



## COAST AND MARINE STUDIES SYLLABUS REPORT

This report was written to determine the effectiveness of the Coast and Marine Education MTAQ Marine Studies Trial Syllabus 2003-2004 as teachers developed work programs and implemented the course. The MTAQ CME syllabus was developed to:

- allow marine studies teachers to show their school principals a QSA fully accredited Junior Marine Studies Course
- provide for a pathway for students into Senior Marine Studies and Marine and Aquatic Practices.
- offer an new and engaging low cost Year 8-10 program that can be adopted in ANY Queensland school with minimal teaching qualifications
- offer a syllabus that is outcomes based that can be modified into rich tasks or criterion based assessment.
- use existing equipment supplied to industrial arts, science, SOSE or Physical Education subject departments
- use existing curriculum materials involving one text for three years with a MTAQ curriculum exchange available to financial members

This report has concluded that a pathway is possible and that workprograms developed were low cost and did not require additional teaching qualifications. The syllabus does link to many topics in the senior Marine Studies and MAP syllabi.

Further evaluation should provided opportunities for teachers, administrators, parents, students, industry representatives, QSA staff and panel members, and career advisers to make suggestions for improving the syllabus in line with current teaching, learning and vocational developments.

Unfortunately due to budget constrains, this was not possible in this report.

### THIS REPORT RECOMMENDS THAT

- the syllabus be submitted to QSA for approval subsequent to minor modifications and editorial changes indicated throughout the trial period, Jan 2004- November 2004
- a one day workshop on the syllabus be held at the MTAQ annual state Conference at Noosa in 2004.
- a teacher be seconded to Education Queensland to assist schools
  - develop syllabus elaborations for the five syllabus strands for the MTAQ web site
  - assist schools to write workprograms and assess in outcomes
  - develop task sheets and anticipated evidence assessment statements
  - collect workprograms, task sheets etc and place them on MTAQ web site
  - liaise with QSA and Education Queensland on current pedagogy to ensure these are embedded in school workprograms as well as licence and copyright issues
  - liaise with teachers, administrators, parents, students, industry representatives, QSA staff and panel members, and career advisers to make suggestions for improving the syllabus
  - network and run in-service workshops in the ten MTAQ regions with other MTAQ industry partners



*Trial teachers Martin Taylor, Zoe Hiddins, Sheree Bell, Simone Baker and Kelly Goodingham with outgoing syllabus chairman Bob Moffatt*

### NEW MTAQ CME SYLLABUS CHAIRPERSON

Sheree Bell Sunshine Coast Rep and Vanuatu Conference trip organiser has offered to take over the final stage of the CME syllabus which involves the ominous task of accreditation with QSA. Sheree has been teaching Junior Marine Studies under a criterion based scheme for over three years now and has been able to adapt the trial syllabus that involves outcomes based assessment. However like many schools who are in the transition to outcomes, she has been able to successfully report in both formats using standards and anticipated evidence statements.

### INITIAL FUNDING

Thanks to our funds raised through sponsorship, we now have the \$3000 in the bank to begin this process however the time will all be voluntary. At the end of the day MTAQ own the copyright on the syllabus and will licence school systems to use it. It is hoped to second a secondary teacher from MTAQ to complete this process or we hope that Sunshine Coast will be very generous with their TRS day allocations.

### NOOSA HALF DAY CME WORKSHOP

This will be held in conjunction with our State conference

#### DATE, TIME AND VENUE

Wednesday 29 September 9am - 12noon Moana Conference Room, South Pacific Resort, 179 Weyba Rd, Noosaville: Ph: 5473 1200

#### PROGRAM

- 9.00 am Welcome and Syllabus presentation - Sheree Bell MTAQ Syllabus Chairperson, Questions on the syllabus design
- 10.00am Evaluators report
- 10.30am Morning tea
- 11.00am Group workshops run by trial school teachers
  - A. Schools with outcomes based assessment
  - B. Schools contemplating CME as part of rich tasks
  - C. Schools using outcomes but reporting in criteria
- 12.30pm Lunch and informal networking

#### HANDOUTS INCLUDE

Workprograms from Sunshine Beach, Kirwin and Mercy College

#### COST

MTAQ and MESA financial members \$Nil, Non-financial members \$55

# WESTFIELD PREMIERS SCHOLARSHIP



Simone is on study leave from the 23rd June - Dec 30  
Send all electronic news to [bmoffatt@wetpaper.com.au](mailto:bmoffatt@wetpaper.com.au)

## STAGE I STUDY LEAVE TRIP 2004

The Westfield Premier's Educational Scholarship is a grant for a science teacher to undertake a study overseas on a topic that they would like to research.

The main focus of my trip is "Innovative science teaching practices that inspire students' learning and the professional learning of colleagues".

I am a junior / senior marine studies teacher at Holy Spirit College in Mackay North Queensland. I have been teaching marine science now for six years. How I became involved in this great subject was that my hobby turned into my job. I moved to Queensland in 1997 & all the previous marine teachers at my school had left - so I volunteered - yes with no teaching experience in the sciences. My training area is Bachelor of Education Social Science.

The study topic I was interested in was looking at how USA schools & educational centres such as Sea World & other facilities (aquariums etc) that teach Marine Science use innovative teaching to inform & educate students as well as colleagues.

As part of my 3 month scholarship I will be focusing on the West Coast of the USA attending the National Marine Educators Assoc. (NMEA) conference in Florida 2004. I will be travelling with Harry Bredahl (SEAEXCHANGE founder) for the first month. I will keep you all posted with my scholarship plans - its going to be a huge experience with so many great opportunities for myself & the Marine Teachers of Australia. Everyone of you inspires a student / colleague everyday. Check out this years nomination form. WESTFIELD SCHOLARSHIP DETAILS web link;

<http://education.qld.gov.au/community/awards/newprofessionalism/index.html>

Attending my 1st MTAQ conference in Townsville was the beginning. The MTAQ is a great organisation full of very supportive, keen and inspiring teachers. Thank you everyone especially Bob — if it wasn't for your never ending encouragement, support & belief I wouldn't be teaching today & a winner of this award. Thank you. Take Care & keep smiling. Looking forward to speaking to you soon.

Miss Simone Baker Marine Studies Co-coordinator Holy Spirit College Mt. Pleasant QLD Australia. 0749422088 (work)

## CALIFORNIA JUNE/JULY 2004 AND SOME WEB SITES

### LOS ANGELES

LA schools and smaller centres

- Santa Monica Pier Aquarium (Ocean Discovery Centre) [www.healthebay.org/smpa/temp/about.asp](http://www.healthebay.org/smpa/temp/about.asp)
- Matthew's School - Pacific Palisades web [www.stmatthewsschool.com/sm\\_about.html](http://www.stmatthewsschool.com/sm_about.html) DEEP program
- SEA Laboratory Redondo Beach [www.sealaboratory.org/www.lacorps.org/sealabprogram.htm](http://www.sealaboratory.org/www.lacorps.org/sealabprogram.htm)
- Long Beach Aquarium [www.aquariumofpacific.org/index.html](http://www.aquariumofpacific.org/index.html)
- Cabrillo Aquarium [www.cabrilloaq.org/dmap.htm](http://www.cabrilloaq.org/dmap.htm)

### SAN DIEGO

- [www.tas.noaa.gov](http://www.tas.noaa.gov)
- HI-San Diego, Point Loma [www.sandiegohostels.com](http://www.sandiegohostels.com)
- Birch Aquarium (Scripps) <http://aquarium.ucsd.edu>
- Sea World San Diego [www.adventureisland.com/seaworld/ca/default.aspx](http://www.adventureisland.com/seaworld/ca/default.aspx)
- San Diego, Point Loma

### SANTA BARBARA

- Scott Santa Barbara Museum of Natural History
- Santa Barbara Museum of Natural History Sea Center [www.sbnature.org/seacenter/index.htm](http://www.sbnature.org/seacenter/index.htm)
- National Geographic Society Sustainable Seas Expeditions, [www.coexploration.org/ceo](http://www.coexploration.org/ceo)

## MONTEREY

- Pismo Beach, Morrow Bay, elephant seals.
- HI-Monterey [www.montereyhostel.org](http://www.montereyhostel.org)
- Monterey Bay Aquarium [www.mbayaq.org](http://www.mbayaq.org)
- Marine Advanced Technology Education Centre [www.marinetech.org](http://www.marinetech.org)
- Monterey Peninsula College [www.mpc.edu/homex.asp](http://www.mpc.edu/homex.asp)
- MBARI (Monterey Bay Aquarium Research Institute) [www.mbari.org](http://www.mbari.org)
- Seymour Marine Discovery Centre at Long Marine Laboratory [www2.ucsc.edu/seymourcenter](http://www2.ucsc.edu/seymourcenter)

## FLORIDA

- Harbor Branch Oceanographic Institution [www.hboi.edu/](http://www.hboi.edu/)
- Harbor Branch Oceanographic Institution
- Harbor Branch Oceanographic Institution
- Kennedy Space Center [www.ksc.nasa.gov](http://www.ksc.nasa.gov) and [www.kennedyspacecenter.com](http://www.kennedyspacecenter.com)

## ORLANDO NMEA CONFERENCE

- Sea World Florida [www.buschgardens.com/seaworld/fla](http://www.buschgardens.com/seaworld/fla)
- Conference venue – Eckerd College [www.eckerd.edu](http://www.eckerd.edu)
- Pre-conference trips - Mote Marine Laboratory [www.mote.org](http://www.mote.org)
- Conference Keynote Address and Exhibitors Reception, Exhibits open
- General, plenary and concurrent sessions, Dinner at Florida Aquarium
- Marine Quest at the Florida Marine Research Institute and University of South Florida
- Field trips, Tastes of Florida Dinner and NMEA Auction, Awards breakfast, NMEA general meeting, Concurrent sessions, Dinner at Mote Marine Laboratory

## WATCH THE NEWS SECTION

One of the nice features of our web site is that Simone can add news and photos from anywhere in the world so she is going to attempt to do this in our news section on a monthly basis.

# CME SYLLABUS STRANDS

Courses of study can be planned using learning outcomes from a single strand or from a number of strands.

1. The **practices and skills** strand focuses on the practices and skills that allow people to use marine and coastal environments as well as on marine and coastal situations that are potentially dangerous to humans. The organisers for this strand from which the outcomes are written are:
  - Safe practices involves an understanding of safe and unsafe situations, behaviours and their consequences.
  - Matching approved equipment with desired use is necessary to effect skills and practices.
  - Skills and strategies are required to participate in marine recreational activities.
2. The **industry strand** focuses on industries that are related to coastal and marine environments. The organisers for this strand from which the outcomes are written are:
  - Marine industries involves technology and design methods that take into account specific features of the coast and marine environments.
  - Marine industries are extremely diverse in their operations, employment requirements, marketing and income streams.
  - Industry involves the establishment and maintenance of systems and subsystems.
3. The **oceanography strand** focuses on the physical and chemical interactions between the ocean and the coast. The organisers for this strand from which the outcomes are written are:
  - Events on Earth and in the solar system effect natural systems on Earth
  - Advances in scientific research have contributed greatly to our knowledge of the oceans, the climate and coastal geomorphology.
4. The **ecology strand** focuses on the biological interactions that occur between the ocean and the coast. The organisers for this strand from which the outcomes are written are:
  - An organism needs to survive to the age of reproduction to continue its species.
  - Ecology involves the interaction between the living and non living environment..
5. The **conservation strand** focuses the sustainability of coastal and marine systems. The organisers for this strand from which the outcomes are written are:
  - For 200 years European impact on the Australian coastal zone and marine environment has been significant.
  - Community groups have been working for many years to conserve our coast and marine zones.

# COAST AND MARINE STUDIES CENTRAL CONTENT

## RELATIONSHIP WITH SENIOR MARINE STUDIES

The syllabus writers have been very aware of the fact that many students will go on to do Senior Marine Studies. With this in mind the content recommended is significantly different from Senior Marine in that:

- General skills and concepts are emphasised eg Students are NOT encouraged to obtain their boat licence or SCUBA ticket
- Navigation and Marine Radio are part of boating and only briefly mentioned. There is no requirement for any skills in these areas.
- Marine conservation is aimed at the practical level and concepts of planning and marine parks are left to Senior Marine.
- There is great emphasis on longer time project work such as building an aquarium, boat hull or fishing rod. In other words, the content explores those projects which are highly engaging that teachers of Senior Marine Studies just do not have the time to do.

## STUDENT ENGAGEMENT WITH CENTRAL CONTENT

The central learning outcomes are the focus for planning learning activities and assessment tasks. Students will engage with central content when they are provided with opportunities to demonstrate central learning outcomes.

Unit writers are strongly advised that:

- The organisation of content within a strand should not be considered hierarchical.
- Any of the content can be addressed at any appropriate level and not all of the content need be addressed at every level.
- Each list should not be considered exhaustive.
- Central content should be selected to suit students' needs, interests and abilities and to take account of their prior knowledge and experiences.
- In the Coast and Marine Education subject area, there is an overlap of central content across strands. For example, safety is in the central content for the Safety strand, but is also relevant to other strands.

Possible central content of each strand is identified on the following pages.

## PRACTICES AND SKILLS CONTENT

### BOATING

- Types of craft, boating terms, equipment, boating skills, boating, the environment and licencing and safe practices
- Knots and ropes, splicing, knot types and uses, rope types and uses
- History of navigation, rules of the road, navigation aids

### FISHING

- Amateur fishing, fishing gear, commercial fishing, fishing and conservation, safe practices, ethics and etiquette, water safety

### SNORKELLING

- Snorkelling skills, equipment, safe practices, certificates, water safety

### SAILING

- Types of craft, sailing skills, sailing equipment, safe practices, dingy sailing, yachting skills, cruising and racing
- Knots and lines, knot types and uses, rope types and uses

### CANOEING

- Kyacking and rowing, types of craft, skills, equipment, safe practices

### FIRST AID

- The DRABC action plan, Expired air resuscitation (EAR), External cardiac compression (ECC). Cardiopulmonary resuscitation (CPR)
- Burns, cuts and bleeding, marine medical emergencies, accidents with marine organisms, dangerous creatures

### SURFING

- Skills, equipment, the environment, how surfboards are made, accreditation, professional surfing, water safety

### COMMUNITY ORGANISATIONS

- Yacht clubs, surf clubs, Coast Guard, DPI – Fisheries, Recreational clubs eg. diving, fishing, sailing, boating

## INDUSTRY CONTENT

- Aquariums
- Equipment maintenance and repairs
- Education and training
- Tourism
- Retail
- Mariculture and aquaculture
- Research
- Manufacturing
- Salvage
- Food from the sea
- Communications
- Shipping
- Boat building and hull design



## OCEANOGRAPHY CONTENT

- Weather lore, temperature, air pressure, rainfall and humidity, weather forecasting, your weather station
- Seawater, properties of sea water, gases in sea water, sea water and corrosion
- Oceans, ocean formation, depth and characteristics, the greenhouse effects, ocean shape, mining ocean resources, power from the sea, ocean management and mapping
- Wave characteristics, types, effects of waves on beaches and marine life, surfing the waves
- Currents, ocean currents, southern oscillation index, coastal currents, local currents, tidal currents
- Tide definitions, the importance of tides, causes of tides, tide height and tidal range, tidal currents, destructive tides
- Topography, coastlines, abyssal, continental shelves, reefs, ridges, sea mounts, catchments

## ECOLOGY CONTENT

- Dangerous sea creatures, aggressors, retaliators
- Plankton, temporary plankton, permanent plankton, plankton adaptations
- Energy in the sea and energy relationships
- Plants, marine plants, dune plants, mangroves, conservation
- Animals, classifying and naming living things:
- Animals without backbones, protozoans, sponges jellyfish, corals and anemones, comb jellies, worms, animals with jointed legs, spiny-skinned animals, animals with shells
- Animals with backbones: fish, reptiles, birds and mammals
- Living together, problems with living in the sea, living in habitats, adaptations for coast and marine zones, relationships between individuals
- Sea birds: Adaptations for coast and marine life, migration patterns, different types of seabird, observing birds, significance of seabirds
- Antarctica, marine life, the significance of Antarctica
- Excursions eg: Rocky shore, mangroves, reef, sand dune, estuary

## CONSERVATION CONTENT

- Pollution — who causes it? Sources of pollution, the cost of pollution, trashing the coastline, solutions, legislation. Marine pests and threats.
- Water quality. What determines seawater quality? Seawater quality tests. Macro-invertebrate sensitivity tests
- Taking actions to save the sea. Acting locally, thinking globally, repairing the sea
- Roles of Government and Non-Government Organisations - Local, State, Commonwealth, National Oceans Office
- Shipwrecks — importance and significance. Research projects.
- Maritime archaeology, preservation of materials, display, museums, national protected wrecks
- Environmental protection action plans - Seaweek, world environment day
- Education, Raising awareness, Best practices, Ecological sustainability
- GBRMPA Reef Rangers program - practical solutions to saving the sea.

# NEW ON THE MTAQ YEAR 8-10 CURRICULUM EXCHANGE

Posted by: Sheree Bell Sunshine Beach State High School

Last updated: 9/06/2004

## WHERE: YEARS 8-10

### 1. ASSESSMENT OUTCOMES FOR 7 UNITS OF WORK

Content area: Course outlines

File Type: Program Outline

3D Model of the coral polyp

Artificial baits – lure construction and written report

Conservation of the sea – Written Report 800 word

Rocky Shore – Field Research Booklet

Marine Plants – Informative Brochure

### 2. REVISION TEST CORAL POLYP

Content area: Animals

File Type: Test

25 Short answer questions on Biology and Ecology or coral polyps Coral Polyps

### 3. REEF GUARDIANS ACTION PLAN IDEAS

Content area: Saving the sea

File Type: Task

23 group project or individual student ideas on how to save the sea through the GBRMPA Reef Guardians program

### 4. YEAR 10 SAVING THE SEA - REEF GUARDIANS PROJECT

Content area: Saving the sea

File Type: Task

Students devise (in groups) a plan to reduce litter waste (calico bags) (reduce, recycle, reuse) in schools and in the neighbourhood Students develop an education program (signs posters, murals, newsletters) about litter and waste reduction for school and community

### 5. YEAR 8 SAVING THE SEA - REEF GUARDIANS PROJECT

Content area: Saving the sea

File Type: Task

Students map the catchment area of Burgess Creek, participate in water testing, visit Noosa Wastewater Treatment Plant and devise a plan to better manage the catchment area.

### 6. FISHING - LURE CONSTRUCTION ASSIGNMENT

Content area: Fishing

File Type: Task

Recreational Fishing – Lure Construction A task is to design and construct a lure specifically targeted to a specific fish using particular buoyant structural materials.

### 7. ROCKY SHORE - CRITERIA AND ASSESSMENT SHEETS

Content area: Course outlines

File Type: Unit Outline

Rocky Shore Ecology ideas for assessment outlines includes – Coast and Marine Level Outcomes for Ecology, anticipated evidence, tasks, criteria sheets, standards and indicators of achievement.

The purpose of this unit is to give students an understanding of the physical elements of the rocky shore ecosystem including biotic and abiotic factors. Students will be testing abiotic factors and making inferences as to how

Posted by: Martin Taylor Sunshine Beach State High School

Last updated: 9/06/2004

### 1. PARTS OF AN AQUARIUM

Syllabus: Industry

Content area: Aquariums

File Type: Worksheet

Student notes or a good OHP on the nitrogen cycle in an aquarium, the parts of an aquarium and a worksheet.

### 2. BOAT HULL TESTING PROCEDURES

Syllabus: Industry

Content area: Employment

File Type: Test

Four procedures to test a student designed hull



### HULL DESIGN TESTING PROCEDURE (THE FULL WORKSHEET IS ON THE CURRICULUM EXCHANGE - JUST TYPE IN HULL TO THE SEARCH FUNCTION)

TEST 1 Boat Hull Speed Test (Standard Weight or Motor)

Method:

Place boat at one end of the testing tank. Attach pulley system and record weight used Use a stopwatch to time how long it takes the boat to travel 2 m. Calculate the speed by the formula

Speed = Distance /Time

Record the speed and acceleration using a graphics calculator. Copy the graph curve from calculator Repeat test 3 times and average results

TEST 2 Boat Hull Speed Test (Wind Power)

Method:

Place boat at one end of the testing tank. Turn on Fan and watch boat sail for 2 metres. Use a stopwatch to time how long it take the boat to travel 2 m. Calculate the speed by the formula

Speed = Distance /Time

Record the speed and acceleration using a graphics calculator. Copy the graph curve from calculator

Repeat test 3 times and average results

TEST 3 STABILITY

Method: Place boat in sink and add weights along one side of the boat until the gunnel is under water. Record the weight required

TEST 4 CARRYING CAPACITY

Method: Place boat in sink and add weights along the centre of the boat until the boat takes water over the gunnel. Record the weight required.

Curriculum Exchange  
Please select a year below  
[Years 8 - 10](#)  
[Years 11 - 12](#)  
[Search Curriculum Exchange](#)

Use the search function at the bottom of the choice list.

Eg: You are planning a rocky shore excursion. So type into the search function the words:

rocky shore

## Yr 11&12 QUESTIONS NEEDED

As yet you are all a bit coy about sending me senior questions for the curriculum exchange. Surely someone has some good ones - how about state panel members submit just one from each area - or people with accredited workprograms or really anyone - its exam time and all you have to do is email the word document to [bmoffatt@wetpaper.com.au](mailto:bmoffatt@wetpaper.com.au) - the site is password protected and for MTAQ members use ONLY