



Australian Government
Bureau of Meteorology

15 priorities for wind-waves research

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Background

- Undertaken under the auspices of the Australian Forum for Operational Oceanography (FOO) Surface Waves Working Group
- Objective to provide advice on national priorities for wave research
- Initial priorities (2015)
 - Combining spectral and phase resolving models
 - Ocean (vs lake) observations to inform source term development
 - Shallow water bathymetry for nearshore waves
 - Sources of error in swell set up
- Mid-2017, proposed process for collaborative priority setting
 - Sutherland et al (2011) *Methods for collaboratively identifying research priorities and emerging issues in science and policy*
 - Collaborative
 - Democratic
 - Iterative





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Process

Five main steps:

1. Canvas possible research priorities from the community
 - Open survey emailed to 360 people
 - Included researchers, industry, service providers etc.
 - 69 responses (19% response rate)
 - 444 possible research/infrastructure priorities
 - Collated and merged to a 'long list' of 209 priorities in 11 categories
2. Reviewed the questions at a face-to-face workshop (Waves symposium, Perth, Oct 2017)
 - Round-table discussions of the priorities in each category
 - Editing, clarifying, merging
 - 155 possible priorities



Process

3. Voting on the research priorities by researchers (58 participants)

- at workshop and online
- in each category, vote to retain up to 50% of the priorities
- Collated results and removed bottom third
- 114 priorities remained (8 categories)

4. Voting on priorities by industry and stakeholders

- 22 participants

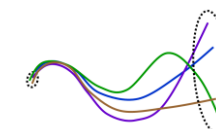
5. Final ranking

- Priorities with highest number of votes overall



Results – Tier 1

1. Enhanced and updated nearshore and coastal bathymetry
2. Improved understanding of extreme sea-states
3. Maintain and enhance the in situ buoy network
4. Improved data access and sharing
5. Ensemble and probabilistic wave modelling and forecasting

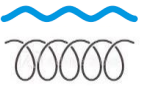


Results – Tier 2

6. Advancement of remote sensing capabilities to measure wave conditions in coastal environments



7. Improved understanding of wave-induced currents and transport



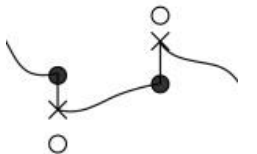
8. Long-term beach / coastline monitoring



9. Nearshore modelling and forecasting

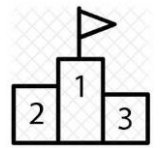


10. Development of wave data assimilation



Results – Tier 2

11. Development of a standardised data and QA/QC specification for wave observations



12. Better engagement of maritime industries with research



13. Improved understanding and prediction of coastal wave impacts



14. Improved understanding of the effect of future climate variability and change on coastal areas



15. Improved modelling of swell propagation



Discussion

- Low hanging fruit
 - High priority, low cost, easy to do
- All 15 priorities already identified as high priorities
- Need to identify cost and difficulty





Discussion

| Priority | Item | Cost | Difficulty |
|----------|--|------|------------|
| 1 | Enhanced and updated nearshore and coastal bathymetry | | |
| 2 | Extreme sea-states | | |
| 3 | Maintain and enhance waverider buoy network | | |
| 4 | Data access and sharing | | |
| 5 | Ensemble and probabilistic wave modelling and forecasting | | |
| 6 | Advancement of remote sensing capabilities to measure wave conditions in coastal environments | | |
| 7 | Wave-induced currents and transport | | |
| 8 | Long-term beach / coastline monitoring | | |
| 9 | Nearshore modelling and forecasting | | |
| 10 | Development of wave data assimilation | | |
| 11 | Development of a standardised data and QA/QC specification for wave observations | | |
| 12 | Better engagement of maritime industries with research | | |
| 13 | Coastal wave impacts | | |
| 14 | Improved understanding of the effect of future climate variability and change on coastal areas | | |
| 15 | Improved modelling of swell propagation | | |



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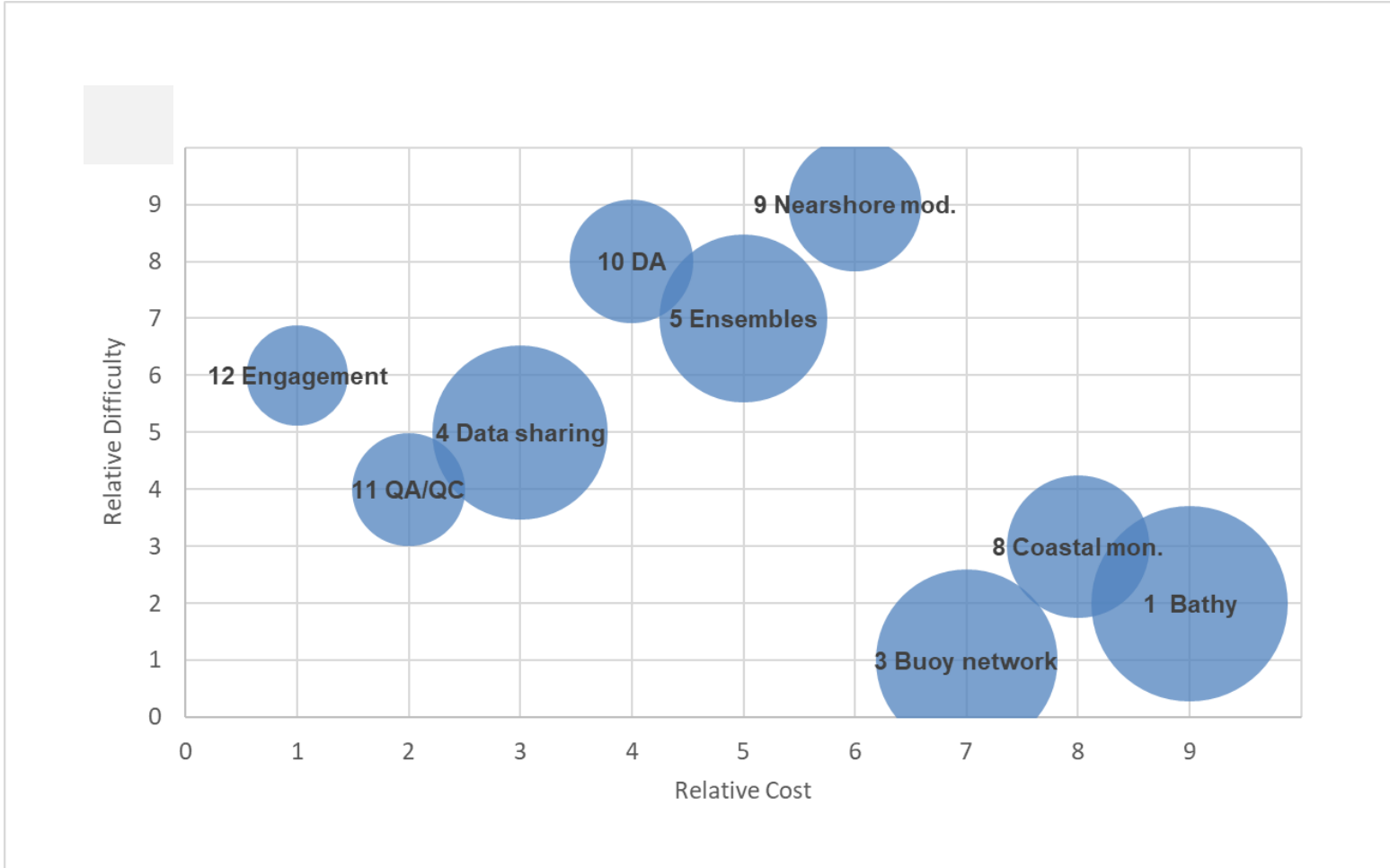


Discussion

| Priority | Item | Cost | Difficulty |
|----------|--|------|------------|
| 1 | Enhanced and updated nearshore and coastal bathymetry | 9 | 2 |
| 2 | Extreme sea-states | | |
| 3 | Maintain and enhance waverider buoy network | 7 | 1 |
| 4 | Data access and sharing | 3 | 5 |
| 5 | Ensemble and probabilistic wave modelling and forecasting | 5 | 7 |
| 6 | Advancement of remote sensing capabilities to measure wave conditions in coastal environments | | |
| 7 | Wave-induced currents and transport | | |
| 8 | Long-term beach / coastline monitoring | 8 | 3 |
| 9 | Nearshore modelling and forecasting | 6 | 9 |
| 10 | Development of wave data assimilation | 4 | 8 |
| 11 | Development of a standardised data and QA/QC specification for wave observations | 2 | 4 |
| 12 | Better engagement of maritime industries with research | 1 | 6 |
| 13 | Coastal wave impacts | | |
| 14 | Improved understanding of the effect of future climate variability and change on coastal areas | | |
| 15 | Improved modelling of swell propagation | | |



Discussion





Summary

- Undertaken an extensive collaborative and democratic process to identify wave research priorities for Australia
- Five Tier 1 priorities
 1. Enhanced and updated nearshore and coastal bathymetry
 2. Improved understanding of extreme sea-states
 3. Maintain and enhance the in situ buoy network
 4. Improved data access and sharing
 5. Ensemble and probabilistic wave modelling and forecasting
- Published in Bulletin of the American Meteorological Society (BAMS) – early online release
Greenslade + 73 co-authors, **15 priorities for wind-waves research: An Australian perspective**,
<https://doi.org/10.1175/BAMS-D-18-0262.1>
- Future work
 - Review every few years





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Thank you

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