



# THE SCHOOL CONTEXT

**Exmouth District High School** 

452 Primary and High School studentgrowing number in Year 11 &12.35 Teachers and 14 Education assistants

Closest town:

Carnarvon 348 kms

Distance from Perth:

1200kms





### THE SCIENCE CONTEXT

Exmouth District High School The STEM Team Susie Bedford (BSc, MSc, Grad Dip Ed) – Team leader Level 3 Classroom Teacher Year 12 Human Biology, Year 10 and 9 Science

Coding & Robotics, 3D Printing

Warren BushYr 7 & 8 Science and Maths(BSc Grad Dip Ed )James Taylor (BEd)Yr 8 & 9 \$

Yr 8 & 9 Science and Maths

**Nerida Baker** 

Yr 9,10,11 & 12 Maths

Simon Wright (BEd)

**Primary Science specialist** 

**Candice Stewart** 

Ningaloo Outlook! Here we come!! Where dreams become reality! Most amazing Lab assistant

# Ningaloo Outlook Science Engagement with Exmouth DHS

Linking a research programme with school science



If it has faults, it's geology.

If it's incomprehensible, it's mathematics.

If it doesn't make sense, it's either economics or psychology

Any engagement must have links to the Curriculum, the School Vision and be STEM/STEAM oriented

**School Vision** 

Challenge students to aim higher than their personal best Make Connections between their learning and the wider world Utilise Creativity to develop innovative solutions Cultivate Quality teaching and learning Students become Independent and Lifelong learners







#### www.seaturtles.org



Group

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# Ningaloo Outlook Community Engagement with Exmouth DHS

#### Linking the Curriculum and the Research

#### **Biological Science**

Ecosystems consist of communities of interdependent organisms and abiotic components of the <u>environment</u>; <u>matter</u> and energy flow through these <u>systems</u>

 considering how energy flows into and out of an ecosystem via the pathways of food webs, and how it must be replaced to maintain the sustainability of the system.

#### Ningaloo Outlook Turtle Research

- In addition to tagging, researchers are studying the role of these species in the **food webs** of Ningaloo
- and aim to provide insights into the diet and habitat use of turtles



# Ningaloo Outlook Science Engagement with Exmouth DHS

How does it all come together?

#### Ningaloo Outlook

Enthusiastic Lead Scientists who are prepared to share their knowledge and scientific research with the students Mat Vanderklift, Russ Babcock, Damian Thomson



Project Delivery Coordinator CSIRO Ocean and Atmosphere Flagship

#### <u>School side – very supportive Principal</u> <u>Enthusiastic teachers:</u>

Excursion planning (inc. risk management plans), notes to parents, bus bookings, photographic permission, student medical forms, liaise to get students out of other classes, co-opt other teachers, Bronze medallion requal



# Field Excursion Turtle Tagging









With Mat Vanderklift , Richard Pillans and Jessica Stubbs. Satellitle and acoustic tagging, recording physical measurements, blood samples for analysis of carbon isotopes to ascertain diet from local environment





# Field Excursion Turtle Tagging









Students were given hands on opportunities to take turtle measurements, record data, prepare turtle carapaces for the satellite tags and be research assistants for the day!





# Ningaloo Outlook Community Engagement with Exmouth DHS

Linking the Curriculum and the Research

Group 10 Science Inquiry Skills

#### Questioning and predicting

- Formulate questions or <u>hypotheses</u> that can be investigated scientifically **Planning and conducting**
- Plan, select and use appropriate <u>investigation</u> methods, including <u>field work</u> and laboratory experimentation, to collect <u>reliable data</u>; assess risk and address ethical issues associated with these methods
- Select and use appropriate equipment, including <u>digital technologies</u>, to systematically and accurately collect and record data

#### Ningaloo Outlook Deep Reefs

- the focus will include analysis of video, bathymetry and backscatter data to improve habitat characterisation
- and initial mapping of deep water reef areas as well as further survey work.
- The team have now created a habitat map by exploiting the characteristic signals produced by sonar, coupled with data collected from video and AUV field deployments."



# Deep reefs – AUV pool exercise







Nick Mortimer, Ross Babcock, Joe Turner, Karl Forcey set up an artificial reef in the local swimming pool and explained how the AUV can be utilised to survey the deep reefs, gathering a huge amount of data in the process.





Students learnt how to calibrate cameras to estimate the size of fish from photos





# Students from Years 7-10 helped to build a RUV under the expert guidance of Nick Mortimer





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#### Saturday morning testing - will it work?









And it worked!!!!!





#### Students took turns to control the RUV and the AUV "Starbug"





"We thought it was really interesting how scientists research the reef with an AUV, collect the data, check the health of the system and discover new things.

Thanks BHP and CSIRO." Chelsea Davies Yr 12 (2018 School Captain)





# *Ningaloo Outlook* Incursion at Exmouth DHS August 2017 with Dr Suzie Starfish "A picture paints a thousand words"





Group

### Ningaloo Outlook Community Engagement with Exmouth DHS

Linking the Curriculum and the Research

7&8 Communicate ideas, findings and evidence based solutions to problems using scientific language and representations, using digital technologies as appropriate selecting and using appropriate language and representations to communcate science ideas within a specified text type and for a specified audience

Suzie Starfish School Incursion Communicating ideas through sketching and note taking







# A Year 3 teacher's thoughts

Sue has worked in my Year 3 and four classrooms and shares her knowledge in turtle tagging and shark tagging projects. She brings photos, video clips and whale shark, tiger shark and turtle satellite and radio tags for the students to investigate.

The students are most excited by her visits – they share their stories of the reef and 'Suzie Starfish' provides them with facts about the megafauna we are lucky to have in and around the Ningaloo Reef.

She makes the lesson fun and exciting by sharing her artistic skills. In the past we have painted whalesharks using wax and ink, constructed tiger shark hats and used recycled materials to make amazing jelly fish.

Her 'Suzie Starfish' outfit, complete with colourfully embroided starfish and a reef scene, is always a big hit and engaged the students. They leave the lesson with a new knowledge our unique environment and ways different groups from around the country are trying to preserve it.

Lucas Plummer Year 3 teacher



I link her visit to the HASS learning outcome : "The importance of environments to animals and people, and different views on how they can be protected."





#### Mr Lucas Plummer's Year 3/4 Class











# SHALLOW REEFS MARINE DEBRIS WITH DAMIAN THOMSON

Curriculum Links Use and influence of science Science knowledge helps people to understand the effect of their actions

"Damian gave sessions on marine debris to middle and upper primary – where it comes from; how it gets into the ocean; its effects on coral reef systems. The concepts were really well received and one of our year 3s after answering a question and receiving a prize asked "If plastic is so bad for our environment then why did you just give me a prize made of Plastic! - Proud teacher moment!!! Simon Wright Primary Science Teacher

# THE OCEAN CONFERENCE JUNE 2017 – NEW YORK





Funding: Ningaloo Outlook, Parks & Wildlife Mrs Mac's Shed



# HOW TO MEASURE/GAUGE THE SUCCESS OF THESE ACTIVITIES





# They say it takes a village to raise a child.

It takes an amazing team to run the Ningaloo Science Engagement activities with Exmouth DHS



https://research.csiro.au/ningaloo/

#### School Curriculum and Standards Authority

https://www.scsa.wa.edu.au/

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#### **CSIRO**

Jo Myers, Mat Vanderklift, Russ Babcock, Richard Pillans, Damian Thomson Suzie Starfish, Nick Mortimer, Karl Forcey, Jessica Stubbs, Joe Turner

BHP Billiton Claire Hall, Tim Cooper, Bindi Gove, Belinda Fox

#### **Exmouth DHS**

Ray Denholm (Principal), Warren Bush, Simon Wright, Lucas Plummer, Candice Stewart and school office staff

and all the staff at the school whose classes are affected when we have these exciting activities! Lastly - a question to ponder.

# Why have swings been removed from school playgrounds?





Why science teachers should not be given playground duty.