

4.3 Logistic Plankton

Figure 3-Figure 7 illustrate the long-term average spatial patterns of abundance and depletion predicted for logistically growing plankton. Under the default parameterisation, fast growing plankton (sub-classes 1 & 2) suffer almost no depletion (<10%) under either of the two with-farms scenarios. In contrast, sub-class three (slow-growing, vulnerable plankton) suffer depletion that sometimes approaches 10% around Wilson bay, and depletion of ~20% around the western firth AMA is common. This latter area of depletion often extends for several km beyond the AMA's perimeter and can extend as far as Wilson Bay. Under the default parameterisation, sub-classes 4 & 5 are predicted to suffer depletion of ~10% around the western firth AMA, but little depletion around Wilson Bay.

Results from the parameter sensitivity trial (ENE winds only) are also presented. Recall, that in these sensitivity trials, we increased the relative vulnerabilities of sub-classes 4 and 5. In the case of sub-class 2, this has made little difference – they are still predicted to suffer little depletion. In contrast, sub-classes 4 and 5 are predicted to suffer depletion of much greater magnitude and spatial extent than previously. Near the farms, depletion can approach 20%, and the depletion 'halo' is predicted to extend over much of the southern and central firth. Changes to the relative vulnerabilities of sub-classes 4 & 5 make little difference to the dynamics of the other plankton sub-classes.

Figure 3:

Simulated carbon concentrations of the sub-class one of logistically-growing plankton under scenario NF (a), relative differences between the simulated concentrations for the scenario NF and scenario 0 (b), scenario 1 and scenario NF (c) for the default parameterisation of relative vulnerability and weakly buoyant snapper; (d) scenario1 strongly buoyant eggs/larvae & revised rel. vulnerability vs scenario NF default parameterisation.

