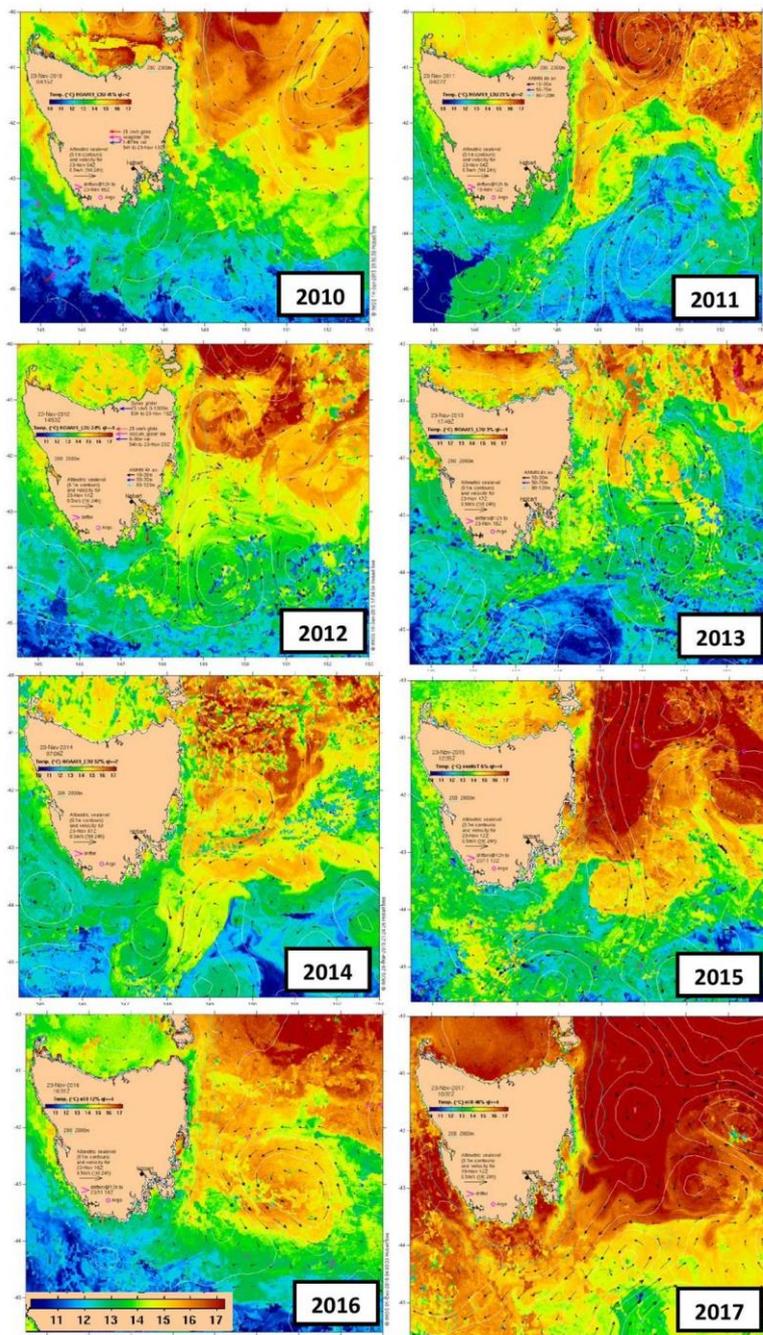


POMS UPDATE - SUMMER 2017/18: # 10 - Jan'18

Belated Happy New Year to everyone and very best wishes for a more productive and less stressful year for oyster growers in 2018.

The weather was not very kind to oyster farmers last spring 2017, with exceptionally warm water temperatures leading to a POMS outbreak in Pitt Water and Pipe Clay Lagoon in late November. Just to prove how exceptionally warm the coastal waters off Tasmania were at this time, Sarah Ugalde put together a diagram of satellite images of water temperatures on 23 November each year for the last eight years; see below. This day was probably the warmest that occurred in November last year.



This was followed by a major storm event which lead to farm closures across much of Tasmania, and even worse, a sewage spill in Pitt Water, which left this area closed until after Christmas. Hopefully this is the end of bad luck for oyster growers, and that much better times are ahead.

BIOSECURITY TASMANIA - JOHN PRESTON

THE POMS SEASON - SO FAR

Firstly I echo Christine's happy New Year message to everyone and I wish all growers and their families the best for the year ahead.

As reported by Christine, the POMS season started with a vengeance in Pitt Water with the first significant mortalities reported on the 23 November. Samples were taken as per our standard protocol of PCR testing the first reported mortalities in any growing area. The results from this testing indicated that individual CT values, or the amount of virus per oyster tested, was significantly higher than the oysters tested from the same growing area the previous year, which in turn, were much higher than the oysters tested in the first year of POMS.

The most likely conclusion drawn from these higher CT values is that there is greater amount of available virus within the impacted area than in previous years. Mortalities were generally reported as being higher than expected as well. Following on soon after, Pipe Clay Lagoon reported mortalities on the 28 November and these oysters were sampled and PCR tested. The results were positive for POMS and again the CT values were the highest that had been recorded.

The torrential rains in the first weekend of December put an end to the POMS season for a while but did create other problems with all growing areas being closed for a period of time. By January 2018, water temperatures had again risen to the extent that both Blackman Bay and Little Swanport have reported mortalities and have had confirmation PCR tests done. Both areas tested positive to POMS although the individual CT's were not as high in either case as Pitt Water or Pipe Clay Lagoon. Mortalities have also been reported as patchy across both of these growing areas.

Unlike the patchy water temperatures of last summer, this year's temperatures have been remarkably consistent across a number of growing areas. This has resulted in more than 36 consecutive days of water temperatures of 18c or above. This translates to approximately 6 consecutive incubation periods for the POMS virus, making repeat disease activations a really strong possibility.

I have recently received reports from Pitt Water of slow or dozy fish, often regarded as a sign that an out-break of POMS is imminent. In particular, the current weather pattern is likely to increase possibility of this occurring.

PROOF OF FREEDOM - SUMMER SURVEILLANCE TESTING

Since the last POMS newsletter I have undertaken the Proof of Freedom testing of all of the three POMS Free area of the state.

For Proof of Freedom testing in the 3 free areas, up to 80 samples were collected from each growing area. These samples were then PCR tested for POMS at Mt Pleasant laboratories. All of the samples tested negative, which is fantastic news for the whole industry. At this stage it is intended that this process will be repeated at the end of summer to check that these areas remain free heading into winter.

TESTING OF OTHER AREAS

Testing will be undertaken in a number of other areas around the state after the testing of the 3 free areas. Some of these other areas will include, Great Oyster Bay, Dunalley Bay, Great Bay and Eaglehawk Bay. I will be contacting growers in these areas to discuss sampling over the next few weeks.

MOVEMENT PERMITS

Most of you have moved over to the new Movement Permit periods in place for the state. Previously issued Movement Permits expired on 31 October 2017 so if you have a need to move stock or used oyster equipment, please check first that you have a current movement permit to do so.

For those of you unaware of the change to period, generally Movement Permits will be issued from 1 December to 31 March and from 1 April to 30 November. If you intend to move oysters or used oyster equipment make sure you have a permit. If you are uncertain of any issues in relation to permits, please call me.

FINALLY...

As always, if you do experience any unusual mortality events on your farms, in the first instance contact me on the numbers below. I think that this summer could potentially be very active in the POMS sense and as such as always, I urge everyone to remain vigilant and continue to employ good Biosecurity practices in whatever they do with their oysters

And if you have any concerns in relation to POMS or Biosecurity please don't hesitate to contact me.

My contact details area: John Preston
 Mob: 0428 504 150; Ph: 6165 4825
 Email: john.preston@dpipwe.tas.gov.au

IMAS - CHRISTINE CRAWFORD AND SARAH UGALDE

We have been busy conducting our research largely as planned. Below are some initial results, although we prefer to wait until we have all the results for this POMS season before we make any major comments and conclusions. We also won't have qPCR results for viral loading until the end of summer because the Fish Health Labs has offered us a significantly reduced price for the analysis if we provide them with many samples at once and if the analyse is done at a later date when they are not busy.

Chilling

This project investigated whether chilling oysters can reduce the severity of disease and mortalities during summer exposure to POMS.

Two groups of oysters were used for the experiment (80 % EBV), 20 – 30 mm unchallenged oysters and 30 – 40 mm pre-exposed oysters. Oysters were put out on a lease in Pitt Water on the 29th October 2017 at a density of 100 oysters per tube. The oysters were subjected to four treatments;

- Chilling just before POMS outbreak (**'First'** treatment, chilled on 21 November 2017)
- Chilling during POMS outbreak (**'Second'** treatment, chilled on 29 November 2017)
- Chilled every week (**'Weekly'** treatment starting on 21 November 2017)
- No chilling (**'On farm'**, oysters left on lease)

All treatments were chilled for approximately 3 days (**'C3'**), except 'First' chilling treatment that was chilled for both 1 day (**'C1'**) and 3 days (**'C3'**).

At the beginning and end of the experiment, mortality and total oyster weight was measured. Some oysters were also taken for qPCR analysis to measure the viral load (samples not yet analysed).

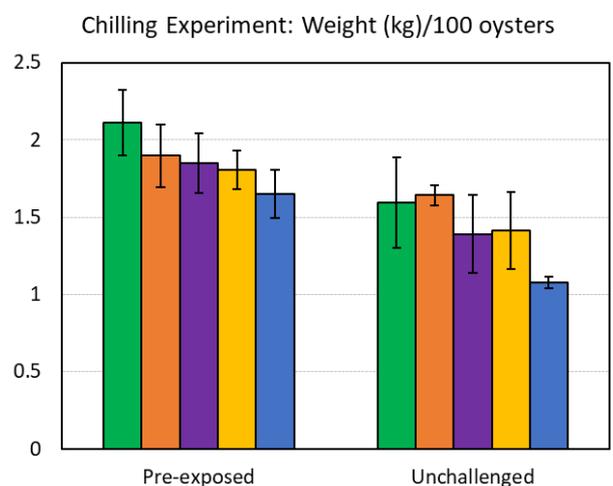
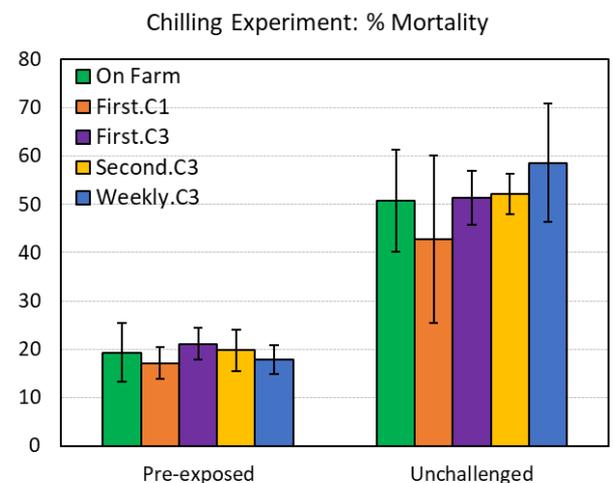
The top graph shows the percentage mortality for the two oyster groups (unchallenged and pre-exposed) across chilling treatments. Unchallenged oysters had significantly higher mortality than pre-exposed.

The bottom graph of total weight per 100 oysters for the two oyster groups across treatments shows that for unchallenged oysters only, those chilled every week had significantly reduced weight, probably because they had less time in the water to feed compared with other oysters. Chilling may have also slowed down the metabolism of the oysters.

These results indicate that chilling oysters under these specific conditions is not connected with POMS-associated mortality. However, we are yet to get the data on viral concentrations occurring during these experiments. We also need to clarify whether size of the oysters is important, and if chilling has an effect on mortality of spat and market-sized oysters under diverse conditions.

Window of infection

This project aims to provide information on the period of infection, i.e. when the oysters are vulnerable to disease, including when the virus is first activated and if there is one virus outbreak or several waves of the disease.



Spat (EBV 80%) have been deployed at four sites at each of Pitt Water and Pipeclay approximately every two weeks since mid November 2017 (see Figure below). At each site, spat are held in both floating packs and in tubes on racks, about 20 m apart from each other.

The spat are replaced about every fortnight and the percentage mortality of spat over the previous fortnight is determined and a sample is set aside for qPCR .

Results so far show low mortality, except at Pipeclay for the first fortnight (deployed 13th – 30th November 2017), which had up to 95 % mortality. During these two weeks no mortality was detected in Pitt Water, which is different to the relatively high levels of mortality observed on some farms. At this stage we have no clear explanation for these discrepancies and will examine qPCR and temperature data when they become available.

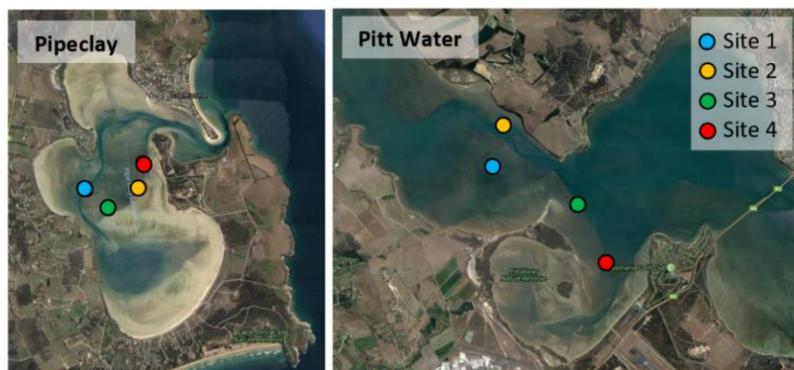


Fig 1. Sites at Pitt Water and Pipeclay for Window of Infection trials.

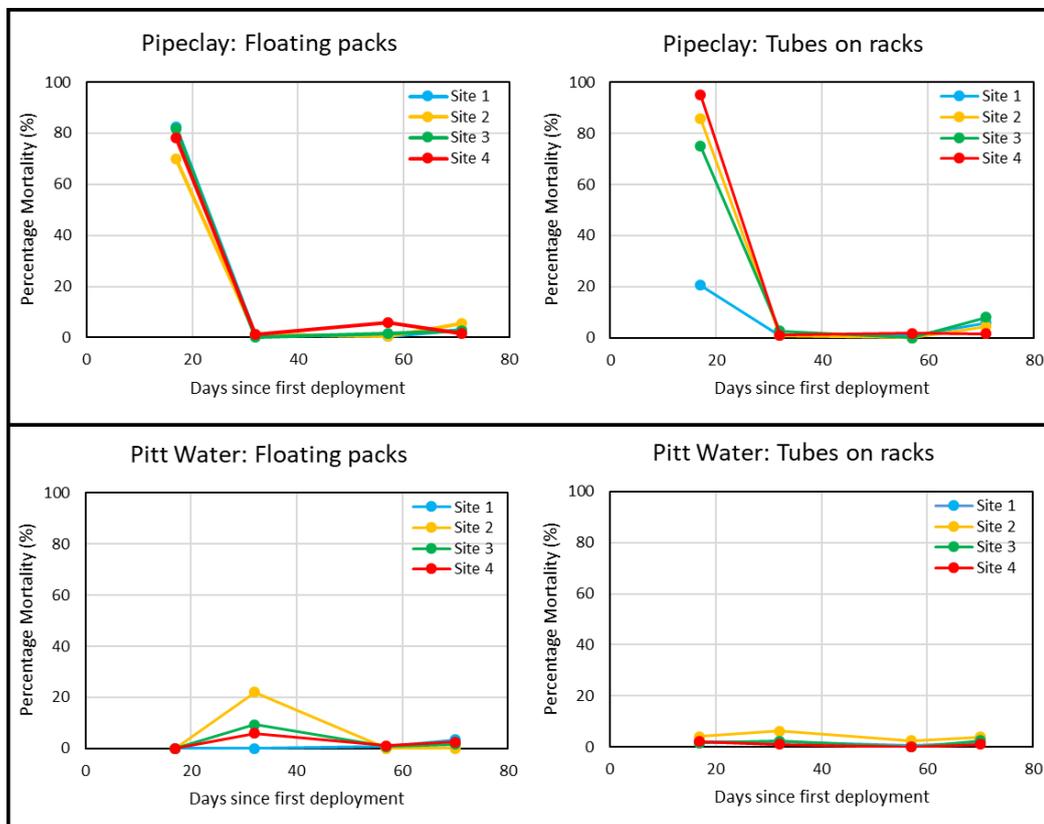
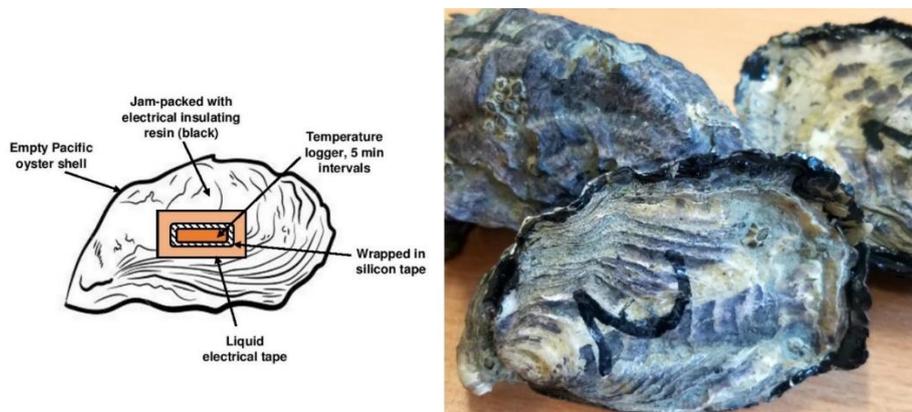


Fig. 2 Percentage mortality of oysters every fortnight at each site.

'Robo' oysters

Due to some industry interest to look at temperatures experienced within oysters, IMAS is trialing four 'robo-oysters' in Pitt Water. These consist of small temperature loggers (recording temperature every 30 minutes) within an empty oyster shell that has been filled with resin with similar thermal properties to shellfish meat.

The robo-oysters are currently being kept in tubes at two different heights; bottom clip and top clip, and will be deployed for up to 3 months. These data may shed some light on temperatures within oysters during times of exposure, and whether high rack height induces temperature stress on oysters, potentially making them more susceptible to POMS-associated mortality.



Finally, if you have any questions or comments about our research, please give us a call. We are always interested in hearing your views.

Christine Crawford: 0428 277 222 or Christine.Crawford@utas.edu.au

Sarah Ugalde: 0467 750 337 or Sarah.Ugalde@utas.edu.au

Biosecurity Tasmania - Kevin Ellard

Update on environmental testing for OsHV using plankton tows.

Many people may not be aware, but there is currently a strong push in many countries, including Australia, to reduce the risk of introduced marine pests. Improved biosecurity for introduced marine pests has the advantage of also improving aquatic disease biosecurity, so much so, that many jurisdictions now include both under the single banner of 'aquatic biosecurity'.

One of the key areas of research currently being undertaken in marine pest biosecurity is the use of environmental DNA (eDNA). This surveillance method uses samples collected from environmental sources (often water) to test for traces of the target species DNA. Although the DNA test method is often similar to that used for detecting disease, ie. PCR, the process of collection samples and extracting eDNA varies and can often be challenging. Use of

standardised eDNA methods may offer an alternative in future POMS surveillance, but the process also has potential for a range of other aquatic diseases affecting Tasmanian aquaculture.

Soon after the first reports of POMS in Tasmania, Biosecurity Tasmania began investigating potential pathways and timing of introduction of the virus. As part of these investigations, we looked for suitable samples collected prior to February 2016 that might provide a clue. This included eDNA extracted from Hobart plankton samples as part of the marine pest project undertaken by SARDI in 2016. Samples were forwarded to the CSIRO Australian Animal Health Laboratories (AAHL), Geelong and 13 of 22 were confirmed positive for the OsHV-1, the causative agent of POMS. This suggested that virus was present in the Derwent and Hobart port areas prior to disease outbreaks on farms.

Biosecurity Tasmania and SARDI have recently been investigating the potential for using similar eDNA methods for detecting aquatic animal disease. A pilot project was conducted during the first half of 2017 in which plankton samples were collected from two previously infected oyster-growing regions and the Derwent River. Sampling included a series of 100-meter tows repeated over a number of months. The aim of this testing was to determine if the results of plankton sampling undertaken in 2016 could be reproduced and whether there was an association between the presence of oyster DNA and virus DNA.

Figures 1 and 2 illustrates pilot study findings for Pacific oyster DNA and OsHV-1 DNA for summer, autumn and early spring. Both virus and oyster DNA can be detected in summer/autumn but virus was not detected in September. Within the attached map, a result identified as indeterminate is considered positive, but at a very low level. Funding has now been provided by the Oyster CRC and the project will be extended to include monthly throughout 2017/18. This testing will help to determine the seasonal pattern of eDNA detection.

So, if you see a small blue and yellow boat towing plankton nets around oysters leases, this is us. We are always happy to chat to you about the project. I would also like to take this opportunity to thank staff at both Camerons of Tas. and Shellfish Culture for their assistance. SARDI staff included in the project are Marty Deveney and Kathryn Wiltshire.

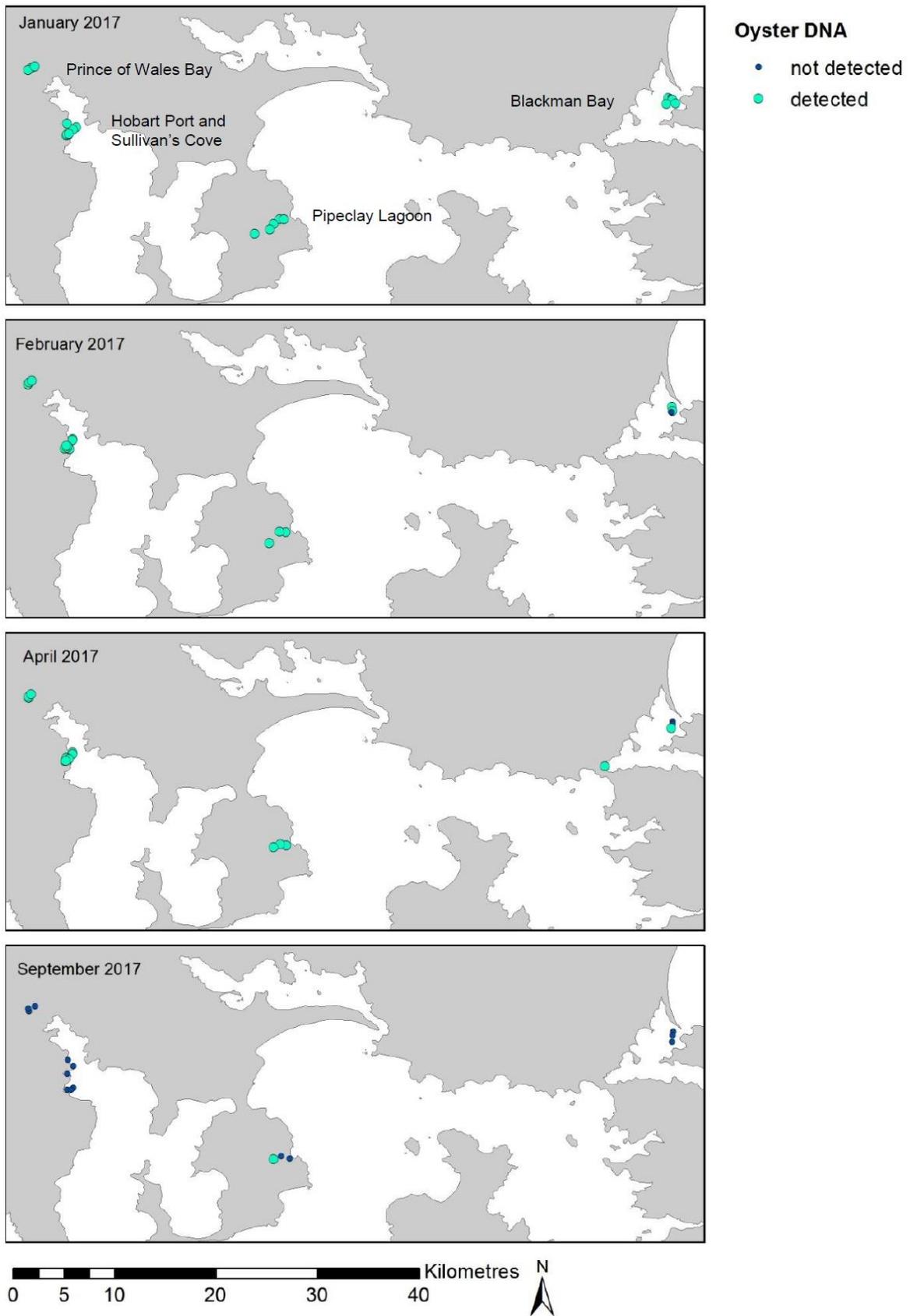


Figure 1. Plankton sample locations by sample period showing detection of Pacific Oyster (*Magallana gigas*) DNA



Figure 2. Plankton sample locations by sample period showing detection by OIE Martenot OsHV-1 FAST qPCR

Oysters Tasmania – Sue Grau

Oysters Tasmania is in the process of developing a regular email newsletter to distribute to the local shellfish industry and other interested stakeholders such as researchers and

interstate industry members every two months. For the moment, as some of those currently on the distribution list for the POMS Newsletter may not be interested in a whole of industry perspective, there will be two separate newsletters. Oysters Tasmania will include a summary of the POMS newsletter in their publication.

The biggest news from Oysters Tasmania this edition is the Tasmanian Government's recent decision to continue to support the industry with an extension of fee relief for the quality assurance program levy, previously provided under the **POMS Industry Support Package**. The Tasmanian Government remains committed to supporting our oyster industry to recover from the widespread impacts of POMS and ultimately grow the value and reputation of our quality product. In recognition that the industry is still recovering the Government has provided an additional \$640,000 in transitional assistance through reduced industry levies for this financial year.

While this won't equate to a full waiver for all licence holders, the industry has shown maturity by electing to provide full fee relief for those in POMS infected areas for the quality assurance program levy. The areas classified as free or intermediate will still receive a 25% reduction in this levy. Oysters Tasmania is very appreciative of the Government's continued commitment to supporting our industry.