

Abalone Research Portfolio Status - October 2013

Below is a summary (as of October 2013) of the major ACA/CRC Abalone projects and their outcomes/benefits to date:

1. Australian Seafood Diagnostic Capability Map

The availability of diagnostic services for marine bio-toxin analyses is limited in Australia and various government and industry stakeholders have identified this as a critical gap in national capability. The lack of these services in Australia (until now) has meant that shellfish have to be tested at offshore facilities (principally at Cawthron - www.cawthron.org.nz - in New Zealand) to ensure the compliance of shellfish with marine toxin regulatory limits. Sending samples to New Zealand for testing imposes unnecessary costs on the industry and government through heightened transportation and customs charges. There are also unacceptable delays in receiving analytical results due to the additional transportation times associated with sending samples to New Zealand – this exposes the industry to longer closures and heightens public health risk. Given the foregoing, the establishment of a diagnostic service in Australia for marine bio-toxins is essential to meet increasing trade access and food safety requirements for shellfish, including abalone.

In 2011, the project team, through ASCRC support, facilitated a business review and implementation plan for marine bio-toxin diagnostic services in Australia. A key recommendation of this review was that a single site-single market pathway is commercially realistic and attractive. Further to this, several Australian agencies (industry and regulatory) have joined together in an informal partnership to ‘offer’ (tender) their combined samples for marine bio-toxin analysis to a laboratory based in Australia (to secure a lower cost for testing per sample).

The Australian Seafood Cooperative Research Centre (ASCRC) on behalf of the ‘Australian Marine Bio-toxin Partnership’ issued the tender. Four tenders were received from Australian based laboratories that indicated they are able to undertake marine bio-toxin testing for the Australian seafood industry. The tender assessment panel completed their review and a preferred Australian based provider was “duly appointed” in July of 2012.

The preferred provider (Advanced Analytical Ltd – www.advancedanalytical.com.au) is situated at North Ryde in NSW and has developed and validated all of the required tests for various shellfish matrices including abalone. Several of the methods implemented (including methods for the detection of paralytic shellfish toxins) have been assessed and accredited by NATA (National Association of Testing Authorities – www.nata.asn.au).

New Marine Bio-toxin Testing Facility

Advanced Analytical Ltd is now fully accredited (by NATA) to undertake testing of shellfish for the full range of regulated Paralytic Shellfish Toxins (PST’s).

This project is of particular relevance to the Australian abalone industry at the moment as testing of abalone foot tissue and viscera for Paralytic Shellfish Toxins in the wake of the recent algal bloom events in East and SE Tasmania has previously necessitated the “export” of abalone tissue samples for analysis to the Cawthron Institute in Nelson, New Zealand – it is great news that there is now a laboratory facility within Australia with the appropriate level of infrastructure and accredited technical expertise to conduct this type of analytical research.

Inshore Eastern Tasmania has recently suffered two separate algal bloom events - *Alexandrium tamarense* around the central East coast and *Gymnodinium catenatum* in the South East. Both algal blooms produce toxins that may accumulate within the meat and viscera of various shellfish including abalone.

The *Alexandrium* bloom during November 2012 created fishery management challenges for abalone, oysters, mussels, scallops, clams, and rock lobster – thankfully, after initial testing for paralytic shellfish toxins, abalone samples came back well below the human health limit and as such we were able to lift temporary harvesting restrictions shortly after the bloom was detected.

Gymnodinium bloom events have been occurring for many years in South East Tasmania and a particularly significant bloom in late 2010/early 2011 created some management “headaches” for our industry following sampling in the d’Entrecasteaux Channel. Harvesting restrictions in certain abalone sub blocks have been in place “on and off” ever since.

Initial chromatographic analysis of affected abalone tissue samples in both the foot and viscera in early 2011 confirmed the presence of PST’s in concentrations (in some abalone sub-blocks) “apparently” above the human health limit. I say “apparently” because the chromatographic analysis revealed two “unknown peaks” which could not be identified against “known” algal toxin peaks. A FRDC funded project has recently produced some preliminary toxicity results that show that the unknown peaks are very likely to represent a particular family of PST’s called doSTX which in fact have a very low toxicity. Final confirmation of these results will be available by about July this year and it now appears likely that future *Gymnodinium* blooms will be far less onerous from a fishery management perspective simply because the cumulative toxicity for this species of bloom is significantly lower than originally determined.

This is very good news for our industry!!

What this means for the Tasmanian abalone industry is that this particular species of algae are not as toxic as was originally thought to be the case.

From a broader perspective, a risk assessment currently being conducted by Dr Cath McLeod of the South Australian Research & Development Institute (and funded from within the ACA/SCRC Abalone R&D portfolio) is likely to declare that algal bloom bio-toxins are a very low risk for Australian wild abalone. Initial baseline survey results from across the five abalone producing states have been very encouraging with bio-toxin concentrations just at or below the limits of detection. The abalone bio-toxin risk assessment will be completed by about July 2013 and this document will then be used to ensure ongoing access to our international markets.

Even though it is highly likely that the risk assessment will declare that algal bloom bio-toxins are effectively a “non issue” as far as abalone is concerned, the industry will still be required to implement a management plan for future algal bloom events – such a plan is currently being drafted and will culminate in a coordinated monitoring and response strategy involving the Tasmanian Abalone Council, the Tasmanian Departments of Human Health and Primary Industry and the Commonwealth Department of Agriculture, Fisheries and Forestry.

2. Compositional profiles for seafood products sold by CRC participants

Whilst most abalone exporters already have nutritional information/panels included on their product packaging/labeling, this project has provided a scientifically robust and independent assessment of the compositional profile of abalone that will withstand scrutiny from any source – commercial or government.

In early August 2012, the final report for SCRC project 2008/905 “Australian Seafood Compositional Profiles” was made available to the ACA Ltd. By late September 2012, another “sister” project was completed and made available to the ACA Ltd – this project was conducted by Flinders University and involved a Nutrition and Dietetics expert taking the abalone specific nutritional data from project 2008/905 and turning it into a nutritional information panel suitable for use by the Abalone industry to satisfy labeling requirements and to assist with product marketing. The final Nutritional Information Panel for abalone is as follows:

NUTRITION INFORMATION PANEL (NIP) for Wild Australian Abalone (raw muscle)			
Serving size: 100g			
	Average Quantity per Serving	% Daily Intake* (per serving)	Average Quantity per 100g
Energy	392	4.5	392kJ
Protein	18.6	37.3	18.6g
Fat, total	0.58	0.82	0.58g
– saturated	0.20	0.85	0.20g
– trans	0.00		0.0
– polyunsaturated	0.24		0.24g
– omega 3	0.094		0.094g
– docosahexaenoic acid	29.30	97.7	29.30mg
– eicosapentaenoic acid	0.67	2.2	0.67mg
– monounsaturated	0.13		0.13g
Carbohydrate	3.14	1.01	3.14g
– sugars	0.9	1.0	0.9g
Sodium	268	11.6	268mg
Phosphorus	132	13.2	132mg
Iodine	0.13	84.4	0.127mg
Iron	2.86	23.8	2.86mg
Vitamin E	1.33	13.3	1.33mg
Magnesium	48.3	15.1	48.3mg
Selenium	0.009	12.9	0.009mg
*Percentage daily intakes are based on an average adult diet of 8,700kJ. Your daily intakes may be higher or lower depending on your energy needs.			

Please note:

The Food Standards Code does not set Daily Intakes for all nutrients, for example, trans, mono and polyunsaturated fats and total omega 3 fatty acids. The convention is to leave these spaces blank on the NIP.

The *Standards* in the *Australia New Zealand Food Standards Code* are legislative instruments under the *Australian Legislative Instruments Act 2003* – the authoritative versions of these standards are on the Australian Government ComLaw website www.commlaw.gov.au.

A summary of the nutritional benefits of eating Australian Wild Caught abalone is as follows:

Nutritional benefits of Wild Australian Abalone

There are ten reasons why Australian Wild Abalone is healthy to eat:

1. Australian Wild Abalone is a good source of **Protein** – protein is a nutrient needed by the human body for growth and maintenance – proteins are one of the building blocks of body tissue and can also serve as a fuel source.
2. Australian Wild Abalone is a good source of **Docosahexaenoic acid (DHA)** which is an OMEGA 3 fatty acid that is a primary structural component of human brain tissue, sperm, testicles and the retina (eye). Dietary DHA may reduce the risk of heart disease by reducing the level of blood triglycerides in humans. DHA has also been found to inhibit growth of human colon cancer cells.
3. Australian Wild Abalone is a source of **Phosphorous** - Phosphate helps to protect blood systemic acid/base balance, acts as a temporary store and transport mechanism for energy and helps in activating catalytic proteins. 85% of the body's phosphorus is in bone and the remainder is distributed through soft tissues.
4. Australian Wild Abalone is a good source of **Iodine** - Iodine is an integral part of the thyroid hormone and helps normal growth and metabolism. Thyroid hormones are required for normal growth and development of tissues such as the central nervous system and have a broader role in maturation of the body as a whole.
5. Australian Wild Abalone is a source of **Iron** - Iron is important in transporting oxygen in the blood, which is essential in providing energy for everyday life. Iron deficiency is common, especially in female sub groups (menstruating women, pregnant women, teenagers and athletes) as well as babies and toddlers.
6. Australian Wild Abalone is a source of **Vitamin E** - Vitamin E is a fat-soluble vitamin, mainly found in fats and oils and foods such as fish as well as some vegetables, and in the fat of meat and poultry. Vitamin E acts as an antioxidant, thereby protecting the membrane of polyunsaturated fatty acids from free radical damage.
7. Australian Wild Abalone is a source of **Magnesium** - Magnesium is a mineral and about 50% is found in bone. It is needed for many reactions in the body and helps maintain normal muscle and nerve function, keeps heart rhythm steady, supports a healthy immune system, and keeps bones strong.
8. Australian Wild Abalone is a source of **Selenium** - Selenium acts as an antioxidant and assists in the activity of the thyroid hormone. Selenium is also beneficial for the immune system.
9. Australian Wild Abalone is very low in **Saturated fat** – consumption of saturated fat may increase the risk of heart disease. Health authorities recommend a diet low in saturated fat.
10. Australian Wild Abalone contains zero **Trans fat** – consumption of trans fat may increase the risk of heart disease. Health authorities recommend a diet low in trans fat.

This nutritional information about Australian Wild Abalone was sourced from the “Australian Seafood Compositional Profile Study” which was conducted by the South Australian Research and Development Institute (SARDI – www.sardi.sa.gov.au) on behalf of the Australian Seafood Cooperative Research Centre.

The above information has been uploaded to the new *AWA - Australian Wild Abalone* website at www.australianwildabalone.com.au

This important nutritional information may now be utilised to assist exporters to comply with product labeling requirements and to assist with product marketing and promotion activities.

3. CRC project 2009/723: “Analysis of product differentiation opportunities for Australian Wild Caught Abalone in China—Stage 2”;

This project was established following industry concerns regarding:

1. Declining returns to industry during the last decade
2. The massive proliferation of farmed abalone product now available in the market place and
3. The lack of any coordinated, industry-wide strategic focus in the marketplace

This project can be divided into two distinct phases – the first phase is now complete and the second phase is about to commence.

The **first phase** involved *direct recruitment* of restaurants via an activation strategy delivered by the China based market partner Grey Group Asia Pacific (G2 Shanghai). A considerable amount of marketing collateral was designed and tested during this phase of the project to see if it was possible to introduce abalone based dishes into non-Chinese cuisine restaurants. The collateral was designed to generate interest in Australian wild abalone and to specifically support and underpin the creation of a new industry “brand/mark” entitled “Australian Wild Abalone” (AWA). This project phase focused on a small number of premium “top end” restaurants in Shanghai and utilized product provided by three Australian exporters and imported/distributed via two local Shanghai seafood distribution companies.

The main learning’s and conclusions overall from phase one of this project are as follows:

1. The emerging “upwardly mobile” Chinese middle class (*Mass Affluents*) is steadily growing in number and in wealth. The *Mass Affluents* are increasingly well educated, sophisticated and discerning – they are globally aware, brand oriented and actively seek new “lifestyle” experiences
2. The *Mass Affluents* are embracing new dining experiences as is evident in the proliferation of “new” fusion cuisine restaurants across all Tier One and Tier Two Chinese cities
3. There is an opportunity to expand the abalone consumption footprint in China by encouraging chefs to utilise abalone in a “non traditional” way - non traditional Chinese restaurants can be recruited (to buy abalone) with appropriate “activation” – restaurants that have never had abalone products on their menus can be recruited via a staged process involving product trials, cuisine development, specials menu and finally a permanent place on the menu leading to regular product orders
4. Chefs in “top end” restaurants are eager to expand their *expertise in* and *familiarity with* abalone products – they are “hungry” for the story behind the product and want to acquire specialized knowledge re product handling, storage, preparation and cooking styles and techniques
5. Chinese Food Health and Safety standards are becoming more stringent and ongoing compliance is an issue for top end restaurants – hence the increasing desire for raw materials of proven provenance with appropriate food health certification - possession of non-certified product by restaurants presents the risk of prosecution from Chinese Food Safety Authorities
6. Premium Quality “Independent and Hotel Chain” Restaurants are willing to pay premium prices for premium quality Abalone products that are import compliant and of proven provenance
7. Premium restaurants currently find it difficult to place Australian Wild Caught Abalone as a permanent entry on their menu due to Price, Supply and Quality volatility and a lack of product certification (COO & HACCP)
8. Currently, the seafood supply chain in China is not sophisticated enough to target and develop these opportunities - the single biggest difficulty encountered during this phase of the project was backing up successful activation and recruitment with a willing and capable supply chain
9. An ongoing investment by industry could be used to overcome this service gap and capitalize on the opportunities that are ripe for exploitation.
10. The industry should consider establishing a restaurant and consumer focused promotional strategy for the *Australian Wild Abalone* product portfolio (legally compliant products complete with COO and HACCP labelling). The industry could seek out a suitable Chinese entity(s) to engage in restaurant recruitment, sales and product supply functions – this entity would act as a “go-between” between restaurant and Chinese distributor/wholesaler.
11. The industry should consider developing product variants specifically customised to suit the requirements (quality, convenience, portion size) of the top end restaurant and food service sector.
12. High service levels will provide a source of differentiation - Value Added Products and Services pose an opportunity to expand the category footprint and thus provide differentiation in both the food service and retail environments.

The **second phase** of the project involves an increased number of Australian exporters and an increased number of China based Importers/Wholesalers/Distributors and will focus mainly on restaurants currently being supplied with abalone products. The focus of this phase will be on “activating” the China based section of the supply chain – i.e. seeing if it is possible to increase/enhance the marketing/promotional “activities” of the existing abalone importer/distributor.

This phase will be underpinned by generic promotional material/activities/events and the introduction of a unique product provenance technology (NanoTag© - please refer www.nanotag.com.au).

The project team has been working with a group of ten (10) Australian Abalone exporters to facilitate the provision of AWA product (legally compliant product with NanoTag© verification) via the established China import supply and distribution chain via the selected importers/distributors.

The companies involved are as follows; Dover Fisheries (Adelaide, SA), Western Abalone (Port Lincoln, SA), Eyre Woolf Enterprises (Port Lincoln, SA), Streaky Bay Marine Products (Streaky Bay, SA), Blue Sky Fisheries (Adelaide, SA), Dragon King Abalone (Esperance, WA), Ralphs Tasmanian Seafoods (Margate, Tas), Tasmanian Seafoods (Margate (Tas), Smithton (Tas), Dandenong (Vic)), Tas Live Abalone (Mornington, Tas), Lonimar (Kensington, Vic).

A dedicated AWA website has been established as an educational tool for purchasers (and potential) purchasers of AWA products. This website is a source of relevant information regarding Australian Wild Abalone, the products and the companies that export abalone under the AWA industry standard. It has been designed primarily to provide relevant information to any business interested in sourcing and utilising AWA product – focusing initially on the Hong Kong and China market and expanding later to include other markets. The website has four language options – English, Simple and Traditional Chinese and Japanese. The new website has the following URL: www.australianwildabalone.com.au and went “live” in late January 2013.

In addition to the establishment of the website, print media files for AWA brochures, posters and banners have been developed. These media files have been developed to have the same “look and feel” as the AWA website and will be used “on the ground” in China and Hong Kong to help promote the new AWA Brand.

Product sold under the AWA banner will be premium quality wild harvest Australian abalone and suppliers will maintain their own proprietary brand but will also utilise the AWA© industry mark on their packaging. An AWA Code of Conduct describing the terms of engagement for any exporter wishing to utilize the AWA logo and associated promotional activities has been finalised. Australian Abalone exporters must sign on to the Code in order to co-brand their products with the AWA Certification Mark.

The presence of the AWA logo on product packaging will indicate the following:

1. That the product is wild harvest Australian Abalone
2. That the supplier has conformed with the AWA Quality Assurance Code of Practice and
3. That product provenance is genuine due to the presence of Nano-Tag© labelling technology

The NanoTag© Brand Protection System consists of two main components:

1. Covert protection and
2. Overt protection

Covert Protection – this component consists of tiny metallic tags (NanoTags) that are applied to the surface of the abalone product – the tags are suspended in a UV sensitive adhesive. The Nanotags are smaller than a grain of sand but contain on their surface the AWA Certification logo and the individual Export Establishment Number (EEN) of the Abalone Processing company.

Purchasers of AWA© product can verify that it is genuine by shining an ultraviolet light over the product – the UV sensitive adhesive will react with the light and confirm the presence of NanoTags.

Examination of the individual tags via a magnifying glass will reveal the AWA© logo and the unique EEN which confirms that the product is genuine AWA© product and identifies the particular Australian Abalone Export company that supplied the product.

Overt Protection – this component consists of specially branded AWA© High Security stickers, labels, seals and packaging tape attached to the product and/or its packaging that identifies that it is protected by the NanoTag© Brand Protection system – the AWA© stickers, labels, seals and tape are embedded with NanoTags that have the AWA© Logo printed on them. All shipments of AWA© products can be readily identified by the presence of AWA© stickers, labels, seals and packaging tape.

Building the team

The project team travelled to China and Hong Kong in June and September 2013 to conduct a series of AWA™ Importer Seminars which were well attended and highly successful in showcasing the AWA™ Platform to key abalone importers across China and Hong Kong.

Nine import companies attended the Beijing Supply Chain Education Seminar, eleven import companies attended the Shanghai briefing and 20 import companies attended the Shenzhen/Hong Kong briefings. All in all, 35 different abalone import companies attended the briefing sessions and were awarded AWA™ Foundation Partner Certificates”.

The AWA™ Team is currently engaged with Marketing Professionals in China and Hong Kong to refine the AWA™ market activation strategy for the next 12 months and beyond – this strategy will take into account the challenging conditions currently being experienced within the China Food & Beverage sector due to the significant reduction in Chinese Government sponsored banquets.

More than ever, it is necessary to target the non-Government sector within the domestic Chinese market to create awareness of and preference for Australian Wild Abalone products – restaurants in China are currently adapting to the changes by focussing more on their corporate and private individual/family clients - the AWA™ Program will work with the abalone supply chain and their clients in the F&B sector to target these consumers.

Several “in market” AWA™ promotional events are being planned for Hong Kong and China during 2014. AWA™ promotional activities in China will be “lower key” than in Hong Kong. AWA™ promotional activities in Hong Kong will be more overt and will include representatives from the major seafood Importer companies and the media as well as HOREX (hotel, cafe, restaurants etc) representatives.

The challenge for this next phase of the project will be for the exporters (and the project team) to successfully energise and activate selected Chinese importers and distributors to engage in new promotional activities centred around the NanoTag rollout and a fresh round of AWA™ promotional activities.

4. CRC project 2009/708 “An Abalone Quality Assurance program for the Australian Wild Caught Abalone Industry”;

The *Australian Wild Abalone* Quality Assurance Code of Practice Master Manual has now been nationalised – i.e. it is now truly a “National” document suitable for use in all five abalone producing States. The format has been improved following recommendations from a stakeholder review. Legislative and regulatory summaries have been provided for each State and there have been a number of State specific protocols added to the document to reflect the fact that there are some operational differences between states.

This document can be downloaded from the *Abalone Council Australia* website at the following link:

http://abalonecouncil.com.au/wp-content/uploads/2013/04/Australian-Wild-Abalone-Quality-Assurance-Code-of-Practice-Master-Manual_June-2013.pdf

Seafood Training Tasmania has developed a Training package that will be used to “roll out” the QA Code of Practice across all abalone fisheries. This package was released to peak abalone organizations in each of the five abalone producing states in June 2013 – it is now up to each state body to provide these documents to a Registered Training provider to rollout the Code and conduct the training.

The target audience will be Divers, Deckhands, Mother-boat Skippers, Processors and Transporters across all abalone producing States within Australia.

Training will be non-accredited allowing for maximum customisation and to minimise course length and (therefore) the cost to deliver. In its initial iteration, the Training Package is to be contained within a 3-4 hour format (half day).

A Statement of Attendance will be issued to attendees of course. The course is to be developed in a format that allows for further expansion into accredited training as Industry/market demand for more rigorous QA/food safety/quarantine compliance increases in the future.

There will be strong linkages between the *Abalone Master CoP Manual* and associated *Abalone Training Package* and the CRC project 2010/704 “*Maximising the value by minimising stressing abalone – Optimising harvesting strategies*”: by Dr Craig Mundy and Dr Natalie Moltschaniwskyj (see below). The stress minimization strategies developed as an outcome of this CRC project will be progressively adopted within the *Abalone Master CoP Manual* and associated Training materials. This CRC project is expected to deliver outcomes in the months ahead which will provide research based advice regarding improvements in fish handling, transport and live storage practices within the Australian wild harvest abalone industry.

5. CRC project 2010/737: Marine Bio-toxins and Market Access for abalone”; Dr Cath McLeod et al

This project aims to produce comprehensive risk assessments for marine bio-toxins in abalone to assist the Australian and New Zealand abalone industries meet market access requirements. Within this broad objective there are several components of work, including: (a) adverse event sampling; (b) baseline testing in Australia; (c) depuration and canning experiments; and (d) risk assessments.

The project is scheduled to run through to mid-2014. The first 12 months of the project have seen an extraordinary amount of work undertaken due to several significant environmental events (algal blooms). These environmental events resulted in significant acceleration of the experimental design and approach for all major project components, and initial laboratory contracts were developed and in place by May 2011. From late April 2011 through to the current time the project team has undertaken significant scientific investigations into several major algal blooms events, which has facilitated the completion of two of the five project components (adverse event and depuration sampling). This rapid initial progress has meant that the project is more advanced at this stage than planned and significant focus is now being given to undertaking the baseline survey component of the work.

In early 2011, Paralytic shellfish toxins (PSTs) were detected in wild abalone sourced from several fishing zones off the eastern coast of Tasmania. These results led to the temporary suspension of live exports of abalone from some fishing areas. To assist the industry to resume live exports as quickly as possible additional investigative work was undertaken which included:

- Preliminary investigations to elucidate the identity of a novel toxin analogue discovered in the abalone samples – this additional research is being conducted via an FRDC Tactical Response Fund Application (see below comments) and utilises the proven analytical expertise of the Cawthron Institute in New Zealand.
- Additional testing to delineate the affected areas; and
- Preliminary investigations into the source of toxicity in the abalone through application of PCR tests for dinoflagellates in the viscera of the abalone.

The results from this project are now being used by industry and regulatory groups for informing risk management strategies for abalone. The active users of project information include DAFF, the Tasmanian Department of Health (TSQAP), the Tasmanian Abalone Council, the NZ Food Safety Authority and the Paua Industry Council. The Project Team has been involved in numerous teleconferences and face-to-face meetings with these end users to discuss the interpretation of results from the project, and to assist risk managers to develop well informed sampling and management plans.

The project is now preparing to focus on the baseline surveys and sample collection systems are currently being developed in conjunction with key stakeholders in each of the five abalone producing States.

Baseline Survey

This survey involves the collection of 225 samples from all abalone producing states in Australia and testing these abalone for the full range of regulated marine biotoxins (e.g. PSTs, domoic acid, DSTs). Over half the samples have now been collected and tested.

No regulated toxins have been detected in the samples tested to date. **This is good news for the Australian wild capture abalone industry.**

Canning Experiments

This work aims to investigate the reduction of PSTs in abalone following canning. If the findings suggest significant reductions of PST following canning, this work is intended to support the use of

canning as a risk management step for abalone that are contaminated with PSTs (to enable harvesting and processing). The experimental design for this work is now completed. There is currently (Feb 2013) a bloom of *Gymnodinium catenatum* in the Huon Estuary in Tasmania. Plans to harvest abalone contaminated with PSTs and then can these are underway. It is anticipated this work will be completed in the next few months (i.e. by late 2013).

Toxicity Project (FRDC TRF Application)

Initial mouse bioassays have been undertaken to investigate the toxicity of the doSTX (rare PST congener) that was detected in abalone samples taken during the Catenatum bloom events in South East Tasmania in 2011, 2012 and 2013. These bioassays involved extracting doSTX, along with other PSTs, from Tasmanian abalone and injecting the extract into mice.

These initial studies indicate that doSTX is of low toxicity compared with other PST congeners. **This is very good news for the Abalone industry and is likely to result in a much less onerous management regime in future. It will also inform the Abalone/PST Risk Assessment which in turn will assure the international market that the risks to humans of consuming Australian abalone harvested during a toxic algal bloom are very low indeed.**

To confirm that doSTX is of low toxicity it is necessary to isolate doSTX from the other PSTs present in abalone. The doSTX will then be purified to ensure no other PSTs (or other substances) are present. Purified extracts will then be injected into mice to determine the LD50. This work is currently underway and is expected to be completed during the latter half of 2013.

Once the work is completed, discussions between scientists, industry and regulatory agencies will be held to determine an appropriate approach to regulation of doSTX (and what toxicity factor should be used for this congener).

This project will be completed in the latter half of 2013 – a comprehensive Abalone/PST Risk Assessment will be produced as one of the outcomes of this project.

6. CRC Project 2010/704 — Maximising the value by minimising stressing abalone – Optimising harvesting strategies: Dr Craig Mundy and Dr Natalie Moltschaniwskyj

Harvesting, handling and transportation of abalone are stressful events and influence the capacity of the animals to recover from harvesting and their post-harvest survival. Having a better understanding of the stress profile during these phases will enable divers, transport drivers and processors to better manage the supply chain and will maximise the condition and survival rates of abalone and ensure that the maximum value of the harvest quota is retained.

The stress profiles are to be developed for a range of harvesting and transport scenarios including day fishing from runabouts and extended stay fishing from abalone mother-boats.

Based on the understanding gained from the stress profiles, the project will make a series of recommendations regarding improved harvesting, handling and transportation methods as well as how to minimise stress (and spawning) of abalone whilst in the tank holding phase prior to export and/or processing.

The Principal Investigator (PI) for this project, Natalie Moltschaniwskyj gave a comprehensive project update at the International Abalone Symposium held in Hobart in early May 2012. The “summer” series of testing was conducted near Southport in SE Tasmania in early 2012. A series of tests were conducted on abalone immediately following harvest to measure the stress response under various “on deck” storage and cooling scenarios.

The next series of "winter stress" testing was scheduled for early November 2012 but was postponed due to bad weather and the PI 's commitment on another project – this series of "winter" tests was completed during September 2013.

The PI has submitted a project extension to conduct further research focussing on:

1. The recovery of animals that have been held in stressed conditions for different times due to transit time from reef to processors - To address the question of capacity and rate of recovery following different times of transport-induced stress an experiment is proposed to monitor recovery of live abalone held in processor tanks following harvest by commercial fishers. Upon arrival at the processors blood collection of randomly selected animals will occur at 0, 15, and 30mins, then 1, 2, 3, 4, 5, 6, 8, 10 12, 18 and 24 hrs, and then every 12 hours for the following 4 days, or until blood parameters return to normal. This experiment will be repeated on abalone that have been undergone different travel times (eg 4 hrs, 8hrs & 10hrs)
2. Assess the stressing impact and recovery of animals transported using commercial wet wells systems vs commercial dry bin systems. An experiment is proposed to compare the stress related effects on blood parameters of abalone transported dry in draining bins with abalone kept in live wells. Additional parameters such as loss of abalone weight during transit will be recorded as an estimate of the loss of fluid i.e. dehydration during transit.
3. Quantifying the influence of increased seawater temperature and air temperature on stress response to live transport. Both seawater and air temperatures during summer are substantially (>5°C) greater in NSW than in Tasmania, yet the NSW harvest is also landed live at port before being shipped live, predominantly to Japan. A reduced version of the summer stress experiment is proposed for NSW to determine if adaptation to warmer temperatures by black-lip abalone exists

This project will be completed by late 2013 and is expected to inform the AWA Quality Assurance Code of Practice (CRC project 2009/708) with improved product handling strategies.

7. *CRC project 2009/714: "Decision Support Tools for economic optimisation of invertebrate fisheries"; Principal Investigator; Dr Caleb Gardner*

The first phase of this project involves collection of economic data from processors and from fishers. This provides the essential economic basis for the bio-economic modeling and other analyses to be conducted in this project. A time series of export prices has been collected from several Tasmanian processors. Additional export data has been obtained from ABARES. A database has been built which will store the economic data at IMAS and ensure that it continues to be available in future.

This project attempts to include economic information in abalone management decision-making. This process has been used successfully in other fisheries such as rock lobster and prawns where management decisions were previously based on very formal biological data but only ad-hoc or anecdotal analysis of the economic effects. Examples of applications include the tracking of fishery performance through assessments, setting stock targets based on maximum economic yield, and assessing the effect of other factors such as recreational allocations or MPAs.

The 1st project workshop was carried out on 10th of October 2012 in Melbourne. The attendants exchanged information on the status of the fishery, and drafted a work plan that attempted to cater for the different needs in different states

Most bio-economic analyses are directed to increasing economic yield, which is revenue minus cost. Revenue is found from landings data and processor data on price. Cost is more difficult to obtain because it involves surveying participants. Cost data has been collected on several occasions previously and in different states – but by different methods. In this project a common approach is being used that aims to provide a standard for future reporting of fishery performance in a way that results can be compared between regions and through time.

Import data has been collected and analysed for the Japanese and Hong Kong markets with papers in review with the Australian Journal of Agriculture and Research Economics. The intent of this work was to examine the sensitivity of price to supply of Australian product, substitute product, and change in product forms. This has been a different approach to that applied in rock lobster and prawns where price is independent of supply at the Australian jurisdictional scale.

This project will be completed in late 2013 and is expected to provide a valuable tool for industry and fishery managers to improve bio-economic outcomes for Australian wild harvest abalone fisheries.

8. CRC project 2009/715: “Optimising business structures and fisheries management systems for key fisheries” Dr Tim Ward

There has been progress with commencing an economic performance evaluation for the South Australian prawn fisheries and discussing options for improving profitability of the fisheries. These fisheries were selected as pilot case study fisheries to measure economic performance of key CRC fisheries using the wealth-based fishery performance indicators (EPI) developed by Anderson and Anderson (2010). Two stakeholder workshops were held during 27-28th of February 2012 at Port Lincoln and Adelaide, which entailed 1) presentation of the current economic status of the SA prawn fisheries; 2) presentation of the assessment results using EPI system; 3) a series of presentations about fisheries that have established improved management systems; and 4) discussion of suitability of various options. The workshops provided an opportunity to address the issues that are of concern to the industry, and a basis for further discussion.

The next step is to carry out similar economic assessment for the selected CRC fisheries (e.g. southern rock lobster, abalone fisheries) and following each workshop the project team would work with industry, managers and scientists for each fishery to develop an options paper that assessed the pros and cons of various systems for each fishery.

This project will be completed by the end of 2013 with a preliminary report available in June 2013.

9. CRC Project 2012/704: “Industry Strategies to support Intergovernmental negotiations concerning the export of Australian Rock Lobster and Abalone to China”

Representatives of the Seafood CRC and the Australian Abalone industry went to Hong Kong and China in November 2011 (as part of the SCRC China Project) - the purpose of the trip was to meet with key Chinese seafood importers and to try and understand some of the issues they were facing (re importing product - tariffs' etc) and to see if they were willing to engage in a collaborative market/promotional initiative with their customers for Australian Wild Abalone.

The two key outcomes of the November 2011 mini trade mission were that:

1. Chinese Seafood Importers were willing to engage in some form of collaborative marketing initiative (the preparatory work for this is currently being done within project 2009/723 China Market project - ie. new AWA website and associated marketing collaterals, NanoTag© rollout, QA Code of Practice etc etc)) and

2. Chinese Seafood Importers wanted the Australian Government to engage with the Chinese Government regarding improving/stabilising the current trading arrangements re imported Australian seafood.

There are a range of risks and uncertainties within the current trading environment for abalone and rock lobster with recent issues at the HK/China border gradually encouraging Australian exporters of abalone and lobster to move over to the direct trade route into the larger Chinese cities of Shanghai, Beijing and Guangzhou - the Chinese Central Government has initiated steps to increase compliance with customs/importing laws and we are now witnessing a transition from the "traditional" Hong Kong/Shenzhen trade route to the "newer" (compliant) direct trade route.

This transitional period throws up a number of challenges but also offers some opportunities if we are smart about it! To this end, the SCRC and the China Project team are working to gain a more detailed insight into what is happening in China and how we can best position ourselves to smooth out the bumps in the transition process. The SCRC have also been talking with key representatives of the Southern Rock Lobster (SRL) industry (Tasmania, Victoria and South Australia) and the Western Rock lobster (WRL) industry (WA). The upshot of these discussions was a tripartite agreement (between Abalone Council Australia, Southern Rock Lobster and Western Rock Lobster) to seek assistance and professional expertise to undertake a comprehensive assessment of the current and future trading environment for abalone and lobster products into China so that the industries can:

- a. communicate that advice to the Australian Government staff that are involved in China trade and market access issues and
- b. assist the exporters to better understand the "newer" trading arrangements so that they can adapt as necessary :

Three major outputs were required:

1. A report suitable for use by the Australian lobster and abalone industries, Australian government agencies and the SCRC that
 - a. Describes the details of the current trade policy instruments and procedures applicable to lobster and abalone imports to China, including regional differences if any.
 - b. Describes issues identified by Australian exporters that might be resolved through trade negotiations. For example, tariff rates, consistency in application of declared values, delays in customs clearances, port to port inconsistencies, etc.
 - c. Comments on the status of any inter-government negotiations to change Australia – China trade conditions and recommendations for short, medium and long term opportunities for improvement in these arrangements. (Free Trade agreement, bilateral agreement for Seafood).

- d. Contains an analysis of the impact of the New Zealand - China Free Trade Agreement on the lobster and abalone industries and an assessment of the likely impact of an Australia – China FTA.

2. A confidential report and plan that sets out any activities the industry might consider implementing to assist in inter-government negotiations. This would include industry awareness activities undertaken with commercial counterparts in China. The report would also contain a manual that provides key messages and a guide to constructive engagement by industry officials involved in trade negotiations.

3. A series of options or recommendations on how the industries could establish a program to provide ongoing intelligence and awareness of developments in China trade policy and input to Australian government negotiations with China.

A brief describing the work required was placed in key media publications and was responded to by a number of Consultancy firms specialising in Communications/Trade & Market Access services. Three expressions of interest were received and following interviews with the SCRC/ACA/SRL/WRL Assessment Panel in July 2012, the company Kreab and Gavin Anderson (KGA) was engaged by the SCRC on behalf of the ACA, SRL and WRL. Please refer to www.kreabgavinanderson.com for details re who KGA are and what services they specialise in.

The key KGA consultant is Sam Guthrie - he gave a presentation on the China marketing strategies of Wool Innovations Australia at the 5th National Abalone Convention at Hamilton Island in July 2011. He is now a senior consultant at KGA. KGA also has available the services of Geoff Raby - the immediate past Australian Ambassador to China - Geoff completed his China role in August 2011 and now works for KGA.

A round of industry briefings (for Sam and another KGA partner, Michael Morgan) in Hobart, Melbourne, Adelaide and Perth were held in late 2012 where abalone and rock lobster stakeholders were able to fully brief KGA re their experiences and accumulated knowledge of the China seafood market. At the same time, KGA conducted research within China and Hong Kong regarding trade and market access issues within those two jurisdictions.

A forum held in Adelaide in January 2013 (attended by stakeholders from Abalone, WRL and SRL) provided an opportunity for KGA to release their preliminary report entitled “ Protecting Australia’s Abalone and Rock Lobster Trade with China – Trade Agenda and Communications Strategy”.

The report provides the following:

- Background information regarding the abalone and rock lobster trade with China, the Australian Asian Trade Agenda (White paper 2012) and the status and challenges of direct trade with China
- A Situation Analysis of the current trade routes (both direct and informal) into China focussing on the challenges and impact on the Australian Seafood Industry
- An analysis of the opportunities for the seafood industry to improve trade with China via “partnering” with the Australian and Chinese Governments in order to ensure that China’s evolving systems of customs and quarantine regulation work efficiently and continue to facilitate a mutually beneficial trade between the two countries
- Recommendations regarding the “correct” approach to Trade Negotiations
- Recommendations regarding a Trade Agenda Communications Strategy
- Recommendations regarding a Trade Agenda Activity Plan

The first step in the Activity Plan was to establish a singular body that represents Australian Abalone and Rock Lobster re international trade. As mentioned above, this group has now been formed and

has travelled to Canberra during March and July 2013 to meet with the Australian Government to commence discussions regarding improving market access, reducing tariffs and streamlining Customs clearance into China. The March round of meetings included representations to the following; *Department of Foreign Affairs and Trade, Department of Agriculture, Fisheries and Forestry, The Office of the Prime Minister, The Honourable Julie Bishop – Shadow Minister for Foreign Affairs and Shadow Minister for Trade, Senator Richard Colbeck – Shadow Parliamentary Secretary for Agriculture, Fisheries and Forestry, Dr Craig Emerson – Minister for Trade, The Office of Joe Ludwig – the Minister for Agriculture, Fisheries and Forestry and Rowan Ramsey, Federal Member for Grey, South Australia.* The July round of meetings included representations to the Acting Secretary of DAFF and other senior DAFF staff.

Combined Abalone and Rock lobster trade into China was worth \$378.2 million in 2010/11 (ABARE statistic) - this represents an impressive 8% of the total gross value of all agricultural exports from Australia to China!!

It is vitally important for Tasmania (and indeed all States that produce abalone and lobster) that we do everything possible to protect and enhance our trade with China – this important new project has brought our highly valuable abalone and rock lobster industries together in a collaborative initiative to strengthen and expand the legitimate *direct trade* platform into China.

Dean Lisson

Executive Chairman, Abalone Council Australia Ltd