

(8) 植物（付着藻類）

1) 調査目的

ダム撤去により環境が変化すると予測されるダム上・下流地点における付着藻類の生育状況を把握することを目的とする。

2) 調査時期・頻度

年2回（春季、冬季）の調査を実施する。  
春季は平成27年5月13日、平成28年5月24～27日及び6月2日、冬季は平成28年1月19～20日に実施した。

3) 調査方法

浅瀬の流れの均一な所から、頭大程度の石をランダムに6箇所採取し、それぞれの石に5cm×5cmのコドラートを当て枠外の付着物をブラシで削ぎ落としした。次に、枠内の付着物をブラシで全量剥ぎ落とし、清水で洗い流しつつバットの中に移した。6つの試料は2つに分け、3つは付着藻類の分析用、残りの3つは付着物（強熱減量、クロロフィルa、フェオフィチン）の分析用とした。試料をまとめずに別個に処理した。すなわち、付着藻類は3検体、付着物も3検体を分析対象とした。  
最後に、付着藻類の試料は約1%のホルマリンで固定した。  
室内に持ち帰った試料は、付着藻類の試料は、沈降させた後、顕微鏡にて種の同定及び細胞数の計数を行った。また、付着物の試料は、強熱減量、クロロフィルa、フェオフィチンの分析を行った。

4) 調査地点

次の7地点で観測した。①下代瀬、②道の駅坂本、③荒瀬ダム百済木川流入部、④葉木、⑤与奈久、⑥西鎌瀬、⑦瀬戸石ダム下流。



※この地図は、国土地理院発行の2万5千分の1地形図(坂本、中津道)を背景図として使用したものである。

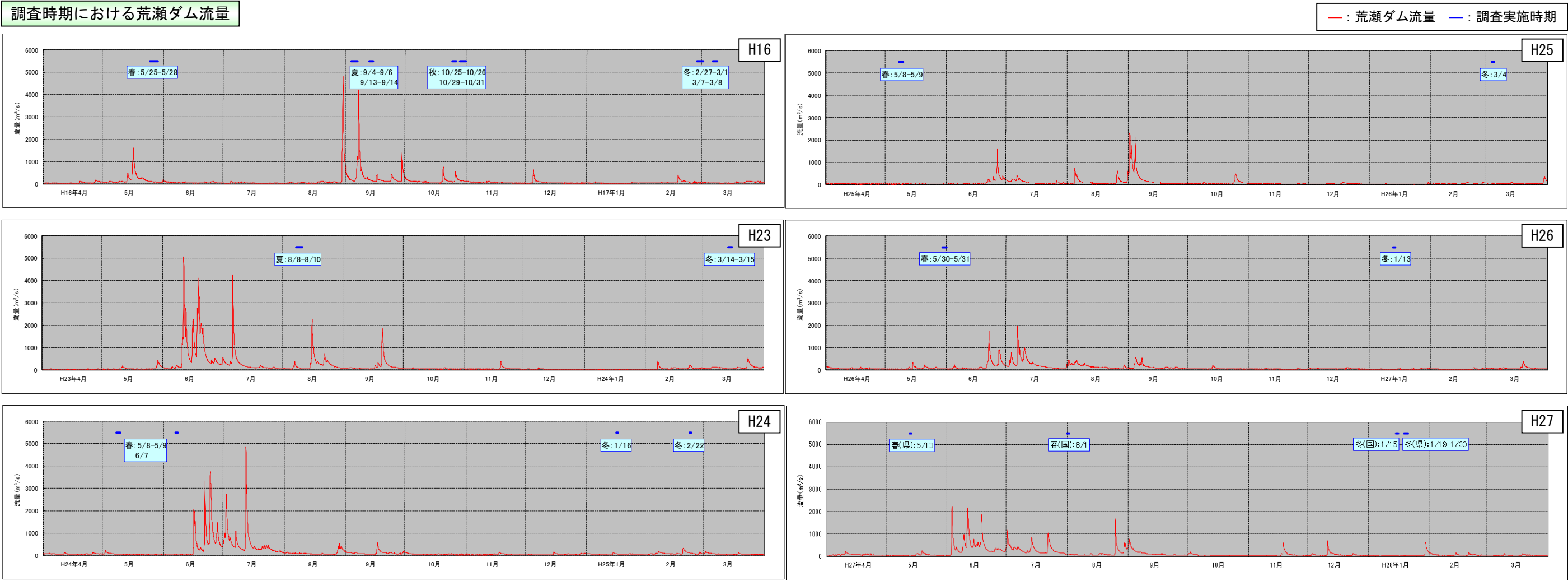
5) 調査結果

(1) 今年度の確認種の概要

春季調査で4綱7目12科68種、冬季調査で3綱7目14科65種の付着藻類を確認した。

(2) 今年度の詳細調査結果

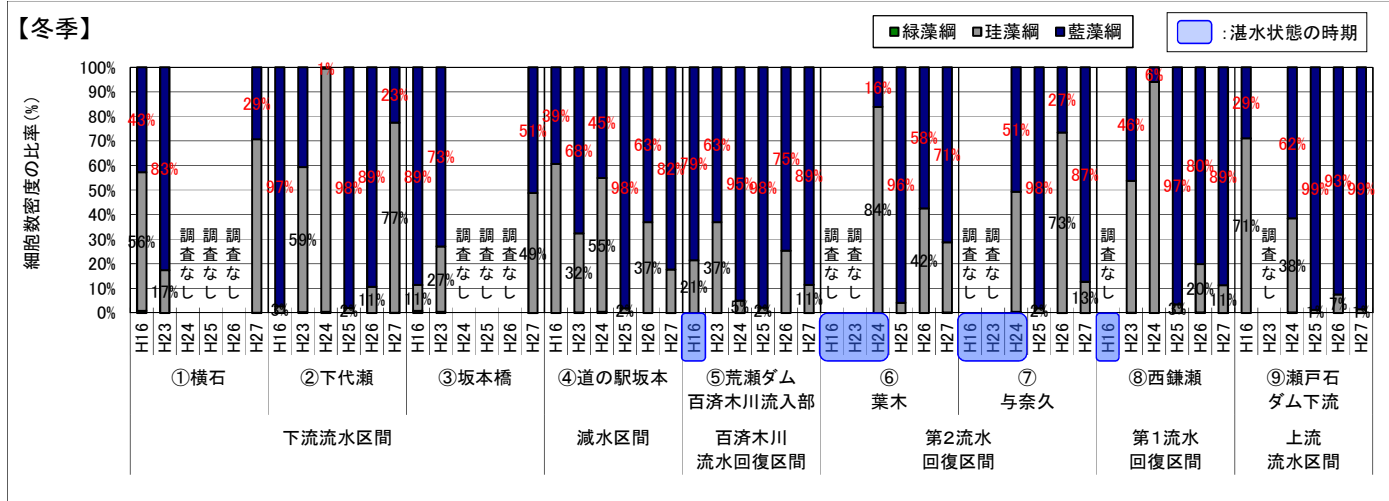
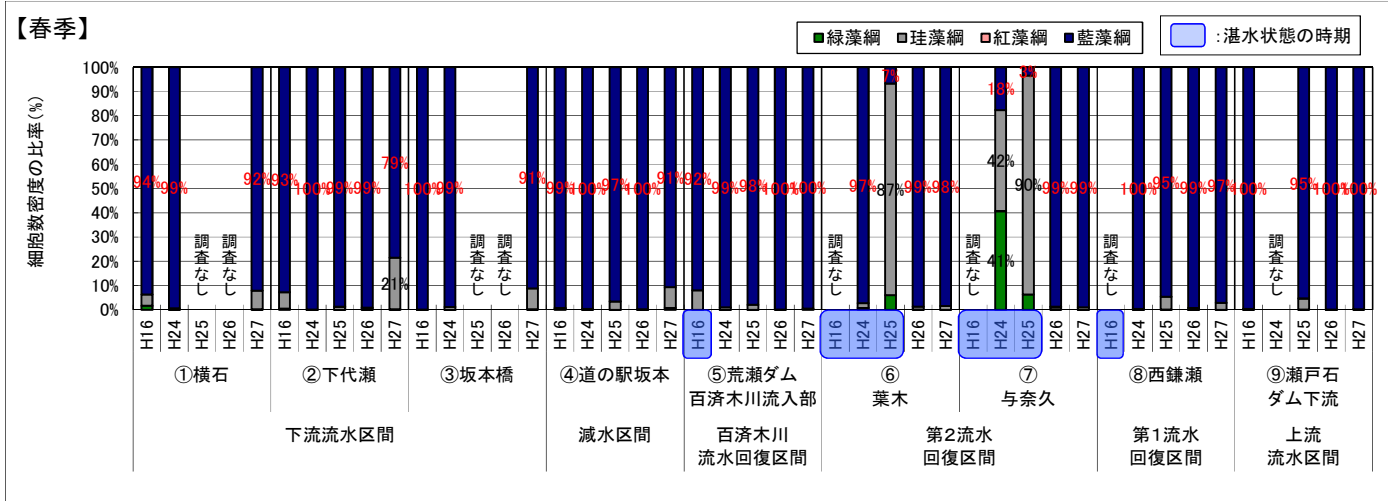
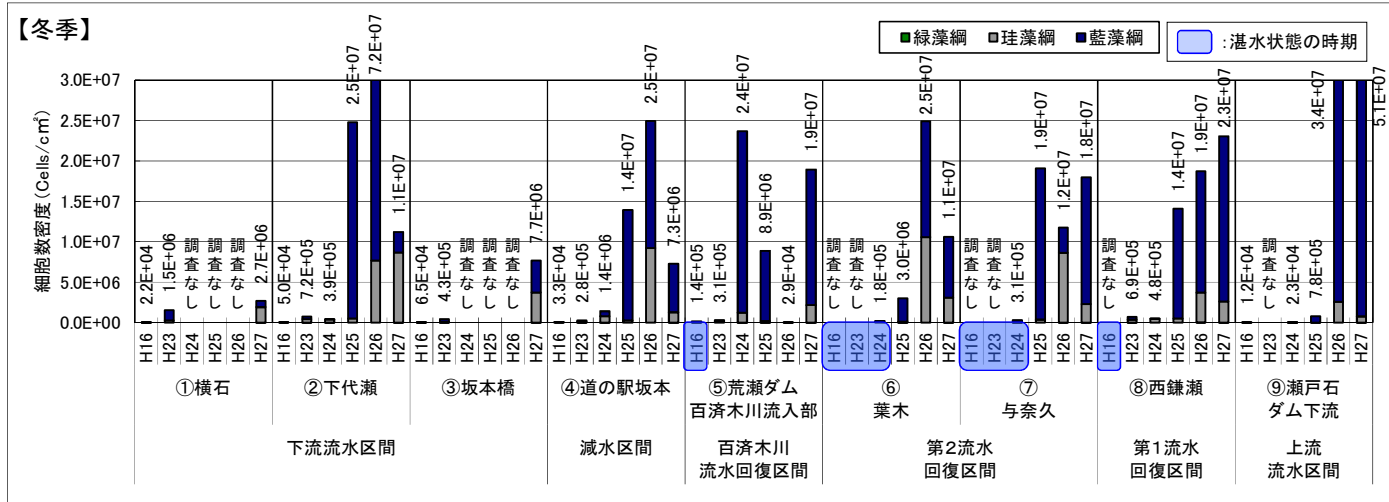
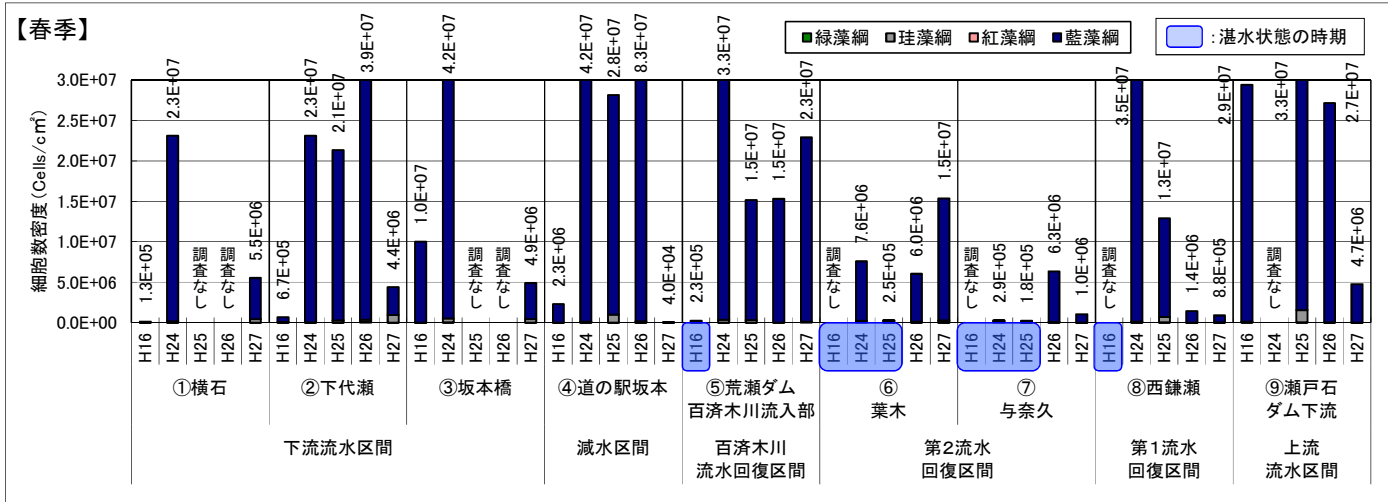
調査時期における荒瀬ダム流量



H24

H27

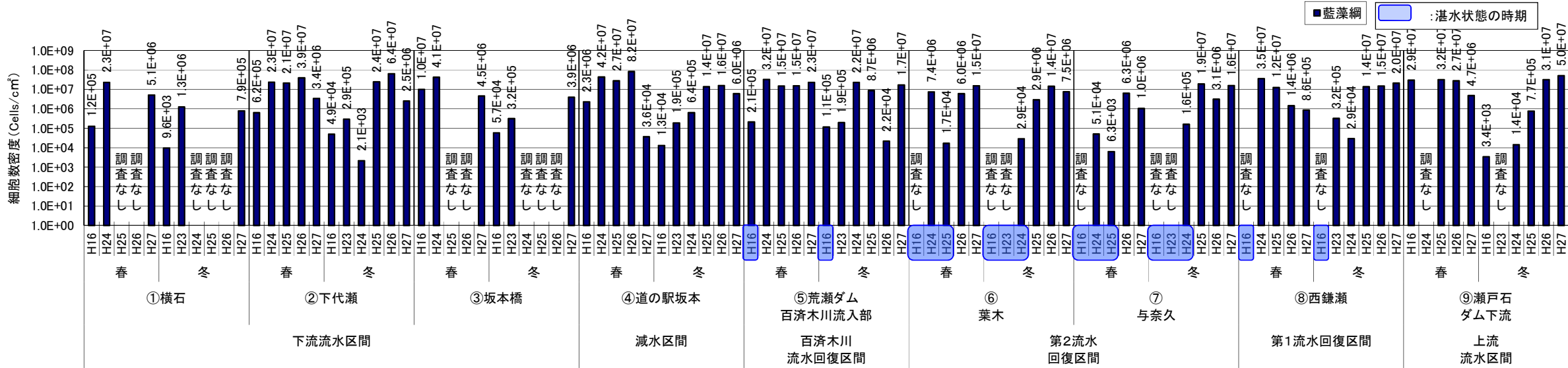
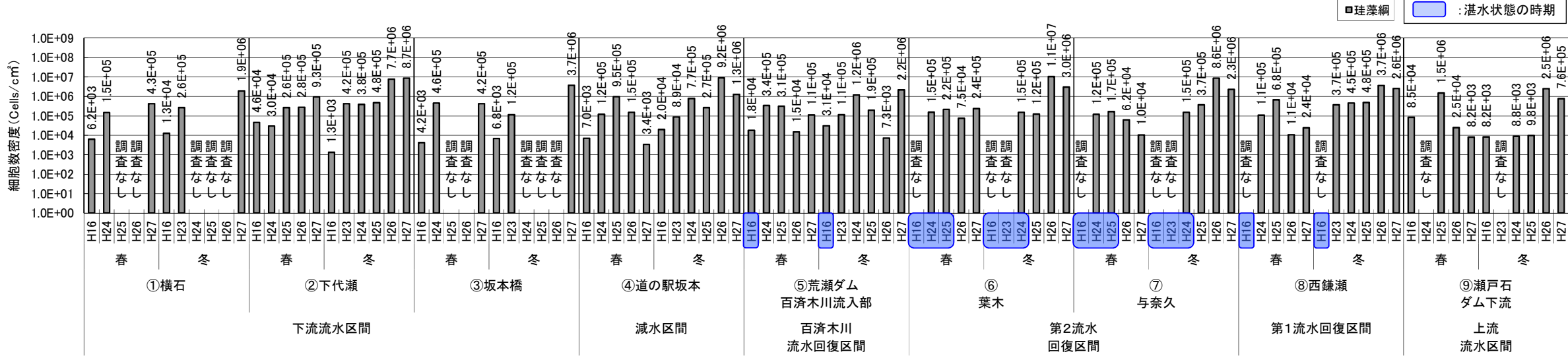
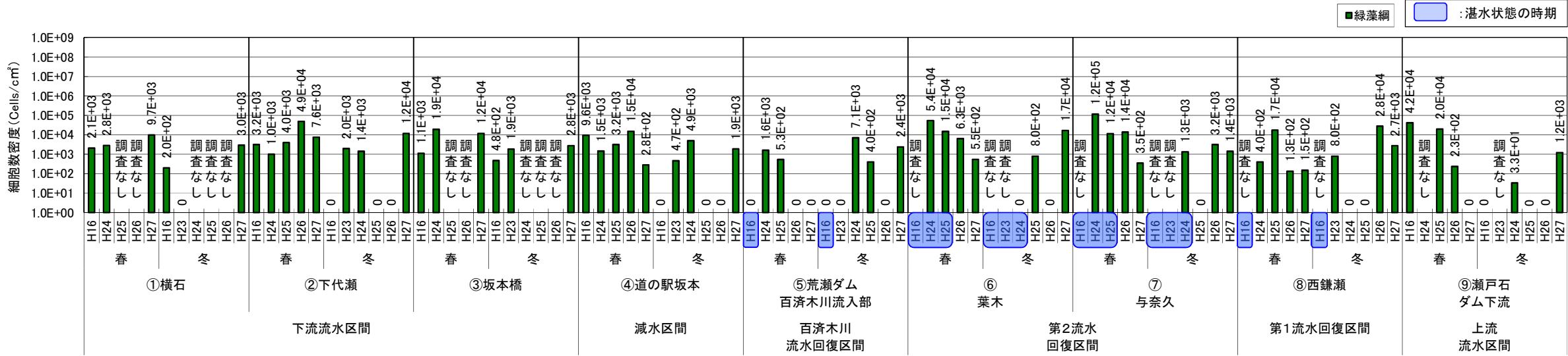
## 付着藻類の細胞数密度



### 【用語の解説】

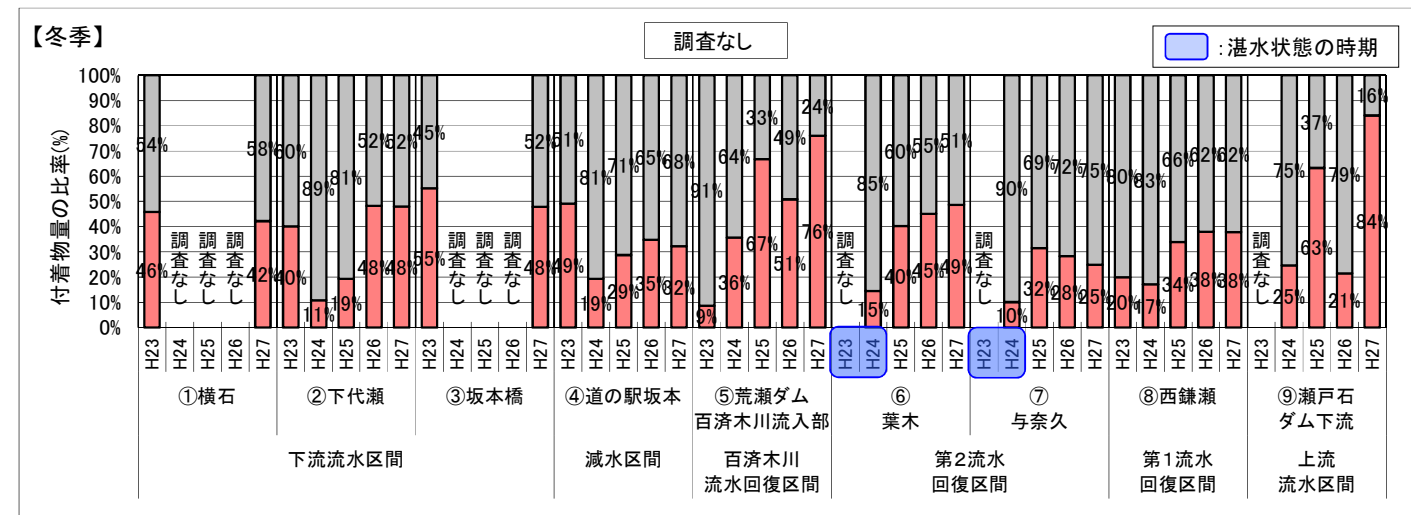
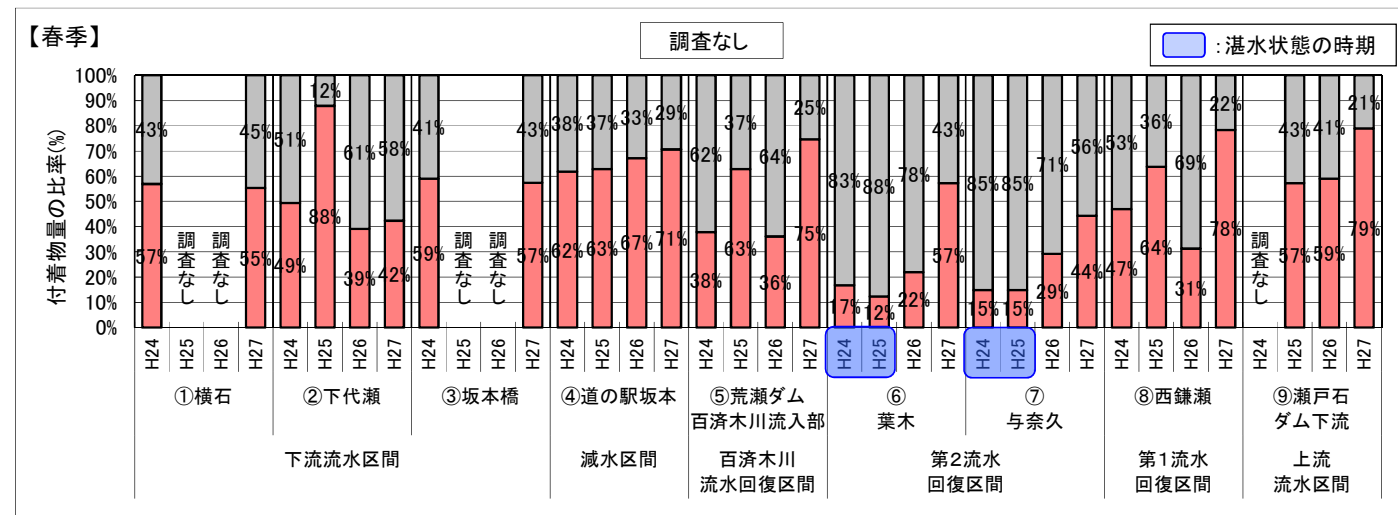
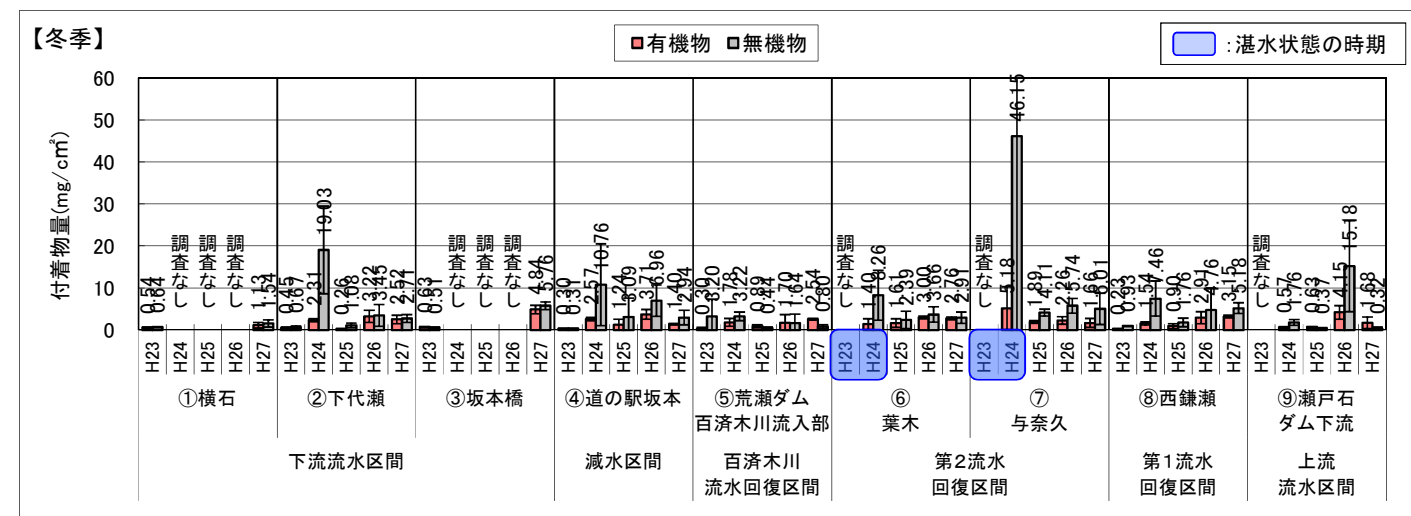
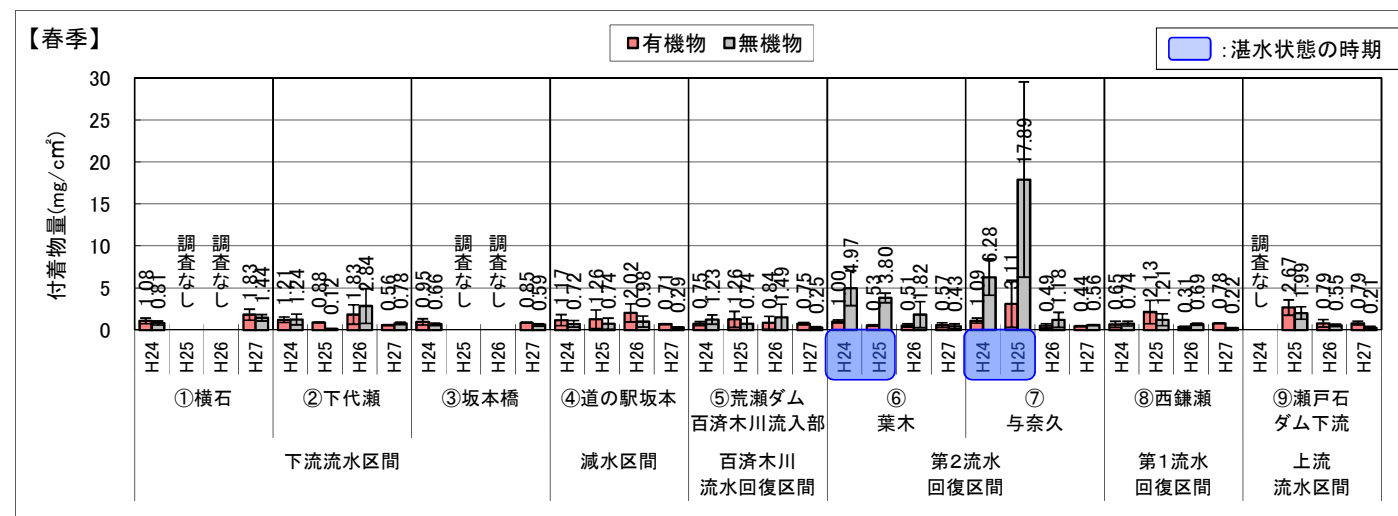
- ・ **藍藻綱**：細胞の中にははっきりとした核のない原核生物であり、群体を形成し黒っぽく見えることが多い。流速が速く、石礫上に堆積物が少なく、アユによる摂食が盛んな箇所では優占していることが多い。代表種として、*Homoeothrix janthina* (ホモエオスリックス・ヤンチナ) が挙げられる。
- ・ **珪藻綱**：ガラスの成分である珪酸でできた殻を持ち、黄褐色に見えるのが特徴である。流速が比較的遅く、古い石の付着物が残る箇所が多い傾向にある。代表例として、*Gomphonema* 属(クサビケイソウ属)が挙げられる。
- ・ **緑藻綱**：細胞中に緑色の色素を多く含むことから、色鮮やかな緑色に見えるのが特徴である。この仲間の中には、大型糸状緑藻となって繁茂し、アユの餌となる藍藻や珪藻が付着する石を被ってしまうカワシオグサがある。

付着藻類の細胞数密度（綱別グラフの片対数表示）



付着藻類の付着物量

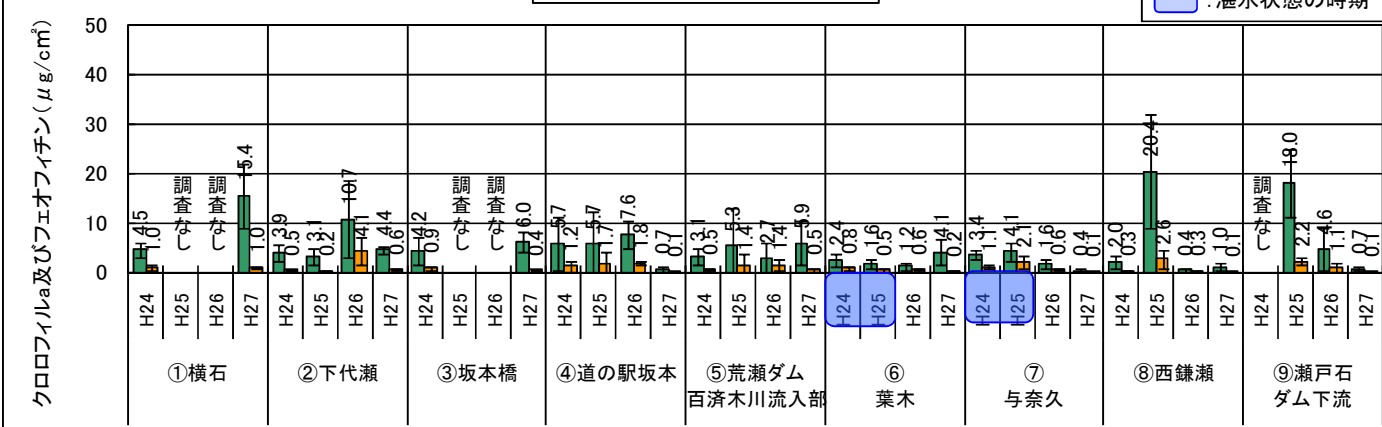
— :標準偏差



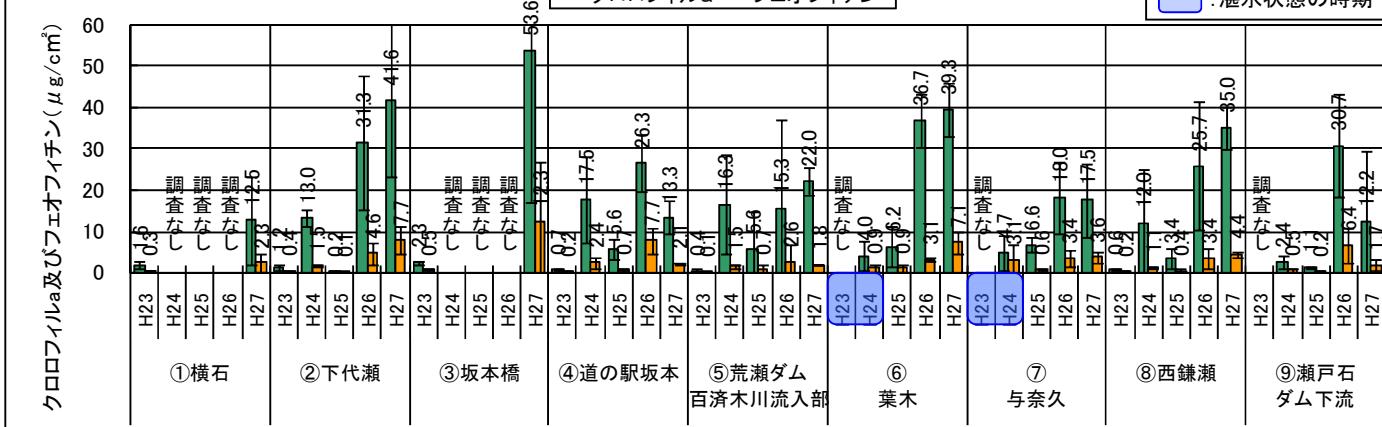
付着藻類のクロロフィルa量及びフェオフィチン量

— : 標準偏差

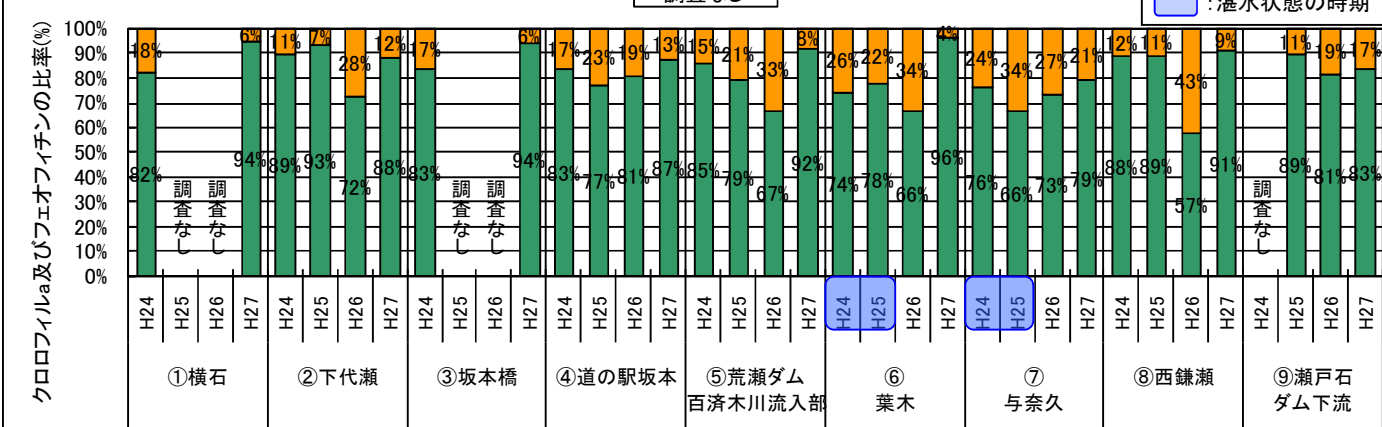
【春季】



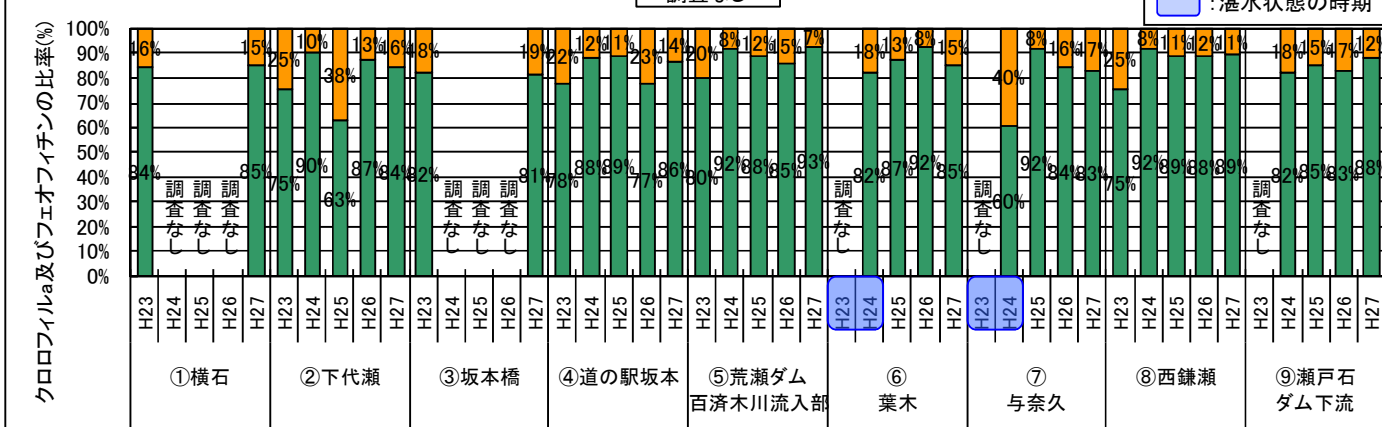
【冬季】



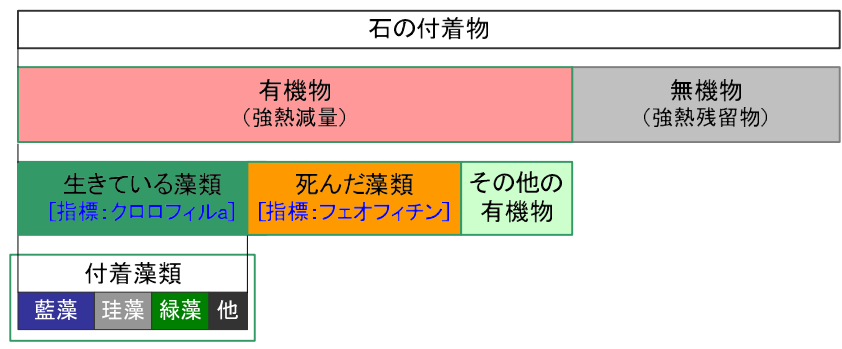
【春季】



【冬季】



【石の付着物の説明】



|         | 水生動物の餌としての特徴              | 指標      |
|---------|---------------------------|---------|
| 有機物     | アユ等の藻食魚や刈取食の底生動物等の餌を一部に含む | 強熱減量    |
| 無機物     | シルトや粘土等から構成され、餌とならない      | 強熱残留物量  |
| 生きている藻類 | 栄養価の高い餌の量を示す              | クロロフィルa |
| 死んだ藻類   | 栄養価の低い餌の量を示す              | フェオフィチン |
| その他の有機物 | 主な餌とはならない                 | —       |

表1 付着藻類の確認種リスト（平成27年度春季）

| 網   |          |          |                  | 付着藻類                              |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
|-----|----------|----------|------------------|-----------------------------------|--------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------------|----------|----------|----------|----------|----------|--------|---------|-------|--------|--------|---------|---------|---------|--------|-----|--|
| No. | 綱        | 目        | 科                | 種名                                | 横石                 |                         |         | 下代瀬     |         |         | 坂本橋     |         |         | 道の駅坂本 |       |       | 荒瀬ダム百済木川流入部 |          |          | 栗木       |          |          | 与奈久    |         |       | 西鎌瀬    |        |         | 瀬戸石ダム下流 |         |        |     |  |
| 1   | 2        | 3        | 4                | 5                                 | 1                  | 2                       | 3       | 1       | 2       | 3       | 1       | 2       | 3       | 1     | 2     | 3     | 1           | 2        | 3        | 1        | 2        | 3        | 1      | 2       | 3     | 1      | 2      | 3       |         |         |        |     |  |
| 1   | 藍藻綱      | ネンジュモ目   | ヒゲモ科             | Homeothrix janthina               | 520000             | 3100000                 | 5700000 | 4600000 | 2700000 | 2200000 | 4900000 | 3800000 | 3500000 | 40000 | 15000 | 35000 | 28440000    | 16680000 | 22800000 | 16005000 | 16800000 | 11895000 | 826000 | 2200000 | 23000 | 925000 | 285000 | 1335000 | 7245000 | 6800000 | 124000 |     |  |
| 2   |          |          | ネンジュモ科           | Anabaena sp.                      | 100                |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 3   |          |          | ユレモ科             | Phormidium sp.                    |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 4   |          |          |                  | Lynxibya sp.                      | 10800              | 90000                   | 90000   | 100     |         | 400     | 40000   | 125000  | 70800   |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 5   | カマエシフオン目 | カマエシフオン科 | Chamaesiphon sp. | 500000                            | 190000             | 356000                  | 370000  | 200000  | 250000  | 520000  | 310000  | 109000  |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 6   |          |          | 紅藻綱              | ベニマダラ目                            | ベニマダラ科             | Hildenbrandia rivularis |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        | 800 |  |
| 7   |          |          | 珪藻綱              | 中心目                               | タラシオン科             | Cyclotella meneghiniana |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 8   |          |          |                  |                                   | Stephanodiscus sp. |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 9   |          | 羽状目      | メロシラ科            | Melosira varians                  | 300                | 1200                    | 200     |         |         |         | 800     | 1000    | 1200    | 200   | 100   |       |             |          | 500      | 750      |          | 380      | 100    | 200     | 200   | 100    | 300    | 200     | 100     | 50      | 200    |     |  |
| 10  |          |          | ディアトマ科           | Diatoma vulgaris                  |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          | 130      |        |         |       |        |        |         |         |         |        | 50  |  |
| 11  |          |          |                  | Fragilaria caputellata            | 600                | 1200                    | 300     |         | 200     |         |         | 300     | 900     | 500   |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 12  |          |          |                  | Fragilaria capucina               |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          | 100      |          |        |         |       |        |        |         |         |         |        |     |  |
| 13  |          |          |                  | Fragilaria crotonensis            |                    |                         |         |         |         |         |         |         |         | 200   | 300   |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 14  |          |          |                  | Fragilaria vaucheriae             |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         | 100   |        |        |         |         |         |        |     |  |
| 15  |          |          |                  | Fragilaria rumpens                |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        | 200 |  |
| 16  |          |          |                  | Ulnaria acus                      |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 17  |          |          |                  | Ulnaria inaequalis                | 100                | 300                     |         |         |         |         | 100     |         |         |       | 50    |       | 30          |          | 100      | 250      | 50       |          | 50     | 50      | 100   | 50     | 50     | 200     |         |         |        |     |  |
| 18  |          |          |                  | Ulnaria ulna                      | 1200               | 500                     | 900     |         |         |         | 300     | 500     |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 19  |          |          |                  | Amphora pediculus                 | 300                | 200                     |         |         | 300     | 500     |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 20  |          |          |                  | Cymbella distula                  |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 21  |          |          |                  | Cymbella tumida                   | 600                | 1300                    | 900     |         | 100     |         | 100     | 800     | 300     | 50    |       | 30    |             |          |          |          |          |          |        |         |       |        |        | 30      | 50      |         |        |     |  |
| 22  |          |          |                  | Cymbella turridula                | 2900               | 16100                   | 1000    | 800     | 500     | 100     | 200     | 14400   | 1700    | 100   | 100   | 30    | 100         |          |          | 1670     | 250      |          |        | 70      | 100   |        |        |         |         |         | 380    |     |  |
| 23  |          |          |                  | Cymbella turridula var. nipponica |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          | 250      |        |         |       |        |        |         |         |         |        |     |  |
| 24  |          |          |                  | Diploneis boldiana                |                    |                         |         | 100     |         |         |         |         | 100     |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 25  |          |          |                  | Encyonema minutum                 | 9400               | 17300                   | 9800    | 900     | 3300    | 100     | 10400   | 21600   | 7900    | 500   | 50    |       |             |          | 100      |          |          | 250      |        |         |       |        |        |         |         |         |        |     |  |
| 26  |          |          |                  | Encyonema silesiacum              |                    |                         |         |         |         |         |         |         |         |       |       | 50    | 50          |          |          |          | 2500     | 500      | 250    | 100     | 100   | 100    |        | 100     | 200     |         | 1250   | 50  |  |
| 27  |          |          |                  | Encyonema leei                    | 1100               | 900                     | 600     | 100     | 100     |         |         | 400     | 700     | 200   |       |       |             |          | 330      |          |          |          |        | 30      |       |        |        |         |         |         | 130    |     |  |
| 28  |          |          |                  | Gomphonopsis heterominuta         | 600                | 1500                    | 700     |         |         |         | 100     | 200     | 300     | 100   | 300   |       |             |          | 4950     | 17710    | 7230     | 50       | 300    | 50      |       |        | 50     | 170     | 100     | 50      | 130    | 30  |  |
| 29  |          |          |                  | Gomphonopsis minuta               | 100                | 200                     | 100     |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 30  |          |          |                  | Gomphonopsis okunoi               |                    | 100                     | 200     |         |         |         | 100     |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 31  |          |          |                  | Gomphonema biceps                 | 2100               | 1300                    | 300     | 100     | 100     | 100     | 1400    | 2900    | 1000    |       |       |       |             | 930      |          | 20770    | 50       |          |        |         | 100   |        |        |         | 100     |         |        |     |  |
| 32  |          |          |                  | Gomphonema clevei                 |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          | 310      |          |          |          |        |         |       |        | 50     | 330     | 100     |         | 250    |     |  |
| 33  |          |          |                  | Gomphonema inaequolongum          | 200                | 200                     | 200     |         |         |         |         | 200     |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |
| 34  |          |          |                  | Gomphonema parvulum               | 100                | 500                     | 100     | 900     | 200     | 500     | 100     | 200     | 300     |       |       |       | 30          |          |          |          |          |          |        |         |       |        |        |         |         | 130     | 30     |     |  |
| 35  |          |          |                  | Gomphonema parvulum var. rigidum  |                    |                         |         |         |         |         |         |         |         |       |       |       |             |          |          |          |          |          |        |         |       |        |        |         |         |         |        |     |  |

注1】分類体系は、「河川水辺の国勢調査のための生物リスト[平成26年度 河川・ダム湖統一版](財団法人リバーフロント整備センター 2015年)」に従った。

表 2 付着藻類の確認種リスト（平成 27 年度冬季）

| No. |                 | 綱               | 目                           | 科                                 | 種名     | 横石      |       |         | 下代瀬     |        |         | 坂本橋     |         |         | 道の駅坂本   |          |         | 荒瀬ダム百済木川流入部 |          |         | 栗木      |          |          | 与奈久     |          |         | 西條瀬     |          |          | 瀬戸石ダム下流  |          |        |
|-----|-----------------|-----------------|-----------------------------|-----------------------------------|--------|---------|-------|---------|---------|--------|---------|---------|---------|---------|---------|----------|---------|-------------|----------|---------|---------|----------|----------|---------|----------|---------|---------|----------|----------|----------|----------|--------|
|     |                 |                 |                             |                                   |        | 1       | 2     | 3       | 1       | 2      | 3       | 1       | 2       | 3       | 1       | 2        | 3       | 1           | 2        | 3       | 1       | 2        | 3        | 1       | 2        | 3       | 1       | 2        | 3        |          |          |        |
| 1   | 藍藻綱             | ネンジュモ目          | ヒゲモ科                        | Homoeothrix janthina              | 530000 | 1600000 | 25000 | 3700000 | 3300000 | 330000 | 1900000 | 2000000 | 3000000 | 4512000 | 2112000 | 11232000 | 7008000 | 3072000     | 40128000 | 1824000 | 8640000 | 11904000 | 10944000 | 1824000 | 33984000 | 1056000 | 1728000 | 58560000 | 14448000 | 63840000 | 71136000 |        |
| 2   |                 |                 |                             | Lynbrya sp.                       | 15600  | 7200    | 300   | 2000    | 500     | 100    | 2400000 | 890000  | 1110000 |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 3   |                 |                 |                             | Phormidium sp.                    |        |         |       |         |         |        |         |         |         |         |         | 67200    | 14400   | 4800        | 4800     | 37920   | 72000   | 33600    | 24000    | 187200  | 72000    | 9600    | 259200  | 24000    |          |          | 4800     | 460800 |
| 4   | 珪藻綱             | カマエシフォン目<br>中心目 | カマエシフォン科<br>タラシオン科<br>メロシラ科 | Chamaesiphon sp.                  | 40000  | 140000  |       | 200000  | 70000   |        | 50000   | 70000   | 340000  |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 5   |                 |                 |                             | Cyclotella sp.                    |        |         |       |         |         |        |         |         |         |         | 480     |          |         | 100         |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 6   |                 |                 |                             | Melosira varians                  | 6500   | 9700    |       | 600     | 1000    | 1900   | 1000    | 3800    | 400     | 16800   | 26400   | 21600    |         | 960         |          | 14880   | 9600    | 14400    | 17760    | 89280   | 35520    | 2400    | 5760    | 9600     |          | 960      | 3840     | 100    |
| 7   | 羽状目             | ディアトマ科          |                             | Diatoma mesodon                   |        |         |       | 1100    | 2700    | 2400   | 300     | 700     | 200     | 480     | 1440    | 480      |         |             |          | 5760    |         | 2400     |          | 1920    | 960      |         |         | 480      | 480      |          |          |        |
| 8   |                 |                 |                             | Diatoma vulgare                   | 1800   | 1500    |       | 1100    | 2700    | 2400   | 300     | 700     | 200     | 480     | 1440    | 480      |         |             |          | 5760    |         | 2400     |          | 1920    | 960      |         |         | 480      | 480      |          |          |        |
| 9   |                 |                 |                             | Fragilaria capitellata            | 1500   | 1300    |       | 12600   | 5800    | 10100  | 6200    | 2600    |         | 12270   | 11520   | 6240     |         |             |          | 8000    | 8230    | 6760     |          |         |          |         |         | 25600    | 45390    | 160      |          |        |
| 10  |                 |                 |                             | Fragilaria capucina               |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         | 25600    | 45390    | 160      |          |        |
| 11  |                 |                 |                             | Fragilaria vaucheriae             |        |         |       |         |         |        |         |         | 12270   | 11520   | 12480   |          |         |             |          |         | 13630   | 14070    | 33310    | 10700   | 21100    |         |         | 9330     | 61570    | 100      | 300      | 8690   |
| 12  |                 |                 |                             | Hamaaea arcus var. hattoriana     | 300    | 300     | 100   |         | 300     |        | 300     | 100     |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          | 9600     | 7200     | 96000  |
| 13  |                 |                 |                             | Ulnaria inaequalis                | 27500  | 19200   | 200   | 12900   | 88300   | 58900  | 4200    | 60700   | 15000   | 28800   | 67200   | 38400    |         |             |          | 105600  | 230400  | 182400   | 76800    | 9600    |          | 9600    | 7200    | 96000    | 480      | 960      | 67200    |        |
| 14  |                 |                 |                             | Ulnaria ulna                      | 300    |         |       |         | 100     | 100    |         | 200     |         | 480     | 240     | 480      |         |             |          | 480     | 480     | 480      | 480      |         |          |         |         | 480      |          |          |          |        |
| 15  |                 |                 |                             | Eunotia sp.                       |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         | 100      |          |         |          |         |         |          |          |          | 100      |        |
| 16  | ユーノチア科<br>ナビクラ科 |                 |                             | Amphora pediculus                 |        |         |       | 600     | 900     |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 17  |                 |                 |                             | Cymbella tumida                   |        |         |       | 100     | 700     |        | 400     | 1200    | 600     | 480     | 5280    | 480      |         |             |          |         | 1440    | 960      | 1440     | 2400    | 8160     | 6720    | 3840    | 4800     |          |          |          |        |
| 18  |                 |                 |                             | Cymbella turgidula                | 9200   | 2300    | 300   | 6200    | 92300   | 200300 | 11000   | 9300    | 11800   | 127060  | 29540   | 32000    |         | 57600       | 100      | 19200   | 7680    | 8230     | 15360    | 9600    | 67200    | 6720    | 7680    | 9600     |          | 240      | 30180    | 60350  |
| 19  |                 |                 |                             | Cymbella turgidula var. nipponica |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 20  |                 |                 |                             | Diploneis boldtiana               | 100    |         | 100   | 200     |         |        |         |         | 100     |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 21  |                 |                 |                             | Encyonema leei                    | 1100   | 600     |       | 2300    | 24800   |        | 1100    | 1500    | 4000    |         |         |          |         |             |          |         |         | 3840     |          |         |          |         |         |          |          |          |          |        |
| 22  |                 |                 |                             | Encyonema minutum                 | 4600   | 6300    | 100   | 41900   | 11400   | 41800  | 14100   | 10300   | 7400    | 9600    | 19200   | 67200    | 100     |             | 100      | 9600    | 38400   | 105600   | 19200    | 48000   | 9600     | 19200   | 28800   | 19200    | 1920     | 960      | 38400    |        |
| 23  |                 |                 |                             | Gomphonema heterominuta           | 1300   | 900     |       | 12700   | 88500   | 17200  | 300     | 3700    | 1000    | 9600    | 36000   | 258790   | 125420  | 517110      |          | 100     | 9600    | 38400    | 105600   | 19200   | 48000    | 9600    | 19200   | 28800    | 19200    | 1920     | 960      | 38400  |
| 24  |                 |                 |                             | Gomphonema minuta                 | 30000  | 46900   | 300   | 14700   | 40800   | 40100  | 18300   | 33500   | 16400   |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 25  |                 |                 |                             | Gomphonema okuno                  | 1500   | 1300    | 100   | 38400   | 27600   | 95100  | 700     | 1000    | 5600    |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 26  |                 |                 |                             | Gomphonema quadripunctatum        |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 27  |                 |                 |                             | Gomphonema biceps                 | 200    | 600     | 200   | 200     |         |        | 126000  | 161000  | 225000  |         |         |          |         |             |          |         |         | 86400    | 126180   | 9600    | 33170    |         |         | 12800    | 19200    | 160      | 100      | 67200  |
| 28  |                 |                 |                             | Gomphonema clevei                 |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          | 16590   |         |          |          |         |          |         |         |          |          |          |          |        |
| 29  |                 |                 |                             | Gomphonema herculeana             |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         | 16590    |          |         |          |         |         |          |          |          |          |        |
| 30  |                 |                 |                             | Gomphonema inaequilongum          | 200    |         | 300   |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 31  |                 |                 |                             | Gomphonema kobayashii             | 200    | 900     | 200   |         | 9800    | 200    | 300     |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 32  |                 |                 |                             | Gomphonema parvulum               | 800    |         |       | 300     | 7300    |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 33  |                 |                 |                             | Gomphonema parvulum var. lagenula |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 34  |                 |                 |                             | Gomphonema rhombicum              |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 35  |                 |                 |                             | Navicula amtonii                  | 900    | 4000    | 300   | 31600   | 3900    | 9000   | 700     | 4100    | 200     |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 36  |                 |                 |                             | Navicula arkona                   | 500    |         |       | 300     | 200     |        | 100     |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 37  |                 |                 |                             | Navicula atomus                   | 27700  |         |       | 169000  | 36400   | 128000 |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 38  |                 |                 |                             | Navicula bacillum                 | 200    |         |       |         | 100     |        | 300     |         | 200     |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 39  |                 |                 |                             | Navicula capitatoradiata          | 100    | 100     |       |         |         |        | 100     |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 40  |                 |                 |                             | Navicula cincta                   | 1000   | 3200    | 500   |         |         |        |         | 6100    |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 41  |                 |                 |                             | Navicula clementoides             | 200    |         |       |         |         |        | 200     |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 42  |                 |                 |                             | Navicula cryptoccephala           | 100    | 400     |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 43  |                 |                 |                             | Navicula cryptotenella            | 600    | 3200    | 100   | 13500   | 500     | 3000   | 2200    | 5400    | 500     | 24540   |         | 6240     | 1440    | 17280       | 4800     | 16000   |         |          | 11520    |         | 5340     |         | 25600   |          |          | 960      | 16460    |        |
| 44  |                 |                 |                             | Navicula gresaria                 | 9100   | 32700   | 1600  | 104000  | 27600   | 332000 | 17800   | 6800    | 5300    | 85870   | 34560   | 49920    |         | 28800       | 14400    | 56000   | 82290   | 87830    | 11520    | 167570  | 64000    | 155010  | 102400  | 181530   | 160      | 960      | 24690    |        |
| 45  |                 |                 |                             | Navicula mutica                   | 34700  |         |       | 190000  | 134000  | 64200  | 161000  | 35900   |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 46  |                 |                 |                             | Navicula nipponica                | 800    | 200     |       | 100     | 900     |        | 100     | 100     | 200     |         | 11520   | 6240     |         |             |          |         | 13520   |          |          |         | 5340     |         |         |          |          |          |          |        |
| 47  |                 |                 |                             | Navicula pseudoccephata           | 41600  | 53000   | 100   |         | 6100    | 417000 | 49400   |         |         |         | 10730   |          |         |             |          |         |         | 27250    |          |         | 21100    |         | 9090    | 6550     | 9330     |          |          |        |
| 48  |                 |                 |                             | Navicula pseudolanceolata         |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 49  |                 |                 |                             | Navicula rostellata               | 100    |         |       | 500     |         |        |         | 100     |         |         | 5760    |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 50  |                 |                 |                             | Navicula slesvicensis             | 1100   | 300     | 100   | 100     |         |        | 100     | 100     |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 51  |                 |                 |                             | Navicula subminuscula             |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |
| 52  |                 |                 |                             | Navicula subrostellata            |        |         |       |         |         |        |         |         |         |         |         |          |         |             |          |         |         |          |          |         |          |         |         |          |          |          |          |        |

表 3 付着藻類の確認種リスト 1 (平成 28 年度春季)

| No. | 綱       | 目                        | 科                                | 種名                         | 18k400 (平瀬)             |            |            | 18k400 (早瀬) |            |            | 18k400 (ワンド) |           |            | 道の駅阪本       |            |            | 荒瀬ダム百済木川流入部 |           |            | 栗木         |             |            | 与奈久         |             |            | 西鎌瀬       |           |            | 瀬戸石ダム下流   |           |         |        |
|-----|---------|--------------------------|----------------------------------|----------------------------|-------------------------|------------|------------|-------------|------------|------------|--------------|-----------|------------|-------------|------------|------------|-------------|-----------|------------|------------|-------------|------------|-------------|-------------|------------|-----------|-----------|------------|-----------|-----------|---------|--------|
|     |         |                          |                                  |                            | 1                       | 2          | 3          | 1           | 2          | 3          | 1            | 2         | 3          | 1           | 2          | 3          | 1           | 2         | 3          | 1          | 2           | 3          | 1           | 2           | 3          | 1         | 2         | 3          | 1         | 2         | 3       |        |
| 1   | 藍藻綱     | ネンジュモ目                   | ヒゲモ科                             | Homoeothrix janthina       | 44,016,000              | 80,640,000 | 38,976,000 | 67,536,000  | 47,040,000 | 69,216,000 | 1,142,400    | 2,083,200 | 12,364,800 | 198,912,000 | 61,555,200 | 53,424,000 | 14,280,000  | 1,670,400 | 22,848,000 | 63,504,000 | 278,880,000 | 62,832,000 | 137,424,000 | 171,360,000 | 53,424,000 | 1,632,000 | 7,795,200 | 60,979,200 | 8,371,200 | 7,814,400 | 672,000 |        |
| 2   |         | ユレモ科                     | Phormidium sp.                   |                            | 19,200                  |            |            |             |            |            | 480          | 240       | 1,800      |             |            |            | 2,400       | 4,800     |            |            | 480,000     |            | 24,000      | 4,800       |            |           | 240       | 3,600      |           | 10,800    |         |        |
| 3   |         | 紅藻綱                      | ベニマダラ目                           | ベニマダラ科                     | Hildenbrandia ribularis |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           | 480     | 54,240 |
| 4   |         |                          | タラシオシラ科                          | Stephanodiscus sp.         |                         | 100        | 200        | 100         | 100        |            |              | 100       |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           | 100       | 100     | 100    |
| 5   |         |                          | 中心目                              | メロシラ科                      | Melosira varians        |            | 480        | 2,880       | 4,560      | 3,600      | 1,680        | 1,920     | 1,200      | 5,040       | 5,760      | 9,120      | 480         | 480       | 2,880      | 1,920      | 2,880       |            | 4,800       | 1,920       |            |           | 12,000    | 1,920      | 100       | 960       | 480     |        |
| 6   |         |                          | 羽状目                              | ディアドマ科                     | Diatoma vulgareis       |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         | 120    |
| 7   |         |                          |                                  | Fragilaria caputellata     | 8,650                   |            | 7,800      |             |            | 1,160      |              |           |            |             |            |            |             | 3,520     | 7,910      | 5,970      |             |            |             |             |            |           |           |            |           | 100       | 150     |        |
| 8   |         | Fragilaria capucina      |                                  |                            |                         |            |            |             |            |            |              |           |            |             |            |            | 3,520       | 400       |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 9   |         | Fragilaria crotonensis   |                                  | 1,920                      | 780                     |            |            |             |            |            |              |           | 150        |             |            |            |             | 1,200     |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 10  |         | Fragilaria vaucheriae    |                                  | 8,650                      |                         |            |            |             | 1,160      |            |              | 350       |            |             |            |            |             |           |            |            | 26,880      |            |             | 5,520       |            |           |           |            |           |           |         |        |
| 11  |         | Ulnaria inaequalis       |                                  | 240                        |                         |            |            |             |            |            |              |           |            | 200         | 240        | 100        | 100         |           |            |            |             |            |             |             |            |           |           |            |           |           | 100     |        |
| 12  |         | Ulnaria ulna             |                                  |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           | 240        | 240        |             |            |             |             |            |           |           |            |           |           |         |        |
| 13  | ナビクラ科   |                          |                                  | Amphora pediculus          |                         |            | 100        |             | 100        |            | 100          |           |            |             |            |            |             |           |            |            |             |            |             |             |            | 100       | 100       |            |           |           |         |        |
| 14  |         |                          |                                  | Cymbella tumida            |                         | 960        |            | 240         | 480        |            | 480          |           | 480        |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           | 240       |         |        |
| 15  |         |                          |                                  | Cymbella turridula         | 19,200                  | 19,200     | 9,600      | 9,600       | 9,600      | 8,000      | 1,920        | 1,920     | 23,040     | 9,600       | 41,480     | 9,600      | 4,800       | 1,920     | 7,680      | 48,000     |             | 2,400      |             |             |            |           | 67,200    | 1,920      | 100       | 480       | 100     |        |
| 16  |         |                          | Cymbella turridula var nipponica |                            |                         |            |            |             | 1,600      |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 17  |         |                          | Encyonema silesiacum             | 240,000                    | 38,400                  | 57,600     | 153,600    | 182,400     | 144,000    | 28,800     | 36,480       | 138,240   | 38,400     | 314,880     | 201,600    | 19,200     | 1,920       | 30,720    | 556,800    | 57,600     | 96,000      | 2,400      | 100         | 528,000     | 1,920      | 7,680     |           | 480        | 960       | 480       |         |        |
| 18  |         |                          | Gomphonopsis heterominuta        | 64,000                     | 19,200                  | 7,680      | 16,670     | 38,400      | 78,550     | 3,840      | 1,380        | 1,160     | 35,200     | 97,750      | 128,000    | 22,500     | 67,040      | 278,590   | 153,600    | 200        | 26,190      | 100        |             | 143,210     | 72,850     | 49,900    | 7,840     | 240        | 360       | 100       |         |        |
| 19  |         |                          | Gomphonopsis okunoi              |                            |                         |            |            |             |            |            |              |           |            |             | 12,800     |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 20  |         |                          | Gomphonema biceps                |                            |                         |            |            | 5,240       |            |            |              | 390       |            |             |            |            |             |           |            |            |             |            | 100         |             |            |           |           |            |           |           |         |        |
| 21  |         |                          | Gomphonema clevei                |                            |                         |            |            |             |            |            |              |           |            |             |            |            | 100         |           |            |            |             |            |             |             |            |           |           | 240        | 120       | 100       |         |        |
| 22  |         |                          | Gomphonema herculeana            | 480                        | 480                     | 480        |            | 720         | 2,640      |            | 770          | 960       | 3,360      |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 23  |         |                          | Gomphonema parvulum              | 12,800                     |                         |            | 11,910     | 38,400      | 26,190     |            | 550          | 390       | 3,200      | 9,780       | 12,800     | 1,500      | 9,580       | 5,580     | 19,200     |            | 2,620       |            |             |             | 28,650     | 9,720     | 560       | 100        |           |           |         |        |
| 24  |         |                          | Gomphonema parvulum var lagenula |                            |                         | 1,920      | 240        |             | 5,240      |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 25  |         |                          | Gomphonema pumilum var rigidum   |                            |                         |            |            |             |            |            |              |           |            |             |            |            | 100         |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 26  |         |                          | Navicula amphiceropsis           |                            |                         |            |            |             | 1,160      |            |              |           | 360        |             |            |            | 680         |           | 2,190      |            |             |            |             |             |            |           | 320       |            |           |           |         |        |
| 27  |         |                          | Navicula atomus                  | 216,440                    | 14,640                  | 217,500    | 83,120     | 192,880     | 21,780     |            | 570          |           | 260        | 252,190     | 182,180    | 89,820     | 54,290      | 378,060   | 471,080    |            | 189,640     |            |             |             | 63,440     | 150       | 560       |            |           |           |         |        |
| 28  |         |                          | Navicula capitatoradiata         |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 29  |         |                          | Navicula cryptocephala           | 17,290                     | 1,600                   |            | 21,220     |             | 11,600     | 4,240      | 6,830        |           | 10,540     | 15,810      | 11,930     | 60,820     | 21,120      | 87,230    | 1,490      | 2,680      | 21,080      | 800        |             |             | 11,200     | 320       | 100       | 100        |           | 70        |         |        |
| 30  |         |                          | Navicula cryptotenella           | 8,650                      | 1,600                   |            | 10,610     | 32,760      |            | 4,240      | 350          | 7,420     | 360        | 3,960       | 23,860     | 3,380      |             | 2,190     |            |            |             | 2,400      | 1,920       |             | 16,790     |           |           |            | 150       | 70        |         |        |
| 31  |         |                          | Navicula decussis                | 870                        | 1,600                   | 7,800      | 10,610     |             |            | 2,120      | 350          | 7,420     |            |             |            | 13,520     |             |           | 1,490      |            |             |            |             | 1,920       |            | 560       |           |            |           |           |         |        |
| 32  |         |                          | Navicula gregaria                | 354,320                    | 11,200                  | 93,600     | 106,080    | 409,450     | 266,630    | 38,140     | 119,510      | 118,650   | 14,060     | 55,320      | 35,780     | 202,710    | 21,120      | 239,890   | 237,530    | 107,180    | 63,220      | 800        |             | 3,840       | 89,550     |           |           | 800        | 1,160     | 140       |         |        |
| 33  |         |                          | Navicula lanceolata              |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 34  |         |                          | Navicula mutica                  |                            |                         |            |            |             |            |            |              |           |            | 5,970       |            |            |             |           |            |            |             |            |             |             |            | 320       |           |            |           |           |         |        |
| 35  |         |                          | Navicula nipponica               |                            |                         | 7,800      |            | 1,070       | 1,640      | 1,160      |              |           |            |             |            |            |             | 1,490     |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 36  |         |                          | Navicula pseudoeceptata          | 13,970                     | 14,640                  | 15,540     | 7,560      | 60,280      | 27,220     | 1,380      | 3,930        | 57,140    | 7,360      | 32,550      | 72,870     | 123,500    | 10,860      | 359,160   | 75,380     |            | 33,470      | 4,710      | 11,030      | 38,070      |            |           | 160       | 40         |           |           |         |        |
| 37  |         |                          | Navicula pupula                  |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 38  |         |                          | Navicula subrostellata           | 8,650                      | 1,600                   |            |            | 32,760      | 1,160      | 8,480      | 13,660       | 14,840    | 360        |             | 600        | 680        |             | 2,190     |            | 2,680      |             |            |             | 1,920       |            |           |           | 800        |           |           |         |        |
| 39  |         |                          | Navicula tripunctata             |                            |                         |            |            |             |            |            |              |           | 360        | 3,960       |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 40  |         |                          | Navicula ventralis               |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            | 800       |           |         |        |
| 41  |         |                          | Navicula viridula var linearis   |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             | 1,490     |            |            |             |            |             |             |            | 560       |           |            |           |           |         |        |
| 42  |         |                          | Navicula yuraensis               | 34,570                     | 1,600                   | 7,800      | 42,440     | 147,410     | 23,190     | 4,240      | 6,830        | 66,740    | 24,600     | 35,570      | 11,930     | 87,840     | 30,720      | 196,270   | 29,700     | 2,680      |             |            |             | 5,600       |            |           |           |            | 70        |           |         |        |
| 43  |         |                          | Reimeria sinuata                 | 27,930                     | 29,280                  | 124,290    | 52,890     | 48,220      | 16,340     | 690        | 570          | 47,620    | 14,720     | 32,550      | 91,090     | 67,370     | 152,010     | 18,910    | 56,530     | 53,740     | 44,620      | 18,840     | 22,050      | 38,070      | 25,180     | 83,170    | 23,510    | 160        | 120       | 130       |         |        |
| 44  |         | Rhoicosphenia abbreviata | 100                              |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 45  | アクナンテス科 |                          | Achnanthes crenulata             |                            |                         |            |            |             |            |            |              |           | 100        |             |            |            | 240         |           |            |            |             |            |             |             |            |           |           | 240        | 120       | 480       |         |        |
| 46  |         |                          | Achnantheidum biaolettianum      |                            |                         |            |            |             |            |            |              |           |            |             | 2,460      |            | 36,440      | 11,230    |            |            |             |            |             | 5,520       |            | 1,490     | 5,550     |            |           |           |         |        |
| 47  |         |                          | Achnantheidum clevei             |                            |                         |            | 3,780      |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 48  |         |                          | Achnantheidum japonicum          | 251,350                    | 1,295,440               | 310,710    | 317,340    | 542,480     | 206,860    | 8,280      | 8,990        | 95,240    | 125,120    | 170,840     | 491,870    | 145,960    | 206,300     | 189,030   | 113,060    | 4,083,960  | 200,790     | 941,540    | 832,180     | 317,190     | 96,260     | 299,400   | 712,860   | 2,280      | 1,000     | 1,770     |         |        |
| 49  |         |                          | Achnantheidum minutissimum       |                            |                         |            | 3,780      | 1,210       |            | 1,380      | 60           |           |            | 820         |            | 11,230     | 1,090       | 1,900     |            |            |             |            |             | 5,520       |            |           |           |            | 15,670    | 80        |         |        |
| 50  |         |                          | Achnantheidum subhudsonis        | 6,990                      | 7,320                   | 7,770      |            | 24,110      |            | 690        | 60           |           |            | 4,920       | 1,830      |            |             |           |            | 18,850     | 26,880      | 11,160     | 9,420       |             |            |           | 1,270     | 160        | 40        |           |         |        |
| 51  |         | ニッチア科                    |                                  | Cocconeis pediculus        |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |
| 52  |         |                          |                                  | Cocconeis placentula       | 960                     | 1,920      |            | 100         | 100        | 100        | 100          | 100       |            | 9,600       | 3,840      | 100        | 4,800       | 3,840     | 15,360     | 100        | 200         | 100        | 100         | 4,800       | 2,880      | 3,840     | 480       | 100        | 480       | 240       |         |        |
| 53  |         |                          |                                  | Planonithidium lanceolatum | 20,950                  | 7,320      | 82,150     | 7,560       | 12,060     | 2,730      | 350          |           |            | 19,640      | 8,140      | 18,220     | 101,050     | 10,860    | 94,520     | 9,430      | 13,440      | 22,310     |             |             | 25,380     | 16,290    | 38,820    | 7,840      | 160       | 40        |         |        |
| 54  |         |                          |                                  | Nitzschia acicularis       |                         | 960        |            | 100         | 100        |            | 480          | 240       |            |             |            |            |             |           | 100        |            |             |            |             |             |            |           | 25,380    | 16,290     | 38,820    | 7,840     | 160     | 40     |
| 55  |         |                          |                                  |                            |                         |            |            |             |            |            |              |           |            |             |            |            |             |           |            |            |             |            |             |             |            |           |           |            |           |           |         |        |

表 4 付着藻類の確認種リスト 2 (平成 28 年度春季)

| No.                                         | 綱名  | 目名     | 科名    | 和名            | 学名                                              | 下代の瀬                        |                          |           | 横石付近       |            |            | 坂本支所      |            |           |         |
|---------------------------------------------|-----|--------|-------|---------------|-------------------------------------------------|-----------------------------|--------------------------|-----------|------------|------------|------------|-----------|------------|-----------|---------|
|                                             |     |        |       |               |                                                 | 瀬1                          | 瀬2                       | 瀬3        | 瀬1         | 瀬2         | 瀬3         | 瀬1        | 瀬2         | 瀬3        |         |
| 1                                           | 藍藻綱 | ネンジュモ目 | ヒゲモ科  | ピロウドラソウ       | <i>Homoeothrix janthina</i> *                   | 7,600,000                   | 2,700,000                | 4,700,000 | 14,500,000 | 19,000,000 | 15,000,000 | 7,400,000 | 15,000,000 | 2,500,000 |         |
| 2                                           |     |        |       | ユシモ科          | <i>Lyngbya</i> sp.*                             | 12,500                      | 3,600                    | 6,400     | 32,600     | 33,100     | 45,700     | 3,300     | 36,000     | 700       |         |
| 3                                           |     |        |       | カマエシフォン目      | カマエシフォン科                                        | カマエシフォン属                    | <i>Chamaesiphon</i> sp.  | 680,000   | 90,000     | 200,000    | 60,000     | 300,000   | 50,000     | 40,000    | 100,000 |
| 4                                           | 珪藻綱 | 中心目    | メロシラ科 | スジタルケイソウ属     | <i>Aulacoseira granulata</i>                    |                             |                          |           |            |            |            |           | 500        |           |         |
| 5                                           |     |        |       | タルケイソウ属       | <i>Melosira varians</i>                         | 5,700                       | 5,600                    | 2,600     | 1,100      | 1,000      | 8,300      | 50,700    | 109,000    | 5,200     |         |
| 6                                           |     |        |       | イタケイソウ属       | <i>Diatoma vulgare</i>                          | 200                         |                          | 300       | 200        | 200        | 2,100      | 1,300     | 1,700      |           |         |
| 7                                           | 羽状目 | ディプトマ科 |       | オビケイソウ属       | <i>Fragilaria caputellata</i>                   | 23,600                      | 1,400                    | 3,600     | 3,900      | 600        | 9,300      | 23,400    | 10,300     | 7,800     |         |
| 8                                           |     |        |       | オビケイソウ属       | <i>Fragilaria crotonensis</i>                   |                             |                          |           | 300        |            |            |           |            |           |         |
| 9                                           |     |        |       | クノジケイソウ属      | <i>Hannaea arcus</i> var. <i>hattoriana</i>     |                             |                          |           |            |            |            | 1,300     |            |           |         |
| 10                                          |     |        |       | ハリケイソウ属       | <i>Ulnaria inaequalis</i>                       | 1,200                       | 900                      | 600       | 100        | 200        | 700        | 7,200     | 6,000      |           |         |
| 11                                          |     |        |       | ハリケイソウ属       | <i>Ulnaria ulna</i>                             | 500                         | 500                      | 300       | 100        | 700        | 800        | 7,800     | 13,700     |           |         |
| 12                                          |     |        |       | ナビクワ科         | ニセクチビルケイソウ属                                     | <i>Amphora pediculus</i>    | 200                      |           |            |            |            |           | 2,600      |           |         |
| 13                                          |     |        |       | クチビルケイソウ属     | <i>Cymbella cistula</i>                         | 100                         | 100                      |           | 200        |            | 200        | 300       | 700        | 200       |         |
| 14                                          |     |        |       | クチビルケイソウ属     | <i>Cymbella tumida</i>                          | 200                         | 200                      | 100       | 200        | 100        | 2,100      | 7,800     | 100        | 300       |         |
| 15                                          |     |        |       | クチビルケイソウ属     | <i>Cymbella turgidula</i>                       | 1,500                       | 100                      | 300       | 600        | 300        | 4,200      | 19,000    | 21,600     | 1,900     |         |
| 16                                          |     |        |       | クチビルケイソウ属     | <i>Cymbella turgidula</i> var. <i>nipponica</i> | 2,900                       | 400                      | 300       | 2,000      | 200        | 3,100      | 1,200     | 13,500     | 900       |         |
| 17                                          |     |        |       | マユケイソウ属       | <i>Diploneis boldiana</i>                       | 100                         |                          |           | 100        |            |            |           |            |           |         |
| 18                                          |     |        |       | ハラムクチビルケイソウ属  | <i>Encyonema leei</i>                           | 4,800                       | 100                      | 400       | 300        |            | 2,100      | 8,500     | 6,900      | 200       |         |
| 19                                          |     |        |       | ハラムクチビルケイソウ属  | <i>Encyonema minutum</i>                        | 73,100                      | 4,400                    | 3,900     | 30,900     | 9,300      | 66,400     | 148,000   | 144,000    | 71,100    |         |
| 20                                          |     |        |       | クサビフネケイソウ属    | <i>Gomphonema heterominuta</i>                  | 17,500                      | 1,600                    | 200       |            | 100        |            | 7,800     | 1,100      | 1,100     |         |
| 21                                          |     |        |       | クサビフネケイソウ属    | <i>Gomphonema minuta</i>                        | 500                         | 200                      | 300       | 600        | 700        | 5,200      | 18,200    | 38,600     | 2,200     |         |
| 22                                          |     |        |       | クサビフネケイソウ属    | <i>Gomphonema okunoi</i>                        | 100                         |                          |           |            |            | 600        |           |            |           |         |
| 23                                          |     |        |       | クサビケイソウ属      | <i>Gomphonema biceps</i>                        |                             | 400                      |           |            | 400        | 400        | 9,200     | 19,500     | 1,500     |         |
| 24                                          |     |        |       | クサビケイソウ属      | <i>Gomphonema pseudoaugur</i>                   |                             |                          | 100       |            |            |            |           |            |           |         |
| 25                                          |     |        |       | クサビケイソウ属      | <i>Gomphonema inaequibrangum</i>                | 1,100                       | 100                      | 400       |            |            |            |           |            |           |         |
| 26                                          |     |        |       | クサビケイソウ属      | <i>Gomphonema kobayashii</i>                    | 39,400                      | 700                      | 700       |            |            |            |           |            | 4,200     |         |
| 27                                          |     |        |       | クサビケイソウ属      | <i>Gomphonema parvulum</i>                      | 11,000                      | 1,100                    |           | 800        |            | 5,200      |           |            | 1,600     |         |
| 28                                          |     |        |       | エスジケイソウ属      | <i>Gyrosigma procerum</i>                       |                             |                          |           | 100        | 900        |            | 200       |            |           |         |
| 29                                          |     |        |       | フネケイソウ属       | <i>Navicula amphiceropsis</i>                   | 100                         | 100                      |           | 100        |            | 300        |           |            | 100       |         |
| 30                                          |     |        |       | フネケイソウ属       | <i>Navicula antonii</i>                         | 5,600                       | 600                      | 500       | 2,400      | 3,000      | 10,400     | 13,000    | 6,900      | 8,200     |         |
| 31                                          |     |        |       | フネケイソウ属       | <i>Navicula arkona</i>                          |                             |                          |           | 500        | 100        | 800        | 500       |            |           |         |
| 32                                          |     |        |       | フネケイソウ属       | <i>Navicula atomus</i>                          | 32,800                      | 4,700                    | 4,000     |            |            | 32,600     | 4,200     | 75,500     | 14,400    |         |
| 33                                          |     |        |       | フネケイソウ属       | <i>Navicula bacillum</i>                        |                             | 100                      | 100       |            |            |            | 800       |            |           |         |
| 34                                          |     |        |       | フネケイソウ属       | <i>Navicula capitatoradiata</i>                 |                             |                          |           |            | 100        | 1,200      | 100       | 2,600      | 200       |         |
| 35                                          |     |        |       | フネケイソウ属       | <i>Navicula cincta</i>                          | 200                         | 1,000                    | 2,300     | 1,600      | 2,900      | 1,300      | 7,200     | 43,700     | 300       |         |
| 36                                          |     |        |       | フネケイソウ属       | <i>Navicula cryptocephala</i>                   | 400                         | 300                      |           | 700        | 400        | 9,300      | 3,300     | 6,000      | 400       |         |
| 37                                          |     |        |       | フネケイソウ属       | <i>Navicula cryptotenella</i>                   | 800                         | 290                      | 300       | 800        | 1,100      | 22,800     | 3,300     | 25,700     | 1,900     |         |
| 38                                          |     |        |       | フネケイソウ属       | <i>Navicula decussa</i>                         |                             | 200                      | 300       |            |            |            |           |            |           |         |
| 39                                          |     |        |       | フネケイソウ属       | <i>Navicula gregaria</i>                        | 16,500                      | 3,600                    | 2,200     | 8,800      | 7,400      | 86,200     | 83,900    | 355,000    | 40,900    |         |
| 40                                          |     |        |       | フネケイソウ属       | <i>Navicula minima</i>                          | 164,000                     | 12,500                   | 151,000   |            |            | 18,100     | 5,000     | 28,300     | 3,100     |         |
| 41                                          |     |        |       | フネケイソウ属       | <i>Navicula nipponica</i>                       | 100                         | 200                      | 200       | 100        | 100        | 100        | 2,000     |            |           |         |
| 42                                          |     |        |       | フネケイソウ属       | <i>Navicula notha</i>                           |                             |                          |           |            |            | 4,200      |           |            |           |         |
| 43                                          |     |        |       | フネケイソウ属       | <i>Navicula pseudiceptata</i>                   | 21,900                      | 3,100                    |           |            |            |            | 800       | 4,700      |           |         |
| 44                                          |     |        |       | フネケイソウ属       | <i>Navicula rostellata</i>                      | 200                         |                          | 100       | 700        | 400        | 2,100      | 1,300     |            | 700       |         |
| 45                                          |     |        |       | フネケイソウ属       | <i>Navicula rhynchocephala</i>                  | 100                         |                          |           |            |            |            |           |            |           |         |
| 46                                          |     |        |       | フネケイソウ属       | <i>Navicula silvicaensis</i>                    |                             |                          |           | 300        | 1,600      | 11,400     | 1,800     | 9,400      | 1,900     |         |
| 47                                          |     |        |       | フネケイソウ属       | <i>Navicula tripunctata</i>                     | 2,200                       | 600                      | 200       |            |            | 100        | 2,100     | 700        |           |         |
| 48                                          |     |        |       | フネケイソウ属       | <i>Navicula trivialis</i>                       | 400                         | 100                      | 100       | 100        |            |            | 2,000     | 1,300      |           |         |
| 49                                          |     |        |       | フネケイソウ属       | <i>Navicula wetanabai</i>                       |                             | 700                      | 600       | 1,000      |            | 500        | 9,800     | 1,500      | 400       |         |
| 50                                          |     |        |       | フネケイソウ属       | <i>Navicula yuransis</i>                        | 66,000                      | 11,600                   | 3,400     | 10,200     | 10,600     | 107,000    | 110,000   | 943,000    | 69,200    |         |
| 51                                          |     |        |       | カイコマメケイソウ属    | <i>Rhizomeria sinuata</i>                       | 48,100                      | 400                      | 1,700     | 300        | 100        | 1,200      | 18,200    | 15,400     | 35,300    |         |
| 52                                          |     |        |       | マザリクサビケイソウ属   | <i>Rhoicosphenia abbreviata</i>                 | 200                         | 100                      | 400       |            |            |            |           |            |           |         |
| 53                                          |     |        |       | エリツキケイソウ属     | <i>Sallaphora japonica</i>                      |                             | 100                      | 100       |            |            | 100        | 300       | 800        |           |         |
| 54                                          |     |        |       | アウナンテス科       | ツメケイソウ属                                         | <i>Achnanthes crenulata</i> | 300                      | 100       | 600        | 200        |            | 3,300     |            |           |         |
| 55                                          |     |        |       | ツメワカルケイソウ属    | <i>Achnantheidum convergens</i>                 | 3,350,000                   | 947,000                  | 857,000   | 302,000    | 215,000    | 297,000    | 244,000   | 1,280,000  | 55,500    |         |
| 56                                          |     |        |       | ツメワカルケイソウ属    | <i>Achnantheidum minutissimum</i>               |                             | 6,300                    |           |            |            |            | 1,700     |            |           |         |
| 57                                          |     |        |       | ツメワカルケイソウ属    | <i>Achnantheidum subhudsonis</i>                |                             | 7,800                    | 7,900     |            |            |            |           |            |           |         |
| 58                                          |     |        |       | コメツブケイソウ属     | <i>Cocconeis pleurotula</i> var. <i>lineata</i> | 2,300                       | 700                      | 500       | 200        | 100        |            | 200       |            | 100       |         |
| 59                                          |     |        |       | オスジツブワカルケイソウ属 | <i>Planorbidium lanceolatum</i>                 | 700                         | 200                      | 200       |            |            |            | 1,600     | 1,800      | 600       |         |
| 60                                          |     |        |       | ニッチア科         | ササノハケイソウ属                                       | <i>Nitzschia amphibia</i>   | 200                      | 100       |            |            | 400        |           | 1,600      | 800       |         |
| 61                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia dissipata</i>                      | 3,400                       | 700                      | 400       | 3,500      | 16,900     | 10,300     | 40,500    | 81,900     | 15,600    |         |
| 62                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia fonticola</i>                      | 3,200                       | 1,000                    | 700       | 3,100      | 13,500     | 12,900     | 20,200    | 18,900     | 31,300    |         |
| 63                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia frustulum</i>                      |                             | 300                      | 200       | 900        | 1,700      | 1,700      | 14,200    | 3,200      | 3,100     |         |
| 64                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia inconspicua</i>                    | 3,220,000                   | 279,000                  | 381,000   | 12,900     | 16,700     | 18,100     | 785,000   | 888,000    | 191,000   |         |
| 65                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia palea</i>                          | 12,500                      | 2,700                    | 2,600     | 108,000    | 72,700     | 46,500     | 245,000   | 284,000    | 62,600    |         |
| 66                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia paleacea</i>                       | 200                         |                          | 300       | 8,400      | 18,600     | 6,000      | 4,000     | 6,300      | 9,400     |         |
| 67                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia sinuata</i> var. <i>tabellaria</i> | 200                         |                          |           | 12,400     |            |            |           | 34,700     |           |         |
| 68                                          |     |        |       | ササノハケイソウ属     | <i>Nitzschia</i> sp.                            |                             |                          |           |            | 10,100     | 2,600      | 18,200    |            | 28,200    |         |
| 69                                          |     |        |       | スリレラ科         | コリンケイソウ属                                        | <i>Surirella angusta</i>    | 500                      |           |            | 100        |            |           | 400        | 1,800     |         |
| 70                                          |     |        |       | コリンケイソウ属      | <i>Surirella linearis</i>                       |                             |                          |           |            |            |            |           | 100        |           |         |
| 71                                          |     |        |       | 緑藻綱           | セネデスムス科                                         | イカダモ属                       | <i>Scenedesmus</i> sp.   | 2,000     | 1,600      |            | 600        | 3,600     | 4,400      | 13,000    | 17,200  |
| 72                                          |     |        |       | カエトフォラ目       | カエトフォラ科                                         | ゴングロンラ属                     | <i>Gongrosira</i> sp.    |           | 26,200     |            |            |           |            |           |         |
| 73                                          |     |        |       | サヤミドロ目        | サヤミドロ科                                          | ステゲオクロニウム属                  | <i>Stigeoclonium</i> sp. | 6,500     | 2,600      | 12,300     | 400        | 3,400     | 17,500     | 160,000   | 168,000 |
| 74                                          |     |        |       | サヤミドロ目        | サヤミドロ科                                          | オダゴニウム属                     | <i>Oedogonium</i> sp.    |           |            | 1,300      |            |           |            | 11,500    |         |
| 種類数                                         |     |        |       |               |                                                 | 53                          | 52                       | 49        | 47         | 41         | 47         | 54        | 48         | 42        |         |
| 総細胞数 (cells and filaments/cm <sup>2</sup> ) |     |        |       |               |                                                 | 15,437,800                  | 4,101,700                | 6,379,200 | 15,114,700 | 19,748,400 | 15,933,300 | 9,576,600 | 19,833,000 | 3,205,600 |         |
| 沈殿量 (mL/100cm <sup>2</sup> )                |     |        |       |               |                                                 | 12.9                        | 6.0                      | 4.9       | 50.0       | 64.0       | 50.8       | 28.7      | 50.8       | 13.7      |         |

表 5 付着物の分析データ（平成 27 年度春季）

| 項目      | 単位                            | 下流流水区間 |     |     |      |      |     |      |     |      |     |     |     | 減水区間   |     |     |     | 百済木川<br>流水回復区間   |     |     |     | 第2流水<br>回復区間 |     |     |     |          |     |     |     | 第1流水<br>回復区間 |      |     |     | 上流<br>流水区間   |      |     |     |
|---------|-------------------------------|--------|-----|-----|------|------|-----|------|-----|------|-----|-----|-----|--------|-----|-----|-----|------------------|-----|-----|-----|--------------|-----|-----|-----|----------|-----|-----|-----|--------------|------|-----|-----|--------------|------|-----|-----|
|         |                               | ①横石    |     |     |      | ②下代瀬 |     |      |     | ③坂本橋 |     |     |     | ④道の駅坂本 |     |     |     | ⑤荒瀬ダム<br>百済木川流入部 |     |     |     | ⑥<br>葉木      |     |     |     | ⑦<br>与奈久 |     |     |     | ⑧西鎌瀬         |      |     |     | ⑨瀬戸石<br>ダム下流 |      |     |     |
|         |                               | H24    | H25 | H26 | H27  | H24  | H25 | H26  | H27 | H24  | H25 | H26 | H27 | H24    | H25 | H26 | H27 | H24              | H25 | H26 | H27 | H24          | H25 | H26 | H27 | H24      | H25 | H26 | H27 | H24          | H25  | H26 | H27 | H24          | H25  | H26 | H27 |
| クロロフィルa | ( $\mu\text{g}/\text{cm}^2$ ) | 4.5    |     |     | 15.4 | 3.9  | 3.1 | 10.7 | 4.4 | 4.2  |     |     | 6.0 | 5.7    | 5.7 | 7.6 | 0.7 | 3.1              | 5.3 | 2.7 | 5.9 | 2.4          | 1.6 | 1.2 | 4.1 | 3.4      | 4.1 | 1.6 | 0.4 | 2.0          | 20.4 | 0.4 | 1.0 |              | 18.0 | 4.6 | 0.7 |
| フェオフィチン | ( $\mu\text{g}/\text{cm}^2$ ) | 1.0    |     |     | 1.0  | 0.5  | 0.2 | 4.1  | 0.6 | 0.9  |     |     | 0.4 | 1.2    | 1.7 | 1.8 | 0.1 | 0.5              | 1.4 | 1.4 | 0.5 | 0.8          | 0.5 | 0.6 | 0.2 | 1.1      | 2.1 | 0.6 | 0.1 | 0.3          | 2.6  | 0.3 | 0.1 |              | 2.2  | 1.1 | 0.1 |
| クロロフィルa | %                             | 82%    |     |     | 94%  | 89%  | 93% | 72%  | 88% | 83%  |     |     | 94% | 83%    | 77% | 81% | 87% | 85%              | 79% | 67% | 92% | 74%          | 78% | 66% | 96% | 76%      | 66% | 73% | 79% | 88%          | 89%  | 57% | 91% |              | 89%  | 81% | 83% |
| フェオフィチン | %                             | 18%    |     |     | 6%   | 11%  | 7%  | 28%  | 12% | 17%  |     |     | 6%  | 17%    | 23% | 19% | 13% | 15%              | 21% | 33% | 8%  | 26%          | 22% | 34% | 4%  | 24%      | 34% | 27% | 21% | 12%          | 11%  | 43% | 9%  |              | 11%  | 19% | 17% |
| クロロフィルa | 標準偏差                          | 1.6    |     |     | 6.4  | 1.6  | 1.7 | 7.8  | 0.7 | 2.8  |     |     | 2.0 | 5.5    | 6.4 | 2.9 | 0.6 | 1.7              | 7.6 | 3.3 | 4.5 | 1.3          | 0.9 | 0.8 | 2.7 | 1.0      | 1.8 | 0.9 | 0.3 | 1.3          | 11.7 | 0.3 | 0.7 |              | 6.9  | 4.2 | 0.3 |
| フェオフィチン | 標準偏差                          | 0.6    |     |     | 0.1  | 0.1  | 0.2 | 2.7  | 0.1 | 0.4  |     |     | 0.1 | 1.0    | 2.4 | 0.5 | 0.0 | 0.2              | 2.2 | 1.2 | 0.4 | 0.4          | 0.3 | 0.2 | 0.1 | 0.3      | 1.4 | 0.2 | 0.0 | 0.2          | 1.8  | 0.2 | 0.0 |              | 0.8  | 0.9 | 0.1 |

|     |                             |      |  |  |      |      |      |      |      |      |  |  |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |      |      |  |      |      |      |
|-----|-----------------------------|------|--|--|------|------|------|------|------|------|--|--|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|--|------|------|------|
| 有機物 | ( $\text{mg}/\text{cm}^2$ ) | 1.08 |  |  | 1.83 | 1.21 | 0.88 | 1.83 | 0.56 | 0.95 |  |  |  | 0.85 | 1.17 | 1.26 | 2.02 | 0.71 | 0.75 | 1.26 | 0.84 | 0.75 | 1.00 | 0.53 | 0.51 | 0.57 | 1.09 | 3.11  | 0.49 | 0.44 | 0.65 | 2.13 | 0.31 | 0.78 |  | 2.67 | 0.79 | 0.79 |
| 無機物 | ( $\text{mg}/\text{cm}^2$ ) | 0.81 |  |  | 1.44 | 1.24 | 0.12 | 2.84 | 0.78 | 0.66 |  |  |  | 0.59 | 0.72 | 0.74 | 0.98 | 0.29 | 1.23 | 0.74 | 1.49 | 0.25 | 4.97 | 3.80 | 1.82 | 0.43 | 6.28 | 17.89 | 1.18 | 0.56 | 0.74 | 1.21 | 0.69 | 0.22 |  | 1.99 | 0.55 | 0.21 |
| 有機物 | %                           | 57%  |  |  | 55%  | 49%  | 88%  | 39%  | 42%  | 59%  |  |  |  | 57%  | 62%  | 63%  | 67%  | 71%  | 38%  | 63%  | 36%  | 75%  | 17%  | 12%  | 22%  | 57%  | 15%  | 15%   | 29%  | 44%  | 47%  | 64%  | 31%  | 78%  |  | 57%  | 59%  | 79%  |
| 無機物 | %                           | 43%  |  |  | 45%  | 51%  | 12%  | 61%  | 58%  | 41%  |  |  |  | 43%  | 38%  | 37%  | 33%  | 29%  | 62%  | 37%  | 64%  | 25%  | 83%  | 88%  | 78%  | 43%  | 85%  | 85%   | 71%  | 56%  | 53%  | 36%  | 69%  | 22%  |  | 43%  | 41%  | 21%  |
| 有機物 | 標準偏差                        | 0.3  |  |  | 0.7  | 0.3  | 0.0  | 1.2  | 0.1  | 0.4  |  |  |  | 0.1  | 0.7  | 1.1  | 1.1  | 0.1  | 0.3  | 1.0  | 0.7  | 0.1  | 0.2  | 0.1  | 0.2  | 0.3  | 0.3  | 2.8   | 0.3  | 0.1  | 0.4  | 1.4  | 0.1  | 0.0  |  | 0.9  | 0.4  | 0.2  |
| 無機物 | 標準偏差                        | 0.2  |  |  | 0.4  | 0.6  | 0.0  | 2.1  | 0.1  | 0.2  |  |  |  | 0.1  | 0.4  | 0.6  | 0.7  | 0.1  | 0.6  | 0.8  | 1.6  | 0.1  | 2.1  | 0.6  | 1.5  | 0.3  | 2.2  | 11.6  | 0.9  | 0.1  | 0.3  | 0.7  | 0.1  | 0.0  |  | 0.7  | 0.1  | 0.2  |

表 6 付着物の分析データ（平成 27 年度冬季）

| 項目      | 単位                            | 下流流水区間 |     |     |     |      |      |      |     |      |      |      |     |     |     |      | 減水区間   |      |     |      |      | 百済木川<br>流水回復区間   |      |     |      |      | 第2流水<br>回復区間 |     |     |      |      | 第1流水<br>回復区間 |     |     |      |      | 上流<br>流水区間 |      |     |      |      |              |     |     |      |      |
|---------|-------------------------------|--------|-----|-----|-----|------|------|------|-----|------|------|------|-----|-----|-----|------|--------|------|-----|------|------|------------------|------|-----|------|------|--------------|-----|-----|------|------|--------------|-----|-----|------|------|------------|------|-----|------|------|--------------|-----|-----|------|------|
|         |                               | ①横石    |     |     |     |      | ②下代瀬 |      |     |      |      | ③坂本橋 |     |     |     |      | ④道の駅坂本 |      |     |      |      | ⑤荒瀬ダム<br>百済木川流入部 |      |     |      |      | ⑥<br>葉木      |     |     |      |      | ⑦<br>与奈久     |     |     |      |      | ⑧西鎌瀬       |      |     |      |      | ⑨瀬戸石<br>ダム下流 |     |     |      |      |
|         |                               | H23    | H24 | H25 | H26 | H27  | H23  | H24  | H25 | H26  | H27  | H23  | H24 | H25 | H26 | H27  | H23    | H24  | H25 | H26  | H27  | H23              | H24  | H25 | H26  | H27  | H23          | H24 | H25 | H26  | H27  | H23          | H24 | H25 | H26  | H27  | H23        | H24  | H25 | H26  | H27  |              |     |     |      |      |
| クロロフィルa | ( $\mu\text{g}/\text{cm}^2$ ) | 1.6    |     |     |     | 12.5 | 1.2  | 13.0 | 0.2 | 31.3 | 41.6 | 2.3  |     |     |     | 53.6 | 0.7    | 17.5 | 5.6 | 26.3 | 13.3 | 0.4              | 16.3 | 5.6 | 15.3 | 22.0 |              | 4.0 | 6.2 | 36.7 | 39.3 |              | 4.7 | 6.6 | 18.0 | 17.5 | 0.6        | 12.0 | 3.4 | 25.7 | 35.0 |              | 2.4 | 1.1 | 30.7 | 12.2 |
| フェオフィチン | ( $\mu\text{g}/\text{cm}^2$ ) | 0.3    |     |     |     | 2.3  | 0.4  | 1.5  | 0.1 | 4.6  | 7.7  | 0.5  |     |     |     | 12.3 | 0.2    | 2.4  | 0.7 | 7.7  | 2.1  | 0.1              | 1.5  | 0.7 | 2.6  | 1.8  |              | 0.9 | 0.9 | 3.1  | 7.1  |              | 3.1 | 0.6 | 3.4  | 3.6  | 0.2        | 1.1  | 0.4 | 3.4  | 4.4  |              | 0.5 | 0.2 | 6.4  | 1.7  |
| クロロフィルa | %                             | 84%    |     |     |     | 85%  | 75%  | 90%  | 63% | 87%  | 84%  | 82%  |     |     |     | 81%  | 78%    | 88%  | 89% | 77%  | 86%  | 80%              | 92%  | 88% | 85%  | 93%  |              | 82% | 87% | 92%  | 85%  |              | 60% | 92% | 84%  | 83%  | 75%        | 92%  | 89% | 88%  | 89%  |              | 82% | 85% | 83%  | 88%  |
| フェオフィチン | %                             | 16%    |     |     |     | 15%  | 25%  | 10%  | 38% | 13%  | 16%  | 18%  |     |     |     | 19%  | 22%    | 12%  | 11% | 23%  | 14%  | 20%              | 8%   | 12% | 15%  | 7%   |              | 18% | 13% | 8%   | 15%  |              | 40% | 8%  | 16%  | 17%  | 25%        | 8%   | 11% | 12%  | 11%  |              | 18% | 15% | 17%  | 12%  |
| クロロフィルa | 標準偏差                          | 0.9    |     |     |     | 10.7 | 0.6  | 2.0  | 0.1 | 16.3 | 18.5 | 0.5  |     |     |     | 36.5 | 0.3    | 10.5 | 2.3 | 6.8  | 4.2  | 0.3              | 12.0 | 9.0 | 21.5 | 3.5  |              | 3.7 | 4.9 | 6.4  | 6.4  |              | 4.1 | 1.7 | 8.9  | 8.8  | 0.2        | 13.0 | 2.5 | 15.6 | 5.2  |              | 1.4 | 0.3 | 12.7 | 17.3 |
| フェオフィチン | 標準偏差                          | 0.1    |     |     |     | 2.1  | 0.2  | 0.2  | 0.0 | 2.7  | 3.3  | 0.2  |     |     |     | 14.2 | 0.1    | 1.3  | 0.3 | 3.0  | 0.2  | 0.0              | 0.5  | 1.0 | 3.9  | 0.2  |              | 0.8 | 0.8 | 0.6  | 2.5  |              | 3.4 | 0.2 | 1.9  | 1.3  | 0.1        | 0.2  | 0.3 | 2.5  | 0.7  |              | 0.3 | 0.1 | 4.1  | 1.3  |

|     |                             |      |  |  |  |      |      |       |      |      |      |      |  |  |  |  |      |      |       |      |      |      |      |      |      |      |      |  |      |      |      |      |  |       |      |      |      |      |      |      |      |      |  |      |      |       |      |
|-----|-----------------------------|------|--|--|--|------|------|-------|------|------|------|------|--|--|--|--|------|------|-------|------|------|------|------|------|------|------|------|--|------|------|------|------|--|-------|------|------|------|------|------|------|------|------|--|------|------|-------|------|
| 有機物 | ( $\text{mg}/\text{cm}^2$ ) | 0.54 |  |  |  | 1.13 | 0.45 | 2.31  | 0.26 | 3.22 | 2.52 | 0.63 |  |  |  |  | 4.84 | 0.30 | 2.57  | 1.24 | 3.71 | 1.40 | 0.30 | 1.78 | 0.89 | 1.70 | 2.54 |  | 1.40 | 1.61 | 3.00 | 2.76 |  | 5.18  | 1.89 | 2.26 | 1.66 | 0.23 | 1.54 | 0.90 | 2.91 | 3.15 |  | 0.57 | 0.63 | 4.15  | 1.68 |
| 無機物 | ( $\text{mg}/\text{cm}^2$ ) | 0.64 |  |  |  | 1.54 | 0.67 | 19.03 | 1.08 | 3.45 | 2.71 | 0.51 |  |  |  |  | 5.76 | 0.31 | 10.76 | 3.09 | 6.96 | 2.94 | 3.20 | 3.22 | 0.44 | 1.64 | 0.80 |  | 8.26 | 2.39 | 3.66 | 2.91 |  | 46.15 | 4.11 | 5.74 | 5.01 | 0.93 | 7.46 | 1.76 | 4.76 | 5.18 |  | 1.76 | 0.37 | 15.18 | 0.32 |
| 有機物 | %                           | 46%  |  |  |  | 42%  | 40%  | 11%   | 19%  | 48%  | 48%  | 55%  |  |  |  |  | 48%  | 49%  | 19%   | 29%  | 35%  | 32%  | 9%   | 36%  | 67%  | 51%  | 76%  |  | 15%  | 40%  | 45%  | 49%  |  | 10%   | 32%  | 28%  | 25%  | 20%  | 17%  | 34%  | 38%  | 38%  |  | 25%  | 63%  | 21%   | 84%  |
| 無機物 | %                           | 54%  |  |  |  | 58%  | 60%  | 89%   | 81%  | 52%  | 52%  | 45%  |  |  |  |  | 52%  | 51%  | 81%   | 71%  | 65%  | 68%  | 91%  | 64%  | 33%  | 49%  | 24%  |  | 85%  | 60%  | 55%  | 51%  |  | 90%   | 69%  | 72%  | 75%  | 80%  | 83%  | 66%  | 62%  | 62%  |  | 75%  | 37%  | 79%   | 16%  |
| 有機物 | 標準偏差                        | 0.1  |  |  |  | 0.6  | 0.2  | 0.4   | 0.1  | 1.4  | 1.0  | 0.1  |  |  |  |  | 1.0  | 0.1  | 0.4   | 1.3  | 1.2  | 0.2  | 0.3  | 0.9  | 0.4  | 1.9  | 0.2  |  | 1.3  | 1.1  | 0.3  | 0.3  |  | 5.1   | 0.3  | 0.9  | 1.1  | 0.1  | 0.4  | 0.6  | 1.4  | 0.3  |  | 0.2  | 0.2  | 1.6   | 1.4  |
| 無機物 | 標準偏差                        | 0.0  |  |  |  | 0.9  | 0.3  | 10.4  | 0.5  | 2.6  | 0.9  | 0.2  |  |  |  |  | 0.9  | 0.1  | 9.7   | 4.5  | 3.8  | 1.7  | 4.1  | 1.0  | 0.2  | 2.1  | 0.4  |  | 6.0  | 2.1  | 1.8  | 1.3  |  | 46.3  | 0.8  | 1.8  | 3.7  | 0.1  | 4.2  | 1.0  | 5.2  | 1.3  |  | 0.7  | 0.2  | 10.9  | 0.3  |