

## Occurrence and distribution of red tide species in different Water Control Zones (WCZs), 1980 –2005

| Species                                     | Number of occurrences      |              |                    |                  |              |                      |                     |                   |                    |              |            | Total |
|---|----------------------------|--------------|--------------------|------------------|--------------|----------------------|---------------------|-------------------|--------------------|--------------|------------|-------|
|   | Tolo Harbour & Channel WCZ | Mirs Bay WCZ | Eastern Buffer WCZ | Port Shelter WCZ | Junk Bay WCZ | Victoria Harbour WCZ | Southern Waters WCZ | North Western WCZ | Western Buffer WCZ | Deep Bay WCZ |            |       |
| <i>Noctiluca scintillans</i>                | 58                         | 64           |                    | 46               |              |                      | 52                  | 5                 | 6                  |              | 231        |       |
| <i>Skeletonema costatum</i>                 | 23                         | 3            |                    | 1                | 3            | 8                    | 9                   | 3                 | 8                  | 1            | 59         |       |
| <i>Gonyaulax polygramma</i>                 | 21                         | 8            |                    | 12               |              |                      | 6                   | 1                 |                    |              | 48         |       |
| <i>Mesodinium rubrum</i>                    | 8                          | 8            |                    | 7                | 1            |                      | 15                  | 6                 |                    | 2            | 47         |       |
| <i>Prorocentrum minimum</i>                 | 44                         | 1            |                    |                  |              |                      |                     |                   |                    |              | 45         |       |
| <i>Prorocentrum triestinum</i>              | 33                         |              |                    |                  |              |                      |                     |                   |                    |              | 33         |       |
| <i>Ceratium furca</i>                       | 13                         | 7            |                    | 13               |              |                      |                     |                   |                    |              | 33         |       |
| <i>Scrippsiella trochoidea</i>              | 14                         | 4            |                    | 2                |              |                      | 1                   |                   |                    |              | 21         |       |
| <i>Heterosigma akashiwo</i>                 | 14                         | 2            |                    |                  |              |                      |                     | 3                 |                    |              | 19         |       |
| <i>Heterocapsa circularisquama</i>          | 13                         | 3            |                    |                  |              |                      |                     |                   |                    |              | 16         |       |
| <i>Prorocentrum signoides</i>               | 14                         | 1            |                    | 1                |              |                      |                     |                   |                    |              | 16         |       |
| <i>Prorocentrum dentatum</i>                | 8                          | 3            |                    | 1                |              |                      | 1                   |                   |                    |              | 13         |       |
| <i>Thalassiosira nordenskiöldii</i>         | 2                          | 3            |                    |                  |              | 1                    | 4                   |                   | 2                  |              | 12         |       |
| <i>Prorocentrum micans</i>                  | 4                          | 4            |                    | 1                |              | 1                    | 1                   |                   |                    |              | 11         |       |
| <i>Trichodesmium erythraeum</i>             |                            | 5            |                    | 3                |              |                      | 3                   |                   |                    |              | 11         |       |
| <i>Karenia mikimotoi</i>                    | 6                          | 1            |                    | 3                |              |                      |                     |                   |                    |              | 10         |       |
| <i>Leptocylindrus minimus</i>               | 10                         |              |                    |                  |              |                      |                     |                   |                    |              | 10         |       |
| <i>Cryptomonas</i> sp.                      | 8                          |              |                    |                  |              |                      |                     |                   |                    |              | 8          |       |
| <i>Dactyliosolen fragilissimus</i>          | 6                          | 1            |                    | 1                |              |                      |                     |                   |                    |              | 8          |       |
| <i>Thalassiosira mala</i>                   | 6                          |              |                    |                  |              |                      | 2                   |                   |                    |              | 8          |       |
| <i>Chaetoceros</i> spp.                     | 6                          |              |                    | 1                |              |                      |                     |                   |                    |              | 7          |       |
| <i>Karenia digitata</i>                     | 1                          | 3            |                    | 2                |              |                      | 1                   |                   |                    |              | 7          |       |
| <i>Thalassiosira proschkinae</i>            | 6                          | 1            |                    |                  |              |                      |                     |                   |                    |              | 7          |       |
| <i>Plagioselmis prolonga</i>                | 6                          |              |                    |                  |              |                      |                     |                   |                    |              | 6          |       |
| <i>Akashiwo sanguinea</i>                   | 2                          | 2            |                    |                  |              |                      |                     | 1                 |                    | 1            | 6          |       |
| <i>Gyrodinium instriatum</i>                |                            |              |                    |                  |              | 1                    | 1                   | 2                 | 1                  | 1            | 6          |       |
| <i>Thalassiosira</i> spp.                   | 2                          |              |                    |                  | 1            |                      | 2                   |                   |                    |              | 5          |       |
| <i>Dictyocha speculum</i>                   |                            | 2            |                    | 1                |              |                      | 1                   |                   |                    |              | 4          |       |
| <i>Eutreptiella</i> spp.                    | 4                          |              |                    |                  |              |                      |                     |                   |                    |              | 4          |       |
| <i>Haematococcus pluvialis</i>              | 4                          |              |                    |                  |              |                      |                     |                   |                    |              | 4          |       |
| <i>Leptocylindrus danicus</i>               | 3                          | 1            |                    |                  |              |                      |                     |                   |                    |              | 4          |       |
| <i>Phaeocystis globosa</i>                  |                            | 1            |                    |                  |              |                      | 3                   |                   |                    |              | 4          |       |
| <i>Pseudo-nitzschia pseudodelicatissima</i> | 1                          |              |                    |                  |              |                      | 2                   |                   | 1                  |              | 4          |       |
| <i>Chaetoceros curvisetus</i>               |                            |              | 1                  |                  | 1            |                      | 1                   |                   |                    |              | 3          |       |
| <i>Chattonella ovata</i>                    |                            | 2            |                    | 1                |              |                      |                     |                   |                    |              | 3          |       |
| <i>Chattonella marina</i>                   | 2                          | 1            |                    |                  |              |                      |                     |                   |                    |              | 3          |       |
| <i>Cochlodinium</i> sp.                     | 2                          |              |                    |                  |              |                      |                     | 1                 |                    |              | 3          |       |
| <i>Gymnodinium simplex</i>                  | 3                          |              |                    |                  |              |                      |                     |                   |                    |              | 3          |       |
| <i>Karenia longicanalis</i>                 | 1                          | 1            |                    |                  |              |                      | 1                   |                   |                    |              | 3          |       |
| <i>Pseudo-nitzschia seriata</i>             | 1                          |              |                    |                  |              | 2                    |                     |                   |                    |              | 3          |       |
| <i>Prorocentrum balticum</i>                | 1                          | 1            |                    | 1                |              |                      |                     |                   |                    |              | 3          |       |
| <i>Teleaulax acuta</i>                      | 3                          |              |                    |                  |              |                      |                     |                   |                    |              | 3          |       |
| <i>Trichodesmium</i> sp.                    |                            | 1            |                    | 1                |              |                      | 1                   |                   |                    |              | 3          |       |
| <i>Alexandrium tamarense</i>                |                            |              |                    | 2                |              |                      |                     |                   |                    |              | 2          |       |
| <i>Cerataulina pelagica</i>                 | 2                          |              |                    |                  |              |                      |                     |                   |                    |              | 2          |       |
| <i>Chaetoceros socialis</i>                 |                            |              |                    |                  |              |                      | 2                   |                   |                    |              | 2          |       |
| <i>Chattonella</i> sp.                      | 1                          |              |                    |                  |              |                      | 1                   |                   |                    |              | 2          |       |
| <i>Cochlodinium polykrikoides</i>           |                            |              |                    |                  |              |                      | 2                   |                   |                    |              | 2          |       |
| <i>Eucampia zodiacus</i>                    |                            |              |                    |                  |              |                      | 1                   | 1                 |                    |              | 2          |       |
| <i>Gymnodinium</i> sp. X                    |                            |              |                    | 2                |              |                      |                     |                   |                    |              | 2          |       |
| <i>Heterocapsa rotundata</i>                | 2                          |              |                    |                  |              |                      |                     |                   |                    |              | 2          |       |
| <i>Nitzschia longissima</i>                 | 1                          |              |                    |                  |              |                      | 1                   |                   |                    |              | 2          |       |
| <i>Prorocentrum</i> spp.                    | 1                          | 1            |                    |                  |              |                      |                     |                   |                    |              | 2          |       |
| <i>Thalassiosira weissflogii</i>            |                            |              |                    |                  |              |                      |                     |                   |                    | 2            | 2          |       |
| <i>Alexandrium catenella</i>                |                            |              |                    |                  | 1            |                      |                     |                   |                    |              | 1          |       |
| <i>Chaetoceros pseudocrinitus</i>           | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Chaetoceros pseudocurvisetus</i>         |                            |              |                    |                  |              |                      | 1                   |                   |                    |              | 1          |       |
| <i>Chaetoceros</i> sp.0105                  | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Chaetoceros tenuissimus</i>              |                            | 1            |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Chlamydomonas</i> sp.                    | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Chlamydomonas uva-maris</i>              | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Cyclotella caspia</i>                    | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Cyclotella</i> spp.                      | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Cyrtarocyis</i> sp.                      |                            |              |                    | 1                |              |                      |                     |                   |                    |              | 1          |       |
| <i>Cylindrotheca closterium</i>             | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Guinardia delicatula</i>                 | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Guinardia striata</i>                    | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Gymnodinium</i> sp.                      |                            | 1            |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Gyrodinium spirale</i>                   |                            |              |                    |                  |              |                      | 1                   |                   |                    |              | 1          |       |
| <i>Hermesinium adriaticum</i>               |                            | 1            |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Karlodinium micrum</i>                   |                            | 1            |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Katodinium rotundatum</i>                |                            |              |                    |                  |              |                      |                     | 1                 |                    |              | 1          |       |
| <i>Leptocylindrus</i> spp.                  |                            |              |                    |                  |              |                      | 1                   |                   |                    |              | 1          |       |
| <i>Navicula</i> sp.                         |                            |              |                    |                  |              |                      |                     |                   |                    | 1            | 1          |       |
| <i>Odontella mobiliensis</i>                | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Odontella sinensis</i>                   | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Pedinomonadaceae</i> species             | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Protoperidinium quinquecorne</i>         | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Pseudo-nitzschia</i> spp.                |                            |              |                    |                  |              |                      | 1                   |                   |                    |              | 1          |       |
| <i>Thalassomonas</i> sp.                    | 1                          |              |                    |                  |              |                      |                     |                   |                    |              | 1          |       |
| <i>Trichodesmium thiebautii</i>             |                            |              |                    |                  |              |                      | 1                   |                   |                    |              | 1          |       |
| <b>Total : 81 species</b>                   | <b>374</b>                 | <b>139</b>   | <b>1</b>           | <b>103</b>       | <b>7</b>     | <b>13</b>            | <b>119</b>          | <b>24</b>         | <b>18</b>          | <b>8</b>     | <b>806</b> |       |

Note: a red tide incident may involve more than one causative species.

Sources: Agriculture, Fisheries and Conservation Department and Environmental Protection Department