Anchors aweigh: Workshop summary

30\textsuperscript{th} May, 2014

Wollongong

New South Wales

Towards sustainable anchoring practices near Australian Ports
Stakeholders at the Anchors aweigh one day workshop held by researchers at the University of Wollongong.

Andy Davis, Warwick Gullett, James Reveley and Allison Broad

This document provides a summary of the Anchors Aweigh Workshop facilitated by a multidisciplinary team of researchers from the University of Wollongong (UOW), spanning three Faculties in the areas of Science, Law and Business. The workshop was attended by stakeholders from Federal and State government agencies, the shipping industry and other users of the near shore marine environment. A key theme was to develop research that identifies and addresses issues and processes to ensure sustainable anchoring processes. The workshop was convened to raise awareness of the impacts of anchoring and to discuss the best ways forward before embarking on a full-scale research project to achieve environmental and industry best practice in ship anchoring.


This document summarises the discussions presented at the Anchors workshop on 30th May, 2014, in Wollongong, NSW, as documented by the UOW Researchers. This document is not all inclusive or binding. The views and interpretations expressed in this document are those of the Anchors Aweigh Workshop Researchers and do not necessarily reflect the views and policies of the stakeholders.
ANCHORS AWEIGH: TOWARD SUSTAINABLE ANCHORING PRACTICES

This one-day workshop, on the 30th May 2014, brought together 35 key stakeholders to examine how to increase sustainable anchoring practices near NSW Ports. There was representation from 22 organisations, principally Federal and State authorities and the shipping and port industries. The workshop initiated stakeholder engagement to support UOW research on sustainable anchoring practices. This is a program under UOW’s Global Challenges initiative.

The main aim of the workshop was to provide a platform for consultation and exchange between the large range of stakeholders with interests in regions where anchoring takes place. These included:

- Marine scientists & environmental managers
- Biologists
- Fishing representatives
- Policy advisors
- Shipping industry representatives
- Harbour masters
- Ports & shipping managers
- Ships masters
- Geospatial scientists

The workshop introduced participants to the UOW Global Challenges multidisciplinary research team: Andy Davis and Allison Broad from Science, James Reveley from Business and Warwick Gullett from Law. Researchers outlined the biological, legal and governance issues surrounding current anchoring practices. Seven external speakers (see attached program) representing stakeholders provided information ranging from anchorage management and mapping techniques, to safety and commercial considerations. This was followed by a series of group discussions.

The workshop had four general aims:

- To bring together stakeholders of the near shore marine environment to raise awareness of the potential environmental issues associated with anchoring and examine impediments to more sustainable anchoring practices.

- Give stakeholders an opportunity to provide detailed information to participants regarding the current use of anchorage areas and the environmental, governance, legal and safety issues surrounding this activity.

- To enhance stakeholder involvement in the development of environmental best practice in port-related activities while also considering economic, managerial, social and legal points of view.

- To provide a networking opportunity to encourage future dialogue.

Many of the stakeholders were highly supportive of this UOW initiative given its multidisciplinary approach and the involvement of many stakeholders in the initial stages of the research. The general consensus from the shipping industry was that they are committed to sustainable anchoring practices. Here we provide a summary of the key findings of the stakeholder workshop held at UOW’s Innovation Campus.
KEY FINDINGS OF THE WORKSHOP

1. An overview of anchoring

Anchorages

In Australian waters, large commercial vessels are generally free to anchor anywhere outside of state waters, beyond 3nm, in Australia’s territorial sea. Speaker Alec Millett, from the Australian Maritime Safety Authority (AMSA), provided much of the background on anchoring described here. Alec described two types of anchorage areas near a port. The first is non charted or anchor roadsteads. In these areas anchorages points are not specified, however, an anchorage area is inferred on charts outside of prohibited anchorage areas. The second is charted or designated anchorages near other ports. These are clearly marked and uniquely identified on nautical charts.

Anchors and anchoring processes

Anchor designs are numerous, however, the weight of the cable, or anchor chain alone ultimately hold the ship in position. A ratio, relating to the length of anchor chain to the water depth varies depending on the size of the vessel, from 3- 5:1. Each link ~200kg contributes to an anchors holding capacity. Depending on ocean currents and wind, ships may swing around the point at which the cable rises from the seabed.

Discussions of anchor design or use of different practices to secure ships in a stationary position confirmed that current designs and practices were unlikely to change. The use of a mooring was not an option for these large vessels and GPS positioning systems come at a fuel and emission cost, with an elevated probability of collision. Anchors and anchor chains were considered the only meaningful option to maintain a ship’s position.

Masters of ships have many factors to consider before anchoring. General navigational traffic in the area should be taken into account as well as any competing users of the waterways or installed infrastructure. The depth of the water and seabed type, which determines the length of ship's chain to be deployed and the ship’s swinging circle, is an important safety precaution to ensure collisions do not occur. These all require consideration along with environmental conditions of the area; prevailing winds, tidal range, sea and swell conditions and any strong ocean currents. It was mentioned on multiple occasions by different participants that there was generally a ‘pack mentality’ as to where ships choose to anchor when they were not provided with guidance or recommendation regarding specific locations. This was likely due to ships Masters having confidence in anchoring near other vessel already at anchor.

Stakeholders pointed out that ship Masters prefer not to anchor for multiple reasons. They argued that it was not in a ship’s best interest to anchor for any length of time because the longer it stood at anchor the more bio-fouling would occur on the ship’s hull. This is costly for two reasons: (i) it creates drag and slows the ship, causing it to consume more fuel; and (ii) it is costly to remove from the ship’s hull.

Safety issues surrounding anchoring

Ship collision is one of the key risks at anchorages, especially where there are limited suitable anchorages and ships are forced to anchor in close proximity to one another. It imposes a safety risk to personnel and further ship collision may also result in environmental damage, oil spills and loss of cargo. The holding capacity of an anchor may be affected by a region’s bathymetry, water depth, prevailing wind and bottom type. AMSA pointed out that ships will not routinely anchor on charted areas of rock, coral or any seabed which offer marginal holding ability (dragging anchor versus drifting whilst at anchor). However anchoring on soft unconsolidated sediment is not always an option in some locations. This was emphasised for the region near Port Kembla. Here, constrained by deep water beyond the 3nm limit, only a narrow strip is available on which to anchor as anchoring is of limited effectiveness in deep water.
Each port and region is very different and this can become complicated for Masters of ships given that they are involved in international trade with substantial variation in legislative frameworks across the globe.

A current recurring concern among stakeholders was the need to provide ship Masters with clear and simple information regarding anchorages. This is because too much information was difficult to process and may present a risk to safety. If areas of high conservation value were identified then ideally they could be incorporated into an ‘anchor exclusion zone’. Such areas already exist to protect important underwater infrastructure.

2. Common-Pool resources: The issue of competing interests

Issues related to Common-Pool Resources (CPRs), in particular multi-use CPRs, were examined. There are many competing uses of the same water space in near shore areas, including submerged infrastructure, commercial fishing as well as anchoring. Drawing on work by scholars who work in the field of multi-use CPRs, UOW Researcher James Reveley also highlighted that these areas are often characterised by the properties of high ‘subtractability’ and low ‘excludability’ (Steins & Edwards, 1999). To the extent that the near-shore environment is a CPR, one stakeholder cannot exclude its use by other stakeholders. Extensive and continuous consultation with the full range of stakeholders sharing this CPR is necessary in order to change shipping activities to improve outcomes for all stakeholders. The experience of developing the Vessel Arrival System (VAS) at Newcastle Port demonstrates that change will not occur unless all stakeholders are supportive and endemic collective action dilemmas are resolved.

The use of small versus large anchorage areas was also discussed, including the notion that increasing the distance between ships in an anchorage would displace fewer users, by allowing other users access in between vessels at anchor. For example trawl or set line fishers could still fish the area between ships. Overall, it was suggested that a small designated anchoring area was preferred over a larger area because other users, such as fishers, were unlikely to want to use the area between ships for reasons of safety and the increased likelihood of losing equipment in anchor pits or entanglement of long lines in anchor chain.

Marine Spatial Planning

Past, present and future marine spatial planning was discussed in terms of anchoring. The Vessel Arrival System (VAS), developed in Newcastle is a perfect example of how anchoring can drastically be reduced. The Australian Maritime Safety Authority (AMSA) added that what was needed was more marine spatial planning and that AMSA was working with Geoscience Australia to develop a National Shipping Management Plan.

The Great Barrier Reef Anchorage Management Plan has been an excellent initiative and the first of its kind in Australia. However this was a desktop study and rigorous field testing could further ensure that the management plan is robust and would be advantageous.

Demurrage and Vessel Arrival Systems

Representing the Australian Shipowners’ Association, Angela Gilham noted that demurrage can be an impediment to the introduction of Vessel Arrival Systems (VAS). Demurrage is a payment the ship charterer or cargo owner pays to the shipowner to compensate for ships laying idle while anchored in or near ports (and hence not making money while at sea). Demurrage can function as an incentive for ships to speed to port (as opposed to the slowing-up effect of VAS) and anchor up. Conversely, greater fuel efficiency due to VAS encouraging slow steaming can offset the diminution of demurrage charges received by the shipowner. There is, therefore, a delicate balance between demurrage and fuel charges as factors that influence shipowners’ views of VAS.
3. **Legal, governance and environmental issues surrounding anchoring**

**Legal and governance issues**

GC Researcher Warwick Gullett introduced jurisdictional issues and the right of innocent passage\(^1\) which is enjoyed by foreign-flagged vessels in the territorial sea (generally 0-12nm offshore). He believed that directing ships where to anchor would not interfere with their right of innocent passage. He also emphasised that there are circumstances in which States can regulate activities beyond the 3nm State/Federal boundary. These are limited to activities that are directly linked to the State, such as anchoring taking place adjacent to NSW ports by vessels en route to those ports.

Many of the stakeholders were not aware that Australian States can regulate anchoring practices in federal waters (>3nm). It was clear that previously there were differing ideas among stakeholders as to where responsibility lay regarding the regulation of anchoring.

Harbour Masters stated that in the past they would advise Masters of vessels where to anchor and in some instances specific anchorages were identified. However, after the 2007 *MV Pasha Bulker* incident off Newcastle, NSW, Harbour Masters were advised that if there was an incident relating to anchoring then there could be legal ramifications for their Port.

**Environmental issues**

GC Researcher Andy Davis highlighted that the putative impacts of vessels anchoring in deep water habitats (~50 m) represents a significant knowledge gap. This is likely due to it being a logistically difficult and costly area in which to undertake research. Andy gave examples of previous scientific research that has demonstrated that anchoring in most nearshore environments with small recreational and commercial vessels has had significant environmental impacts on the seabed and its associated biota (Demers et al. (2012; West et al 2009; 2007). Andy suggested that it is was likely that large vessels were having similar impacts. Scientific experts in the audience supported this notion. They stated that current anchoring practices would impact upon benthic assemblages (that is, flora and fauna associated with the seabed) regardless of whether the bottom type was unconsolidated sediment or rocky reef, although it was agreed that the impacts on soft sediment assemblages would be lower. A key question identified was determining the appropriate scale over which to quantify any likely impacts of anchoring.

The potential for physical damage to the seabed and its associated biota due to anchoring was the key theme for consideration regarding sustainable anchoring practices, however, other considerations were also raised. These included factors associated with ships whilst they are at anchor, including; light ‘spill’ from vessels at night, engine or generator noise, engine emissions, shading of the substratum and aesthetic considerations when numbers of vessels were at anchor.

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\(^1\) *Innocent passage* refers to the right of merchant ships of all States to pass through another State’s territorial sea. Passage means navigation for the purpose of traversing the territorial sea or proceeding to or from a destination such as a port facility, and it must be continuous and expeditious. It includes anchoring if this is incidental to ordinary navigation or necessary as a result of the ship being in distress. Innocence is defined as not being prejudicial to the coastal State’s peace, good order or security (United Nations Law of the Sea Convention 1982, articles 17 and 19).
4. **Ways forward: Sustainable anchoring practices**

**Preventative measures**

The Vessel Arrival System (VAS) now operating at Newcastle has been effective at dramatically reducing the number of vessels anchoring in the vicinity of the Port. This grew out of safety concerns where vessels were seeking to ensure they maintained their place in the queue rather than concerns over anchoring impacts. However, the VAS may not work at all Ports or for all cargos, though it’s important to note that at Newcastle a few ships now lay at anchor where previously it has been in excess of 80.

**Knowledge of benthic environments**

In order to understand what is sustainable it is necessary to first understand the environment. Scientists, researchers, environmental managers and policy makers use benthic habitat maps to make informed decisions that help protect fragile coastal regions. Unfortunately only a very small fraction of the near shore coastal marine environments near where ships anchor have been mapped to identify and evaluate areas with high priority conservation needs.

In order to understand if an area is threatened by current practices a detailed understanding of the habitat and its associated biota needs to be obtained. Furthermore, to understand if shipping and the associated anchoring processes are having detrimental effects on the environment we need to compare these areas to similar (reference) areas where anchoring is not taking place. Habitat mapping using multi-beam or side-scan sonar offers the opportunity to identify areas of high conservation value, such as high profile reef. With this information it may be possible to seek ways to ameliorate impacts on reefs of high conservation value.

Knowledge of habitats of high conservation value will be region-specific. These could be based on the assessment of the species richness of an area, connectivity of habitats, whether habitats function as larval sources or sinks and whether they support threatened species. A further consideration may be determining whether locations contain populations or groups of species that may be under pressure as described by the State of the Environment Report (2011).

**Designating anchor exclusion zones**

Environmental areas of high biological conservation value once identified could be ‘traded-off’ for areas of lower conservation value, with the latter used as anchorage areas. It was suggested that this might be best done by designating these areas as ‘non-anchoring’ sites on marine charts as has been done for submarine cables.

Each port is operating with a different set of environmental variables and regulations. What works in one region may not work in another. There are a large number of environmental considerations at each port and these may change over time. These considerations include currents, prevailing wind conditions, manoeuvring issues and infrastructure on the seafloor. Any anchor exclusion zones would need to consider these variables.

Scientific experts deemed it preferable to concentrate anchoring activities within a relatively small, though risk safe area, rather than designate anchorages over a large area or implement an anchoring roadstead on rotation. This is so that the environmental and biological impacts are isolated to one area and not spread out and impacting extensive areas and communities.
5. Conclusions

The workshop brought together a number of key stakeholders representing many different organisations and points of view. It facilitated stakeholder discussions, provided a useful exchange of information and a better understanding of key issues facing end-users. The workshop was an efficient platform for stakeholders to establish connections with groups from differing backgrounds and form positive relationships. Numerous stakeholders expressed their appreciation that consideration was being given to development of sustainable anchoring practices and that so many key stakeholders were involved in the process from such an early stage. This serves as a good basis for future discussions on anchoring as the research develops.

KEY OUTCOMES OF THE WORKSHOP IDENTIFIED BY THE UOW RESEARCHERS;

(i) Stakeholders had a greater understanding and awareness of the environmental pressures placed on the marine environment and the ecosystem services that it provides (SoE, 2011).
(ii) The strong likelihood that current anchoring practices will impact on benthic assemblages and the need to develop ways of mitigating these impacts.
(iii) Clarification of the legal and governance issues surrounding anchoring practices in state and federal waters, namely;
   • directing ships where to anchor, will not interfere with the right of innocent passage,
   • states can legally regulate activities beyond the 3nm State/Federal boundary if they are directly linked to the State.
(iv) Identifying appropriate stakeholders to work within the next phase of the research.

The most promising outcome of the stakeholder workshop has been the recognition and willingness to support scientific research to ensure that industry maintains environmental best practice.

There are significant unknowns in relation to the impacts of anchoring on Australia’s eastern seaboard. Scientific research is required and UOW Researchers plan to begin with a case study at Port Kembla in Wollongong. It was further suggested that the inclusion of the Port of Townsville, in Queensland also be a useful case study and would add significantly to the generality of this research.

University of Wollongong researchers are collaborating with the NSW Office of Environment and Heritage on a small pilot study to begin habitat mapping near Port Kembla using multi-beam and sonar capabilities. This will be used in combination with imagery from a Automated Underwater Vehicle (AUV) to assess benthic assemblages of anchorages in the region. University of Wollongong researchers confirmed that there would be future consultations with all stakeholders as the research developed.
References


# Anchors Aweigh: Workshop Summary

## Towards Sustainable Anchoring Practices in Australian Ports

*Program 30th May, 2014, University of Wollongong*

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