Diarrhetic shellfish poisoning in socio-economic perspective in Prymorsky region, Russia

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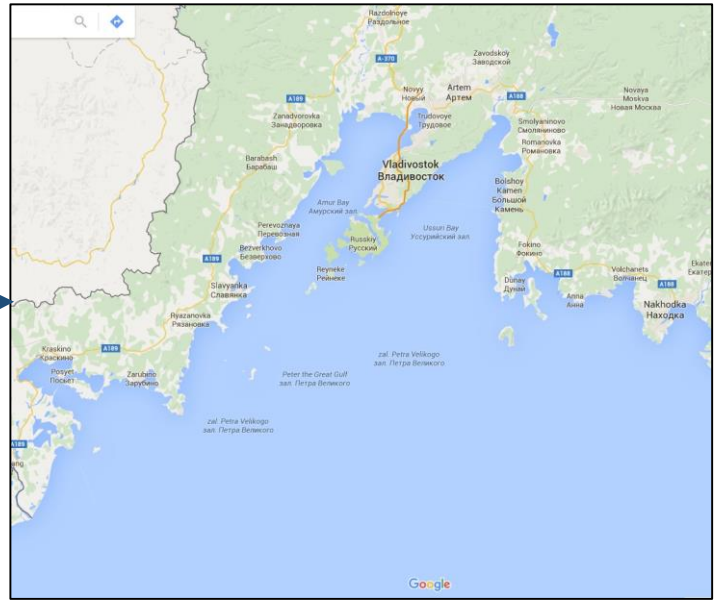
Location of the study area



Average surface temperature from -20°C to +23 °C

Ice coverage from December till March
(Peter the Great bay)

Slightly lower salinity - 33,7—34,3‰

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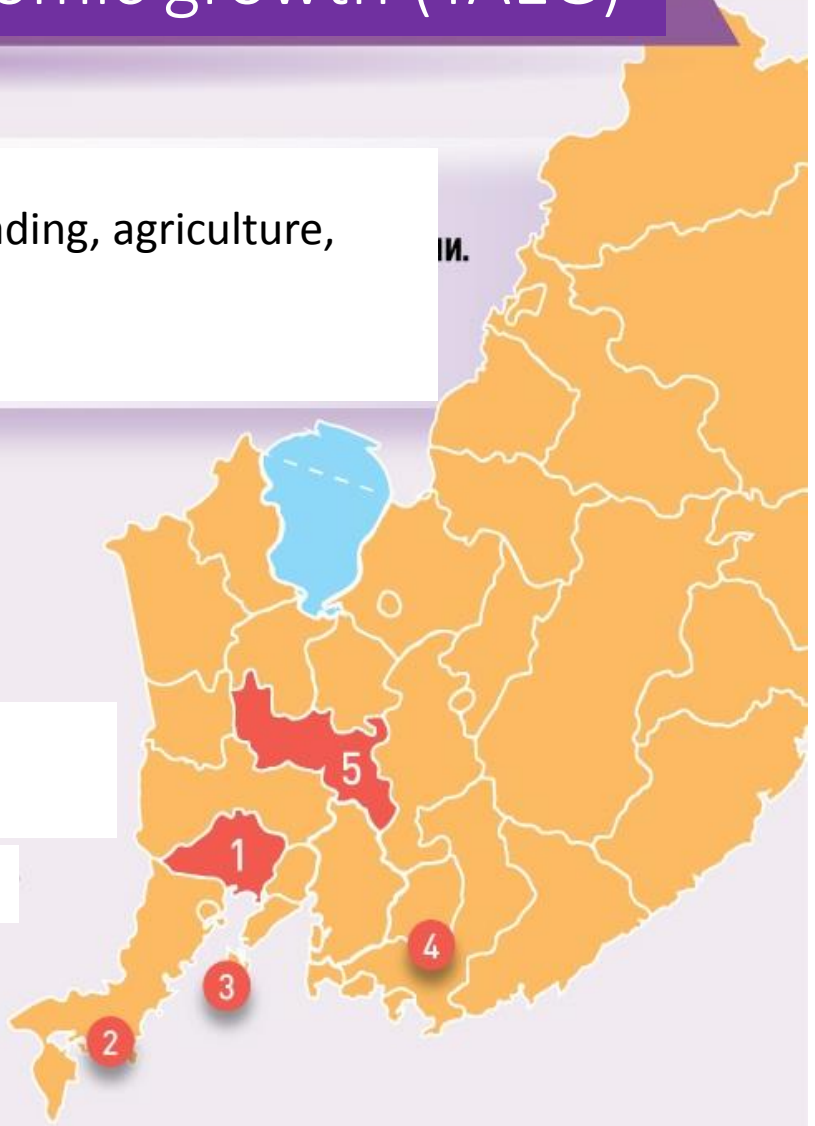
HABs MONITORING since 1999 *:*

- Monitor HAB populations (plankton/benthos)
- Reveal new sources of toxicity (new species/cycts)
- Early warning / mechanism

Territories of advanced economic growth (TAEG)

Investment in the projects for development of treading, agriculture, recreational zones and aquaculture.

1. Industrial park “Nadezhdensky”
2. “Zarubino” harbor
3. **Recreational zone and bio-tehno park “Ostrovnoy”**
4. Project “Eastern Petrochemical Company”
5. Agricultural and animal industry project



Source: Prymorsky region administration

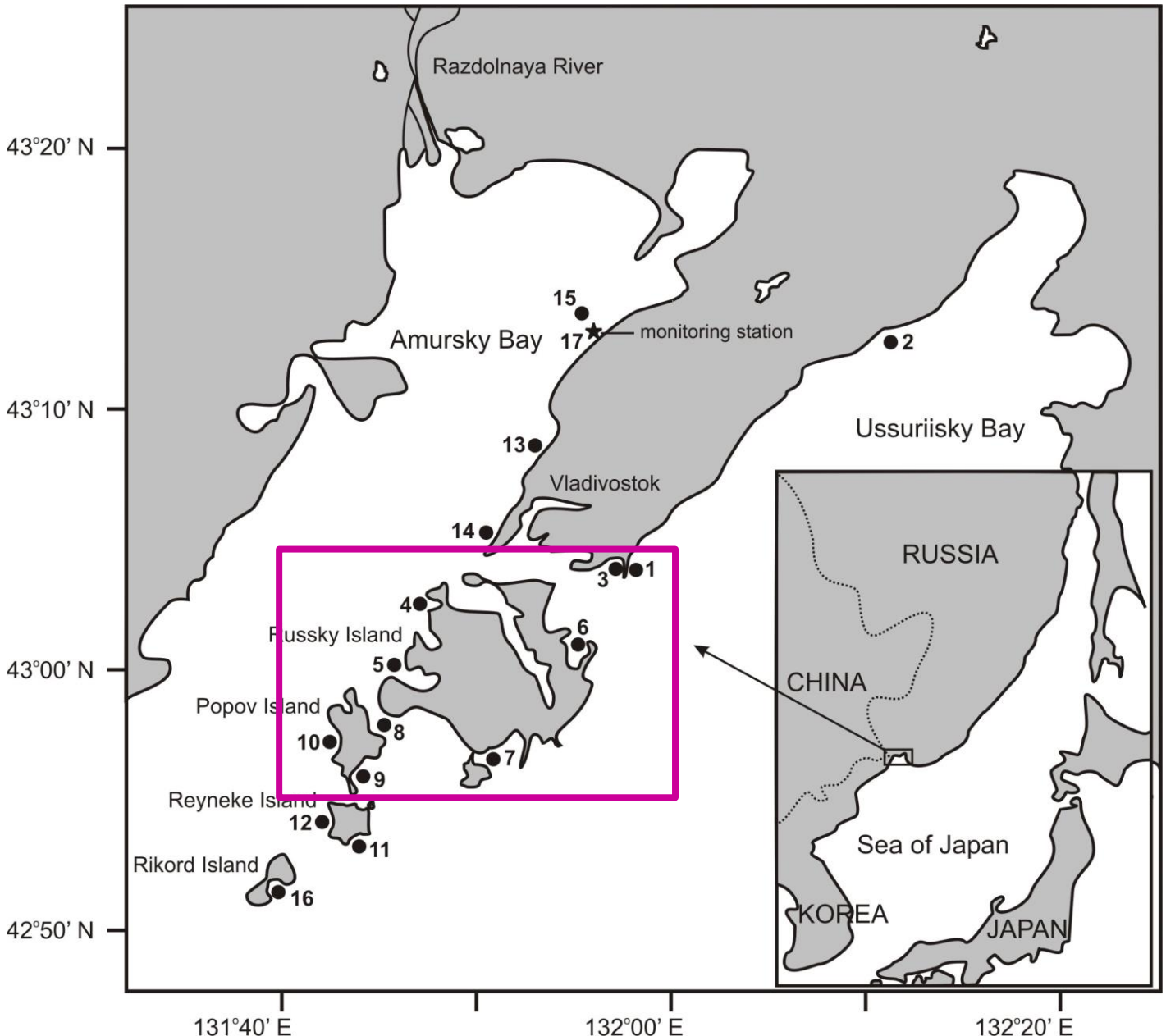
Potential threats from toxin producing algae

- Known toxic species of various group, producing known toxins
    - *Pseudo-nitzchia*
    - *Alexandrium*
    - *Dinophysis*
    - *Ostreopsis*
    - *Prorocentrum*
- Unknown potentially toxic species and possible unknown toxins
- Changing seasonal dynamics of microalgae and toxins

Orlova T. Yu. (2014) Diversity of potentially toxic microalgae on the east coast of Russia.

In Marine Biodiversity and Ecosystem Dynamics of the Northwest Pacific Ocean by Song S. et al.

Spatial distribution of DSP toxins in Peter the Great Bay in 2012



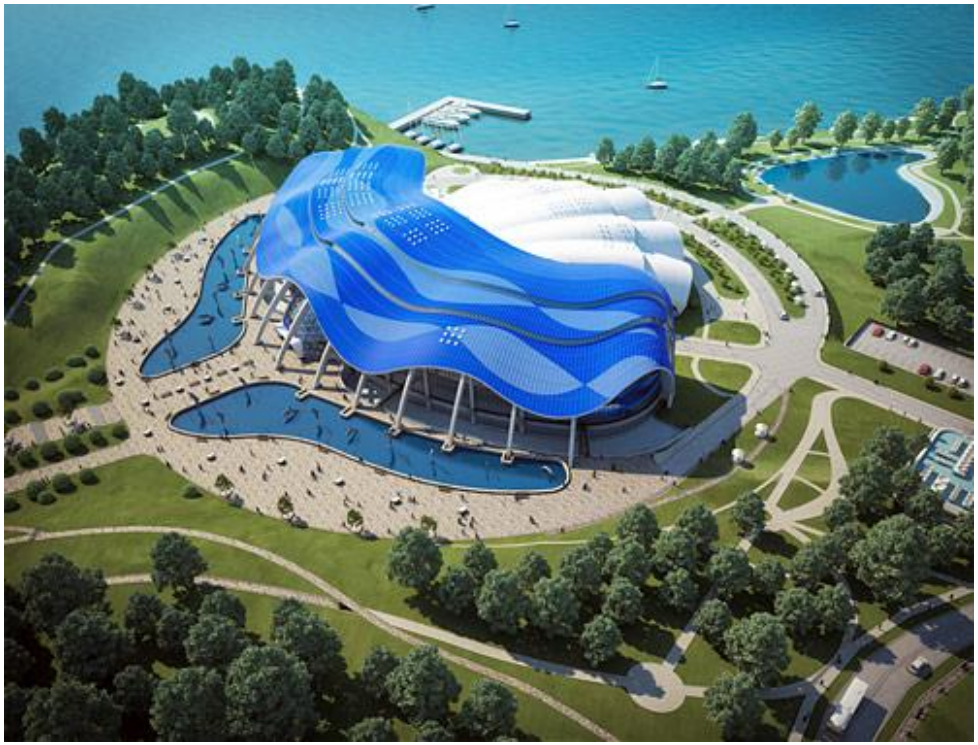
Orlova et al. (in press) Diarrhetic shellfish toxins in Primorsky krai, Russia. Journal of shellfish research

Maximum DSP toxins concentration in shellfish

2011	**September, October**
2012	**June, December**
2013	**May**

Orlova et al. (in press)
Diarrhetic shellfish toxins in Primorsky krai, Russia. Journal of shellfish research
Kameneva et al. (in press)
Investigation of individual diarrheic shellfish poisoning toxins seasonal dynamics in digestive gland of Crenomytilus grayanus (Dunker, 1853) by HPLC with fluorometric detection. Russian journal of marine biology

Research and educational center “Primorsky aquarium”



11 potentially toxic species: diatoms and dinoflagellates

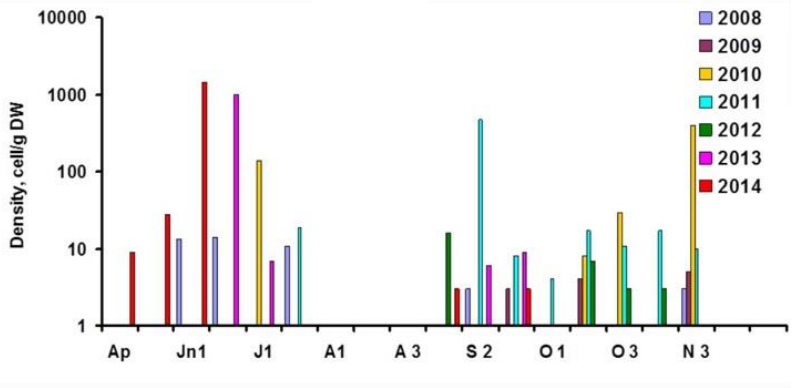
Pseudo-nitzschia species dominated in autumn

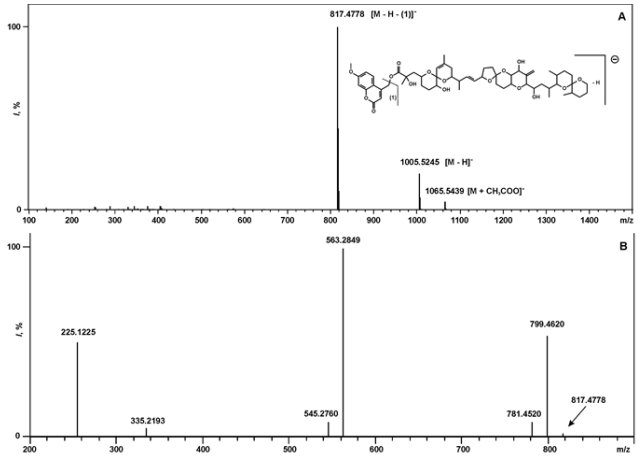
Dinophysis species dominated in summer

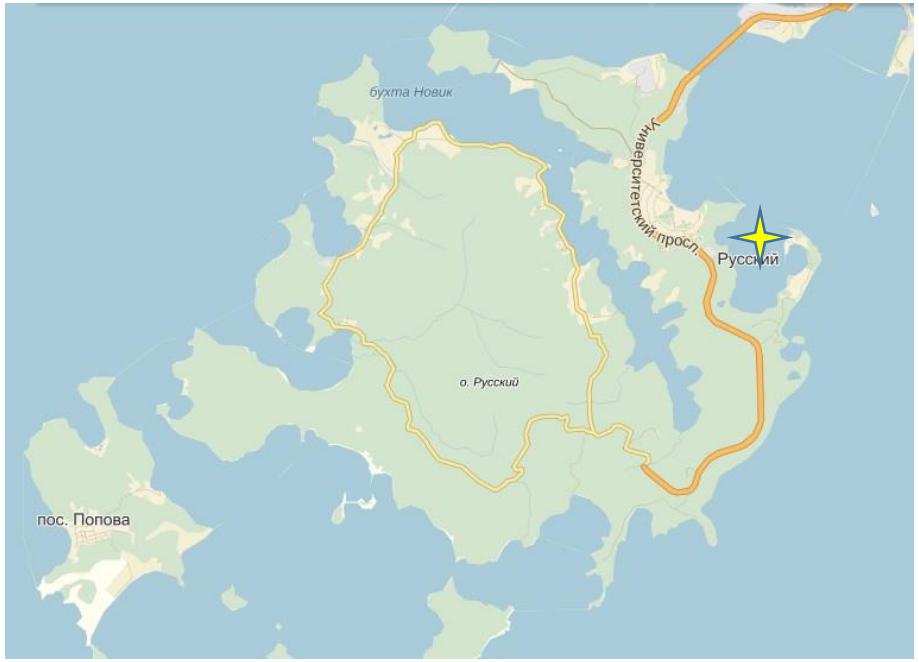
Ponomareva and Shevchenko. (2015)
HAB monitoring in Paris Bay (the north-western part of the East/Japan Sea) where marine mammals are kept in captivity. PICES 2015 Annual meeting abstract book.

New producers of DST

Prorocentrum foraminosum







In culture of *P. foraminosum* containing 3500-5000 cell/mL

DTX-1 was determined

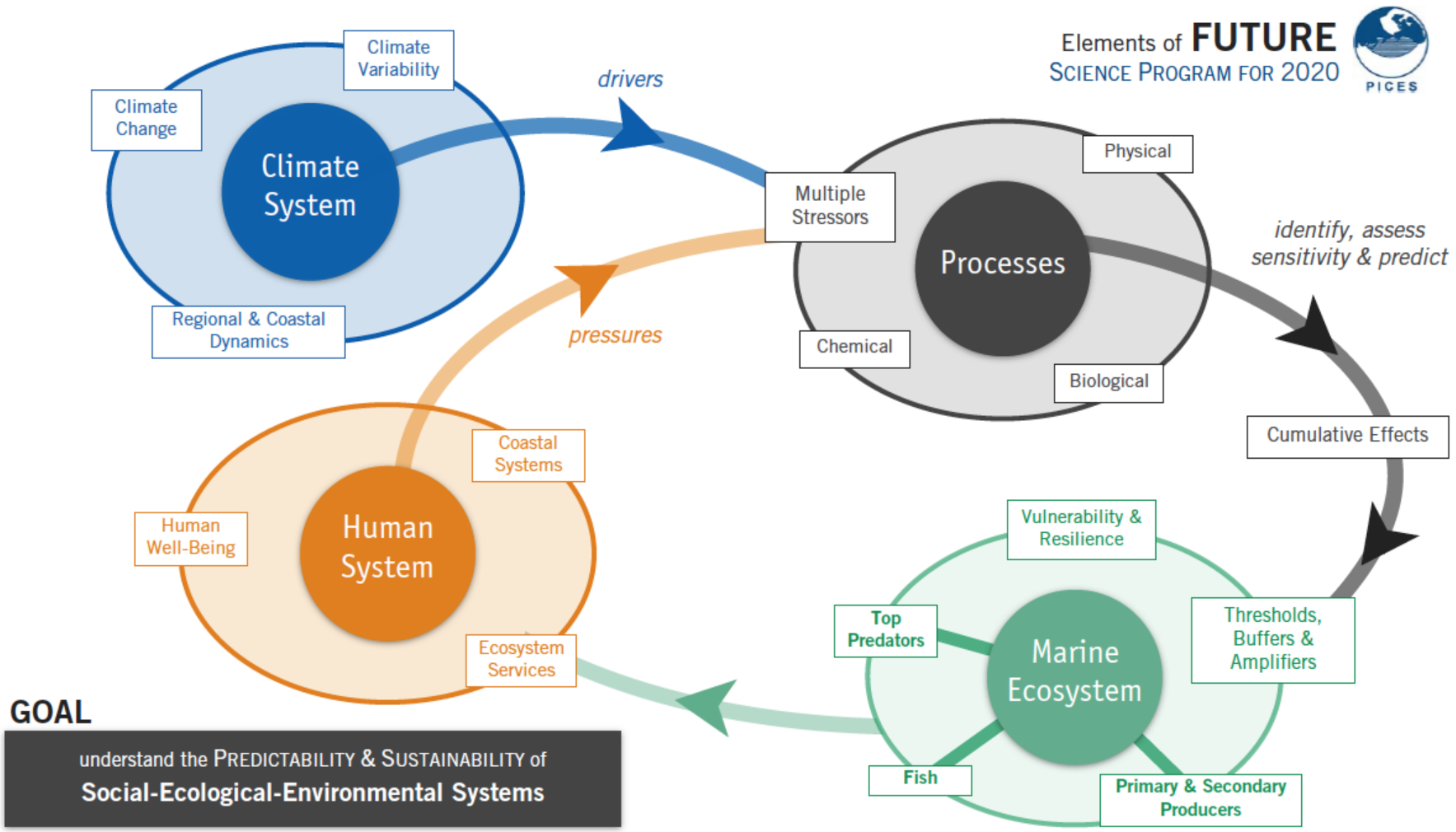
8.4 ± 2.4 pg/cell

22.46 ± 17.6 ng/mL of media

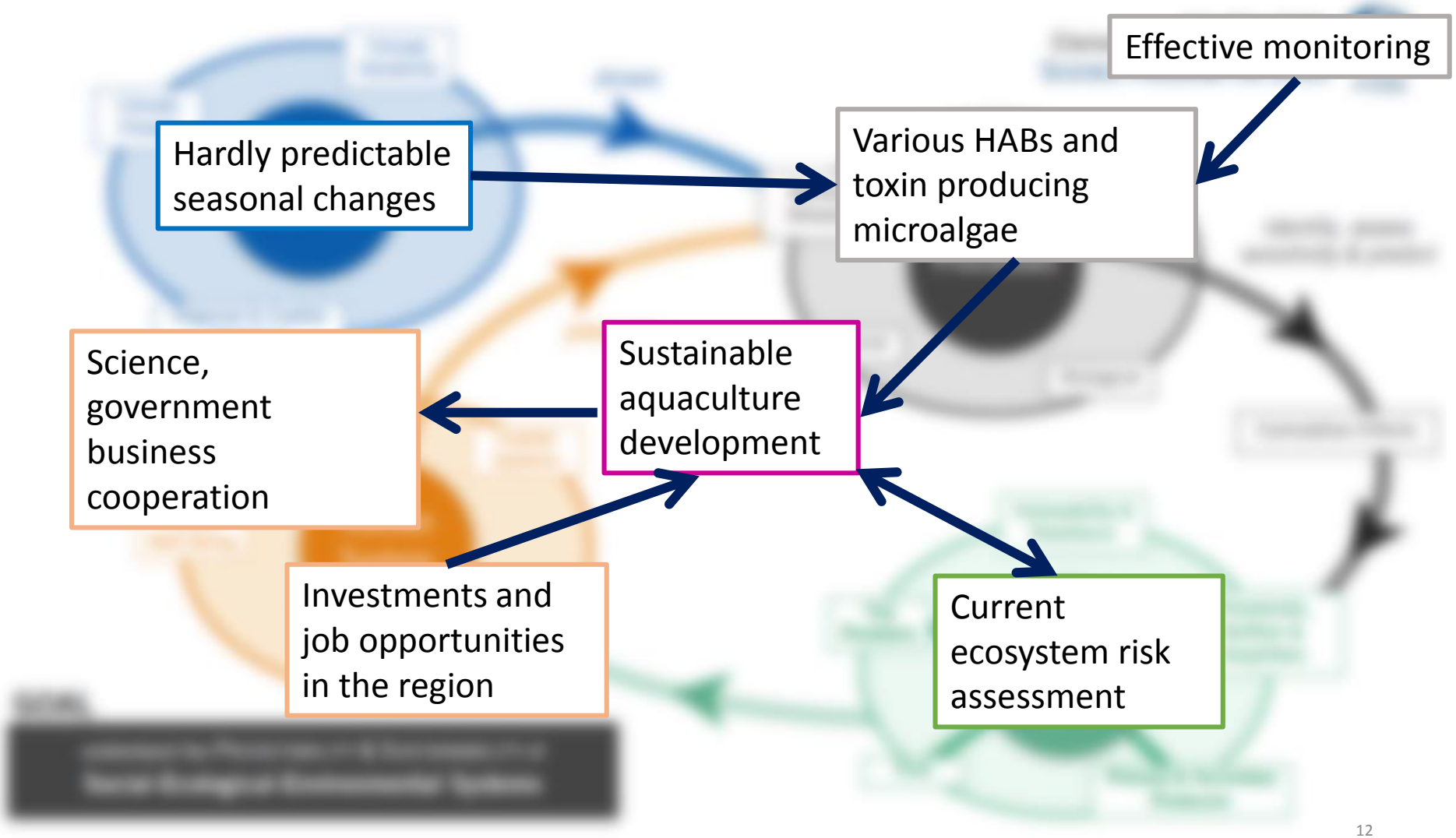
Kameneva et al. (2015)
Detection of Dinophysistoxin-1 in Clonal Culture of Marine Dinoflagellate Prorocentrum foraminosum (Faust M.A., 1993) from the Sea of Japan. Toxins

Agreement on Aquatic Culture Development in Primorye had been signed on September 5, by the Governor of Primorye Vladimir Miklushevskiy and Wen Lian Aquaculture Co., Ltd. and Asia-Pacific Center of Aquaculture Development.

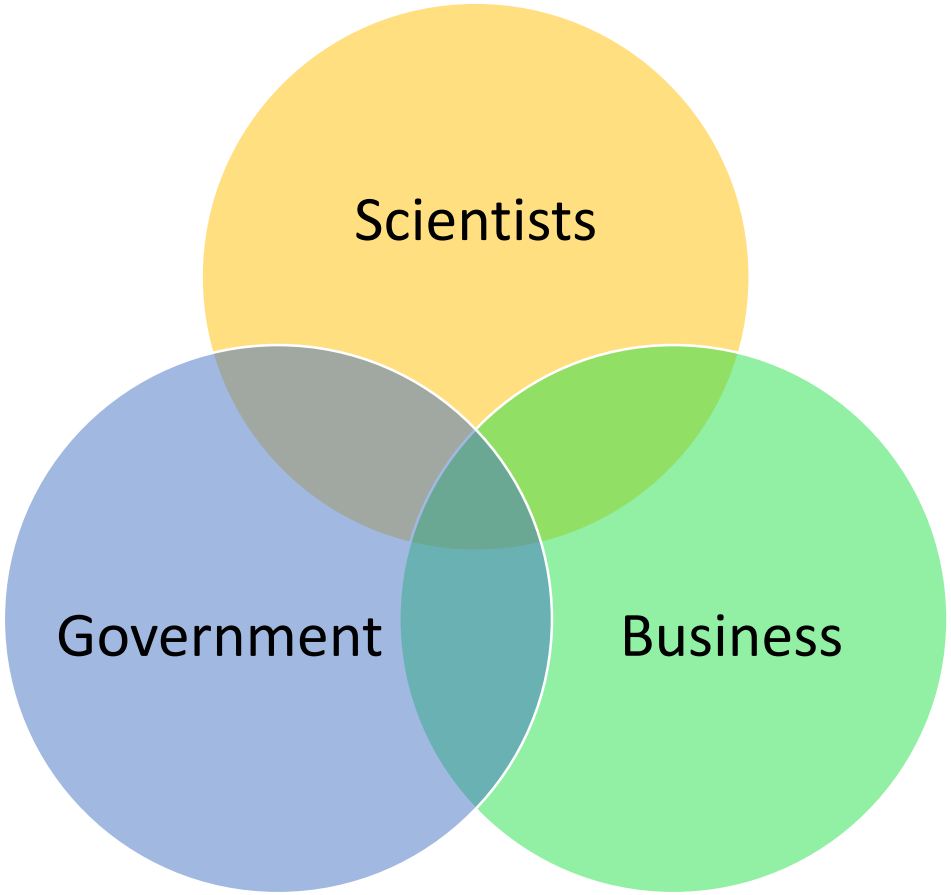
the FUTURE Diagram



Development of aquaculture in Prymorsky region – learning from past experience



Cooperation of business, government and scientists for coordination of actions to develop **effective system for prevention of food poisoning and ensuring sustainable development of aquaculture initiative is crucial**



Acknowledgements

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Thank you!