15 priorities for wind-waves research

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Background

- One objective for Surface Waves Working Group is 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, started 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

Process

5 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

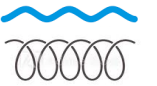5. Ensemble and probabilistic wave modelling and forecasting
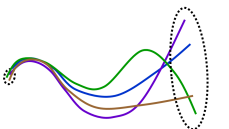
6. Advancement of remote sensing capabilities to measure wave conditions in

     coastal environments

7. Improved understanding of wave-induced currents and transport
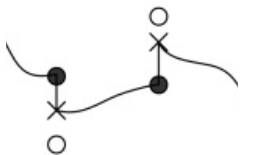
8. Long-term beach / coastline monitoring
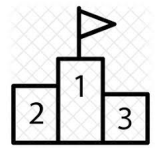
9. Nearshore modelling and forecasting

10. Development of wave data assimilation

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

- Issues of different scope and size of priorities
    - Broader questions likely to attract more support
    - achievable by 1 or 2 researchers within a few years

- Low hanging fruit
    - High priority, low cost, easy to do

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		

Discussion

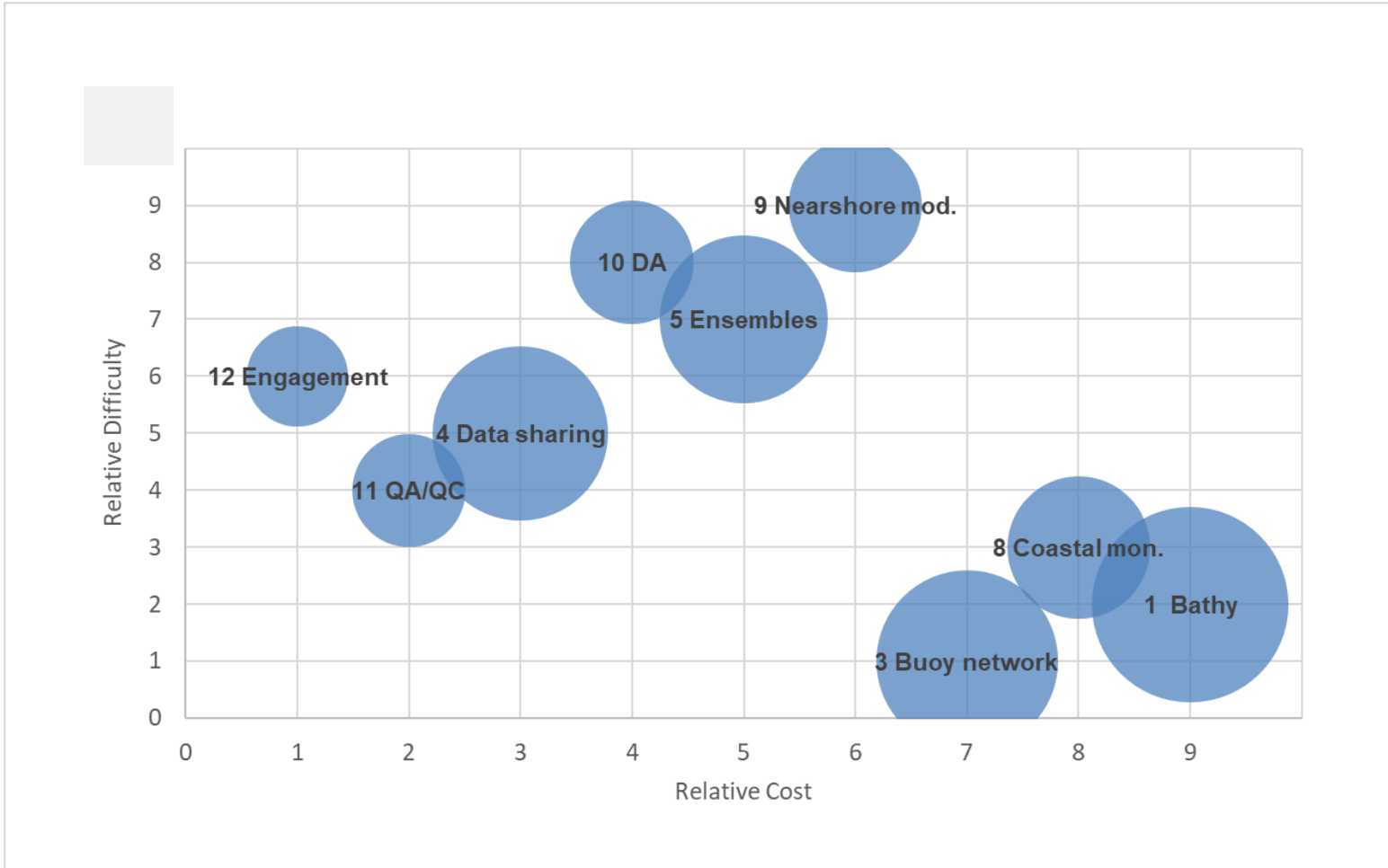| Priority	Item	Cost	Difficulty
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6	Advancement of remote sensing capabilities to measure wave conditions in coastal environments		
7	Wave-induced currents and transport		
8	Long-term beach / coastline monitoring		
9	Nearshore modelling and forecasting		
10	Development of wave data assimilation		
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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		

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		

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

- Plan to review on a regular basis

Thank you

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