Supplementary Materials

Fig. S1 Ecological risk of antibiotics in summer (A) and winter (B) based on the assessment factor method instead of the SSD method.

Table S1 The locations of sampling sites in this study.

Table S2 The aquatic toxicity data and PNEC values for the antibiotics.

Table S3 Concentrations (ng/L) and recoveries of antibiotics and limits of detection (LOD).

Table S4 Resistance risk quotients of antibiotics in the Bohai Bay.

Table S5 Concentrations of antibiotics in coastal waters of the China Seas (ng/L).

Table S6 Ecological risk quotients of antibiotics in the Bohai Bay.



Fig. S1 Ecological risk of antibiotics in summer (A) and winter (B) based on the assessment factor method instead of the SSD method.

Table S1 The locations of sampling sites in this study.

|  |  |  |
| --- | --- | --- |
| Site | Location | Description |
| S1 | 38º54.655′N, 118º31.841′E | Near the Caofeidian Industry Zone |
| S2 | 39º09.628′N, 118º07.737′E | Near the Shahe estuary |
| S3 | 39º12.912′N, 117º57.805′E | Near the Dashentang mariculture area with artificial reefs |
| S4 | 38º58.613′N, 117º52.676′E | Near the Haihe estuary |
| S5 | 38º46.082′N, 117º38.511′E | Near the Duliujianhe estuary |
| S6 | 38º30.198′N, 117º40.201′E | Near the Lijiabao mariculture area by the bottom-sowing mode |
| S7 | 38º24.225′N, 117º55.546′E | Rarely influenced by human activities |
| S8 | 38º13.739′N, 118º06.022′E | Near the Tuhaihe estuary |
| S9 | 38º06.285′N, 118º22.765′E | Near the Xinhu mariculture area with seawater ponds |
| S10 | 38º09.697′N, 118º44.349′E | Rarely influenced by human activities |

Table S2 The aquatic toxicity data and PNEC values for the antibiotics.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Compound | Class | Specie | Endpoint | Values (μg/L) | Reference | PNEC (μg/L) | Comment |
| **Ciprofloxacin** | Algae | *Pseudokirchneriella subcapitata* | NOEC | 500 | (Liu et al. 2011) | 0.001 | BurrliOZ |
|  | Algae | *Platymonas subcordiformis* | NOEC | 5000 | (Wang et al., 2017) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 156 | (Zaleska-Radziwill et al., 2011) |  |  |
|  | Fish | *Lebistes reticulatus* | NOEC | 780 | (Zaleska-Radziwill et al., 2011) |  |  |
|  | Bacteria | *Pseudomonas fluorescens* | NOEC | 0.005 | (Zaleska-Radziwill et al., 2014) |  |  |
|  | Bacteria | *Vibrio fischeri* | NOEC | 0.0015 | (Zaleska-Radziwill et al., 2014) |  |  |
|  | Bacteria | *Pseudomonas aurantiaca* | NOEC | 39.1 | (Zaleska-Radziwill et al., 2014) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 100 | (Brain et al. 2008) |  |  |
|  |  | *Lemna minor* | NOEC | 203 | (Robinson et al., 2005) |  |  |
|  | Rotifer | *Brachionus plicatilis* | NOEC | 10000 | (Wang et al., 2017) |  |  |
|  | Ciliophora | *Tetrahymena thermophila* | NOEC | 195 | (Zaleska-Radziwill et al., 2011) |  |  |
| **Enrofloxacin**  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 5.2 | (Harada et al., 2008) | 0.0006  | BurrliOZ  |
|  | Algae | *Synechococcus leopolensis* | NOEC | 0.78 | (Andreozzi et al., 2004) |  |  |
|  | Algae | *Selenastrum capricornutum* | NOEC | 100000 | (Halling-Sorensen, 2000) |  |  |
|  | Algae | *Desmodesmus subspicatus* | NOEC | 25 | (Baumann et al., 2015) |  |  |
|  | Crustaceans | *Penaeus monodon* | NOEC | 4,000 | (Tu et al. 2009) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 5,000 | (Park et al. 2008) |  |  |
|  | Crustaceans | *Ceriodaphnia dubia* | NOEC | 30000 | (Constantine and Huggett, 2010) |  |  |
|  | Fish | *Pimephales promelas* | NOEC | 10,000 | (Robinson et al. 2005) |  |  |
|  | Fish | *Lebistes reticulatus* | NOEC | 780 | (Zaleska-Radziwill et al., 2011) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 30 | (Brain et al., 2004) |  |  |
|  | Rotifera | *Brachionus calyciflorus* | NOEC | 12500 | (Ferrari et al., 2004) |  |  |
|  | Bacteria | *Vibrio fischeri* | NOEC | 0.0015 | (Zaleska-Radziwill et al., 2014) |  |  |
| **Erythromycin** | Algae | *Anabaena cylindrica* | NOEC | 3.1 | (Ando et al. 2007) | 0.5 | BurrliOZ |
|  | Algae | *Anabaena flosaquae* | NOEC | 47 | (Ando et al. 2007) |  |  |
|  | Algae | *Microcystis aeruginosa* | NOEC | 10 | (Ando et al. 2007) |  |  |
|  | Algae | *Chlorella vulgaris* | NOEC | 12,500 | (Eguchi et al. 2004) |  |  |
|  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 10.3 | (Eguchi et al. 2004) |  |  |
|  | Crustaceans | *Litopenaeus vannamei* | NOEC | 4,900 | (Williams R R. 1992) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 11,100 | (Ji et al. 2012) |  |  |
|  | Fish | *Oryzias latipes* | NOEC | 1,000,000 | (Ji et al. 2012) |  |  |
|  | Invertebrates | *Moina macrocopa* | NOEC | 50,000 | (Ji et al. 2012) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 300 | (Brain et al. 2004) |  |  |
| **Ofloxacin** | Algae | *Pseudokirchneriella subcapitata* | NOEC | 2500 | (Ferrari et al., 2004) | 0.22 | BurrliOZ |
|  | Algae | *Cyclotella meneghiniana* | NOEC | 31.2 | (Ferrari et al., 2004) |  |  |
|  | Algae | *Synechococcus leopolensis* | NOEC | 5 | (Ferrari et al., 2004) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 10000 | (Robinson et al., 2005) |  |  |
|  | Fish | *Pimephales promelas* | NOEC | 10,000 | (Robinson et al. 2005) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 100 | (Brain et al. 2004) |  |  |
|  | Rotifera | *Brachionus calyciflorus* | NOEC | 12500 | (Ferrari et al., 2004) |  |  |
|  | Bacteria | *Vibrio fischeri* | NOEC | 1.13 | (Backhaus et al., 2000) |  |  |
| **Oxytetracycline** | Algae | *Tetraselmis suecica* | NOEC | 10000 | (Seoane et al., 2014) | 1.76 | BurrliOZ |
|  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 100 | (Eguchi et al. 2004) |  |  |
|  | Algae | *Conticribra weissflogii* | NOEC | 2500 | (Eguchi et al. 2004) |  |  |
|  | Crustaceans | *Litopenaeus vannamei* | NOEC | 3,780,000 | (Bray et al. 2006) |  |  |
|  | Fish | *Anguilla anguilla* | NOEC | 20,000 | (Kreutzmann. 1977) |  |  |
|  | Fish | *Labeo rohita* | NOEC | 80,000 | (Ambili et al. 2013) |  |  |
|  | Fish | *Sparus aurata* | NOEC | 4,000,000 | (Cerezuela et al. 2012) |  |  |
|  | Fish | *Cyprinus carpio* | NOEC | 2,000,000 | (Rijkers et al. 1980) |  |  |
|  | Invertebrates | *Brachionus plicatilis* | NOEC | 5,000 | (Balompapueng et al. 1997) |  |  |
|  | Invertebrates | *Brachionus koreanus* | NOEC | 1 | (Rhee et al., 2012) |  |  |
|  | Molluscs | *Argopecten purpuratus* | NOEC | 4000 | (Miranda et al., 2013) |  |  |
|  | Molluscs | *Pinctada mazatlanica* | NOEC | 10000 | (Aguilar-Macias et al., 2010) |  |  |
| **Sulfamethoxazole** | Algae | *Selenastrum capricornutum* | NOEC | 614 | (Eguchi et al., 2004) | 1.08 | BurrliOZ |
|  | Algae | *L. gibba* | NOEC | 10 | (Brain et al., 2004) |  |  |
|  | Algae | *C. meneghiniana* | NOEC | 1250 | (Ferrari, et al., 2004) |  |  |
|  | Algae | *S. leopolensis* | NOEC | 5.9 | (Ferrari, et al., 2004) |  |  |
|  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 500 | (Liu et al. 2011) |  |  |
|  | Crustacean | *Daphnia magna* | NOEC | 120 | (Lu et al., 2013) |  |  |
|  | Crustacean | *Ceriodaphnia dubia* | NOEC | 250 | (Ferrari et al., 2004) |  |  |
|  | Fish | *Danio rerio* | NOEC | 533 | (Madureira et al. 2011) |  |  |
|  | Fish | *Carassius auratus* | NOEC | 80 | (Li et al. 2012) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 9.4 | (Brain et al. 2008) |  |  |
|  | Invertebrates | *Hydra attenuata* | NOEC | 5,000 | (Quinn et al. 2008) |  |  |
|  | Invertebrates | *Brachionus koreanu* | NOEC | 100 | (Rhee et al., 2012) |  |  |
|  | Invertebrates | *Brachionus calyciflorus* | NOEC | 25000 | (Ferrari et al., 2004) |  |  |
| **Tetracycline** | Algae | *Microcystis aeruginosa* | NOEC | 50 | (Yang et al. 2008) | 1.58 | BurrliOZ |
|  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 500 | (Yang et al. 2013) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 500 | (Kim et al. 2012) |  |  |
|  | Fish | *Oryzias latipes* | NOEC | 20,000 | (Kang. 2006) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 30 | (Brain et al. 2004) |  |  |
|  | Invertebrates | *Brachionus plicatilis* | NOEC | 5,000 | (Balompapueng et al. 1997) |  |  |
|  | Molluscs | *Lamellidens corrianus* | NOEC | 73,820 | (Nandurkar. 2010) |  |  |
| **Trimethoprim** | Algae | *Anabaena cylindrica* | NOEC | 20,000 | (Ando et al. 2007) | 2.4 | BurrliOZ |
|  | Algae | *Pseudokirchneriella subcapitata* | NOEC | 16,000 | (Yang et al. 2008) |  |  |
|  | Crustaceans | *Moina macrocopa* | NOEC | 54,800 | (Park et al. 2008) |  |  |
|  | Crustaceans | *Daphnia magna* | NOEC | 6,000 | (Park et al. 2008) |  |  |
|  | Fish | *Danio rerio* | NOEC | 157 | (Madureira et al. 2012) |  |  |
|  | Fish | *Poecilia reticulata* | NOEC | 25000 | (De Liguoro et al., 2012)  |  |  |
|  | Plant | *Lemna gibba* | NOEC | 1,000 | (Brain et al. 2004) |  |  |
|  | Plant | *Lemna minor* | NOEC | 6250 | (De Liguoro et al., 2012) |  |  |
|  | Invertebrates | *Hydra attenuata* | NOEC | 100,000 | (Quinn al. 2008) |  |  |
|  | Invertebrates | *Brachionus koreanus* | NOEC | 10 | (Rhee et al., 2012) |  |  |
| **Amoxicillin**  | Algae | *Phaeodactylum tricornutum* | NOEC | 250000 | (De Orte et al., 2013) | 56.6 | BurrliOZ |
|  | Fish | *Danio rerio* | NOEC | 1125000 | (Oliveira et al., 2013) |  |  |
|  | Plant | *Lemna gibba* | NOEC | 1000 | (Brain et al., 2004) |  |  |
|  | Invertebrates | *Hydra vulgaris* | NOEC | 10000 | (Pascoe et al., 2003) |  |  |
| **Ampicillin** | Algae | *Microcystis aeruginosa* | NOEC | 10 | (Qian et al., 2012) | 0.1 | NOEC(Algae), AF=100 |
|  | Algae | *Chlorella vulgaris* | NOEC | >10000000 | (Eguchi et al., 2004) |  |  |
|  | Invertebrates | *Arbacia lixula* | NOEC | 10000 | (Carballeira et al., 2012) |  |  |
|  | Invertebrates | *Paracentrotus lividus* | NOEC | 100000 | (Carballeira et al., 2012) |  |  |
| **Doxycycline**  | Plant | *Lemna gibba* | NOEC | 100 | (Brain et al., 2004) | 0.1 | NOEC(Plant), AF=1000 |
| **Penicillin** | Algae | *Pseudokirchneriella subcapitata* | NOEC | 100000 | (Halling-Sorensen, 2000) | 100 | NOEC(Algae), AF=1000 |
|  | Algae | *Selenastrum capricornutum* | NOEC | 1000000 | (Halling-Sorensen, 2000) |  |  |
| **Roxithromycin** | Algae | *P. subcapitata* | NOEC | 10 | (Yang et al., 2008) | 0.02 | NOEC(Algae), AF=500 |
|  | Plant | *Lemna gibba* | NOEC | 1000 | (Brain et al., 2004) |  |  |

Table S3 Concentrations (ng/L) and recoveries of antibiotics and limits of detection (LOD).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Mean  | Min  | Max  | Det. freq. (%) | Recovery (%) | LOD (ng/L) |
| AMX | Summer | 2.2 | ND | 5.5 | 60 | 93 | 0.06 |
| Winter | 4.1 | ND | 11.6 | 80 | 97 | 0.10 |
| AMP | Summer | - | ND | ND | 0 | 86 | 0.24 |
| Winter | 0.3 | ND | 0.4 | 90 | 98 | 0.04 |
| PNC | Summer | 2.2 | ND | 5.1 | 50 | 94 | 0.52 |
| Winter | 1.4 | ND | 2.3 | 80 | 96 | 0.36 |
| CIP | Summer | - | ND | ND | 0 | 89 | 0.18 |
| Winter | 2.3 | 1.3 | 2.8 | 100 | 99 | 0.21 |
| ENR | Summer | - | ND | ND | 0 | 91 | 0.31 |
| Winter | 6.6 | ND | 10.4 | 70 | 96 | 0.19 |
| OFL | Summer | 5.7 | 4.3 | 15.3 | 100 | 101 | 0.23 |
| Winter | 0.7 | ND | 0.5 | 80 | 94 | 0.04 |
| SMX | Summer | 6.7 | 1.9 | 17.5 | 100 | 91 | 0.26 |
| Winter | 6.2 | 1.7 | 18.2 | 100 | 98 | 0.48 |
| TMP | Summer | - | ND | ND | 0 | 93 | 0.64 |
| Winter | 2.2 | 0.5 | 5 | 100 | 97 | 0.16 |
| DOX | Summer | 3.3 | 2.3 | 3.7 | 100 | 94 | 0.07 |
| Winter | 0.6 | 0.1 | 1.3 | 100 | 96 | 0.03 |
| OTC | Summer | 20.9 | ND | 200.9 | 30 | 86 | 0.11 |
| Winter | 129.1 | 25.5 | 252.2 | 100 | 94 | 0.37 |
| TC | Summer | 6.2 | 3.0 | 11.8 | 100 | 92 | 0.36 |
| Winter | 4.8 | 1.3 | 17.2 | 100 | 93 | 0.20 |
| ERY | Summer | - | ND | ND | 0 | 82 | 0.39 |
| Winter | 0.3 | ND | 0.4 | 90 | 92 | 0.09 |
| ROX | Summer | - | ND | ND | 0 | 82 | 0.77 |
| Winter | - | ND | ND | 0 | 80 | 0.52 |

ND, Not Detected.

Table S4 Resistance risk quotients of antibiotics in the Bohai Bay.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Antibiotics | Season | Mean  | Min  | Max  |
| AMX | Summer | 8.7E-03 | 0.0E+00 | 2.2E-02 |
| Winter | 1.3E-02 | 0.0E+00 | 4.6E-02 |
| AMP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 9.3E-04 | 0.0E+00 | 1.6E-03 |
| PNC | Summer | 8.8E-03 | 0.0E+00 | 2.0E-02 |
| Winter | 4.6E-03 | 0.0E+00 | 9.0E-03 |
| CIP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 3.6E-02 | 2.1E-02 | 4.4E-02 |
| ENR | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 7.2E-02 | 0.0E+00 | 1.6E-01 |
| OFL | Summer | 1.1E-02 | 8.7E-03 | 3.1E-02 |
| Winter | 1.1E-03 | 0.0E+00 | 6.8E-03 |
| SMX | Summer | 4.2E-04 | 1.2E-04 | 1.1E-03 |
| Winter | 3.9E-04 | 1.1E-04 | 1.1E-03 |
| TMP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 4.3E-03 | 1.1E-03 | 1.0E-02 |
| DOX | Summer | 1.6E-03 | 1.2E-03 | 1.8E-03 |
| Winter | 3.2E-04 | 6.7E-05 | 6.7E-04 |
| OTC | Summer | 4.2E-02 | 0.0E+00 | 4.0E-01 |
| Winter | 2.6E-01 | 5.1E-02 | 5.3E-01 |
| TC | Summer | 6.2E-03 | 3.0E-03 | 1.2E-02 |
| Winter | 4.8E-03 | 1.3E-03 | 1.7E-02 |
| ERY | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 2.9E-04 | 0.0E+00 | 4.0E-04 |
| ROX | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 0.0E+00 | 0.0E+00 | 0.0E+00 |

Table S5 Concentrations of antibiotics in coastal waters of the China Seas (ng/L).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Coastal area in China | AMP | AMX | PNC | CIP | ENR | OFL | SMX | References |
| min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max n | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) |
| (Jia et al., 2011) | -b | - | - | - | - | - | - | - | - | - | - | - | 4.3/30.6/76.9/ | 100.0 | (Jia et al., 2011) |
| This study | ND | 60.0 | ND/3.6/5.5 | 0 | ND/4.4/5.1 | 50.0 | ND/ND/ND | 0 | ND/ND/ND | 0 | 4.3/5.7/15.3 | 100.0 | 1.9/6.7/17.5 | 100.0 | This study |
| (Zhang et al., 2012) | - | - | - | - | - | - | ND/44.2/66.1 | 71.4 | ND/ND/ND/ | 0 | ND/18.5/33.9 | 42.9 | 25.0/112.6/329.5 | 100.0 | (Zhang et al., 2012) |
| (Zhang et al., 2013) | - | - | - | - | - | -- | - | - | -- | - | - | - | 0.2/0.3/0.6 | 100.0 | (Zhang et al., 2013) |
| (Zhang et al., 2013) | - | - | - | - | - | - | - | - | - | - | - | - | 0.2/0.8/1.4 | 80.0 | (Zhang et al., 2013) |
| (Du et al., 2017) | ND/7.7/48.1 | 56.7 | 1.4/7.2/95.8 | 100.0 | ND/0.4/11.8 | 3.3 | ND/7.2/121.2 | 33.3 | ND/25.4/497.6 | 26.7 | - | - | - | - | (Du et al., 2017) |
| (Yan et al., 2013) | - | - | - | - | - | - | ND | 0 | ND | 0 | ND | 0 | 1.5/17.6 /28.5 | 100.0 | (Yan et al., 2013) |
| (Minh et al., 2009) | - | - | 0.6/16.0/76.0 | 90.0 | - | - | 6.1/74.0/504.0 | 100.0 | - | - | 8.1/156.0/1140.0 | 100.0 | 0.6/13.0/47.0 | 100.0 | (Minh et al., 2009) |
| (Chen et al., 2015) | - | - | - | - | - | - | -/5.3/187.0 | 13.2 | -/2.0/56.7 | 23.7 | -/0.8/13.7 | 55.3 | -/1.3/6.2 | 76.3 | (Chen et al., 2015) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | TMP | DOX | OTC | TC | ERY | ROX | References |
| Coastal area in China | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) | min/mean/max | Frq(%) |
| Liaodong Bay | 3.5/7.9/10.2 | 100.0 | - | - | - | - | - | - | - | - | - |  | (Jia et al., 2011) |
| Bohai Bay (In Summer) | ND/ND/ND/ | 0 | 2.6/3.3/3.7 | 100.0 | ND/69.8/200.9 | 30.0 | 3/6.2/11.8 | 100.0 | ND | 0 | ND | 0 | This study |
| Laizhou Bay | 9.5/100.0/329.5 | 100.0 | - | 0 | - | 0 | - | 0 | 1.8/5.0/8.5 | 100.0 | <LOQ1.31/1.5 | 37.5 | (Zhang et al., 2012) |
| North Yellow Sea  | 0.4/0.5/1.1 | 100.0 | - | - | - | - | - | - | 0.30.3/0.5 | 100.0 | <LOQ | 0 | (Zhang et al., 2013) |
| South Yellow Sea  | <LOQ0.3/0.6 | 100.0 | - | - | - | - | - | - | 0.2/0.3/0.4 | 100.0 | <LOQ | 0 | (Zhang et al., 2013) |
| Yellow Sea(Yancheng Area) | - | - | - | - | - | - | - | - | ND/0.5/1.7 | 70.0 | ND/2.7/77.1 | 13.3 | (Du et al., 2017) |
| East China and Yangtze Estuary (In July) | - | - | ND | 0 | ND | 0 | ND | 0 | <LOQ0.8/4.5 | 100.0 | 0.2/0.4/8.2 | 100.0 | (Yan et al., 2013) |
| Victoria Habour | 2.6/52.0/216.0 | 50.0 | - | - | 16.0/30.0/44.0 | 10.0 | 13.0/118.0/313.0 | 30.0 | 4.7/213.0/1730.0 | 100.0 | 5.5/19.0/47 | 35.0 | (Minh et al., 2009) |
| Hailing Bay | -/4.24/36.9 | 100.0 | - | - | -/417.8/15163.0 | 23.7 | -/78.5/2305.0 | 15.8 | -/18.5/183.0 | 94.7 | - | - | (Chen et al., 2015) |

Frq: Frequency

ND: Not Detected

“ - “: Not Analyzed

Table S6 Ecological risk quotients of antibiotics in the Bohai Bay.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Antibiotics | Season | Mean  | Min  | Max  |
| AMX | Summer | 3.8E-05 | 0.0E+00 | 9.7E-05 |
| Winter | 5.7E-05 | 0.0E+00 | 2.0E-04 |
| AMP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 2.3E-03 | 0.0E+00 | 4.0E-03 |
| PNC | Summer | 2.2E-05 | 0.0E+00 | 5.1E-05 |
| Winter | 1.2E-05 | 0.0E+00 | 2.3E-05 |
| CIP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 2.3E+00 | 1.3E+00 | 2.8E+00 |
| ENR | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 7.7E+00 | 0.0E+00 | 1.7E+01 |
| OFL | Summer | 2.6E-02 | 2.0E-02 | 6.9E-02 |
| Winter | 2.5E-03 | 0.0E+00 | 1.5E-02 |
| SMX | Summer | 6.2E-03 | 1.7E-03 | 1.6E-02 |
| Winter | 5.7E-03 | 1.6E-03 | 1.7E-02 |
| TMP | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 9.0E-04 | 2.2E-04 | 2.1E-03 |
| DOX | Summer | 3.3E-02 | 2.3E-02 | 3.7E-02 |
| Winter | 6.5E-03 | 1.3E-03 | 1.3E-02 |
| OTC | Summer | 1.2E-02 | 0.0E+00 | 1.1E-01 |
| Winter | 7.3E-02 | 1.5E-02 | 1.5E-01 |
| TC | Summer | 3.9E-03 | 1.9E-03 | 7.5E-03 |
| Winter | 3.0E-03 | 8.0E-04 | 1.1E-02 |
| ERY | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 5.9E-04 | 0.0E+00 | 8.0E-04 |
| ROX | Summer | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Winter | 0.0E+00 | 0.0E+00 | 0.0E+00 |

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