

FINAL REPORT (DEVELOPMENT AWARD)

AWARD CODE and TITLE

2008/314.31 2012 FRDC International Travel Bursaries: Sean Tracey

AWARD RECIPIENT: Dr Sean Tracey

ADDRESS: University of Tasmania, Private Bag 1, Hobart, TAS 7001

HOST ORGANISATION: University of Tasmania

DATE: 15 February 2013

ACTIVITY UNDERTAKEN

The travel bursary was to attend the 36th annual larval fish conference in Bergen, Norway (2-6 July 2012).

OUTCOMES ACHIEVED TO DATE

My presentation at the conference was well received and it was acknowledged that the integration of temperature based survival into an individual based larval dispersal model was novel and on the cutting edge in the field of larval dispersal modeling.

Having the opportunity to observe the presentations of world leaders in the field of larval dispersal modeling was fruitful. I learned of many developments in the field and also was able to discuss with colleagues what challenges lie ahead in the field and how they can best be tackled.

I had lengthy discussions with Claire Paris, an acknowledged leader in the field of particle dispersal modeling, with multiple high profile papers on the subject in journals such as "Science". These discussions led to access to her models, higher resolution oceanographic data than currently used in my models and discussions of collaboration in the future.

Since the conference I have had an internationally peer reviewed paper published on the work I presented (Tracey et al. 2012) (attached) and been the co-recipient of a prestigious ARC grant that will utilise bio-physical models.

Acknowledgments

I would like to acknowledge the FRDC for funding assistance as well as the University of Tasmania for affording me the time to attend the conference.

Background

The presentation delivered was titled 'The effect of ocean warming on the early life history of *Latris lineata* inferred through a lagrangian bio-physical dispersal model'. The study species, striped trumpeter, is an iconic fish and a popular target of both

commercial and recreational fishers. Over 25 years the population has displayed marked recruitment variability. It is thought that this erratic recruitment is due to variability in the success of the early life stages. By combining biological information with oceanographic models we have been able to model the dispersal and survival of this critical life history. We also ran climate change scenarios that predicted the effect of temperature on the survival of this early life stage.

Need

By attending the conference I have returned with knowledge to develop the model further by implementing world standard procedures, realised by discussion with world leaders in this field and watching a range of presentations relating to the field of research.

Objectives

1. *Hear presentations from a diverse group of international researchers working on bio-physical modelling of the early life-history stages of fish and invertebrate species*

I saw many excellent presentations that covered a broad range of topics relating to larval dispersal modelling. These included presentations on particle dispersal modelling, larval behaviour and larval survival and in many cases how these factors can be incorporated into individual based larval dispersal models.

2. *Present research on a cutting edge bio-physical model that integrates climate change scenarios and assesses their effect on larval survival.*

My presentation was successful and well received by the audience. I had several favourable comments and intriguing questions directly after my presentation, as well as follow up conversation with several people during the remainder of the conference.

3. *Network with peers to enhance the development of bio-physical modelling in Australia*

As previously mentioned I had fruitful discussion with several world leaders in the field of bio-physical modelling. These discussions led to talk of collaboration, access to advanced model code as well as access to high resolution oceanographic data. The connections made will be useful into the future.

Methods

The 36th annual larval fish conference was held over 5 days in Bergen, Norway. The conference venue provided both accommodation for all delegates and the presentation rooms. By having all delegates accommodated at the venue provided many opportunities in the margins of the conference and after hours to engage in discussion with colleagues. This situation maximised the opportunities at the conference.

Results/Discussion

I learned of many cutting edge advancements in the field of bio-physical dispersal modelling and larval biology and behaviour. Much of this research is not yet available in the peer reviewed literature so by attending the conference I can begin to integrate this knowledge into my current work programs.

I have recently been engaged to collaborate on a range of projects that require an aspect of larval dispersal modelling. What I learned at the conference will greatly benefit these collaborations.

The collaborations relate to projects involving a range of species both of commercial and environmental value to Australia, including: Scallops, Deep sea corals, long spined sea urchins and southern rock lobster. The latter relates to a prestigious ARC research grant awarded to a team of IMAS researchers in 2012, of which I am a co-chief investigator. The project is titled 'Understanding the stock-recruitment relationship to reverse the decline in the southern rock lobster' and we will engage a new PhD student in 2013, whom I will be co-supervising. Their project will focus solely on the larval dispersal aspects of this project.

Benefits and Adoption

The knowledge gained by my attendance at the conference will benefit the Australian scientific community, state and government fisheries and environmental management agencies and ultimately commercial and recreational fishers. The modelling outputs are useful for considering scenarios around the spatial management of fisheries and the marine environment. The novel inclusion of temperature based survival into the models also provides predictive scenarios for climate change futures from an individual based model perspective. Although these scenarios are currently species specific, they will complement, and provide potential input, into broader ecosystem consideration of the impacts of climate change.

Further Development

Through on-going work in the field of bio-physical modelling I will keep in contact with colleagues that I met at the conference. These connections will be invaluable in remaining current in the field as utilise bio-physical modelling in a range of projects that will study key Australian marine species.

References

Sean R. Tracey, Klaas Hartmann and Alistair J. Hobday (2012). The effect of dispersal and temperature on the early life history of a temperate marine fish. *Fisheries Oceanography*, 215:336-347.

Intellectual property

There are no issues of intellectual property arising from this travel bursary

Appendices

[Attach any other relevant material including e.g. data, course outline, pamphlets, itineraries, photos]

