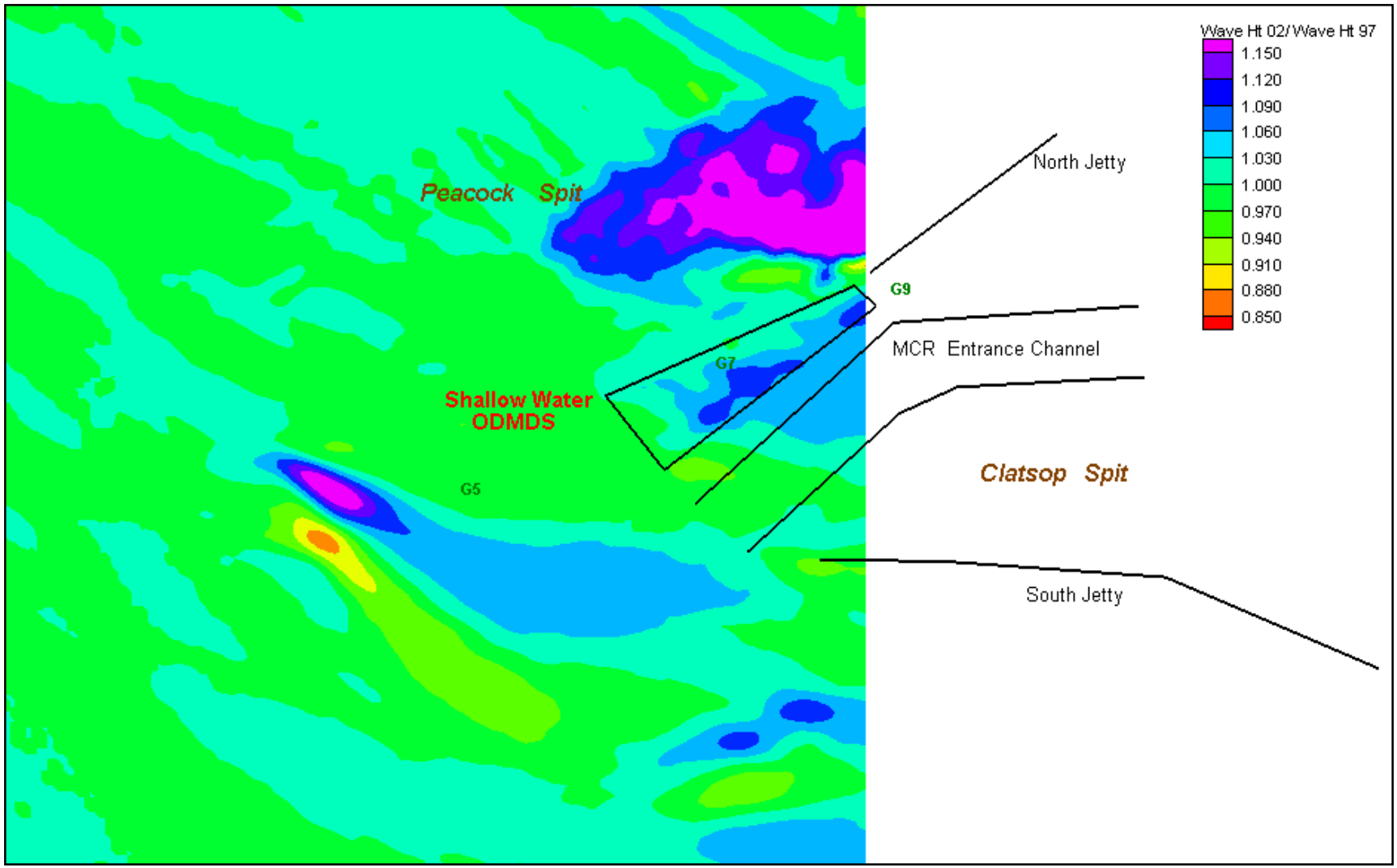
Winter Swell: Avg. wave height= 3.75 m, peak wave period =16.7 sec, Avg. wave direction =W (275 deg), Wind=6.9 m/s @ E (108 deg)

Figure B32. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.



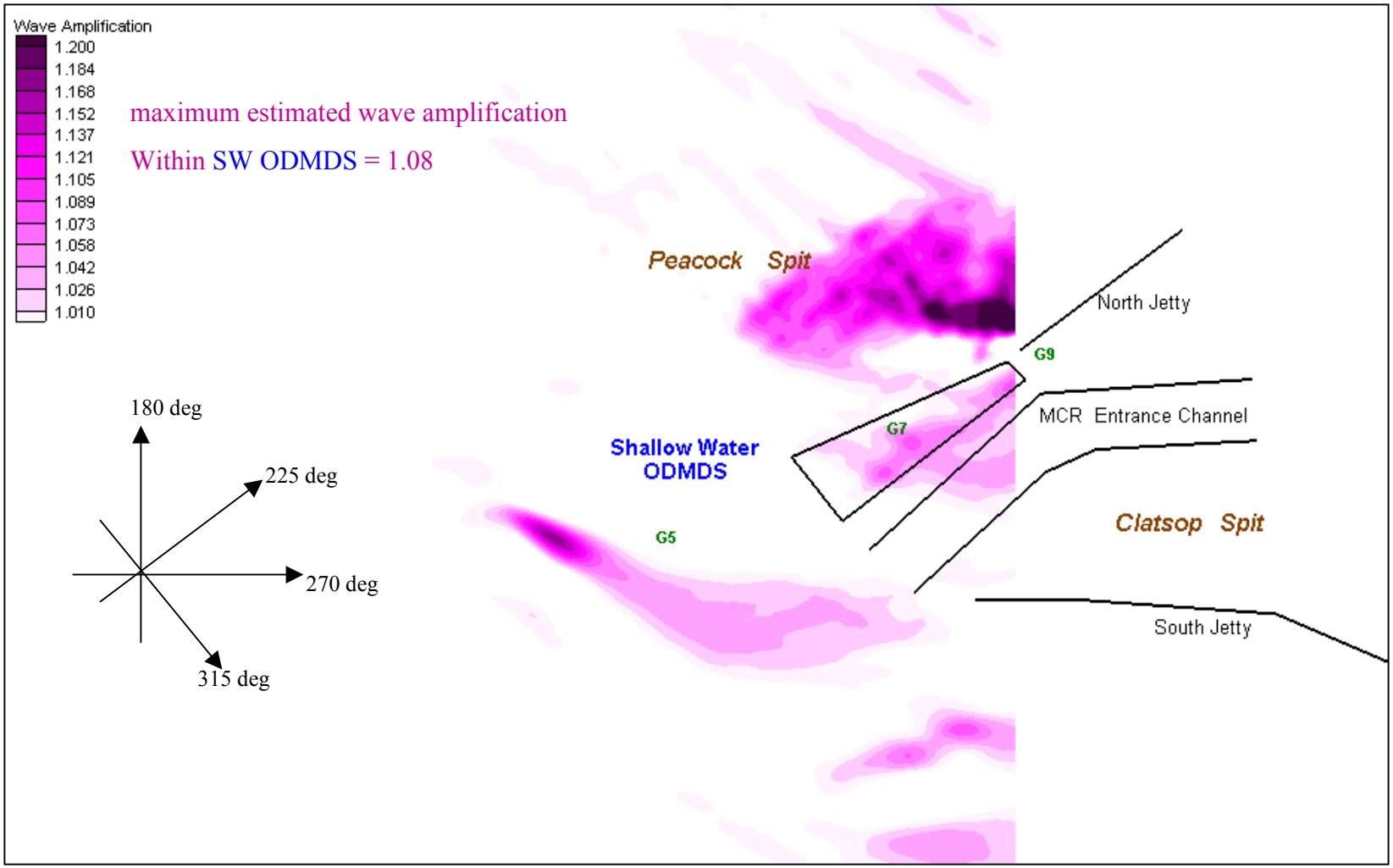
Offshore wave conditions (figure S10) for Winter Storm: Ht = 6.55 m, Tp=14.0 sec, Dir =310 deg, Wind=10.4 m/s @ 294 deg

Figure B41 . STWAVE model simulation of nearshore wave height at MCR, for the prescribed offshore wave condition. Top graphic is for 1997 bathymetry, bottom graphic is for 2002 bathymetry.



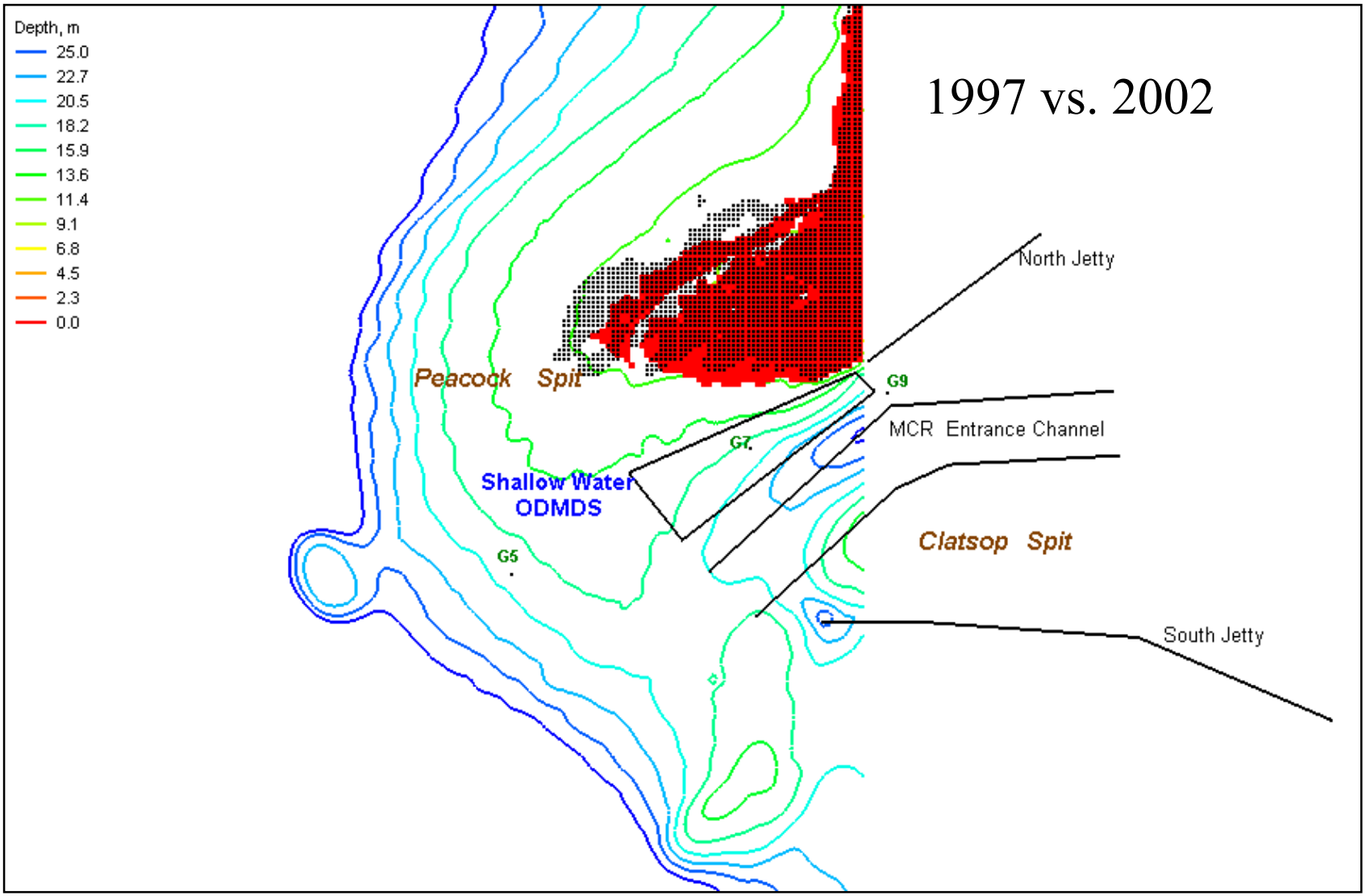
Winter Storm: Avg. wave height = 6.55 m, peak wave period =14.0 sec, Avg. wave direction = NW (310 deg), Wind=10.4 m/s @ NW (294 deg)

Figure B42 . Estimated change in wave height at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height". A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Offshore wave conditions (figure S10) for Winter Storm: Ht = 6.55 m, Tp=14.0 sec, Dir =310 deg, Wind=10.4 m/s @ 294 deg

Figure B43 . Estimated wave amplification at MCR due to 1997-2002 bathymetry change, for the prescribed offshore wave condition. Wave amplification was calculated as "2002 wave height / 1997 wave height"; only values greater than 1.0 are shown. A value of 1.2 means that waves in 2002 were estimated to be 20% greater than in 1997.



Winter Storm: Avg. wave height = 6.55 m, peak wave period =14.0 sec, Avg. wave direction = NW (310 deg), Wind=10.4 m/s @ NW (294 deg)

Figure B44. Estimated wave breaking location for 1997 (shown in black markers) and for 2002 (shown in red markers), based on the prescribed offshore wave condition. Bathymetry is shown for 1997; depth contour values are limited to 25 meters for clarity.