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Media Release

Chiefs of Staff, News Directors

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Bloom diagnostic test to aid shellfish industry

A new project to develop a rapid shellfish toxin screen test is underway at the University of Tasmania.

The test, using a similar platform to home pregnancy test kits, is one of the first steps in a $600,000 Fisheries Research and Development Corporation project to improve the understanding of Tasmanian harmful algal blooms.

The partial 2012 shutdown of the Tasmanian shellfish industry shutdown that cost producers $23m because of a toxic dinoflagellate bloom identified too late on the state's east coast. The new test can reduce screening and analysis times from days to hours or less.

Project leader, Prof Gustaaf Hallegraeff, said research will lead to a quick turnaround water and shellfish toxin sampling procedure able to identify the onset of any harmful blooms, which evolve with changing ocean and climatic conditions.

"Ultimate adoption by the Australian shellfish industry of these improved diagnostic tests will provide an on-site tool for farmers to manage their seafood harvest.

"The outcome is to reduce blanket closures of fisheries, and reducing the risk of unsafe product reaching domestic and export markets," Prof Hallegraeff said.

The project was outlined this week to shellfish growers and industry managers at a meeting the Australian Shellfish Quality Assurance Advisory Committee (ASQAAC) in Hobart.

Prof Hallegraeff said the unnecessary closure and delayed opening/closure advice for marine farmers was recognised as the industry's top problem, with industry calling for more rapid and reliable biotoxin and toxic species analysis.

As well as marine farmers, recreational fisheries on the east coast were impacted, estimated at a cost of nearly $2m.

He said the 2012 Tasmanian biotoxin event represents a paradigm shift for seafood risk management in Tasmania and Australia as a whole.

The offending species of dinoflagellates are extremely difficult to identify by routine plankton monitoring, and are toxic at very low cell concentrations. Sampling the extensive Tasmanian coast line poses a major logistical challenge, with early hints that the blooms originate offshore.

The project brings together expertise from the Institute for Global Food Security of Queens University, Belfast, the University of Tasmania's Institute for Marine and Antarctic Studies (IMAS), CSIRO, the South Australian Research and Development Institute, the Tasmanian Department of Health and Human Services, Cawthron Institute (New Zealand), the University of Technology Sydney and Advanced Analytical Australia Pty Ltd.

As part of the project, Queens University's Dr Katrina Campbell, a UK specialist in diagnostic testing on algal species, will train IMAS postdoc Dr Juan Dorantes-Aranda in the state-of-the-art technology of rapid shellfish toxin screen tests.

The project has four research objectives –

- Develop, test and calibrate screening techniques for rapid detection and evaluation of toxins
- Identify genetic population structure and biology (inshore or offshore origin) of toxic
  Alexandrium tamarense- group algae using state-of-the art molecular and biotoxin screening techniques
- Integrate existing Tasmanian east coast oceanographic modeling with field bloom biology data to enable risk zone prediction during biotoxin event development.
- Establish the relative risk of Tasmanian seafood species to accumulate marine biotoxins to underpin a state-wide approach to biotoxin risk management.

Background

During October 2012 a shipment of blue mussels (*Mytilus galloprovincialis*) from the Tasmanian east coast was tested by the Japanese import authorities and was found to be contaminated with unacceptable levels of paralytic shellfish toxins (PST).

Mussel samples were collected and tested from the implicated consignment and harvest area to confirm the presence of the PST reported. Investigation by regulators confirmed that mussels had bioaccumulated PST through feeding on a bloom of the dinoflagellate alga *Alexandrium tamarense*.

After the presence of PST in mussels was identified, additional seawater and bivalve sampling of sites spanning most of the east coast of Tasmania confirmed the presence of *A. tamarense* cells and PST in shellfish (oysters and mussels) between Eddystone Point in the north-east and Marion Bay in the south-east.

During early November 2012 it was confirmed that oysters, scallops, clams and rock lobsters also had bioaccumulated unacceptable levels of PST. Other fishery products

(including abalone, periwinkles, sea urchins, banded morwong, calamari, flathead and giant crabs) were tested and found to comply with the maximum limit for PST.

Product rejection by Japan led to a high-profile recall of product spanning several Australian states and international markets. Japanese authorities imposed a 100% border testing regime on all bivalves imported from Australia. This non-compliance event resulted in a $23m loss to the Tasmanian economy. The incident resulted in widespread closures for 3-6 months of commercial and recreational bivalve growing areas, rock lobster, scallop and crab fisheries.

The inability to distinguish toxic and non-toxic dinoflagellate species and strains in early 2013 led to unnecessary harvest closures. Biotoxin problems recurred in September, 2013 causing closures along the East coast Tasmanian coastline from Bass Strait (scallops), St Helens and Bicheno (rock lobsters) to Spring Bay (mussels).

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