

## **Supplementary Information**

for article

### **Alternative stable states of tidal marsh vegetation patterns and channel complexity**

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Figure S2. Individual maps of the 113 marsh sites analyzed, grouped by sub-region.

Table S1. List of 113 marsh sites; site location, salinity, age, elevation, and impoundment characteristics; vegetation and channel pattern categories; citations of relevant published site maps; and values of quantitative metrics of site configuration. Map citations are [1] [*City of San Jose*, 2004], [2] [*Rosso et al.*, 2005], [3] [*H.T. Harvey & Associates*, 2005], [4] [*Moffett et al.*, 2010], [5] [*Li et al.*, 2005], [6] [*Watson and Byrne*, 2009], [7] [*Tuxen et al.*, 2010].

| site |                            | centroid location |           | site characteristics |       |           |                   |           | vegetation pattern                   |                               | channel pattern             |                            | published site maps      |               | OBIA-derived pattern metrics    |                                   |                                       |                                    |                                          |                               |                                     |                                         |                                        |                              |
|------|----------------------------|-------------------|-----------|----------------------|-------|-----------|-------------------|-----------|--------------------------------------|-------------------------------|-----------------------------|----------------------------|--------------------------|---------------|---------------------------------|-----------------------------------|---------------------------------------|------------------------------------|------------------------------------------|-------------------------------|-------------------------------------|-----------------------------------------|----------------------------------------|------------------------------|
| ID   | Name                       | latitude          | longitude | salinity             | age   | elevation | impoundment index | area (ha) | channel density index [chden] (m/ha) | vegetation pattern complexity | vegetation pattern category | channel pattern complexity | channel pattern category | map citations | map-based vegetation complexity | mean object size [msize] (pixels) | std. dev. object size [sdsz] (pixels) | mean object compactness [mcompact] | std. dev. object compactness [sdcompact] | mean object shape index [mSI] | std. dev. object shape index [sdSI] | std. dev. object main direction [sddir] | std. dev. object brightness [sdbright] | std. dev. object hue [sdhue] |
|      |                            |                   |           |                      |       |           |                   |           |                                      |                               |                             |                            |                          |               |                                 |                                   |                                       |                                    |                                          |                               |                                     |                                         |                                        |                              |
| 1    | Alviso Triangle            | 37.4577           | -121.9783 | brackish             | old   | high      | 3                 | 35.7565   | 191.85                               | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | [1]           | mosaic-solid                    | 6666.22                           | 6325.51                               | 2.75                               | 1.19                                     | 3.91                          | 1.26                                | 53.11                                   | 33.23                                  | 0.38                         |
| 2    | Coyote Mouth S             | 37.4632           | -121.9977 | brackish             | old   | high      | 2                 | 27.5357   | 139.48                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | [1]           | mosaic-solid                    | 6696.01                           | 4781.50                               | 2.75                               | 1.32                                     | 3.80                          | 0.99                                | 48.13                                   | 26.11                                  | 0.16                         |
| 3    | Mud Slough Marsh           | 37.4682           | -121.9936 | brackish             | young | high      | 1                 | 22.6525   | 133.52                               | simple veg                    | banded                      | simple chan                | perp                     | [1]           | mosaic                          | 7745.03                           | 6150.18                               | 2.64                               | 0.98                                     | 3.78                          | 1.11                                | 40.56                                   | 32.37                                  | 0.25                         |
| 4    | Mud Slough Side            | 37.4763           | -122.0018 | brackish             | young | high      | 4                 | 32.4380   | 104.78                               | complex veg                   | mosaic                      | simple chan                | perp                     | [1]           | mosaic                          | 8325.27                           | 6748.91                               | 3.01                               | 2.71                                     | 3.57                          | 1.31                                | 42.64                                   | 29.35                                  | 0.31                         |
| 5    | Coyote Mouth N             | 37.4686           | -122.0084 | saline               | young | high      | 1                 | 17.0579   | 33.74                                | simple veg                    | solid                       | simple chan                | perp                     | [1]           | solid                           | 11350.99                          | 14249.33                              | 2.57                               | 1.89                                     | 3.13                          | 1.16                                | 35.71                                   | 31.21                                  | 0.26                         |
| 6    | Calaveras Point S          | 37.4675           | -122.0337 | saline               | young | high      | 1                 | 165.5176  | 150.20                               | simple veg                    | banded                      | simple chan                | perp                     | [1] / [2]     | solid / banded                  | 10060.54                          | 10535.63                              | 2.62                               | 1.21                                     | 3.47                          | 1.14                                | 51.50                                   | 27.23                                  | 0.40                         |
| 7    | Calaveras Point W          | 37.4714           | -122.0511 | saline               | old   | high      | 1                 | 17.2870   | 73.85                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | [1] / [2]     | solid / solid                   | 12079.87                          | 10797.62                              | 2.34                               | 0.91                                     | 2.99                          | 1.11                                | 55.00                                   | 21.20                                  | 0.24                         |
| 8    | Mountain View Shore        | 37.4493           | -122.0857 | saline               | old   | high      | 1                 | 29.8815   | 92.93                                | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | [3]           | mosaic-solid                    | 10123.91                          | 11489.80                              | 3.09                               | 2.04                                     | 3.54                          | 1.37                                | 51.68                                   | 40.79                                  | 0.36                         |
| 9    | Hook Island                | 37.4562           | -122.0973 | saline               | old   | high      | 0                 | 17.6264   | 122.75                               | complex veg                   | mosaic                      | simple chan                | sinuous                  | (none)        | (none)                          | 10146.28                          | 9181.25                               | 2.97                               | 1.98                                     | 3.49                          | 1.39                                | 49.45                                   | 29.74                                  | 0.21                         |
| 10   | Palo Alto Yacht Harbor S   | 37.4537           | -122.1051 | saline               | young | low-mid   | 1                 | 14.2586   | 125.70                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 8167.28                           | 7784.53                               | 3.13                               | 1.71                                     | 3.54                          | 1.11                                | 47.31                                   | 15.68                                  | 0.41                         |
| 11   | Palo Alto Yacht Harbor N   | 37.4549           | -122.1084 | saline               | young | low-mid   | 1                 | 3.0371    | 2.47                                 | complex veg                   | mosaic                      | simple chan                | perp                     | (none)        | (none)                          | 5626.48                           | 5661.41                               | 2.70                               | 1.29                                     | 3.23                          | 1.24                                | 63.81                                   | 27.73                                  | 0.36                         |
| 12   | Palo Alto Baylands E       | 37.4602           | -122.1030 | saline               | young | high      | 1                 | 17.9683   | 47.24                                | simple veg                    | solid-banded                | simple chan                | sinuous                  | (none)        | (none)                          | 8792.29                           | 10182.29                              | 2.84                               | 2.19                                     | 3.30                          | 1.44                                | 48.65                                   | 32.84                                  | 0.39                         |
| 13   | Palo Alto Baylands C       | 37.4617           | -122.1104 | saline               | old   | high      | 1                 | 27.0701   | 93.27                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 8404.95                           | 7670.44                               | 2.74                               | 1.38                                     | 3.51                          | 1.16                                | 44.10                                   | 16.34                                  | 0.34                         |
| 14   | Palo Alto Baylands W       | 37.4649           | -122.1158 | saline               | old   | high      | 2                 | 2.7877    | 82.46                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | [4]           | mosaic                          | 7560.00                           | 6110.48                               | 2.84                               | 1.63                                     | 3.53                          | 1.23                                | 43.78                                   | 19.99                                  | 0.38                         |
| 15   | Faber Shoreline            | 37.4667           | -122.1179 | saline               | old   | high      | 3                 | 5.9848    | 127.65                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 10076.42                          | 9329.01                               | 2.97                               | 1.59                                     | 3.32                          | 1.28                                | 52.01                                   | 29.20                                  | 0.36                         |
| 16   | Faber Tract                | 37.4657           | -122.1227 | saline               | young | low-mid   | 4                 | 35.7284   | 125.49                               | complex veg                   | mosaic-solid                | complex chan               | dend                     | (none)        | (none)                          | 13018.00                          | 12759.28                              | 2.85                               | 1.89                                     | 3.28                          | 1.27                                | 54.08                                   | 16.73                                  | 0.32                         |
| 17   | Laumeister Tract           | 37.4715           | -122.1243 | saline               | old   | high      | 3                 | 36.4519   | 120.21                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 9419.99                           | 8109.06                               | 2.97                               | 1.77                                     | 3.54                          | 1.26                                | 48.16                                   | 16.62                                  | 0.27                         |
| 18   | Cooley Landing Pond        | 37.4808           | -122.1277 | saline               | young | low-mid   | 4                 | 48.1159   | 134.92                               | simple veg                    | devel                       | complex chan               | dend-loop                | (none)        | (none)                          | 6244.38                           | 5512.12                               | 3.22                               | 1.80                                     | 3.54                          | 1.35                                | 48.18                                   | 20.11                                  | 0.11                         |
| 19   | Cooley Landing Backshore   | 37.4824           | -122.1301 | saline               | young | high      | 3                 | 15.7289   | 192.16                               | simple veg                    | solid-banded                | simple chan                | linear                   | (none)        | (none)                          | 9500.05                           | 11404.79                              | 2.88                               | 2.31                                     | 3.46                          | 1.38                                | 47.67                                   | 19.36                                  | 0.41                         |
| 20   | Mowry Slough Mouth         | 37.4888           | -122.0509 | saline               | old   | high      | 1                 | 27.4014   | 112.30                               | complex veg                   | mosaic                      | complex chan               | dend                     | [1]           | solid                           | 11850.29                          | 12824.15                              | 2.76                               | 1.89                                     | 3.22                          | 1.32                                | 50.74                                   | 23.42                                  | 0.17                         |
| 21   | Mowry Slough               | 37.4881           | -122.0362 | saline               | young | high      | 1                 | 92.8950   | 185.79                               | complex veg                   | mosaic-solid                | simple chan                | perp                     | [1]           | mosaic-solid                    | 13183.44                          | 13561.34                              | 2.84                               | 2.28                                     | 3.29                          | 1.41                                | 46.56                                   | 21.07                                  | 0.18                         |
| 22   | Newark Shore S             | 37.4962           | -122.0541 | saline               | young | high      | 1                 | 43.4377   | 118.46                               | complex veg                   | mosaic-solid                | simple chan                | perp                     | [1]           | mosaic-solid                    | 14362.32                          | 16653.34                              | 2.76                               | 1.87                                     | 3.14                          | 1.27                                | 45.97                                   | 18.58                                  | 0.16                         |
| 23   | Newark Shore C             | 37.5000           | -122.0643 | saline               | young | high      | 1                 | 38.1297   | 128.38                               | complex veg                   | mosaic                      | simple chan                | sinuous                  | (none)        | (none)                          | 13667.99                          | 15994.14                              | 2.60                               | 1.89                                     | 2.94                          | 1.23                                | 39.25                                   | 18.56                                  | 0.26                         |
| 24   | Newark Shore N             | 37.5028           | -122.0762 | saline               | young | high      | 1                 | 65.8099   | 124.27                               | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        | (none)                          | 12850.99                          | 13977.74                              | 2.88                               | 1.96                                     | 3.11                          | 1.21                                | 40.38                                   | 18.85                                  | 0.21                         |
| 25   | Dumbarton Point Marsh      | 37.5064           | -122.0944 | saline               | old   | high      | 1                 | 224.4608  | 159.39                               | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        | (none)                          | 9482.88                           | 11523.09                              | 3.04                               | 2.12                                     | 3.44                          | 1.56                                | 45.15                                   | 37.01                                  | 0.14                         |
| 26   | Newark Slough Marsh        | 37.5170           | -122.0754 | saline               | old   | high      | 3                 | 96.0942   | 148.35                               | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        | (none)                          | 7550.96                           | 9528.56                               | 2.76                               | 1.53                                     | 3.94                          | 1.90                                | 30.40                                   | 41.15                                  | 0.17                         |
| 27   | Jarvis Landing             | 37.5278           | -122.0692 | saline               | old   | high      | 3                 | 27.4598   | 128.63                               | complex veg                   | mosaic                      | simple chan                | sinuous                  | (none)        | (none)                          | 8454.21                           | 7804.42                               | 3.02                               | 2.65                                     | 3.63                          | 1.29                                | 44.70                                   | 21.54                                  | 0.32                         |
| 28   | Ravenswood Slough          | 37.4909           | -122.1494 | saline               | young | high      | 3                 | 40.8987   | 167.71                               | simple veg                    | solid                       | simple chan                | perp                     | [3]           | banded                          | 9586.05                           | 13351.59                              | 3.26                               | 2.22                                     | 3.57                          | 1.51                                | 45.58                                   | 29.33                                  | 0.22                         |
| 29   | Ravenswood Slough Mouth    | 37.5008           | -122.1547 | saline               | old   | high      | 1                 | 5.6874    | 98.51                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | [3]           | solid                           | 6380.36                           | 7084.24                               | 2.94                               | 2.12                                     | 3.16                          | 1.24                                | 48.46                                   | 29.80                                  | 0.13                         |
| 30   | Bayfront Park Loop         | 37.4887           | -122.1785 | saline               | old   | high      | 2                 | 5.3628    | 135.93                               | simple veg                    | banded                      | simple chan                | sinuous                  | (none)        | (none)                          | 6767.98                           | 6564.82                               | 3.32                               | 1.82                                     | 3.41                          | 1.15                                | 58.50                                   | 25.34                                  | 0.12                         |
| 31   | Greco Island D             | 37.5038           | -122.1736 | saline               | old   | high      | 1                 | 106.3601  | 123.14                               | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        | (none)                          | 10963.73                          | 12065.56                              | 3.28                               | 2.74                                     | 3.46                          | 1.55                                | 46.11                                   | 24.64                                  | 0.21                         |
| 32   | Greco Island A             | 37.5178           | -122.1963 | saline               | old   | high      | 2                 | 31.0051   | 90.84                                | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        | (none)                          | 7253.89                           | 8855.33                               | 3.33                               | 2.34                                     | 3.47                          | 1.53                                | 38.74                                   | 36.70                                  | 0.22                         |
| 33   | Greco Island F             | 37.5077           | -122.1839 | saline               | young | high      | 1                 | 69.5720   | 141.12                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 8080.23                           | 10015.53                              | 3.66                               | 2.41                                     | 3.49                          | 1.35                                | 41.11                                   | 25.86                                  | 0.11                         |
| 34   | Greco Island G             | 37.5042           | -122.1896 | saline               | young | high      | 0                 | 5.2327    | 0.00                                 | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 9382.05                           | 10287.65                              | 3.25                               | 2.74                                     | 3.33                          | 1.71                                | 47.27                                   | 27.36                                  | 0.07                         |
| 35   | Greco Island E             | 37.4998           | -122.1755 | saline               | young | high      | 3                 | 19.3691   | 131.58                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 7968.63                           | 8667.54                               | 3.34                               | 2.28                                     | 3.28                          | 1.24                                | 48.77                                   | 23.67                                  | 0.22                         |
| 36   | Greco Island C             | 37.5151           | -122.1826 | saline               | young | high      | 1                 | 41.0838   | 119.91                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 8998.81                           | 10165.45                              | 2.96                               | 1.67                                     | 3.23                          | 1.16                                | 45.17                                   | 22.27                                  | 0.13                         |
| 37   | Greco Island B             | 37.5207           | -122.1962 | saline               | old   | high      | 0                 | 52.0814   | 134.97                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        | (none)                          | 7799.72                           | 8838.54                               | 3.37                               | 2.18                                     | 3.39                          | 1.42                                | 43.62                                   | 26.14                                  | 0.17                         |
| 38   | Pacific Shores-Bair Island | 37.5135           | -122.2168 | saline               | young | low-mid   | 2                 | 113.4718  | 98.61                                | simple veg                    | solid                       | complex chan               | dend                     | (none)        | (none)                          | 7582.29                           | 8574.18                               | 3.03                               | 2.05                                     | 3.31                          | 1.24                                | 52.57                                   | 25.34                                  | 0.25                         |
| 39   | Corkscrew Slough Marshes D | 37.5242           | -122.2176 | saline               | old   | high      | 0                 | 50.1124   | 195.85                               | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        | (none)                          | 8173.36                           | 9014.86                               | 3.48                               | 2.24                                     | 3.51                          | 1.38                                | 49.85                                   | 22.91                                  | 0.27                         |
| 40   | Corkscrew Slough Marshes E | 37.5227           | -122.2131 | saline               | young | low-mid   | 0                 | 66.9816   | 155.90                               | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        | (none)                          | 9470.39                           | 10971.08                              | 3.46                               | 2.73                                     | 3.32                          | 1.46                                | 45.34                                   | 26.19                                  | 0.29                         |
| 41   | Corkscrew Slough Marshes F | 37.5260           | -122.2049 | saline               | young | high      | 1                 | 16.3310   | 44.07                                | simple veg                    | solid-banded                | simple chan                | sinuous                  | (none)        | (none)                          | 7824.93                           | 9042.85                               | 2.97                               | 2.29                                     | 3.34                          | 1.31                                | 42.25                                   | 28.56                                  | 0.21                         |
| 42   | Corkscrew Slough Marshes C | 37.5207           | -122.2250 | saline               | old   | high      | 1                 | 14.4054   | 144.04                               | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        | (none)                          | 7808.54                           | 9571.27                               | 3.32                               | 2.14                                     | 3.17                          | 1.19                                | 42.76                                   | 26.79                                  | 0.22                         |
| 43   | Corkscrew Slough Marshes B | 37.5199           | -122.2329 | saline               | old   | high      | 0                 | 5.1333    | 264.55                               | simple veg                    | solid                       | complex chan               | dend-loop                | (none)        | (none)                          | 7214.77                           | 9357.84                               | 4.09                               | 2.86                                     | 3.44                          | 1.45                                | 44.31                                   | 23.80                                  | 0.30                         |
| 44   | Corkscrew Slough Marshes A | 37.5207           | -122.2412 | saline               | old   | high      | 2                 | 12.4237   | 161.24                               | complex veg                   | mosaic-solid                | complex chan               | dend                     | (none)        | (none)                          | 9719.73                           | 12042.37                              | 2.97                               | 1.80                                     |                               |                                     |                                         |                                        |                              |

| ID  | site<br>Name                  | centroid location |           | site characteristics |       |           |                   |           | vegetation pattern                   |                               | channel pattern             |                            | published site maps      |               | OBIA-derived pattern metrics    |                                   |                                        |                                    |                                          |                               |                                     |                                         |                                        |                              |
|-----|-------------------------------|-------------------|-----------|----------------------|-------|-----------|-------------------|-----------|--------------------------------------|-------------------------------|-----------------------------|----------------------------|--------------------------|---------------|---------------------------------|-----------------------------------|----------------------------------------|------------------------------------|------------------------------------------|-------------------------------|-------------------------------------|-----------------------------------------|----------------------------------------|------------------------------|
|     |                               | latitude          | longitude | salinity             | age   | elevation | impoundment index | area (ha) | channel density index [chden] (m/ha) | vegetation pattern complexity | vegetation pattern category | channel pattern complexity | channel pattern category | map citations | map-based vegetation complexity | mean object size [msize] (pixels) | std. dev. object size [sdsiz] (pixels) | mean object compactness [mcompact] | std. dev. object compactness [sdcompact] | mean object shape index [mSI] | std. dev. object shape index [sdSI] | std. dev. object main direction [sddir] | std. dev. object brightness [sdbright] | std. dev. object hue [sdhue] |
| 54  | Alameda Shore C               | 37.5531           | -122.1243 | saline               | young | high      | 1                 | 3.0650    | 75.95                                | complex veg                   | mosaic                      | simple chan                | none                     | (none)        |                                 | 3916.31                           | 3129.44                                | 2.80                               | 1.07                                     | 3.59                          | 1.26                                | 50.82                                   | 36.37                                  | 0.37                         |
| 55  | Alameda Shore N               | 37.5563           | -122.1262 | saline               | young | high      | 1                 | 4.7932    | 0.00                                 | complex veg                   | mosaic                      | simple chan                | none                     | (none)        |                                 | 3480.24                           | 3174.74                                | 2.74                               | 1.08                                     | 3.37                          | 1.19                                | 46.55                                   | 42.88                                  | 0.32                         |
| 56  | Alameda Creek Pond 3          | 37.5707           | -122.1224 | saline               | old   | high      | 3                 | 65.3118   | 47.88                                | simple veg                    | solid-banded                | simple chan                | linear                   | [3]           | solid                           | 9610.01                           | 13563.03                               | 2.70                               | 2.14                                     | 3.41                          | 1.52                                | 45.93                                   | 36.24                                  | 0.42                         |
| 57  | Whale's Tail S                | 37.5891           | -122.1438 | saline               | young | high      | 3                 | 69.0686   | 118.89                               | simple veg                    | solid                       | complex chan               | dend                     | [3]           | solid                           | 13259.32                          | 14759.27                               | 2.68                               | 1.62                                     | 3.13                          | 1.29                                | 52.36                                   | 23.24                                  | 0.31                         |
| 58  | Whale's Tail C                | 37.5990           | -122.1436 | saline               | young | low-mid   | 3                 | 51.7078   | 88.51                                | simple veg                    | solid                       | complex chan               | dend                     | [3]           | solid                           | 12300.87                          | 15008.16                               | 2.93                               | 2.82                                     | 3.06                          | 1.33                                | 55.81                                   | 24.91                                  | 0.32                         |
| 59  | Whale's Tail N                | 37.6061           | -122.1424 | saline               | young | high      | 3                 | 23.0317   | 108.27                               | simple veg                    | solid                       | simple chan                | sinuous                  | [3]           | solid                           | 8588.13                           | 9377.80                                | 2.81                               | 1.71                                     | 3.20                          | 1.31                                | 46.63                                   | 24.68                                  | 0.33                         |
| 60  | Brige 92 Triangle             | 37.6166           | -122.1498 | saline               | old   | high      | 2                 | 5.9118    | 53.17                                | simple veg                    | solid-banded                | complex chan               | dend                     | [3]           | solid                           | 7635.87                           | 6985.71                                | 2.67                               | 1.20                                     | 3.24                          | 1.10                                | 45.74                                   | 27.29                                  | 0.38                         |
| 61  | Cogswell Marsh                | 37.6353           | -122.1482 | saline               | young | low-mid   | 4                 | 78.2513   | 146.65                               | complex veg                   | mosaic                      | simple chan                | linear                   | (none)        |                                 | 7552.67                           | 6775.23                                | 3.05                               | 3.05                                     | 3.51                          | 1.32                                | 50.36                                   | 23.12                                  | 0.20                         |
| 62  | Hayward Triangle Marsh        | 37.6440           | -122.1532 | saline               | young | high      | 4                 | 3.6227    | 47.00                                | complex veg                   | mosaic-solid                | complex chan               | dend                     | (none)        |                                 | 10059.55                          | 13302.98                               | 2.94                               | 2.02                                     | 3.33                          | 1.32                                | 52.70                                   | 18.44                                  | 0.35                         |
| 63  | Hayward's Landing             | 37.6458           | -122.1555 | saline               | young | high      | 2                 | 1.9984    | 0.00                                 | simple veg                    | solid-banded                | simple chan                | perp                     | (none)        |                                 | 5416.41                           | 6029.23                                | 3.34                               | 2.37                                     | 3.27                          | 1.11                                | 51.48                                   | 34.29                                  | 0.35                         |
| 64  | Robert's Landing Shoreline    | 37.6721           | -122.1646 | saline               | young | low-mid   | 3                 | 29.1181   | 73.55                                | complex veg                   | mosaic                      | simple chan                | none                     | (none)        |                                 | 6897.59                           | 6427.03                                | 2.84                               | 1.89                                     | 3.28                          | 1.14                                | 52.08                                   | 34.70                                  | 0.40                         |
| 65  | Arrowhead Marsh               | 37.7443           | -122.2138 | saline               | young | high      | 1                 | 21.4472   | 96.49                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 9768.63                           | 8246.27                                | 2.89                               | 1.63                                     | 3.29                          | 1.16                                | 50.75                                   | 16.46                                  | 0.09                         |
| 66  | Damon Marsh                   | 37.7535           | -122.2125 | saline               | old   | high      | 2                 | 4.5949    | 218.28                               | simple veg                    | banded                      | complex chan               | dend-loop                | (none)        |                                 | 6718.91                           | 3965.36                                | 2.94                               | 1.29                                     | 3.39                          | 1.10                                | 51.13                                   | 22.21                                  | 0.20                         |
| 67  | Emeryville Crescent S         | 37.8287           | -122.2971 | saline               | young | high      | 1                 | 9.3486    | 97.21                                | simple veg                    | banded                      | simple chan                | sinuous                  | (none)        |                                 | 7629.65                           | 6600.37                                | 2.75                               | 1.48                                     | 3.17                          | 1.08                                | 44.80                                   | 26.21                                  | 0.37                         |
| 68  | Emeryville Crescent N         | 37.8335           | -122.2962 | saline               | young | high      | 1                 | 12.7865   | 10.42                                | simple veg                    | banded                      | simple chan                | none                     | (none)        |                                 | 7636.03                           | 9604.29                                | 2.54                               | 1.11                                     | 3.10                          | 1.10                                | 52.80                                   | 30.55                                  | 0.43                         |
| 69  | Bothin Marsh S                | 37.8833           | -122.5224 | saline               | young | high      | 3                 | 11.9513   | 86.00                                | simple veg                    | solid                       | complex chan               | dend-loop                | (none)        |                                 | 6775.43                           | 7108.14                                | 2.82                               | 1.24                                     | 3.22                          | 1.12                                | 49.83                                   | 35.56                                  | 0.22                         |
| 70  | Bothin Marsh N                | 37.8882           | -122.5233 | saline               | young | high      | 4                 | 11.4124   | 72.22                                | complex veg                   | mosaic                      | simple chan                | sinuous                  | (none)        |                                 | 6401.76                           | 5792.37                                | 2.80                               | 1.40                                     | 3.32                          | 1.38                                | 58.80                                   | 34.20                                  | 0.22                         |
| 71  | Mill Valley Bayfront Park     | 37.8933           | -122.5268 | saline               | old   | high      | 4                 | 5.7017    | 178.81                               | simple veg                    | banded                      | complex chan               | dend                     | (none)        |                                 | 5807.26                           | 6839.35                                | 2.90                               | 1.60                                     | 3.38                          | 1.35                                | 58.17                                   | 30.95                                  | 0.40                         |
| 72  | Marin Triangle Marsh          | 37.9224           | -122.4964 | saline               | old   | high      | 3                 | 5.2576    | 80.69                                | simple veg                    | solid                       | simple chan                | sinuous                  | (none)        |                                 | 5842.10                           | 5311.01                                | 2.69                               | 1.01                                     | 3.08                          | 0.93                                | 53.64                                   | 29.66                                  | 0.36                         |
| 73  | Marta's Marsh                 | 37.9259           | -122.5029 | saline               | young | high      | 4                 | 6.0275    | 170.48                               | simple veg                    | devel                       | complex chan               | dend-loop                | (none)        |                                 | 4886.51                           | 4158.00                                | 3.15                               | 1.58                                     | 3.63                          | 1.23                                | 46.25                                   | 35.73                                  | 0.30                         |
| 74  | Muzzi Marsh E                 | 37.9282           | -122.5050 | saline               | young | low-mid   | 3                 | 19.8986   | 183.44                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 7842.82                           | 6081.89                                | 2.94                               | 1.73                                     | 3.13                          | 1.13                                | 44.18                                   | 16.66                                  | 0.34                         |
| 75  | Corte Madera Reserve S        | 37.9332           | -122.5061 | saline               | young | high      | 4                 | 19.9679   | 110.84                               | simple veg                    | solid                       | simple chan                | sinuous                  | (none)        |                                 | 10084.99                          | 11223.12                               | 3.03                               | 2.31                                     | 3.10                          | 1.22                                | 58.72                                   | 22.28                                  | 0.39                         |
| 76  | Corte Madera Reserve N        | 37.9398           | -122.5089 | saline               | old   | high      | 1                 | 37.2192   | 88.05                                | complex veg                   | mosaic-solid                | complex chan               | dend-loop                | (none)        |                                 | 7586.55                           | 12807.60                               | 3.19                               | 2.26                                     | 3.04                          | 1.41                                | 54.58                                   | 39.14                                  | 0.32                         |
| 77  | Piper Park                    | 37.9413           | -122.5295 | saline               | old   | high      | 3                 | 10.8666   | 165.37                               | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        |                                 | 4925.93                           | 5432.86                                | 2.96                               | 1.92                                     | 3.11                          | 1.30                                | 48.46                                   | 30.95                                  | 0.26                         |
| 78  | San Rafael Creek S            | 37.9687           | -122.4958 | saline               | young | high      | 2                 | 4.7593    | 0.00                                 | simple veg                    | banded                      | simple chan                | perp                     | (none)        |                                 | 6778.90                           | 6793.30                                | 2.93                               | 2.57                                     | 2.97                          | 0.96                                | 60.38                                   | 33.52                                  | 0.19                         |
| 79  | San Rafael Creek N            | 37.9723           | -122.4967 | saline               | young | low-mid   | 0                 | 0.9749    | 120.38                               | simple veg                    | banded                      | simple chan                | perp                     | (none)        |                                 | 15491.57                          | 26247.57                               | 2.14                               | 0.51                                     | 2.20                          | 0.56                                | 66.71                                   | 27.67                                  | 0.15                         |
| 80  | Wildcat Creek Marsh W         | 37.9570           | -122.3956 | saline               | young | high      | 1                 | 14.2208   | 79.19                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 12954.70                          | 9316.00                                | 2.64                               | 1.48                                     | 3.00                          | 1.07                                | 43.02                                   | 13.10                                  | 0.10                         |
| 81  | Wildcat Creek Marsh E         | 37.9587           | -122.3855 | saline               | old   | high      | 3                 | 120.9142  | 122.08                               | simple veg                    | solid                       | complex chan               | dend-loop                | (none)        |                                 | 13145.13                          | 16119.68                               | 3.19                               | 3.02                                     | 3.21                          | 1.49                                | 52.12                                   | 22.60                                  | 0.27                         |
| 82  | San Pablo Creek Marsh         | 37.9737           | -122.3779 | saline               | young | high      | 1                 | 62.1228   | 140.11                               | complex veg                   | mosaic-solid                | simple chan                | perp                     | (none)        |                                 | 10063.48                          | 11398.36                               | 3.02                               | 2.17                                     | 3.17                          | 1.34                                | 55.71                                   | 20.10                                  | 0.26                         |
| 83  | San Pablo Shoreline S         | 37.9778           | -122.3695 | saline               | young | high      | 3                 | 4.6574    | 197.74                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 7607.28                           | 5649.24                                | 2.69                               | 1.39                                     | 3.13                          | 1.13                                | 43.06                                   | 20.04                                  | 0.41                         |
| 84  | San Pablo Shoreline           | 37.9816           | -122.3655 | saline               | young | high      | 3                 | 10.3278   | 65.93                                | simple veg                    | banded                      | simple chan                | none                     | (none)        |                                 | 6914.79                           | 6900.55                                | 2.77                               | 1.54                                     | 3.09                          | 1.10                                | 54.33                                   | 31.27                                  | 0.32                         |
| 85  | Point Pinole Parchester Marsh | 37.9904           | -122.3590 | saline               | old   | high      | 3                 | 15.3407   | 97.01                                | simple veg                    | solid                       | simple chan                | linear                   | (none)        |                                 | 9850.53                           | 12514.37                               | 2.95                               | 2.08                                     | 3.12                          | 1.16                                | 58.00                                   | 24.47                                  | 0.30                         |
| 86  | Point Pinole Whittell Marsh   | 38.0071           | -122.3559 | saline               | old   | high      | 3                 | 18.9261   | 94.91                                | complex veg                   | mosaic-solid                | simple chan                | linear                   | (none)        |                                 | 9028.37                           | 11835.42                               | 2.96                               | 2.18                                     | 3.08                          | 1.37                                | 46.89                                   | 35.53                                  | 0.34                         |
| 87  | Point Pinole N Shoreline      | 38.0027           | -122.3394 | saline               | old   | high      | 3                 | 20.7530   | 49.53                                | simple veg                    | banded                      | simple chan                | linear                   | (none)        |                                 | 6722.70                           | 9012.14                                | 3.03                               | 2.25                                     | 3.23                          | 1.32                                | 41.31                                   | 36.35                                  | 0.35                         |
| 88  | China Camp                    | 38.0115           | -122.4915 | saline               | old   | high      | 1                 | 113.8819  | 141.03                               | simple veg                    | solid-banded                | complex chan               | dend                     | [5] / [6]     | mosaic-solid / solid            | 10270.27                          | 12042.57                               | 3.09                               | 2.22                                     | 3.27                          | 1.32                                | 47.57                                   | 26.83                                  | 0.22                         |
| 89  | Gallinas Creek N Marsh        | 38.0143           | -122.5330 | saline               | young | low-mid   | 4                 | 11.8083   | 160.17                               | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 5027.10                           | 4017.26                                | 3.09                               | 2.40                                     | 3.43                          | 1.14                                | 48.53                                   | 26.98                                  | 0.32                         |
| 90  | McInnis Park Marsh S          | 38.0184           | -122.5096 | saline               | young | high      | 2                 | 13.1924   | 130.79                               | complex veg                   | mosaic                      | simple chan                | perp                     | (none)        |                                 | 9161.41                           | 7383.47                                | 3.01                               | 3.23                                     | 3.34                          | 1.33                                | 50.24                                   | 16.02                                  | 0.26                         |
| 91  | McInnis Park Marsh E          | 38.0234           | -122.5019 | saline               | young | high      | 1                 | 129.4688  | 154.04                               | simple veg                    | solid-banded                | complex chan               | dend-loop                | (none)        |                                 | 13790.77                          | 14390.99                               | 3.48                               | 3.42                                     | 3.20                          | 1.42                                | 52.29                                   | 15.01                                  | 0.16                         |
| 92  | Gallinas Shoreline            | 38.0456           | -122.4959 | saline               | young | high      | 1                 | 130.4050  | 88.54                                | simple veg                    | banded                      | simple chan                | perp                     | (none)        |                                 | 10799.17                          | 12351.49                               | 2.99                               | 2.32                                     | 3.49                          | 1.35                                | 55.78                                   | 26.91                                  | 0.41                         |
| 93  | Black Point                   | 38.0963           | -122.4899 | saline               | young | high      | 1                 | 155.3377  | 60.80                                | simple veg                    | banded                      | simple chan                | perp                     | (none)        |                                 | 13882.79                          | 13876.40                               | 2.62                               | 1.98                                     | 3.29                          | 1.34                                | 57.39                                   | 18.16                                  | 0.40                         |
| 94  | Greenpoint Centennial Marsh   | 38.1281           | -122.5150 | saline               | young | high      | 2                 | 30.2868   | 150.30                               | simple veg                    | banded                      | simple chan                | perp                     | (none)        |                                 | 7478.94                           | 6814.41                                | 3.01                               | 2.04                                     | 3.72                          | 1.17                                | 54.13                                   | 19.72                                  | 0.27                         |
| 95  | Black John Slough Marsh       | 38.1336           | -122.5182 | saline               | young | high      | 1                 | 30.9038   | 120.55                               | complex veg                   | mosaic                      | simple chan                | perp                     | (none)        |                                 | 8050.24                           | 7492.67                                | 2.93                               | 1.77                                     | 3.76                          | 1.21                                | 44.18                                   | 18.33                                  | 0.08                         |
| 96  | Petaluma River Mouth N        | 38.1171           | -122.4716 | saline               | young | high      | 1                 | 205.7428  | 63.77                                | simple veg                    | banded                      | simple chan                | none                     | (none)        |                                 | 15548.73                          | 16156.91                               | 2.44                               | 1.64                                     | 3.18                          | 1.19                                | 39.10                                   | 14.79                                  | 0.40                         |
| 97  | Island Number 1 Shoreline     | 38.1204           | -122.3244 | saline               | young | high      | 3                 | 639.1928  | 28.63                                | simple veg                    | banded                      | simple chan                | none                     | (none)        |                                 | 12093.66                          | 16894.44                               | 2.49                               | 1.44                                     | 3.23                          | 1.27                                | 43.58                                   | 33.76                                  | 0.35                         |
| 98  | Mare Island S                 | 38.0742           | -122.2724 | saline               | young | high      | 3                 | 186.3128  | 47.90                                | simple veg                    | banded                      | simple chan                | none                     | (none)        |                                 | 11176.23                          | 13557.00                               | 2.50                               | 1.14                                     | 3.33                          | 1.23                                | 48.04                                   | 32.90                                  | 0.26                         |
| 99  | Dutchman Slough Mouth         | 38.1202           | -122.2872 | saline               | young | high      | 3                 | 13.5415   | 63.08                                | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        |                                 | 6966.26                           | 6254.98                                | 2.95                               | 1.99                                     | 3.57                          | 1.18                                | 41.70                                   | 26.65                                  | 0.38                         |
| 100 | White Slough Marsh            | 38.1341           | -122.2671 | brackish             | old   | high      | 1                 | 143.1201  | 95.39                                | complex veg                   | mosaic                      | complex chan               | dend-loop                | (none)        |                                 | 6381.73                           | 7491.42                                | 2.82                               | 1.44                                     | 3.67                          | 1.19                                | 47.25                                   | 24.37                                  | 0.15                         |
| 101 | Napa River E                  | 38.1167           | -122.2741 | saline               | young | high      | 1                 | 11.8974   | 35.48                                | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        |                                 | 5696.09                           | 4682.55                                | 2.66                               | 1.11                                     | 3.44                          | 1.11                                | 49.41                                   | 24.17                                  | 0.38                         |
| 102 | Benicia Marsh                 | 38.0729           | -122.1933 | saline               | old   | high      | 3                 | 65.1847   | 88.41                                | simple veg                    | solid-banded                | complex chan               | dend                     | [6]           | solid-banded                    | 8193.55                           | 7834.73                                | 2.71                               | 1.52                                     | 3.34                          | 1.05                                | 53.25                                   | 21.06                                  | 0.32                         |
| 103 | Joyce Island Point            | 38.1270           | -122.0683 | brackish             | young | high      | 1                 | 113.9689  | 76.60                                | complex veg                   | mosaic                      | simple chan                | perp                     | (none)        |                                 | 6550.34                           | 5984.19                                | 2.55                               | 0.89                                     | 3.52                          | 1.04                                | 46.96                                   | 20.65                                  | 0.20                         |
| 104 | Peyton Hill Marsh             | 38.0370           | -122.1049 | brackish             | young | low-mid   | 3                 | 141.8706  | 120.63                               | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        |                                 | 7115.65                           | 5364.78                                | 2.69                               | 1.22                                     | 3.41                          | 1.04                                | 48.98                                   | 17.83                                  | 0.11                         |
| 105 | Point Edith W                 | 38.0458           | -122.0790 | brackish             | young | low-mid   | 3                 | 119.7524  | 84.81                                | complex veg                   | mosaic                      | complex chan               | dend                     | (none)        |                                 | 6181.13                           | 4932.53                                | 2.71                               | 1.14                                     | 3.58                          | 1.07                                | 48.30                                   | 18.85                                  | 0.27                         |
| 106 | Seal Islands                  | 38.0560           | -122.0477 | brackish             | old   | high      | 0                 | 12.0016   | 0.00                                 | complex veg                   | mosaic                      | simple chan                | none                     | (none)        |                                 | 4922.42                           | 4248.32                                | 3.06                               | 1.57                                     | 3.76                          | 1.09                                | 45.06                                   | 27.33                                  | 0.21                         |
| 107 | Roe Island                    | 38.0721           | -122.0338 | brackish             | old   | high      |                   |           |                                      |                               |                             |                            |                          |               |                                 |                                   |                                        |                                    |                                          |                               |                                     |                                         |                                        |                              |

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Table S2. For saline sites only: relationships among marsh age, elevation, and impoundment characteristics and vegetation and channel pattern complexity: number of 97 total saline sites in each combination of categories.

|                       |         | relative age |       | relative elevation |         | impoundment index |    |    |    |   | vegetation complexity |        | total |
|-----------------------|---------|--------------|-------|--------------------|---------|-------------------|----|----|----|---|-----------------------|--------|-------|
|                       |         | old          | young | high               | low-mid | 0                 | 1  | 2  | 3  | 4 | complex               | simple |       |
| relative age          | old     |              |       | 37                 | 0       | 5                 | 12 | 7  | 12 | 1 | 24                    | 13     | 37    |
|                       | young   |              |       | 46                 | 14      | 4                 | 26 | 5  | 17 | 8 | 33                    | 17     | 60    |
| relative elevation    | high    | 37           | 46    |                    |         | 6                 | 36 | 11 | 25 | 5 | 47                    | 36     | 83    |
|                       | low-mid | 0            | 14    |                    |         | 3                 | 2  | 1  | 4  | 4 | 10                    | 4      | 14    |
| impoundment index     | 0       | 5            | 4     | 6                  | 3       |                   |    |    |    |   | 7                     | 2      | 9     |
|                       | 1       | 12           | 26    | 36                 | 2       |                   |    |    |    |   | 26                    | 12     | 38    |
|                       | 2       | 7            | 5     | 11                 | 1       |                   |    |    |    |   | 5                     | 7      | 12    |
|                       | 3       | 12           | 17    | 25                 | 4       |                   |    |    |    |   | 14                    | 15     | 29    |
|                       | 4       | 1            | 8     | 5                  | 4       |                   |    |    |    |   | 5                     | 4      | 9     |
| vegetation complexity | complex | 24           | 33    | 47                 | 10      | 7                 | 26 | 5  | 14 | 5 |                       |        | 57    |
|                       | simple  | 13           | 17    | 36                 | 4       | 2                 | 12 | 7  | 15 | 4 |                       |        | 40    |
| channel complexity    | complex | 28           | 28    | 46                 | 10      | 7                 | 21 | 6  | 16 | 6 | 41                    | 15     | 56    |
|                       | simple  | 9            | 32    | 37                 | 4       | 2                 | 17 | 6  | 13 | 3 | 16                    | 25     | 41    |
| total                 |         | 37           | 60    | 83                 | 14      | 9                 | 38 | 12 | 29 | 9 | 57                    | 40     | 97    |

Table S3. For saline sites only: number of marsh sites in each specific vegetation and channel pattern category, and relationships to site characteristics.

|                                   |         |                      | relative age |       | relative elevation |         | impoundment index |    |    |    |   | channel pattern category |           |         |                    |        |      | total |
|-----------------------------------|---------|----------------------|--------------|-------|--------------------|---------|-------------------|----|----|----|---|--------------------------|-----------|---------|--------------------|--------|------|-------|
|                                   |         |                      | old          | young | high               | low-mid | 0                 | 1  | 2  | 3  | 4 | complex                  |           | simple  |                    |        |      |       |
|                                   |         |                      |              |       |                    |         |                   |    |    |    |   | dendritic<br>-looped     | dendritic | sinuous | perpen-<br>dicular | linear | none |       |
| vegetation<br>pattern<br>category | complex | mosaic               | 14           | 24    | 31                 | 7       | 3                 | 18 | 3  | 11 | 3 | 18                       | 8         | 4       | 3                  | 2      | 3    | 38    |
|                                   |         | mosaic-<br>solid     | 10           | 9     | 16                 | 3       | 4                 | 8  | 2  | 3  | 2 | 10                       | 5         | 0       | 3                  | 1      | 0    | 19    |
|                                   | simple  | solid                | 4            | 8     | 10                 | 2       | 1                 | 1  | 1  | 8  | 1 | 3                        | 3         | 3       | 2                  | 1      | 0    | 12    |
|                                   |         | solid-<br>banded     | 4            | 5     | 9                  | 0       | 0                 | 4  | 2  | 3  | 0 | 1                        | 3         | 2       | 1                  | 2      | 0    | 9     |
|                                   |         | banded               | 5            | 12    | 16                 | 1       | 1                 | 7  | 4  | 4  | 1 | 2                        | 1         | 2       | 6                  | 1      | 5    | 17    |
|                                   |         | developing           | 0            | 2     | 1                  | 1       | 0                 | 0  | 0  | 0  | 2 | 2                        | 0         | 0       | 0                  | 0      | 0    | 2     |
| channel<br>pattern<br>category    | complex | dendritic-<br>looped | 19           | 17    | 30                 | 6       | 7                 | 16 | 3  | 3  | 3 |                          |           |         |                    |        |      | 36    |
|                                   |         | dendritic            | 9            | 11    | 16                 | 4       | 0                 | 5  | 3  | 3  | 3 |                          |           |         |                    |        |      | 20    |
|                                   | simple  | sinuous              | 4            | 7     | 11                 | 0       | 1                 | 4  | 1  | 1  | 2 |                          |           |         |                    |        |      | 11    |
|                                   |         | perpen-<br>dicular   | 0            | 15    | 13                 | 2       | 1                 | 9  | 4  | 4  | 0 |                          |           |         |                    |        |      | 15    |
|                                   |         | linear               | 5            | 2     | 6                  | 1       | 0                 | 0  | 1  | 1  | 1 |                          |           |         |                    |        |      | 7     |
|                                   |         | none                 | 0            | 8     | 7                  | 1       | 0                 | 4  | 0  | 0  | 0 |                          |           |         |                    |        |      | 8     |
|                                   | total   |                      | 37           | 60    | 83                 | 14      | 9                 | 38 | 12 | 29 | 9 | 26                       | 20        | 11      | 15                 | 7      | 8    | 97    |

Table S4. For saline sites only: results of Fisher's exact tests for relationships between marsh site characteristics, vegetation complexity, and channel complexity. Reported values are significance (p values), with a value  $p^* < 0.017$  required for rejection of the null hypothesis (for  $\alpha = 0.1/6$ , with Bonferroni correction for six comparisons).

|                       | age            | elevation | vegetation<br>complexity | channel<br>complexity |
|-----------------------|----------------|-----------|--------------------------|-----------------------|
| age                   | -              |           |                          |                       |
| elevation             | <b>0.0007*</b> | -         |                          |                       |
| vegetation complexity | 0.3987         | 0.3853    | -                        |                       |
| channel complexity    | <b>0.0061*</b> | 0.1742    | <b>0.0009*</b>           | -                     |

Table S5. Generalized linear mixed-effects models for vegetation complexity (complex/simple) and channel complexity (complex/simple) based on quantitative site configuration metrics.

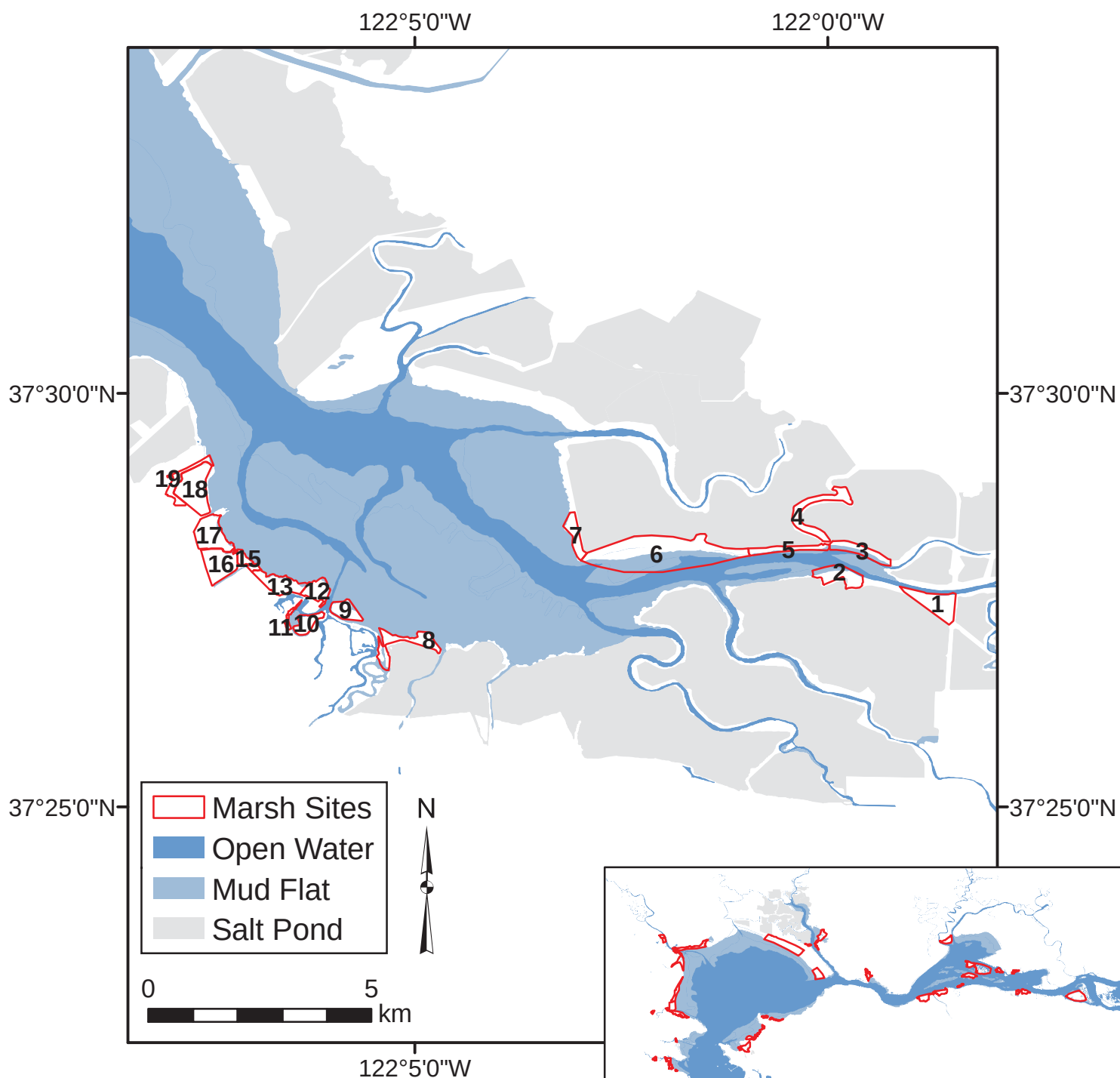
| GLMM vegetation complexity model |                       |                |          |     |            | 95% confidence intervals on coefficients |             |
|----------------------------------|-----------------------|----------------|----------|-----|------------|------------------------------------------|-------------|
| fixed effects:                   |                       |                |          |     |            |                                          |             |
| Variable                         | coefficient estimates | SE             | tStat    | DF  | pValue     | Lower                                    | Upper       |
| (intercept)                      | 4.4496                | 2.6282         | 1.693    | 108 | 0.09333    | -0.75989                                 | 9.6592      |
| std. dev. object size            | -0.0002535            | 7.7522e-05     | -3.2701  | 108 | 0.001443   | -0.00040717                              | -9.9843e-05 |
| std. dev. shape index            | 3.6573                | 1.7461         | 2.0946   | 108 | 0.038547   | 0.19628                                  | 7.1184      |
| std. dev. main direction         | -0.083311             | 0.040007       | -2.0824  | 108 | 0.039665   | -0.16261                                 | -0.0040109  |
| std. dev. brightness             | -0.077582             | 0.034834       | -2.2272  | 108 | 0.028011   | -0.14663                                 | -0.0085339  |
| random effect:                   | covariance estimate   |                |          |     |            |                                          |             |
| site ID                          | 0.00045745            |                |          |     |            |                                          |             |
| model fit statistics:            |                       |                |          |     |            |                                          |             |
| AIC                              | BIC                   | Log Likelihood | Deviance |     |            |                                          |             |
| 138.61                           | 154.97                | -63.305        | 126.61   |     |            |                                          |             |
| GLMM channel complexity model    |                       |                |          |     |            | 95% confidence intervals on coefficients |             |
| fixed effects:                   |                       |                |          |     |            |                                          |             |
| Variable                         | coefficient estimates | SE             | tStat    | DF  | pValue     | Lower                                    | Upper       |
| (intercept)                      | -17.979               | 4.9841         | -3.6072  | 108 | 0.00047037 | -27.858                                  | -8.0993     |
| channel density index            | 0.010496              | 0.0047948      | 2.1891   | 108 | 0.030743   | 0.00099212                               | 0.020001    |
| mean object size                 | 0.00021208            | 0.00011209     | 1.8921   | 108 | 0.061149   | -1.0091e-05                              | 0.00043426  |
| mean compactness                 | 6.8753                | 1.9557         | 3.5155   | 108 | 0.00064285 | 2.9987                                   | 10.752      |
| std.dev. compactness             | -2.4935               | 0.82107        | -3.0369  | 108 | 0.0029971  | -4.121                                   | -0.86598    |
| random effect:                   | covariance estimate   |                |          |     |            |                                          |             |
| site ID                          | 0.00010598            |                |          |     |            |                                          |             |
| model fit statistics:            |                       |                |          |     |            |                                          |             |
| AIC                              | BIC                   | Log Likelihood | Deviance |     |            |                                          |             |
| 135.19                           | 151.55                | -61.593        | 123.19   |     |            |                                          |             |

Figure S1. Marsh site location maps, by sub-region.

Attached.

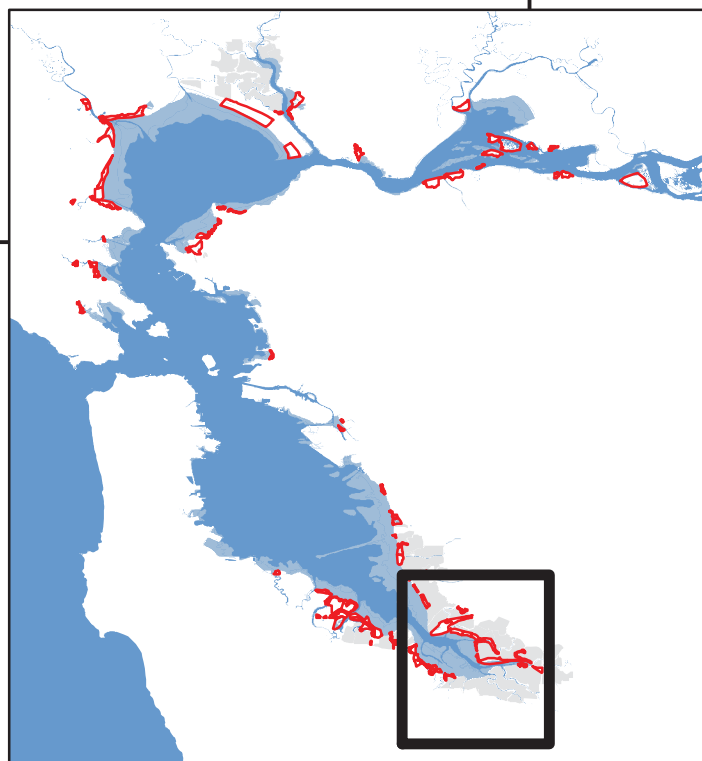
Figure S2. Individual maps of the 113 marsh sites analyzed, grouped by sub-region.

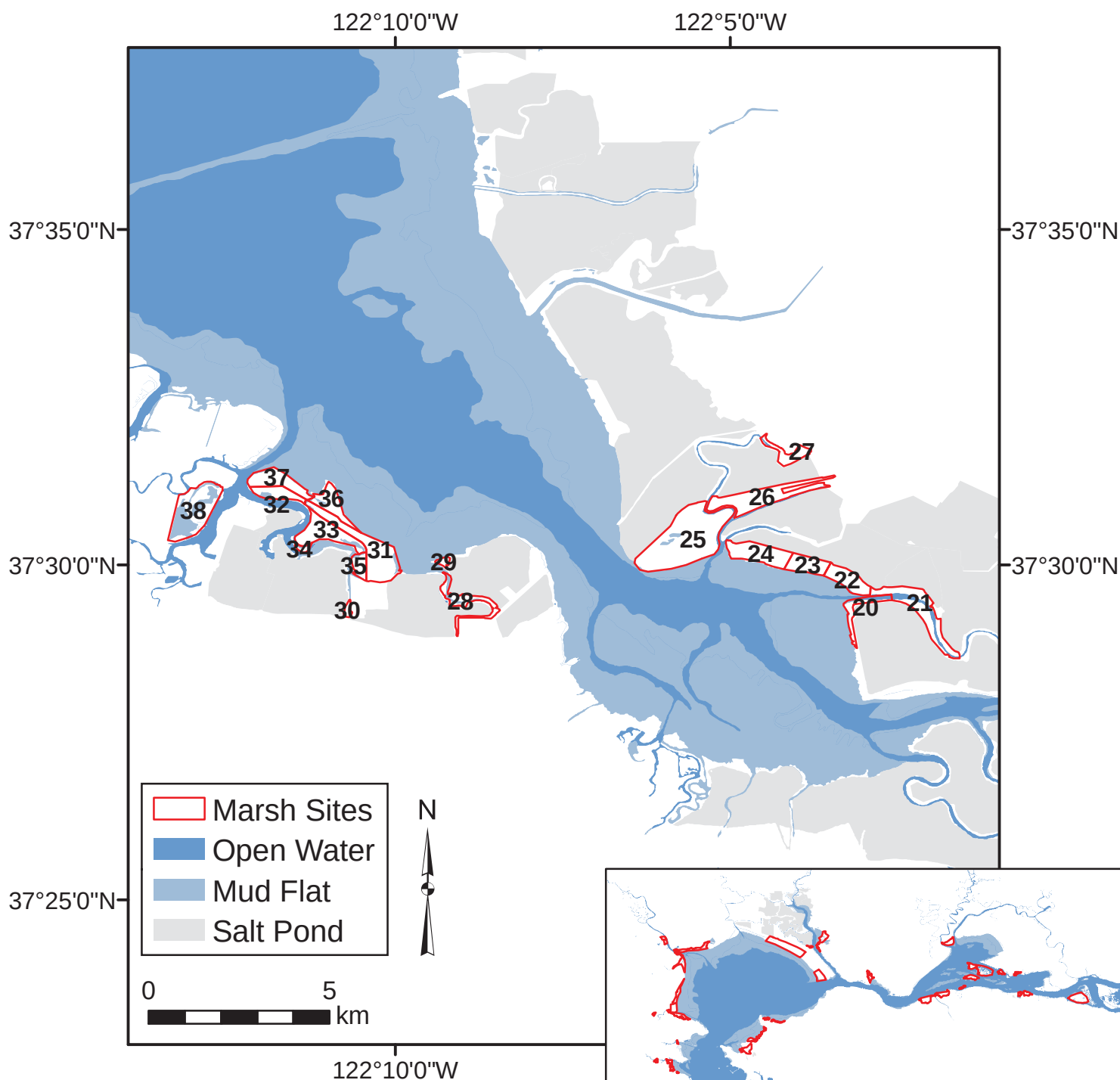
Attached.



(above) Map of subset of marsh study site locations.

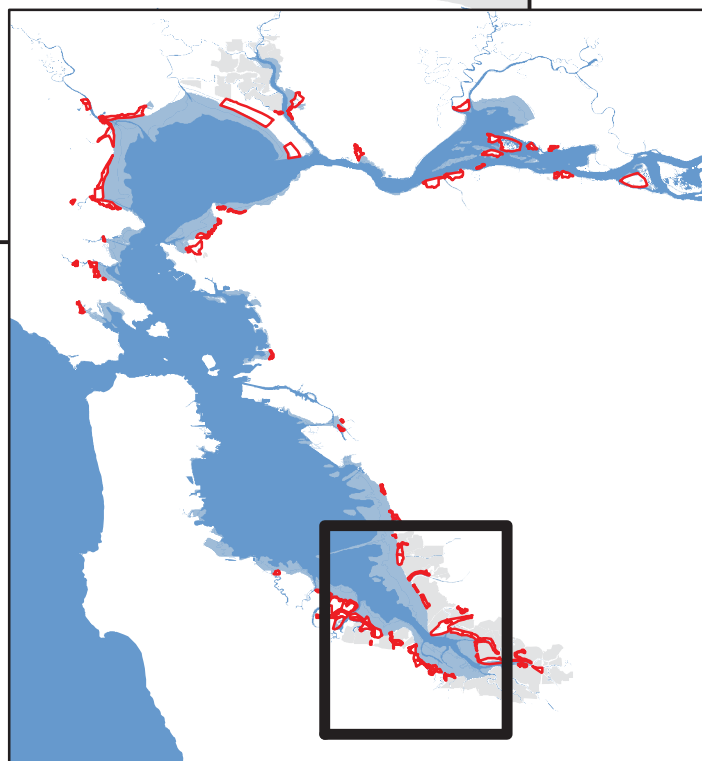
(right) Map showing location of subset within San Francisco Bay estuary and full set of study sites.

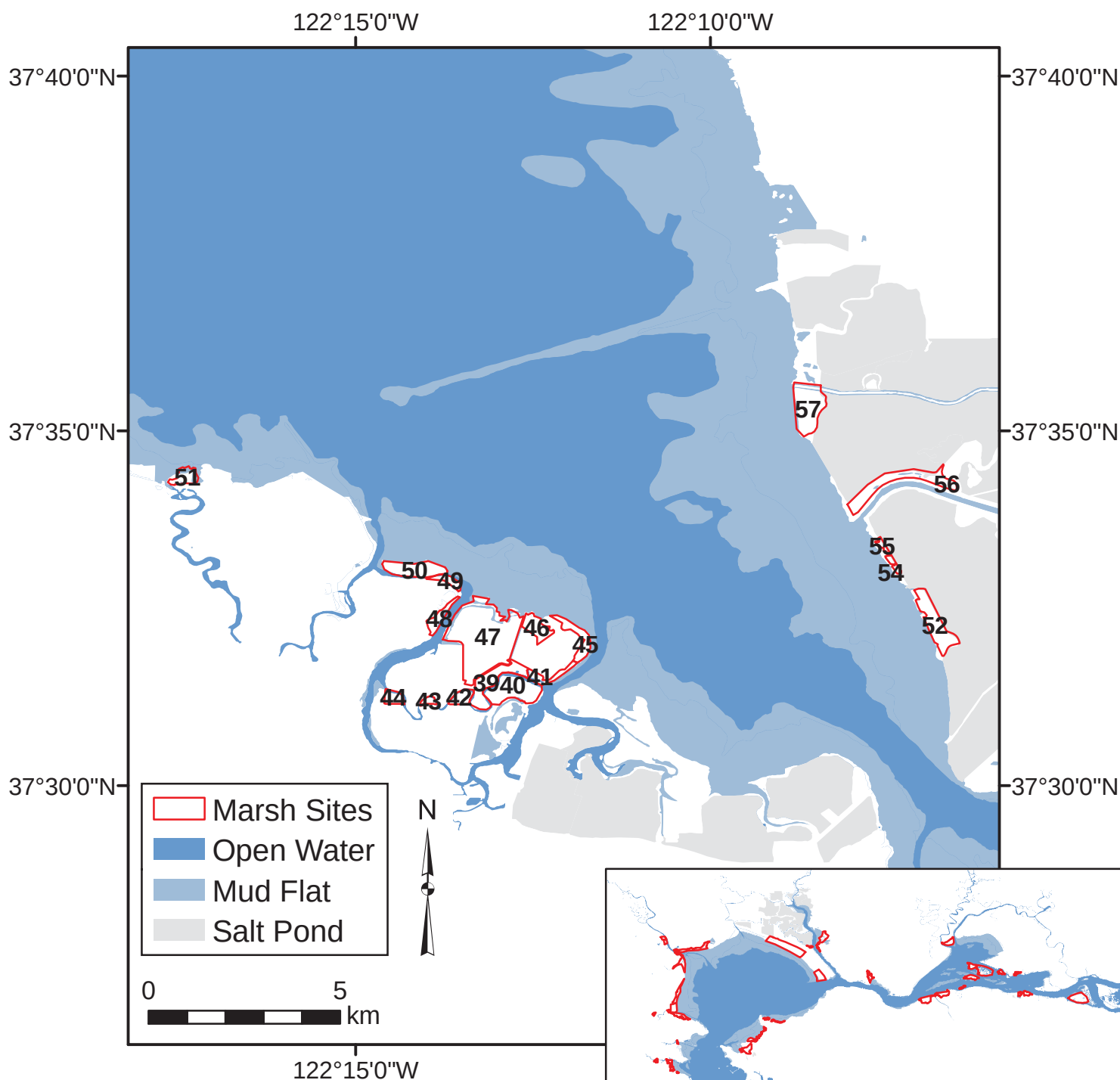




(above) Map of subset of marsh study site locations.

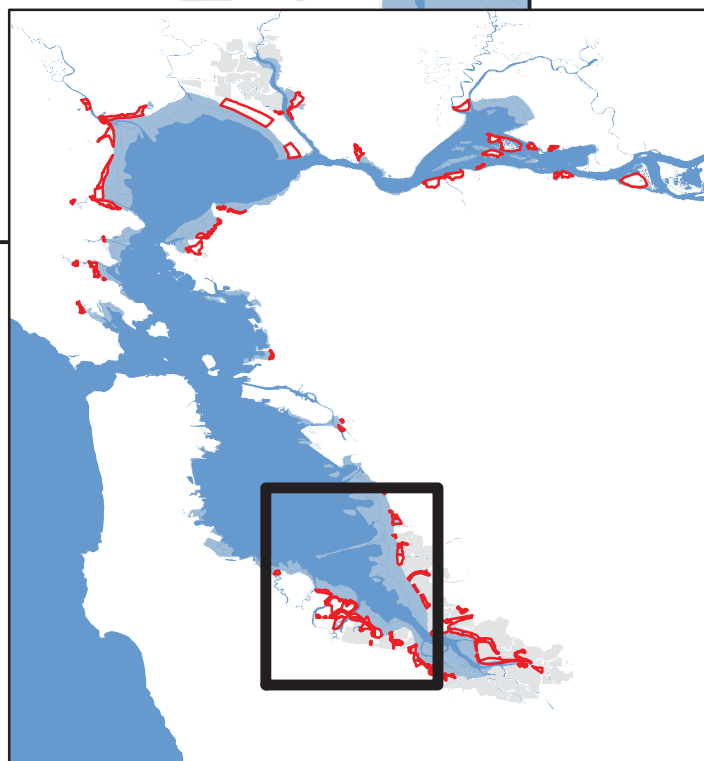
(right) Map showing location of subset within San Francisco Bay estuary and full set of study sites.

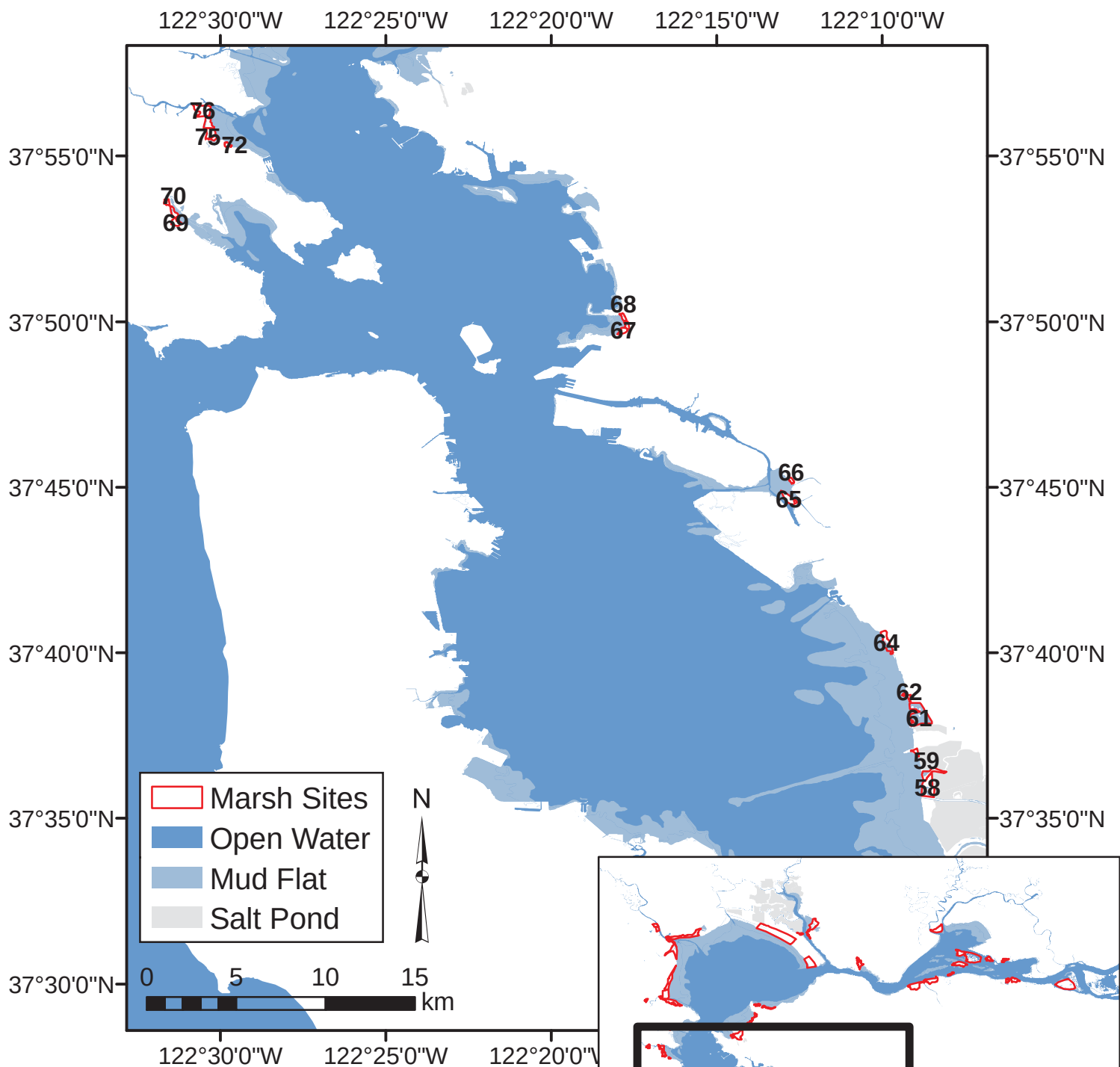




(above) Map of subset of marsh study site locations.

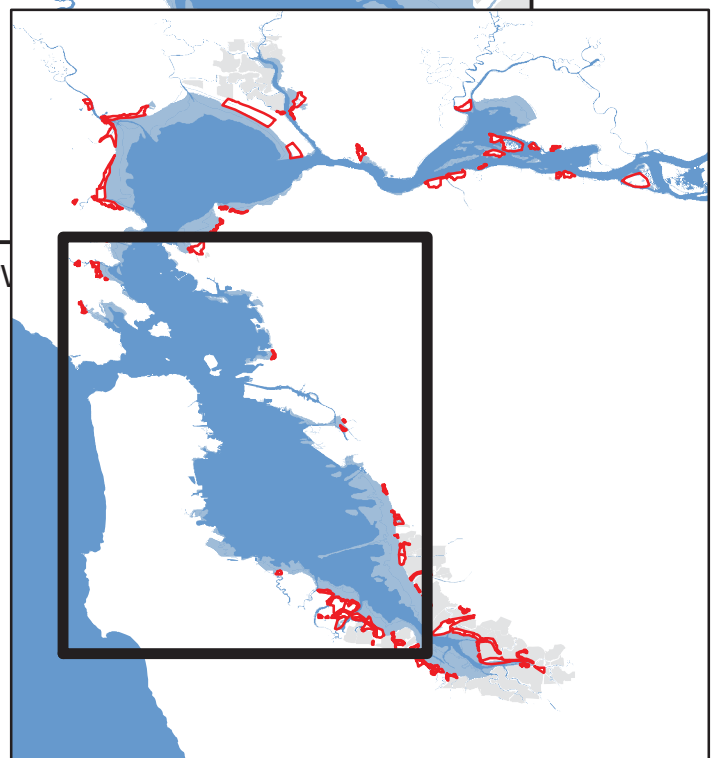
(right) Map showing location of subset within San Francisco Bay estuary and full set of study sites.

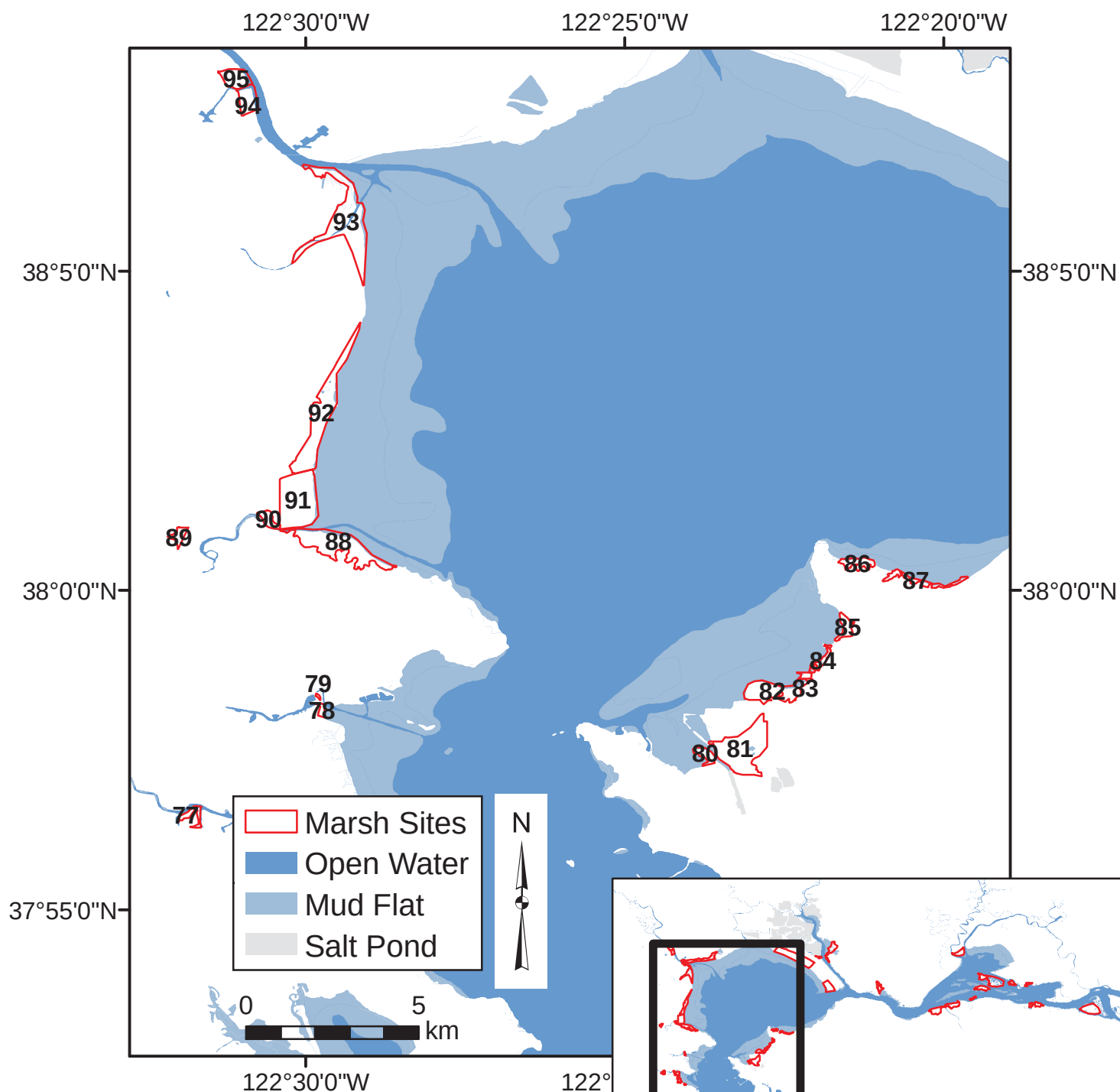




(above) Map of subset of marsh study site locations.

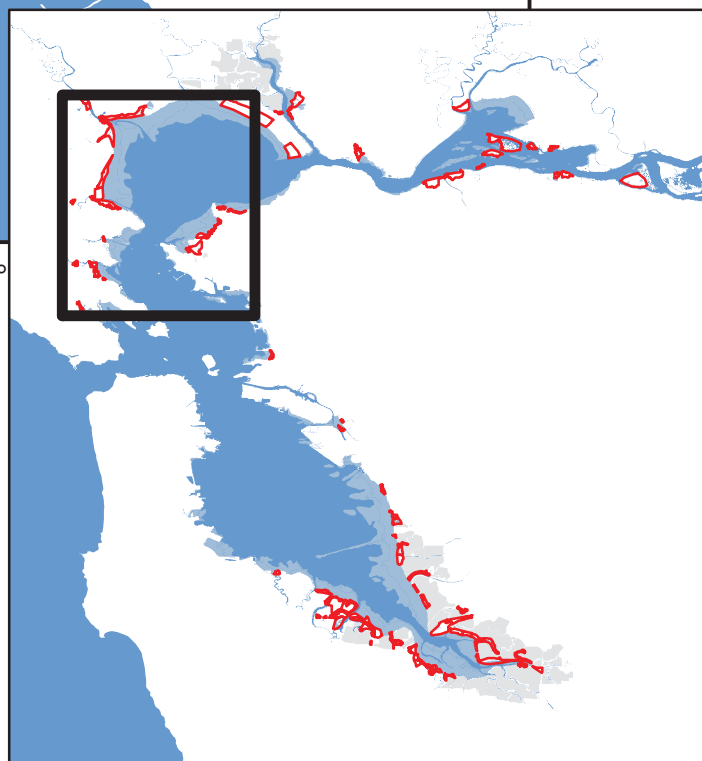
(right) Map showing location of subset within San Francisco Bay estuary and full set of study sites.

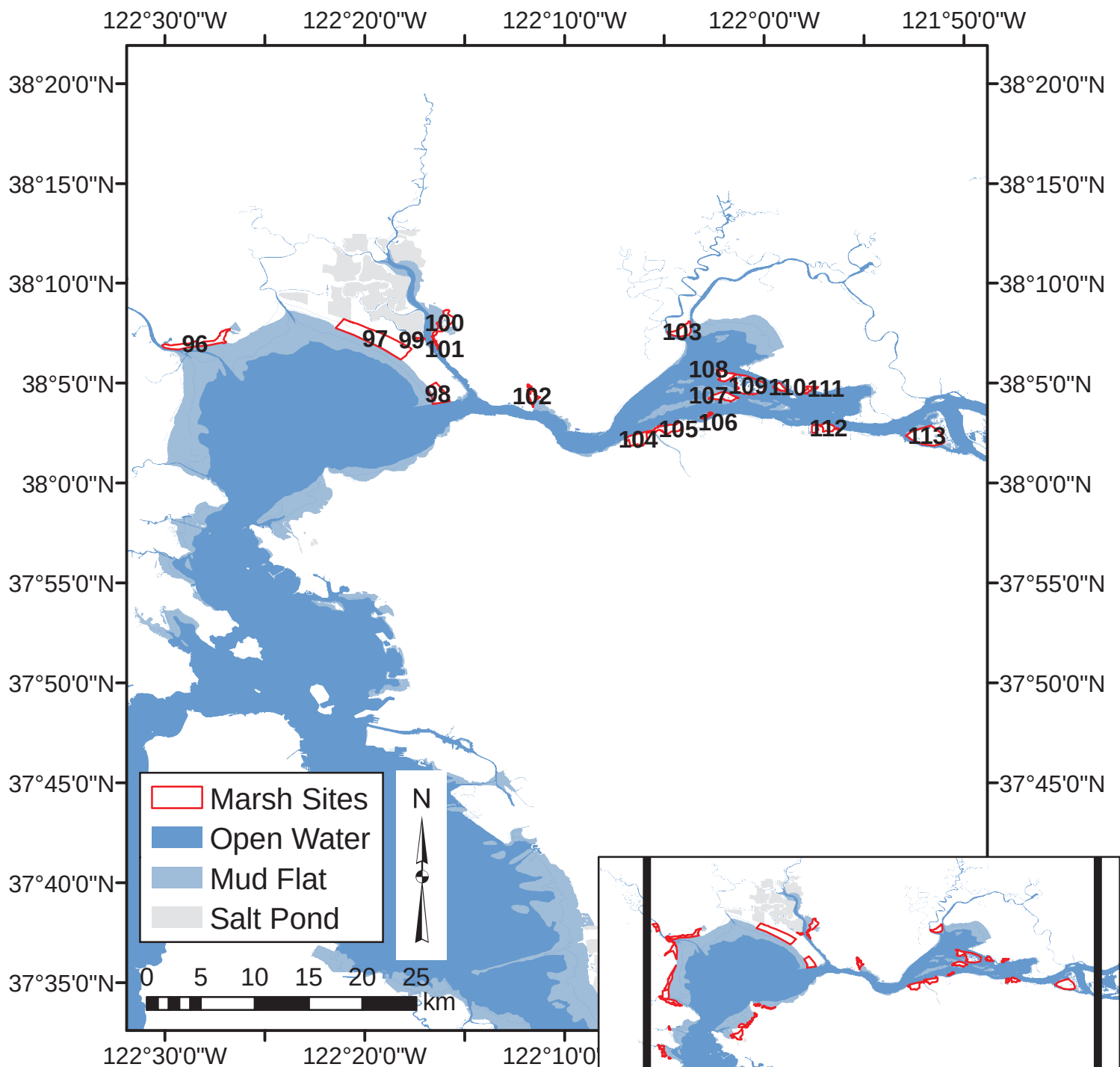




(above) Map of subset of marsh study site locations.

(right) Map showing location of subset within San Francisco Bay estuary and full set of study sites.





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