

# **Integrated assessment of ecological quality combining biological and environmental data in the Yellow River Estuary**

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**Table S1.** Environmental factors.

Environmental factors		S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13
	Depth (m)	2.85±0.26	7.73±3.30	5.1±1.57	13.35±0.5 5	10.53±0.9 1	12.73±3.8 8	5.58±5.28	14.48±1.1 5	13.43±0.9 2	15.85±0.5 8	17.73±0.9 1	2.88±0.1	5.15±0.72
	Salinity	17.88±4.4 3	25.97±1.6 0	29.12±1.8 2	28.65±0.8 2	26.82±2.3 5	29.80±0.8 8	25.86±2.6 5	29.98±2.3 2	30.93±0.4 0	29.45±1.3 9	31.00±0.8 6	27.48±4.39	24.17±2.1 8
	Temperature (°C)	28.25±0.8 3	27.03±2.1 1	26.25±0.3 7	27.20±0.9 9	27.48±0.7 2	26.73±0.7 9	27.63±1.3 5	25.78±0.6 1	25.80±0.5 4	25.50±0.7 6	24.23±1.1 5	25.43±1.02	27.80±1.0 3
	pH	8.17±0.06	8.12±0.08	8.06±0.10	8.16±0.14	8.18±0.10	8.07±0.04	8.16±0.15	8.03±0.13	8.02±0.10	8.06±0.07	7.97±0.14	8.05±0.07	8.20±0.10
	DO (mg/L)	8.09±3.40	6.26±0.79	6.33±1.12	5.73±2.22	6.47±1.59	4.89±1.58	6.76±2.33	4.24±1.13	4.80±0.72	4.50±1.01	4.00±1.42	6.61±1.03	7.06±1.01
	Chl a (ug/L)	11.2±15.4	5.7±4.0	3.1±1.4	4.1±2.5	3.2±1.0	2.1±0.5	4.4±1.4	3.3±2.8	1.8±0.9	3.1±1.0	2.0±0.4	5.3±3.9	7.0±5.7
	Sand (%)	43.41±8.2 0	30.64±1.4 8	20.48±15. 84	6.07±4.08	2.50±2.01	6.95±3.10	39.16±11. 88	17.71±11. 43	18.80±18. 47	28.55±31. 76	13.06±5.4 3	19.93±10.4 8	3.37±2.30
	Mud (%)	56.59±8.2 0	69.36±1.4 8	79.52±15. 84	93.93±4.0 8	97.5±2.01	93.05±3.1 0	60.84±11. 88	82.29±11. 43	81.20±18. 47	71.45±31. 76	86.94±5.4 3	80.07±10.4 8	96.63±2.3 0
	PO <sub>4</sub> -P (mg/L)	0.002±0.0 006	0.001±0.0 005	0.001±0.0 007	0.001±0.0 002	0.002±0.0 005	0.001±0.0 003	0.001±0.0 006	0.002±0.0 016	0.002±0.0 007	0.002±0.0 005	0.001±0.0 016	0.001±0.00 05	0.002±0.0 009
	NO <sub>3</sub> -N (mg/L)	0.85±0.34	0.35±0.14	0.17±0.02	0.15±0.10	0.26±0.25	0.09±0.06	0.30±0.15	0.14±0.08	0.12±0.01	0.15±0.06	0.08±0.04	0.10±0.07	0.38±0.27
	NH <sub>4</sub> -N (mg/L)	0.17±0.11	0.04±0.02	0.02±0.01	0.04±0.01	0.06±0.04	0.06±0.03	0.03±0.02	0.02±0.02	0.02±0.01	0.06±0.03	0.02±0.03	0.02±0.01	0.07±0.05

	NO <sub>2</sub> -N (mg/L)	0.13±0.05	0.05±0.05	0.04±0.03	0.02±0.01	0.03±0.02	0.02±0.02	0.04±0.02	0.04±0.01	0.03±0.01	0.02±0.01	0.04±0.03	0.02±0.03	0.06±0.04
	COD (mg/L)	1.64±0.33	1.53±0.35	1.48±0.29	1.55±0.20	1.48±0.20	1.49±0.24	1.40±0.15	1.21±0.20	1.32±0.38	1.46±0.10	1.33±0.59	1.55±0.08	1.59±0.24
	Organic matter (%)	0.19±0.05	0.23±0.08	0.23±0.14	0.37±0.04	0.35±0.15	0.31±0.03	0.14±0.05	0.24±0.09	0.29±0.12	0.31±0.15	0.23±0.08	0.24±0.09	0.37±0.15
	Q <sub>50</sub> (mm)	4.16±0.21	4.44±0.08	4.70±0.48	5.33±0.67	5.58±0.58	5.21±0.41	4.22±0.27	5.01±0.85	5.11±0.97	4.68±1.08	4.14±0.84	4.75±0.56	4.65±1.29
Diversity indices	Species number	25±12.19	18.5±8.54	13.5±3.42	17.75±6.0 8	21±4.97	18.75±8.5 8	18.25±4.5 0	17.5±9.75	14.25±10. 63	18.5±3.70	22.25±4.3 5	13.5±7.23	21.75±7.2 7
	Abundan ce (ind./m <sup>2</sup> )	192.5±13 8.66	78±38.50	59.4±61.1 8	46.75±20. 65	74±24.51	64.25±37. 21	84.25±40. 80	68±75.64	93.75±14 5.84	82.25±48. 36	88.5±51.0 6	125.75±12 9.27	410.5±62 3.89
	H'	3.68±0.60	3.24±0.78	2.90±0.51	3.55±0.45	3.58±0.88	3.44±0.47	3.29±0.48	3.46±0.36	3.14±0.38	3.26±1.18	3.91±0.36	2.52±1.03	2.73±1.72
	J	0.84±0.07	0.78±0.06	0.79±0.15	0.88±0.06	0.81±0.16	0.84±0.06	0.79±0.11	0.89±0.08	0.90±0.13	0.77±0.25	0.88±0.06	0.68±0.19	0.61±0.36
	d	6.79±1.19	4.89±1.48	2.93±0.42	4.23±0.38	4.72±1.23	4.94±1.82	4.07±1.15	4.61±2.33	4.02±2.66	3.37±0.72	4.89±1.14	3.47±1.76	5.00±1.24
	D	0.89±0.03	0.83±0.08	0.79±0.09	0.88±0.04	0.84±0.16	0.86±0.04	0.85±0.06	0.89±0.01	0.86±0.04	0.79±0.25	0.91±0.03	0.70±0.24	0.65±0.40

**Table S2.** Macrobenthos community abundance at 13 sampling stations in the Yellow River Estuary from 2019 to 2022

**2019**

PHYLUM	CLASS	ORDER	FAMILY	SPECIES	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13
Arthropoda	Acetes	Sergestidae	Decapoda	<i>Acetes chinensis</i>	0	0	0	40	0	0	0	0	0	0	0	0	0
Mollusca	Actaeopyramis	Pyramidellidae	Entomotaeniata	<i>Actaeopyramis eximia</i>	0	0	0	0	20	0	0	0	0	0	0	0	0
Annelida	Aglaophamus	Nephtyidae	Phyllodocida	<i>Aglaophamus sinensis</i>	0	0	0	0	0	0	0	0	0	20	0	0	0
Annelida	Amaeana	Terebellidae	Terebellida	<i>Amaeana occidentalis</i>	0	0	0	0	0	0	0	0	0	0	0	0	80
Arthropoda	Ampelisca	Ampeliscidae	Amphipoda	<i>Ampelisca bocki</i>	0	0	0	0	20	0	0	0	0	0	0	0	20
Arthropoda	Ampelisca	Ampeliscidae	Amphipoda	<i>Ampelisca brevicornis</i>	20	0	0	60	20	0	0	0	0	0	0	0	0
Annelida	Aricidea	Paraonidae	Orbiniida	<i>Aricidea fragilis</i>	40	0	20	20	300	0	60	0	60	80	0	0	40
Arthropoda	Caprella	Caprellidae	Amphipoda	<i>Caprellaequilibras</i>	0	0	0	0	0	0	20	0	0	0	0	0	0
Annelida	Chaetozone	Cirratulidae	Terebellida	<i>Chaetozone setosa</i>	0	0	0	0	0	80	20	0	0	20	20	0	20
Annelida	Chone	Sabellidae	Sabellida	<i>Chone infundibuliformis</i>	0	0	20	0	0	0	0	0	0	0	0	0	0
Mollusca	Cingulina	Pyramidellidae	Entomotaeniata	<i>Cingulina cingulata</i>	0	0	0	0	0	0	0	0	0	0	40	0	0
Mollusca	Decorifera	Acteocinidae	Cephalaspidea	<i>Decorifera</i>	0	0	0	0	0	0	0	0	0	60	0	0	0

				<i>matusimana</i>													
Annelida	Diopatra	Onuphidae	Eunicida	<i>Diopatra chiliensis</i>	0	0	0	0	0	20	0	0	0	0	0	0	0
Mollusca	Others	Others	Others	<i>Endopleura lubrica</i>	0	0	0	0	40	0	0	20	0	80	20	0	0
Mollusca	Eocylichna	Cylichnidae	Cephalaspidea	<i>Eocylichna braunsi</i>	0	0	0	0	0	0	40	0	0	0	0	0	0
Mollusca	Eocylichna	Triclididae	Cephalaspidea	<i>Eocylichna involuta</i>	20	0	0	0	0	0	0	0	0	0	0	0	0
Mollusca	Eulima	Eulimidae	Littorinimorpha	<i>Eulima maria</i>	0	0	0	0	40	0	0	0	40	60	60	0	0
Annelida	Eurythoe	Amphinomidae	Amphinomida	<i>Eurythoe parvecarunculata</i>	0	0	0	0	0	0	0	0	0	0	40	0	0
Mollusca	Ferussaciidae	Ferussaciidae	Stylommatophora	<i>Ferussaciidae</i>	0	0	100	0	0	0	40	0	0	0	0	0	460
Annelida	Gattyana	Polynoidae	Phyllodocida	<i>Gattyana pohaiensis</i>	0	0	0	0	0	0	0	0	0	0	0	20	0
Annelida	Goniada	Goniadidae	Phyllodocida	<i>Goniada maculata</i>	80	20	0	40	20	20	40	60	40	180	220	0	0
Annelida	Haploscoloplos	Orbiniidae	Orbiniida	<i>Haploscoloplos elongatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	20
Annelida	Harmothoe	Polynoidae	Phyllodocida	<i>Harmothoe imbricata</i>	0	0	20	0	0	0	0	0	0	20	0	20	0
Arthropoda	Hemileucon	Leuconidae	Cumacea	<i>Hemileucon bidentatus</i>	0	20	0	0	0	0	0	0	0	0	0	0	0
Annelida	Heteromastus	Capitellidae	Capitellida	<i>Heteromastus</i>	60	440	0	80	60	60	20	60	20	0	40	120	0

[illegible]

				<i>californiensis</i>													
Annelida	Nephtys	Nephtyidae	Phyllodocida	<i>Nephtys oligobranchia</i>	0	0	0	0	0	0	40	0	0	0	0	0	0
Mollusca	Neverita	Naticidae	Littorinimorpha	<i>Neverita didyma</i>	0	20	0	0	0	0	0	0	0	20	20	20	0
Arthropoda	Nihonotrypaea	Callianassidae	Decapoda	<i>Nihonotrypaea japonica</i>	0	0	0	0	0	0	20	0	0	0	0	0	0
Mollusca	Nucula	Nuculidae	Nuculida	<i>Nucula faba</i>	0	0	0	0	0	0	100	20	0	0	0	0	0
Arthropoda	Ogyrides	Ogyrididae	Decapoda	<i>Ogyrides orientalis</i>	20	200	0	0	0	0	0	0	0	0	0	0	0
Annelida	Ophiodromus	Hesionidae	Phyllodocida	<i>Ophiodromus angustifrons</i>	0	0	20	0	40	0	40	20	20	40	20	0	20
Annelida	Paralacydonia	Paralacydoniidae	Phyllodocida	<i>Paralacydonia paradoxa</i>	0	0	0	0	20	0	0	0	0	0	0	0	0
Plathelminthes	Paraplanocera	Planoceridae	Polycladida	<i>Paraplanocera reticulata</i>	0	0	0	0	0	0	0	0	0	60	20	20	0
Annelida	Phyllodoce	Phyllodocidae	Phyllodocida	<i>Phyllodoce papillosa</i>	0	0	0	0	0	0	0	0	0	0	20	0	20
Annelida	Prionospio	Spionidae	Spionida	<i>Prionospio sp.</i>	40	300	20	0	160	0	0	100	0	0	0	0	0
Nemertea	Procephalothrix	Cephalotrichidae	Archinemertea	<i>Procephalothrix sp.</i>	0	40	0	0	0	0	40	0	0	20	0	20	0
Echinodermata	Protankyra	Synaptidae	Apodida	<i>Protankyra bidentata</i>	0	0	20	0	0	0	0	0	0	60	0	60	0
Mollusca	Raetellops	Anatinellidae	Venerida	<i>Raetellops pulchella</i>	0	0	0	0	140	40	0	0	20	20	0	80	0
Mollusca	Ringicula	Ringiculidae	Cephalaspidea	<i>Ringicula doliaris</i>	0	0	0	0	0	20	0	20	0	40	60	0	0

Annelida	Sigambra	Pilargidae	Phyllodocida	<i>Sigambra bassi</i>	0	0	40	20	40	0	60	20	0	200	80	0	40
Mollusca	Siliqua	Pharidae	Adapedonta	<i>Siliqua minima</i>	0	0	0	0	0	40	0	0	0	0	0	0	0
Mollusca	Sinonovacula	Pharidae	Adapedonta	<i>Sinonovacula constricta</i>	0	0	0	0	40	0	0	20	0	0	0	0	0
Annelida	Sternaspis	Sternaspidae	Terebellida	<i>Sternaspis scutata</i>	0	0	0	20	60	0	80	0	0	20	120	0	60
Annelida	Sthenolepis	Sigalionidae	Phyllodocida	<i>Sthenolepis japonica</i>	0	0	0	0	0	40	0	0	0	0	280	0	0
Mollusca	Terebra	Terebridae	Neogastropoda	<i>Terebra tantilla</i>	0	0	0	20	40	0	0	0	0	0	40	0	0
Mollusca	Theora	Semelidae	Cardiida	<i>Theora lata</i>	0	0	0	0	0	0	0	0	0	0	0	40	0
Mollusca	Trigonothracia	Thraciidae	Pholadomyoida	<i>Trigonothracia jinxingae</i>	0	0	0	0	0	0	00	0	0	0	0	0	20
Mollusca	Yokoyamaia	Philinidae	Cephalaspidea	<i>Yokoyamaia acutangula</i>	0	0	0	0	60	0	20	60	0	80	140	0	0

## 2020

PHYLUM	CLASS	ORDER	FAMILY	SPECIES	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13
Arthropoda	Acetes	Sergestidae	Decapoda	<i>Acetes chinensis</i>	0	10	20	0	0	0	0	0	0	0	0	0	0
Annelida	Aglaophamus	Nephtyidae	Phyllodocida	<i>Aglaophamus sinensis</i>	0	0	0	0	0	30	0	0	10	0	20	0	0
Mollusca	Alveinus	Kelliellidae	Venerida	<i>Alveinus ojanus</i>	0	0	0	0	0	0	0	0	0	0	50	0	0
Annelida	Amaeana	Terebellidae	Terebellida	<i>Amaeana occidentalis</i>	35	10	10	10	0	0	0	0	0	10	0	0	0
Arthropoda	Ampelisca	Ampeliscidae	Amphipoda	<i>Ampelisca</i>	215	10	10	0	0	0	5	0	0	0	30	0	20



				<i>brevicornis</i>													
Echinodermata	Amphioplus	Amphiuridae	Amphilepidida	<i>Amphioplus japonicus</i>	0	0	0	0	0	0	0	0	0	0	20	0	0
Annelida	Aricidea	Paraonidae	Orbiniida	<i>Aricidea fragilis</i>	180	10	0	0	0	0	10	10	0	0	0	0	20
Annelida	Cabira	Pilargidae	Phyllodocida	<i>Cabira pilargiformis</i>	10	0	0	0	10	0	0	0	0	0	0	0	0
Mollusca	Others	Capulidae	Littorinimorph a	<i>Capulidae</i>	0	0	10	0	0	0	0	0	0	0	0	0	0
Annelida	Chaetozone	Cirratulidae	Terebellida	<i>Chaetozone setosa</i>	70	0	0	0	0	0	0	0	0	0	0	0	25
Chordata	Ctenotrypauchen	Gobiidae	Gobiiiformes	<i>Ctenotrypauchen chinensis</i>	0	0	0	0	0	10	0	0	0	0	0	0	0
Mollusca	Cultellus	Pharidae	Adapedonta	<i>Cultellus attenuatus</i>	0	0	0	0	15	0	0	0	0	0	0	0	0
Annelida	Diopatra	Onuphidae	Eunicida	<i>Diopatra chiliensis</i>	0	0	10	0	0	0	0	0	0	0	0	0	0
Echinodermata	Echinocardium	Loveniidae	Spatangoida	<i>Echinocardium cordatum</i>	0	0	0	10	0	0	0	0	0	0	0	0	0
Mollusca	Others	Others	Others	<i>Endopleura lubrica</i>	0	0	0	10	15	0	0	0	0	70	40	0	0
Mollusca	Eocylichna	Cylichnidae	Cephalaspidea	<i>Eocylichna braunsi</i>	0	0	0	0	0	0	0	0	0	10	0	0	5
Arthropoda	Eriopisella	Eriopisidae	Amphipoda	<i>Eriopisella sechellensis</i>	80	0	0	0	0	0	0	0	0	0	0	0	0
Mollusca	Eulima	Eulimidae	Littorinimorph a	<i>Eulima maria</i>	0	0	0	0	0	0	0	0	0	30	0	0	0
Mollusca	Ferussaciidae	Ferussaciidae	Stylommatoph ora	<i>Ferussaciidae</i>	0	0	0	110	0	10	0	0	0	0	0	0	10

Arthropoda	Others	Others	Amphipoda	<i>Gammaridea</i>	15	0	0	0	0	0	0	0	0	0	20	0	0
Arthropoda	Gammaropsis	Photidae	Amphipoda	<i>Gammaropsis utinonii</i>	0	0	50	0	0	0	0	0	0	0	0	0	0
Annelida	Glycera	Glyceridae	Phyllodocida	<i>Glycera chirori</i>	0	0	10	0	0	0	0	0	0	0	0	0	0
Annelida	Glycera	Glyceridae	Phyllodocida	<i>Glycera subaenea</i>	0	0	0	0	0	0	5	0	0	0	0	0	0
Annelida	Goniada	Goniadidae	Phyllodocida	<i>Goniada maculata</i>	90	0	0	0	10	10	45	0	0	0	0	0	5
Mollusca	Guraleus	Mangeliidae	Neogastropoda	<i>Guraleus deshayesii</i>	0	0	0	0	0	0	0	0	0	10	0	0	0
Annelida	Haploscoloplos	Orbiniidae	Orbiniida	<i>Haploscoloplos elongatus</i>	0	0	30	0	0	0	5	0	0	0	0	0	0
Annelida	Harmothoe	Polynoidae	Phyllodocida	<i>Harmothoe imbricata</i>	25	0	0	0	0	0	0	0	0	10	10	20	0
Annelida	Heteromastus	Capitellidae	Capitellida	<i>Heteromastus filiformis</i>	125	100	10	10	0	0	160	20	0	10	30	10	0
Annelida	Lagis	Pectinariidae	Terebellida	<i>Lagis neapolitana</i>	20	0	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Leptochela	Pasiphaeidae	Decapoda	<i>Leptochela gracilis</i>	0	0	0	10	5	0	5	0	0	10	20	0	0
Mollusca	Leptomya	Semelidae	Cardiida	<i>Leptomya minuta</i>	0	0	0	0	0	0	0	0	10	0	0	0	0
Nemertea	Lineus	Lineidae	Heteronemertea	<i>Lineus sp.</i>	25	30	0	30	20	10	0	10	10	10	20	20	30
Annelida	Linopherus	Amphinomidae	Amphinomida	<i>Linopherus ambigua</i>	0	10	0	10	25	0	0	10	0	10	0	0	10
Annelida	Listriolobus	Thalassematidae	Echiuroidea	<i>Listriolobus brevirostris</i>	5	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Loimia	Terebellidae	Terebellida	<i>Loimia medusa</i>	0	10	0	0	5	0	0	0	0	10	0	0	0
Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris</i>	0	0	0	0	0	0	0	30	10	0	0	0	0

				<i>cruzensis</i>													
Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris tetraura</i>	0	0	0	0	5	0	0	0	0	0	0	0	0
Annelida	Magelona	Magelonidae	Spionida	<i>Magelona japonica</i>	5	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Micropodarke	Hesionidae	Phyllodocida	<i>Micropodarke dubia</i>	20	0	0	10	0	0	0	0	0	0	20	0	0
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella iridescens</i>	0	20	0	0	0	0	60	0	0	0	10	0	0
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella jedoensis</i>	40	0	0	10	0	20	20	0	0	0	50	0	0
Mollusca	Musculus	Mytilidae	Mytilida	<i>Musculus senhousia</i>	15	0	0	0	0	0	10	0	0	0	0	0	652
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius succinctus</i>	0	0	0	0	0	10	15	0	0	20	0	0	0
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius variciferus</i>	0	0	0	0	5	110	5	0	0	30	0	0	0
Annelida	Nectoneanthes	Nereididae	Phyllodocida	<i>Nectoneanthes oxy-poda</i>	0	0	20	0	5	0	0	0	0	0	10	0	5
Annelida	Nephtys	Nephtyidae	Phyllodocida	<i>Nephtys caeca</i>	35	0	0	10	0	0	5	0	0	0	0	0	0
Mollusca	Neverita	Naticidae	Littorinimorpha	<i>Neverita didyma</i>	30	0	0	0	5	10	0	0	10	0	0	0	5
Arthropoda	Nihonotrypaea	Callianassidae	Decapoda	<i>Nihonotrypaea japonica</i>	0	0	0	40	0	0	0	0	0	0	0	0	0
Mollusca	Nucula	Nuculidae	Nuculida	<i>Nucula faba</i>	0	0	0	10	35	0	0	0	0	0	20	0	0
Mollusca	Odostomia	Pyramidellidae	Entomotaeniata	<i>Odostomia subangulata</i>	0	0	0	0	0	0	0	0	10	0	0	0	0

Arthropoda	Ogyrides	Ogyrididae	Decapoda	<i>Ogyrides orientalis</i>	0	0	0	0	0	0	70	0	0	0	0	0	0
Annelida	Ophiodromus	Hesionidae	Phyllodocida	<i>Ophiodromus angustifrons</i>	0	0	0	0	0	0	0	0	0	0	0	0	5
Echinodermata	Ophiura	Ophiuridae	Ophiurida	<i>Ophiura kinbergi</i>	0	0	0	0	0	20	0	0	0	0	0	0	0
Annelida	Owenia	Oweniidae	Oweniida	<i>Owenia fusiformis</i>	40	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Paraleonnates	Nereididae	Phyllodocida	<i>Paraleonnates uschakovi</i>	0	0	40	0	0	0	0	0	0	0	0	0	0
Arthropoda	Paranthura	Paranthuridae	Isopoda	<i>Paranthura japonica</i>	10	0	0	0	0	0	0	0	0	0	10	0	0
Plathhelminthes	Paraplanocera	Planoceridae	Polycladida	<i>Paraplanocera reticulata</i>	0	0	0	0	0	0	0	0	0	0	10	0	0
Annelida	Paraprionospio	Spionidae	Spionida	<i>Paraprionospio pinnata</i>	0	0	0	0	0	0	0	10	0	0	0	0	0
Annelida	Paraprionospio	Spionidae	Spionida	<i>Paraprionospio sp.</i>	0	0	0	0	0	0	60	0	10	0	0	0	0
Arthropoda	Philyra	Leucosiidae	Decapoda	<i>Philyra pisum</i>	5	10	0	0	0	0	0	0	0	0	0	0	5
Annelida	Phyllochaetopterus	Chaetopteridae	Spionida	<i>Phyllochaetopterus clapedii</i>	65	20	0	140	290	0	0	0	0	20	0	0	5
Annelida	Phyllodoce	Phyllodocidae	Phyllodocida	<i>Phyllodoce papillosa</i>	0	10	0	0	0	0	5	0	0	0	0	0	0
Echinodermata	Protankyra	Synaptidae	Apodida	<i>Protankyra bidentata</i>	40	0	0	0	0	0	10	0	0	80	0	0	0
Annelida	Pseudopolydora	Spionidae	Spionida	<i>Pseudopolydora kemp</i>	0	0	10	20	0	0	0	0	10	0	0	20	5
Mollusca	Pseudopythina	Lasaeidae	Galeommatida	<i>Pseudopythina</i>	0	0	0	0	0	0	0	0	0	90	10	0	0

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Mollusca	Raetellops	Anatinellidae	Venerida	<i>Raetellops pulchella</i>	5	20	10	0	15	30	0	0	10	20	30	0	0
Mollusca	Ringicula	Ringiculidae	Cephalaspidea	<i>Ringicula doliaris</i>	0	120	30	40	0	320	0	0	20	30	0	270	0
Mollusca	Ruditapes	Veneridae	Venerida	<i>Ruditapes philippinarum</i>	0	0	0	0	0	0	5	0	0	0	0	0	0
Annelida	Sigambra	Pilargidae	Phyllodocida	<i>Sigambra bassi</i>	30	0	0	20	0	0	0	0	0	0	0	0	20
Mollusca	Siliqua	Pharidae	Adapedonta	<i>Siliqua minima</i>	0	0	0	0	0	0	0	10	20	0	0	0	0
Mollusca	Solen	Solenidae	Adapedonta	<i>Solen dunkerianus</i>	0	0	0	0	0	20	0	0	0	40	10	0	0
Annelida	Sternaspis	Sternaspidae	Terebellida	<i>Sternaspis scutata</i>	15	0	0	10	0	60	0	20	0	0	0	0	30
Annelida	Sthenolepis	Sigalionidae	Phyllodocida	<i>Sthenolepis japonica</i>	0	0	0	30	0	0	0	0	0	0	0	0	0
Mollusca	Terebra	Terebridae	Neogastropoda	<i>Terebra tantilla</i>	0	100	0	0	0	90	0	0	0	140	0	0	0
Mollusca	Theora	Semelidae	Cardiida	<i>Theora lata</i>	0	0	10	0	0	130	0	20	0	80	0	0	0

## 2021

PHYLUM	CLASS	ORDER	FAMILY	SPECIES	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13
Annelida	Aglaophamus	Nephtyidae	Phyllodocida	<i>Aglaophamus sinensis</i>	0	0	0	0	10	0	0	0	0	0	0	0	0
Mollusca	Alveinus	Kelliellidae	Venerida	<i>Alveinus ojanus</i>	0	0	0	0	0	0	0	0	0	0	0	350	0
Annelida	Amaeana	Terebellidae	Terebellida	<i>Amaeana occidentalis</i>	210	0	7	10	0	0	0	0	0	0	0	50	90
Arthropoda	Ampelisca	Ampeliscidae	Amphipoda	<i>Ampelisca brevicornis</i>	110	0	0	0	0	0	0	0	0	0	0	40	50
Arthropoda	Ampelisca	Ampeliscidae	Amphipoda	<i>Ampelisca cyclops</i>	0	5	0	0	0	0	0	10	0	0	0	0	0

Annelida	Ampharete	Ampharetidae	Terebellida	<i>Ampharete acutifrons</i>	0	0	0	10	10	0	0	0	0	0	0	0	0
Annelida	Aricidea	Paraonidae	Orbiniida	<i>Aricidea fragilis</i>	0	15	0	30	0	40	0	100	100	10	70	0	0
Annelida	Aricidea	Paraonidae	Orbiniida	<i>Aricidea sp.</i>	0	50	0	30	20	0	3	0	0	20	30	0	290
Annelida	Cabira	Pilargidae	Phyllodocida	<i>Cabira pilargiformis</i>	10	0	0	0	0	0	0	0	0	0	0	0	20
Arthropoda	Campylaspis	Nannastacidae	Cumacea	<i>Campylaspis fusiformis</i>	0	0	0	0	0	0	0	0	0	0	10	0	0
Annelida	Chaetozone	Cirratulidae	Terebellida	<i>Chaetozone setosa</i>	0	0	0	10	0	0	0	0	0	0	0	20	70
Chordata	Chaeturichthys	Gobiidae	Gobiiiformes	<i>Chaeturichthys stigmatias</i>	0	0	0	0	0	0	0	0	0	10	0	0	0
Arthropoda	Corophium	Corophiidae	Amphipoda	<i>Corophium sinensis</i>	0	0	0	0	0	0	0	0	0	10	0	0	0
Mollusca	Cryptomya	Myidae	Myida	<i>Cryptomya elliptica</i>	0	0	0	0	10	0	0	0	0	0	0	0	0
Chordata	Ctenotrypauchen	Gobiidae	Gobiiiformes	<i>Ctenotrypauchen microcephalus</i>	0	0	0	10	0	0	0	0	0	0	0	0	10
Mollusca	Decorifera	Acteocinidae	Cephalaspidea	<i>Decorifera matusimana</i>	10	0	7	0	0	0	0	0	0	0	0	10	0
Mollusca	Others	Others	Others	<i>Endopleura lubrica</i>	0	0	23	60	0	0	0	0	0	0	10	30	0
Mollusca	Eocylichna	Cylichnidae	Cephalaspidea	<i>Eocylichna braunsi</i>	0	5	0	0	0	20	0	0	0	0	0	0	0
Arthropoda	Eriopisella	Eriopisidae	Amphipoda	<i>Eriopisella sechellensis</i>	110	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Eteone	Phyllodocidae	Phyllodocida	<i>Eteone longa</i>	0	0	0	0	0	0	0	0	0	0	0	0	10
Arthropoda	Eucrate	Euryplacidae	Decapoda	<i>Eucrate crenata</i>	0	0	0	0	0	20	0	0	0	0	0	0	0
Annelida	Eumida	Phyllodocidae	Phyllodocida	<i>Eumida sanguinea</i>	0	0	0	0	0	0	0	10	0	0	0	0	0

Mollusca	Ferussaciidae	Ferussaciidae	Stylommatophora	<i>Ferussaciidae</i>	0	0	0	10	50	0	0	10	0	0	10	0	80
Arthropoda	Others	Others	Amphipoda	<i>Gammaridea</i>	20	0	0	0	0	0	9	0	0	0	0	10	0
Annelida	Glycera	Glyceridae	Phyllodocida	<i>Glycera capitata</i>	0	0	0	0	0	0	14	0	0	0	0	0	0
Annelida	Glycera	Glyceridae	Phyllodocida	<i>Glycera chirori</i>	0	0	0	0	0	20	0	0	0	20	0	0	0
Annelida	Glycinde	Goniadidae	Phyllodocida	<i>Glycinde gurjanovae</i>	110	25	37	200	50	200	3	30	30	60	90	40	60
Annelida	Haploscoloplos	Orbiniidae	Orbiniida	<i>Haploscoloplos elongatus</i>	0	10	10	0	0	20	6	10	30	0	0	50	10
Annelida	Harmothoe	Polynoidae	Phyllodocida	<i>Harmothoe imbricata</i>	30	0	0	0	10	0	0	0	0	0	0	20	10
Arthropoda	Hemileucon	Leuconidae	Cumacea	<i>Hemileucon bidentatus</i>	0	0	0	0	0	0	0	0	0	0	0	50	0
Annelida	Heteromastus	Capitellidae	Capitellida	<i>Heteromastus filiformis</i>	90	90	20	0	20	0	51	70	70	20	210	330	0
Arthropoda	Iphinoe	Bodotriidae	Cumacea	<i>Iphinoe tenera</i>	0	0	3	10	0	0	0	0	0	0	60	0	0
Annelida	Laonice	Spionidae	Spionida	<i>Laonice cirrata</i>	0	0	0	0	10	0	0	0	0	0	0	0	0
Arthropoda	Leptochela	Pasiphaeidae	Decapoda	<i>Leptochela gracilis</i>	0	0	0	0	10	0	0	0	0	0	0	0	10
Nemertea	Lineus	Lineidae	Heteronemertea	<i>Lineus sp.</i>	60	5	0	0	70	20	0	0	0	30	20	20	50
Annelida	Linopherus	Amphinomidae	Amphinomida	<i>Linopherus ambigua</i>	0	75	0	20	30	20	0	90	50	10	0	0	0
Arthropoda	Listriella	Liljeborgiidae	Amphipoda	<i>Listriella curvidactyla</i>	40	0	0	0	20	0	0	0	0	0	0	0	0
Annelida	Listriolobus	Thalassematidae	Echiuroidea	<i>Listriolobus brevirostris</i>	0	0	0	0	10	20	0	0	0	0	0	0	0
Annelida	Loimia	Terebellidae	Terebellida	<i>Loimia medusa</i>	10	0	0	0	0	80	0	0	0	10	0	0	0

Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris cruzensis</i>	0	0	123	0	0	0	3	10	20	10	0	50	20
Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris heteropoda</i>	0	5	0	0	0	0	0	0	0	0	0	0	0
Annelida	Magelona	Magelonidae	Spionida	<i>Magelona japonica</i>	0	5	7	0	0	0	0	0	0	0	0	0	0
Annelida	Mesochaetopterus	Chaetopteridae	Spionida	<i>Mesochaetopterus japonicus</i>	0	0	0	0	0	0	0	40	0	0	0	0	0
Mollusca	Mitrella	Columbellidae	Neogastropoda	<i>Mitrella bella</i>	0	0	0	0	0	0	3	0	0	0	0	0	0
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella iridescens</i>	30	5	0	0	0	0	26	0	0	0	0	0	30
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella jedoensis</i>	10	0	0	0	20	0	0	0	0	0	0	0	20
Mollusca	Musculus	Mytilidae	Mytilida	<i>Musculus senhousia</i>	0	0	3	30	0	0	0	0	0	0	0	0	0
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius succinctus</i>	0	0	0	0	0	0	3	0	0	0	0	0	30
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius variciferus</i>	10	0	0	20	0	0	0	0	0	0	0	0	0
Annelida	Nephtys	Nephtyidae	Phyllodocida	<i>Nephtys oligobranchia</i>	20	0	0	10	0	0	0	40	0	10	70	0	30
Mollusca	Neverita	Naticidae	Littorinimorpha	<i>Neverita didyma</i>	10	5	0	10	20	0	0	10	0	0	10	0	0
Mollusca	Nucula	Nuculidae	Nuculida	<i>Nucula faba</i>	0	0	0	10	10	0	0	0	0	0	0	0	30
Arthropoda	Ogyrides	Ogyrididae	Decapoda	<i>Ogyrides orientalis</i>	0	5	0	0	0	0	66	0	0	0	0	0	10
Annelida	Ophiodromus	Hesionidae	Phyllodocida	<i>Ophiodromus angustifrons</i>	50	0	3	20	10	40	0	20	0	20	10	0	20
Annelida	Paralacydonia	Paralacydoniidae	Phyllodocida	<i>Paralacydonia paradoxa</i>	0	0	0	0	0	0	0	10	0	0	0	0	0



Arthropoda	Paranthura	Paranthuridae	Isopoda	<i>Paranthura japonica</i>	70	5	0	0	0	0	0	0	0	0	0	0	20
Plathhelminthes	Paraplanocera	Planoceridae	Polycladida	<i>Paraplanocera reticulata</i>	10	0	0	0	0	0	0	0	0	10	0	0	30
Annelida	Paraprionospio	Spionidae	Spionida	<i>Paraprionospio sp.</i>	10	15	220	0	0	0	20	0	0	0	0	240	20
Mollusca	Philine	Philinidae	Cephalaspidea	<i>Philine kinglipini</i>	10	0	13	0	10	0	0	0	0	30	10	0	0
Annelida	Phyllochaetopterus	Chaetopteridae	Spionida	<i>Phyllochaetopterus claparedii</i>	420	15	0	40	10	20	0	0	0	20	50	0	60
Annelida	Phyllodoce	Phyllodocidae	Phyllodocida	<i>Phyllodoce papillosa</i>	40	5	0	0	0	0	0	30	0	0	10	50	0
Annelida	Poecilochaetus	Poecilochaetidae	Spionida	<i>Poecilochaetus serpens</i>	0	0	0	0	0	40	0	0	0	0	0	0	0
Annelida	Prionospio	Spionidae	Spionida	<i>Prionospio queenslandica</i>	0	0	0	0	0	0	0	0	0	0	10	0	20
Nemertea	Procephalothrix	Cephalotrichidae	Archinemertea	<i>Procephalathrix sp.</i>	0	0	7	10	0	60	0	60	0	0	0	20	0
Echinodermata	Protankyra	Synaptidae	Apodida	<i>Protankyra bidentata</i>	20	0	0	0	10	0	3	0	0	0	0	10	0
Mollusca	Pseudoetrema	Clathurellidae	Neogastropoda	<i>Pseudoetrema fortilirata</i>	0	0	0	0	0	0	0	0	0	0	10	0	0
Annelida	Pseudopolydora	Spionidae	Spionida	<i>Pseudopolydora kempii</i>	0	0	0	0	0	0	0	0	0	0	0	20	0
Mollusca	Raetellops	Anatinellidae	Venerida	<i>Raetellops pulchella</i>	0	0	3	0	0	0	0	0	0	0	0	10	0
Arthropoda	Raphidopus	Porcellanidae	Decapoda	<i>Raphidopus ciliatus</i>	0	0	0	0	20	0	0	0	0	0	0	0	0

Mollusca	Ringicula	Ringiculidae	Cephalaspidea	<i>Ringicula doliaris</i>	0	0	3	0	0	0	0	0	0	0	0	270	0
Annelida	Sigambra	Pilargidae	Phyllodocida	<i>Sigambra bassi</i>	20	25	7	10	0	180	0	0	50	80	20	0	70
Mollusca	Siphonodentalium	Gadilidae	Gadilida	<i>Siphonodentalium japonicum</i>	0	0	0	10	0	0	0	0	0	0	0	0	0
Mollusca	Stenothyra	Stenothyridae	Littorinimorpha	<i>Stenothyra glabra</i>	0	0	0	0	0	20	0	0	0	0	0	0	0
Annelida	Sternaspis	Sternaspidae	Terebellida	<i>Sternaspis scutata</i>	90	5	0	20	0	20	0	10	0	0	0	0	110
Annelida	Sthenolepis	Sigalionidae	Phyllodocida	<i>Sthenolepis japonica</i>	0	0	0	0	0	0	0	10	0	0	0	0	0
Mollusca	Terebra	Terebridae	Neogastropoda	<i>Terebra tantilla</i>	10	0	0	0	0	0	0	0	0	0	0	10	0
Mollusca	Tiberia	Pyramidellidae	Entomotaeniata	<i>Tiberia pulchella</i>	0	5	0	0	0	0	0	0	0	0	0	0	0
Mollusca	Trigonostoma	Cancellariidae	Neogastropoda	<i>Trigonostoma scalariformis</i>	0	0	0	0	0	0	0	0	0	0	0	0	10
Mollusca	Trigonothracia	Thraciidae	Pholadomyoida	<i>Trigonothracia jinxingae</i>	0	0	0	10	0	0	0	0	0	0	0	0	10
Arthropoda	Tritodynamia	Varunidae	Decapoda	<i>Tritodynamia horvathi</i>	0	0	0	0	0	0	0	0	0	0	0	0	10
Mollusca	Yokoyamaia	Philinidae	Cephalaspidea	<i>Yokoyamaia acutangula</i>	0	0	0	0	0	0	0	0	0	0	0	70	0

## 2022

PHYLUM	CLASS	ORDER	FAMILY	SPECIES	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13
Arthropoda	Acetes	Sergestidae	Decapoda	<i>Acetes chinensis</i>	0	0	0	0	0	0	0	5	0	0	0	0	0
Arthropoda	Alpheus	Alpheidae	Decapoda	<i>Alpheus japonicus</i>	0	0	0	5	5	0	0	0	0	10	5	0	5
Mollusca	Alveinus	Kelliellidae	Venerida	<i>Alveinus ojanus</i>	0	0	5	0	0	0	0	15	0	0	0	0	0



Mollusca	Cultellus	Pharidae	Adapedonta	<i>Cultellus attenuatus</i>	30	0	0	0	0	0	5	0	0	0	0	0	0
Mollusca	Decorifera	Acteocinidae	Cephalaspidea	<i>Decorifera matusimana</i>	0	20	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Diogenes	Diogenidae	Decapoda	<i>Diogenes edwardsii</i>	20	0	0	0	0	0	0	0	0	0	0	0	0
Mollusca	Dosinia	Veneridae	Venerida	<i>Dosinia japonica</i>	15	0	0	25	0	0	2.5	10	35	0	0	0	0
Mollusca	Others	Others	Others	<i>Endopleura lubrica</i>	0	20	0	0	15	0	0	5	10	0	0	0	0
Mollusca	Eocylichna	Cylichnidae	Cephalaspidea	<i>Eocylichna braunsi</i>	0	0	0	0	5	0	0	0	0	0	30	0	0
Arthropoda	Eriopisella	Eriopisidae	Amphipoda	<i>Eriopisella sechellensis</i>	5	0	0	0	0	0	2.5	0	0	0	0	0	0
Annelida	Eteone	Phyllodocidae	Phyllodocida	<i>Eteone longa</i>	5	0	0	0	0	0	0	5	0	0	5	5	0
Annelida	Eteone	Phyllodocidae	Phyllodocida	<i>Eteone tchangsii</i>	0	0	0	0	0	5	0	0	0	10	0	0	0
Arthropoda	Eucrate	Euryplacidae	Decapoda	<i>Eucrate crenata</i>	0	60	0	0	5	0	0	0	5	0	15	5	0
Mollusca	Eulima	Eulimidae	Littorinimorpha	<i>Eulima maria</i>	5	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Eumida	Phyllodocidae	Phyllodocida	<i>Eumida sanguinea</i>	5	0	0	0	0	5	0	0	0	0	0	0	0
Mollusca	Felaniella	Ungulinidae	Venerida	<i>Felaniella usta</i>	0	110	0	15	30	5	0	0	0	10	0	0	205
Mollusca	Ferussaciidae	Ferussaciidae	Stylommatophora	<i>Ferussaciidae</i>	15	0	0	5	0	0	2.5	0	0	0	0	0	0
Arthropoda	Others	Others	Amphipoda	<i>Gammaridea</i>	0	0	10	0	0	0	2.5	5	0	0	20	0	0
Annelida	Glycera	Glyceridae	Phyllodocida	<i>Glycera chirori</i>	10	340	15	40	40	105	5	115	165	114 0	65	80	0
Annelida	Glycinde	Goniadidae	Phyllodocida	<i>Glycinde</i>	85	0	0	0	5	0	40	20	5	0	15	0	0

Annelida	Haploscoloplos	Orbiniidae	Orbiniida	<i>gurjanovae</i> <i>Haploscoloplos</i> <i>elongatus</i>	0	0	0	10	10	0	0	10	40	0	0	0	0
Annelida	Harmothoe	Polynoidae	Phyllodocida	<i>Harmothoe</i> <i>imbricata</i>	0	0	0	0	0	0	0	0	0	0	0	120	0
Arthropoda	Hemileucon	Leuconidae	Cumacea	<i>Hemileucon</i> <i>bidentatus</i>	30	40	0	0	0	5	77. 5	165	530	0	80	765	0
Annelida	Heteromastus	Capitellidae	Capitellida	<i>Heteromastus</i> <i>filiformis</i>	0	0	0	0	0	0	0	120	110	0	90	0	0
Arthropoda	Iphinoe	Bodotriidae	Cumacea	<i>Iphinoe tenera</i>	0	0	0	0	0	5	0	0	0	0	0	0	0
Arthropoda	Latreutes	Hippolytidae	Decapoda	<i>Latreutes</i> <i>planirostris</i>	0	0	0	0	0	5	0	0	0	10	5	0	0
Arthropoda	Leptochela	Pasiphaeidae	Decapoda	<i>Leptochela</i> <i>gracilis</i>	0	0	0	0	0	0	0	10	0	0	0	0	0
Mollusca	Leptomya	Semelidae	Cardiida	<i>Leptomya minuta</i>	30	20	0	5	10	30	0	10	5	0	5	0	5
Nemertea	Lineus	Lineidae	Heteronemertea	<i>Lineus sp.</i>	0	0	0	0	0	0	2.5	0	0	0	0	0	0
Brachiopoda	Lingula	Lingulidae	Lingulida	<i>Lingula anatina</i>	0	110	0	10	105	65	0	0	10	0	0	0	5
Annelida	Linopherus	Amphinomidae	Amphinomida	<i>Linopherus</i> <i>ambigua</i>	0	0	0	0	0	20	0	0	0	0	0	0	0
Arthropoda	Listriella	Liljeborgiidae	Amphipoda	<i>Listriella</i> <i>curvidactyla</i>	5	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Listriolobus	Thalassematidae	Echiuroidea	<i>Listriolobus</i> <i>brevirostris</i>	0	10	0	0	0	0	0	0	5	0	5	0	0
Annelida	Loimia	Terebellidae	Terebellida	<i>Loimia medusa</i>	0	0	20	0	0	0	5	10	15	0	15	10	0
Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris</i> <i>cruzensis</i>	5	0	0	0	0	0	2.5	0	0	0	0	0	0

Annelida	Lumbrineris	Lumbrineridae	Eunicida	<i>Lumbrineris heteropoda</i>	0	10	0	0	0	0	0	0	5	0	0	0	0
Annelida	Magelona	Magelonidae	Spionida	<i>Magelona japonica</i>	0	0	0	0	0	0	0	0	0	10	0	0	0
Mollusca	Modiolus	Mytilidae	Mytilida	<i>Modiolus modiolus</i>	95	20	0	0	0	0	25	0	0	0	0	0	10
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella iridescens</i>	90	40	25	25	0	5	12.5	0	0	40	20	5	0
Mollusca	Moerella	Tellinidae	Cardiida	<i>Moerella jedoensis</i>	0	0	5	0	0	0	0	5	0	0	0	0	0
Mollusca	Mormula	Pyramidellidae	Entomotaeniata	<i>Mormula terebra</i>	5	0	0	0	0	0	0	0	0	0	0	0	10
Mollusca	Musculus	Mytilidae	Mytilida	<i>Musculus senhousia</i>	0	0	0	0	0	0	2.5	0	0	0	0	0	0
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius succinctus</i>	25	30	0	0	10	0	7.5	0	5	0	0	0	10
Mollusca	Nassarius	Nassariidae	Neogastropoda	<i>Nassarius variciferus</i>	0	0	0	0	0	5	0	0	0	0	0	0	0
Arthropoda	Natatolana	Cirolanidae	Isopoda	<i>Natatolana japonensis</i>	0	10	0	0	0	5	0	0	0	0	0	0	0
Annelida	Nephtys	Nephtyidae	Phyllodocida	<i>Nephtys californiensis</i>	30	10	0	0	0	0	2.5	5	0	0	20	0	5
Annelida	Nephtys	Nephtyidae	Phyllodocida	<i>Nephtys oligobranchia</i>	30	30	0	15	10	5	0	0	10	0	15	5	25
Mollusca	Neverita	Naticidae	Littorinimorpha	<i>Neverita didyma</i>	0	0	0	20	0	15	0	0	0	0	0	0	0
Arthropoda	Nihonotrypaea	Callianassidae	Decapoda	<i>Nihonotrypaea japonica</i>	0	0	0	30	30	0	0	0	0	0	0	0	0

Mollusca	Nucula	Nuculidae	Nuculida	<i>Nucula faba</i>	0	10	0	0	0	0	0	0	0	0	0	0	0
Mollusca	Odostomia	Pyramidellidae	Entomotaeniata	<i>Odostomia subangulata</i>	0	0	0	0	0	0	2.5	0	0	0	0	0	0
Arthropoda	Ogyrides	Ogyrididae	Decapoda	<i>Ogyrides orientalis</i>	20	0	0	0	5	20	0	20	20	0	10	0	5
Annelida	Ophiodromus	Hesionidae	Phyllodocida	<i>Ophiodromus angustifrons</i>	0	0	0	0	0	0	0	0	5	0	0	0	0
Arthropoda	Oratosquilla	Squillidae	Stomatopoda	<i>Oratosquilla oratoria</i>	0	0	5	0	0	0	0	0	0	0	0	0	0
Arthropoda	Orchomene	Tryphosidae	Amphipoda	<i>Orchomene breviceps</i>	20	0	0	0	0	0	0	0	0	0	0	0	0
Annelida	Owenia	Oweniidae	Oweniida	<i>Owenia fusiformis</i>	0	0	0	0	5	0	0	0	0	0	5	0	0
Annelida	Paralacydonia	Paralacydoniidae	Phyllodocida	<i>Paralacydonia paradoxa</i>	180	0	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Paranthura	Paranthuridae	Isopoda	<i>Paranthura japonica</i>	5	10	0	0	0	10	2.5	0	5	0	0	0	0
#N/A	#N/A	#N/A	#N/A	<i>Paraplanocera reticulata</i>	45	0	0	0	0	0	105	155	210	0	0	305	15
Annelida	Paraprionospio	Spionidae	Spionida	<i>Paraprionospio sp.</i>	90	0	0	10	0	0	2.5	15	0	0	0	5	15
Mollusca	Philine	Philinidae	Cephalaspidea	<i>Philine kinglipini</i>	0	0	5	0	0	0	0	0	0	0	0	5	0
Arthropoda	Philyra	Leucosiidae	Decapoda	<i>Philyra pisum</i>	5	30	0	5	25	0	0	0	0	0	0	0	10
Annelida	Phyllochaetopterus	Chaetopteridae	Spionida	<i>Phyllochaetopterus clapedii</i>	50	20	5	0	0	0	5	0	0	0	15	0	15
Annelida	Phyllodoce	Phyllodocidae	Phyllodocida	<i>Phyllodoce papillosa</i>	0	0	0	0	0	5	0	0	0	0	0	0	0

Annelida	Poecilochaetus	Poecilochaetidae	Spionida	<i>Poecilochaetus serpens</i>	0	0	0	0	0	0	0	0	0	0	0	25	0
Arthropoda	Pontocrates	Oedicerotidae	Amphipoda	<i>Pontocrates altamarinus</i>	0	0	5	0	0	0	0	0	0	0	0	0	0
Mollusca	Potamocorbula	Corbulidae	Myida	<i>Potamocorbula laevis</i>	0	40	0	20	40	25	5	0	15	0	25	30	50
Nemertea	Procephalothrix	Cephalotrichidae	Archinemertea	<i>Procephalothrix sp.</i>	0	30	0	0	0	0	0	0	0	0	0	0	10
Echinodermata	Protankyra	Synaptidae	Apodida	<i>Protankyra bidentata</i>	0	0	0	0	5	0	0	0	0	0	0	0	0
Annelida	Pseudopolydora	Spionidae	Spionida	<i>Pseudopolydora kempi</i>	0	0	0	0	0	0	0	10	0	0	0	0	0
Mollusca	Pyrunculus	Retusidae	Cephalaspidea	<i>Pyrunculus tokyoensis</i>	5	0	0	10	5	0	0	0	10	0	5	5	5
Mollusca	Raetellops	Anatinellidae	Venerida	<i>Raetellops pulchella</i>	0	0	0	0	5	0	0	0	0	20	0	0	0
Arthropoda	Raphidopus	Porcellanidae	Decapoda	<i>Raphidopus ciliatus</i>	0	20	125	15	15	0	0	15	105	0	15	95	0
Mollusca	Ringicula	Ringiculidae	Cephalaspidea	<i>Ringicula doliaris</i>	0	40	5	5	10	70	0	15	30	170	55	5	5
Annelida	Sigambra	Pilargidae	Phyllodocida	<i>Sigambra bassi</i>	0	0	0	0	0	0	0	5	15	0	90	0	0
Mollusca	Siphonodentalium	Gadilidae	Gadilida	<i>Siphonodentalium japonicum</i>	0	0	0	0	0	0	0	0	5	0	0	0	0
Annelida	Spio	Spionidae	Spionida	<i>Spio martinensis</i>	30	10	0	10	15	20	2.5	40	50	20	35	25	65
Annelida	Sternaspis	Sternaspidae	Terebellida	<i>Sternaspis scutata</i>	0	0	0	0	0	0	0	5	0	0	0	0	0
Chordata	Taenioides	Gobiidae	Gobiiiformes	<i>Taenioides rubicundus</i>	0	0	0	0	0	10	0	0	0	0	0	0	0



Annelida	Terebellides	Trichobranchidae	Terebellida	<i>Terebellides stroemii</i>	0	0	0	0	0	0	0	5	0	0	0	0	0
Mollusca	Terebra	Terebridae	Neogastropoda	<i>Terebra tantilla</i>	0	0	0	0	0	0	0	0	0	10	0	0	10
Mollusca	Trigonothracia	Thraciidae	Pholadomyoida	<i>Trigonothracia jinxingae</i>	0	0	5	0	10	20	0	10	15	10	0	0	0
Mollusca	Yokoyamaia	Philinidae	Cephalaspidea	<i>Yokoyamaia acutangula</i>	0	0	0	0	0	5	0	0	0	0	0	0	0

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**Table S3.** Results of DistLM (distance-based linear modelling) analysis for macrofauna. The variables explaining macrofaunal community are included. Analyses were conducted for Annelida, Arthropoda and Mollusca separately. Table shows significance levels for each predictor variable and the proportion of variation explained for any faunal assemblage. Only variables with significant results ( $p < 0.05$ ) in marginal tests are shown. Overall best models are also included. AIC: Akaike information criterion; SS (trace): sum of squares of sequential test, Prop.: proportion of variability explained by each factor (in the marginal tests without coaction of factors), Sal: Salinity, DO: Dissolved Oxygen, TOC: Total Organic Carbon.

**ARTHROPODA:**

Variables	SS(trace)	Pseudo-F	P	Prop.
DO	13271	3.3483	0.001	7.9
NO <sub>3</sub> -N	10716	2.6598	0.003	6.4
Md	10738	2.6655	0.004	6.4
Sal	9570.1	2.358	0.004	5.7
Cd	7854.4	1.9145	0.027	4.7
TOC	7626.8	1.8564	0.03	4.5

  

AIC	R <sup>2</sup>	Variables
341.91	0.17	DO, NO <sub>3</sub> -N, TOC
341.22	0.17	NO <sub>3</sub> -N, TOC, Md
341.24	0.21	DO, NO <sub>3</sub> -N, TOC, Md

**ANNELIDA:**

Variables	SS(trace)	Pseudo-F	P	Prop.
TOC	10029	3.5984	0.001	6.7
Cd	7888.2	2.7873	0.003	5.3
DO	5847.4	2.0368	0.014	3.9

  

AIC	R <sup>2</sup>	Variables
414.37	0.10	TOC
414.47	0.07	TOC, Cd

**MOLLUSCA:**

Variables	SS(trace)	Pseudo-F	P	Prop.
NO <sub>2</sub> -N	8465	2.4839	0.004	4.7
NH <sub>4</sub> -N	8233.7	2.4127	0.006	4.6
Md	8261.1	2.4211	0.01	4.6
DO	7416.4	2.1629	0.016	4.2
NO <sub>3</sub> -N	7411.4	2.1614	0.01	4.1
Sal	6586.6	1.9116	0.018	3.7
TOC	6443.1	1.8684	0.037	3.6

AIC	R <sup>2</sup>	Variables
424.92	0.05	NO <sub>2</sub> -N
424.33	0.09	NO <sub>2</sub> -N, NH <sub>4</sub> -N

**Table S4.** The statistics for data reliability and validity test.

Primary indicators	Number of Measured indicators	Cronbach's Alpha
Water	4	0.688
Sediment	7	0.776
Biology	5	0.817

**Table S5.** The integrated ecological quality index for each sample.

Sites	Year				Average
	2019	2020	2021	2022	
1	4.30	4.59	3.80	4.55	4.31
2	3.48	3.29	3.05	3.34	3.29
3	3.53	2.71	3.06	2.86	3.04
4	3.33	2.92	3.43	2.67	3.09
5	3.21	1.70	2.44	3.83	2.79
6	3.27	2.02	3.01	2.69	2.75
7	3.30	3.05	3.20	3.04	3.15
8	3.05	3.28	3.26	2.56	3.04
9	3.50	3.26	2.97	2.87	3.15
10	3.38	3.52	3.41	1.84	3.04
11	3.17	3.49	2.90	3.40	3.24
12	3.22	2.09	3.23	2.44	2.74
13	3.54	1.93	3.12	3.99	3.14
Average	3.41	2.91	3.14	3.08	—