Appendix A: First pass assessment of the vulnerability of mangrove and saltmarsh in the Sydney Region

(Figures from Chapter 3)



Figure A1: Location of study site in the Sydney Basin. **a**) bedrock and Quaternary geology of the Sydney Basin, **b**) extent of the Sydney Coastal Councils Group regional organisation of councils and the Wolli Creek study area, and **c**) extent of estuarine vegetation within the Sydney Basin.



Figure A2: a) Vulnerability assessment and b) inundation and c) erosion assessment without mask applied.



Figure A3: a) Vulnerability assessment and b) inundation and c) erosion assessment with study area mask applied.





Figure A4: a) Vulnerability assessment and b) inundation and c) erosion assessment with study area and built-up area mask applied. Built-up areas shown with blue hatching.



Figure A5: a) Vulnerability assessment and b) inundation and c) erosion assessment with estuarine vegetation mask applied.



Figure A6: a) Vulnerability assessment and b) inundation and c) erosion assessment at Botany Bay with estuarine vegetation mask applied.

34°S



Figure A7: a) Vulnerability assessment and b) inundation and c) erosion assessment with 90cm SLR projection and vegetation mask applied.



Figure A7: a) Vulnerability assessment and b) inundation and c) erosion assessment with 90cm SLR projection and vegetation mask applied.

Appendix B: Projecting sea-level rise threats to mangrove and saltmarsh: a pilot study at Wolli Creek using SLAMM

(Figures from Chapter 4)



Figure B1: a) Model extent and modelled vegetation of the Cooks River catchment at 2100 under b) low, c) intermediate, and d) high sea level rise scenarios. In this model output, developed land was considered to remain stable to 2100 and coastal squeeze effects are evident.

151°10'0"E

151°10'0"E

3°55'0"S 0.5 Vegetation/Landuse Class Developed Land Undeveloped Land Casuarina Saltmarsh Adelling Exten Mangrove Cooks River Catch Tidal Flat Inland Water Estuarine Wate USDA. USG Ocean Beach 151°10'0"E 33°55'0"S

Figure B2: a) Model extent and b) starting vegetation distribution at Cooks River catchment; and comparison of modelled vegetation at 2100 under c) a scenario with coastal squeeze occurring due to the occurrence of wetland migration barriers, and d) coastal squeeze limited due to assumptions of built-areas converting to wetlands vegetation.

151°10'0"E



151°10'0"E



Figure B3: a) Model extent and modelled vegetation of the Wolli Creek sub-catchment at 2100 under b) low, c) intermediate, and d) high sea level rise scenarios. In this model output, developed land was considered to remain stable to 2100 and coastal squeeze effects are evident.



Figure B4: a) Model extent and modelled vegetation of the Wolli Creek study area at 2100 under b) low, c) intermediate, and d) high sea level rise scenarios. In this model output, developed land was able to convert to coastal wetland and coastal squeeze effects were reduced.



Figure B5: Change detection analysis comparing current vegetation distribution with projected vegetation distribution under a **a**) low sea-level rise scenario and developed land is protected from land use changes; **b**) high sea-level rise scenario and developed land is protected from land use changes; c) low sea-level rise scenario and developed land is able to convert to other land uses; and d) high sea-level rise scenario and developed land is able to convert to other land uses