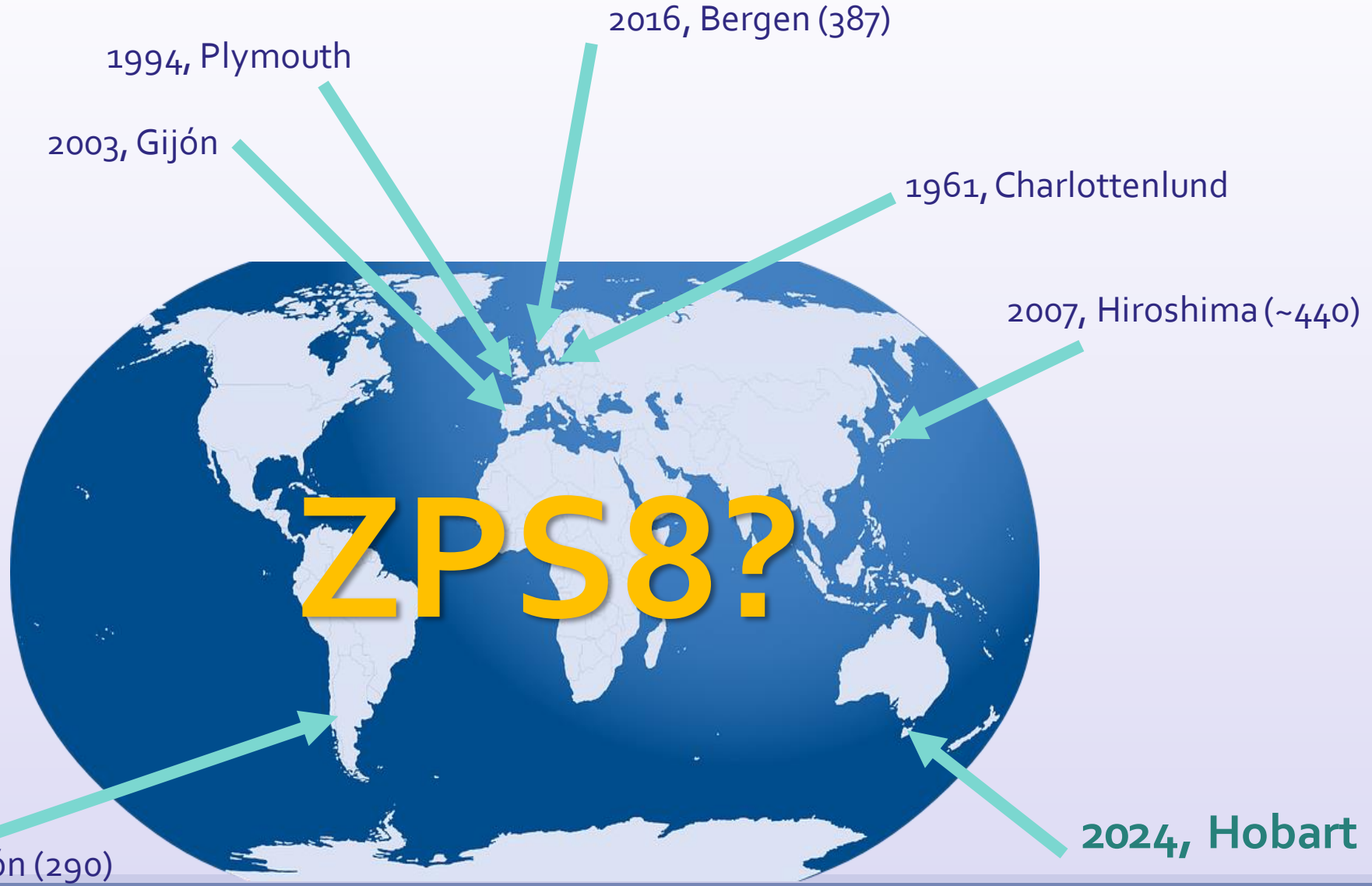
7th Zooplankton Production Symposium, Hobart, March 17-22, 2024

The story so far……



Facts and figures from this week:

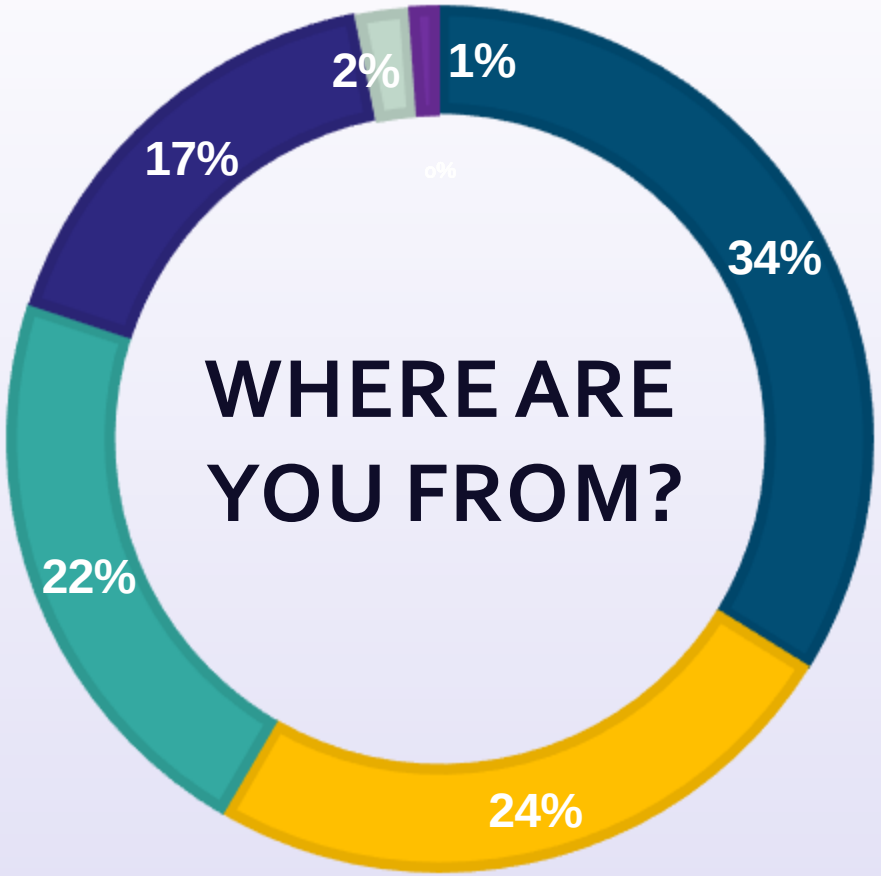
315 Attendees

161 ECOP (>50%!)

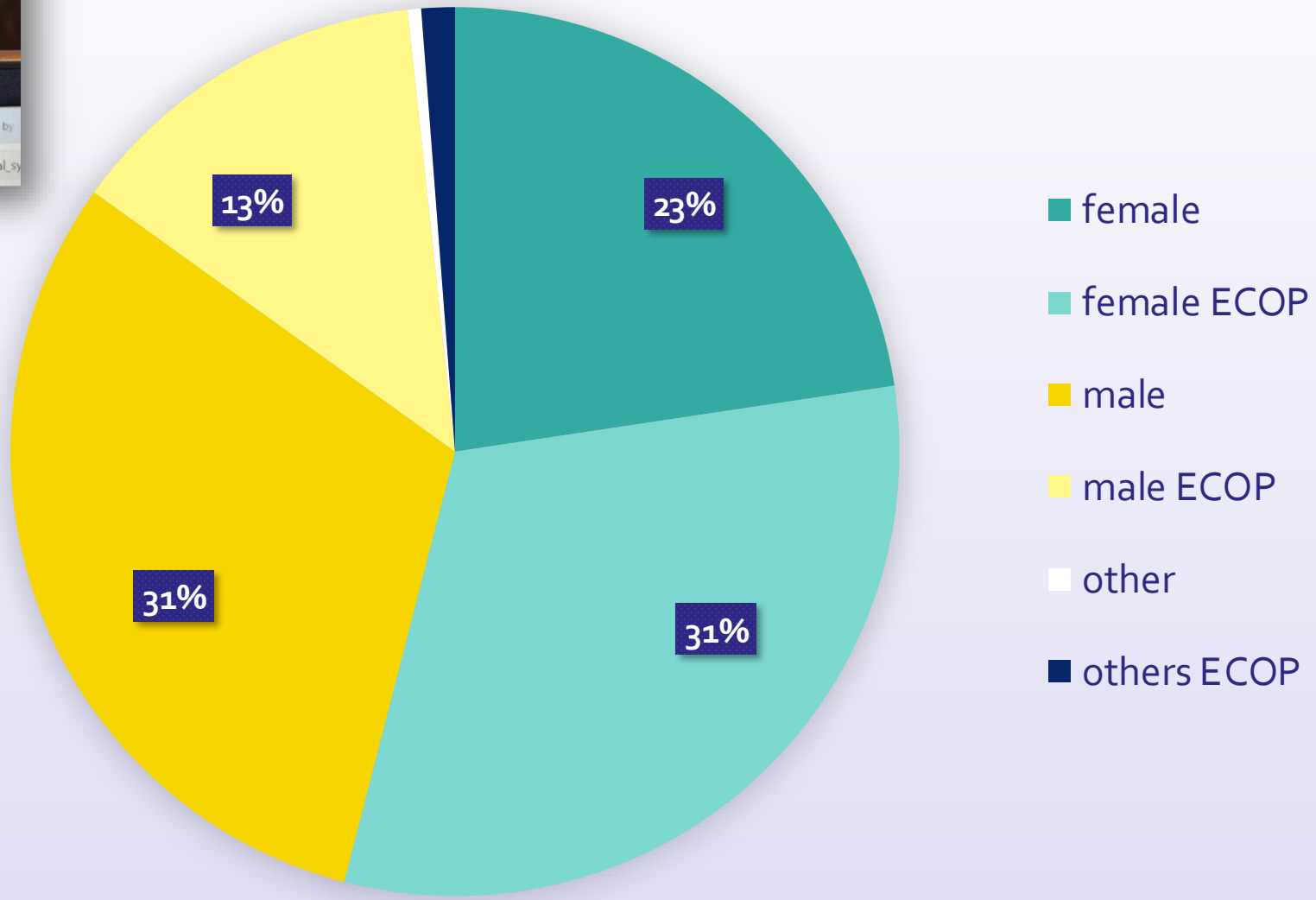
38 Countries

Photo credit: Peter W Allen, UTAS

ZPS7 diversity:



Gender & ECOP Ratio



Facts and figures from this week:

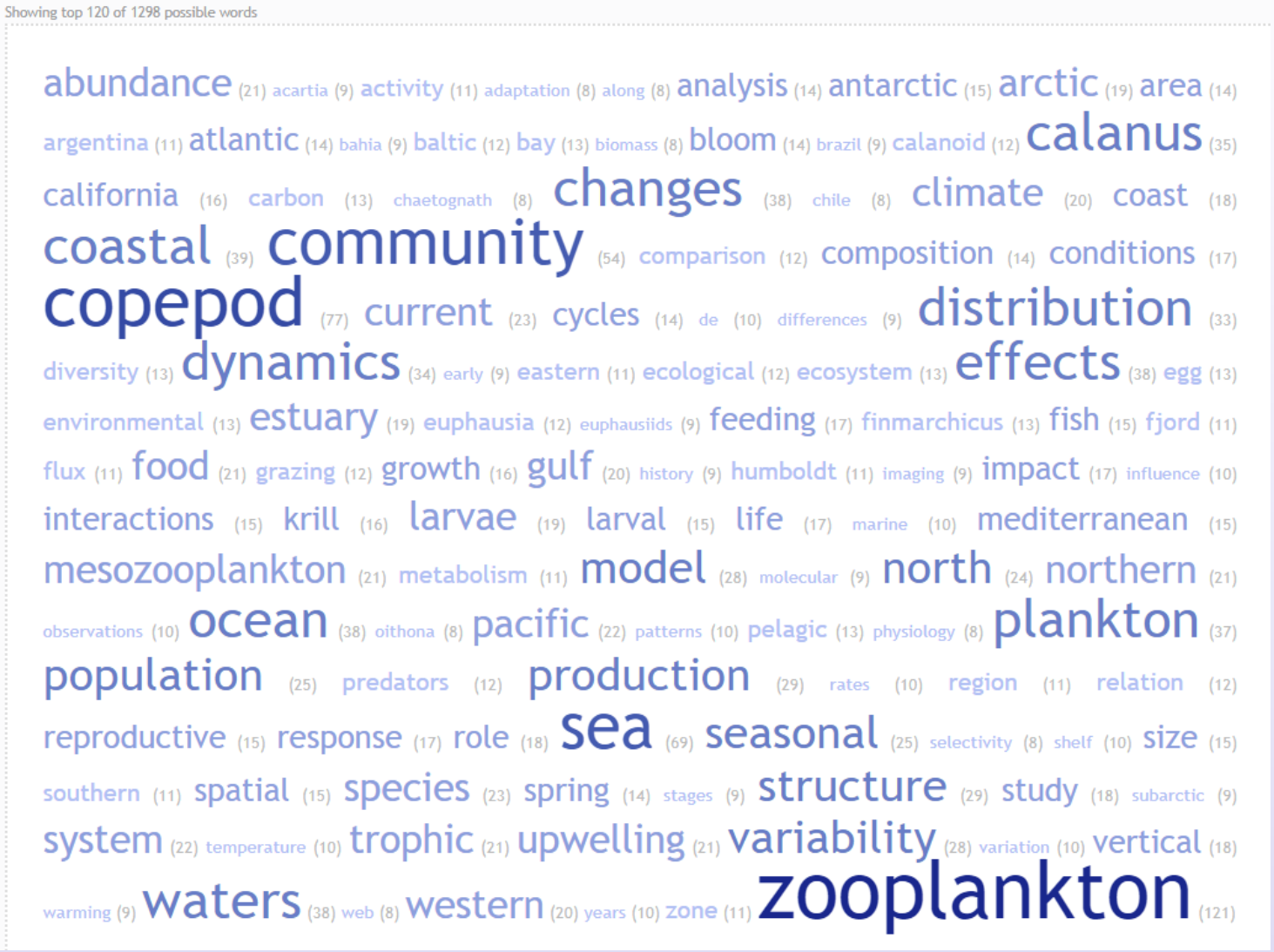
16 Sessions, 5 Workshops

357 Presentations

282 Oral (1 keynote, 27 Invited)

75 Posters

What did people talk about this week?



Hot or Not

Only in 2024 top 120

acoustic	long-term
assessment	mesopelagic
Alaska	metabarcoding
approach	methods
combining	microplastics
continuous	microzooplankton
data	migration
development	monitoring
diet	morphological
DNA	polar
estimates	recorder
evaluate	revealed
exploring	Salpa
functional	series
future	shifts
gelatinous	survey
global	taxonomy
identification	temporal
indicators	tool
insights	traits
integrated	understanding
Japan	

Only in 2011 top 120

Acartia	history
adaptation	Humboldt
activity	interactions
area	larval
Argentina	life
bahia	Mediterranean
Baltic	metabolism
bay	Oithona
Brazil	physiology
chaetognath	predators
Chile	rates
conditions	relation
cycles	reproductive
early	selectivity
egg	spring
Euphausia	stages
feeding	subarctic
finmarchicus	temperature
fjord	upwelling
flux	warming
grazing	years
growth	zone

Questions asked of convenors:

- What was the highlight of your session in terms of groundbreaking new insight, approach or methodology?
- What was the biggest surprise in your session - maybe an unexpected scientific result or any other surprise including a memorable one-liner?
- What is the most notable scientific trend in the topic covered by your session and expressed through the presentations or in the discussion?
- Were there any critical knowledge gaps identified?

Keynote, Angus Atkinson

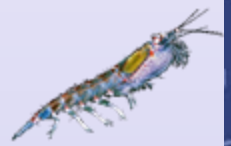
Sanae Chiba

The complex interplay between size spectra, trophic transfer, nutrients and temperature, and implications for a warmer world.

Surprise/concern (for me) – that older data in databases are hard to compile, old paper records are easier. Will we be able to use the acoustic data in 40 years? Only if we address and resource the problem. If not, we may face a new dark age of data…….

New technology and traditional methods can be complementary, not a replacement.

And, we need to worship copepods, their carbon sequestration potential is large too!



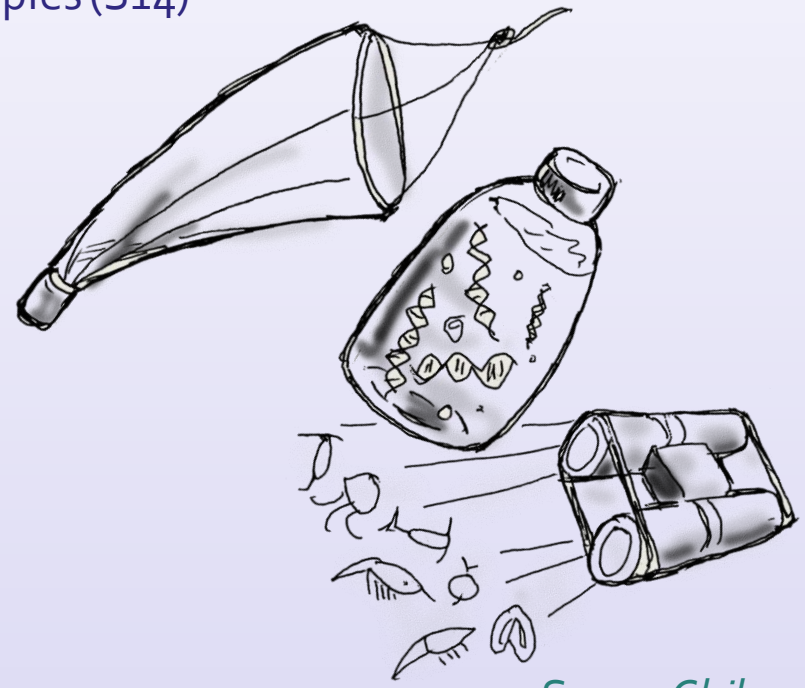
New technologies and traditional methods as ***complementary*** was a theme that came up several times – I see this community as a crucial place to develop and maintain the bridge between them.

They provide different views of the zooplankton community, and can bridge spatial/temporal scales (keynote, W3, S14, S10)

Morphological taxonomy is still very important especially using it in an integrative manner with other techniques, such as molecular analysis. (W4)
New modelling approaches may rely on good old field samples (S14)

complementary approaches (molecular – morphological – imaging – acoustics – etc.) are necessary for a better understanding of the zooplankton community and its change (S4)

How do we make sure the world knows this?
Policy paper planned by W4 on relevance for the economy and the value for ecosystem services if morphological knowledge is integrated into new technologies.



Sanae Chiba

Data……Data……Data……

Importance of time series is clear (standing room only at times in S6!) Anthony Richardson presented (work in progress) what may be the first observational evidence of a clear global decline in zooplankton biomass based an analysis of 90 years of historical biomass data from around the globe.

morphological knowledge should be spread and easily accessible (open access) and that digitalization of ID plankton keys is important to achieve this goal (W4)

Zooplankton data need to be made available to modelers (S9)

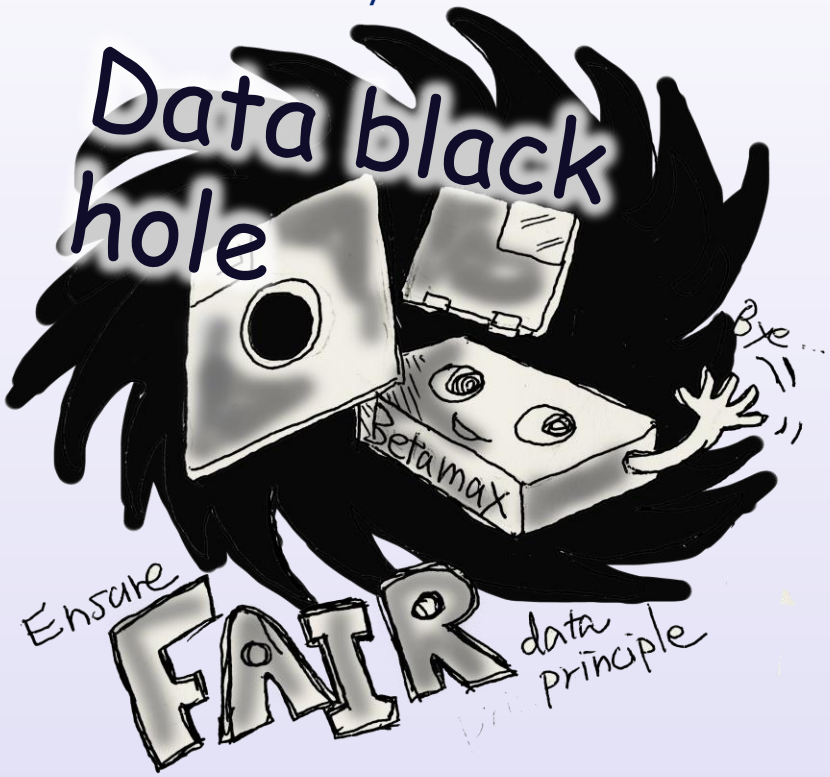
We are in an era of big data, how can we make full use of this complex data and ride the wave? (W5, S8, S14, S4)

Application of AI approaches continues to be promising; however, methods of augmenting training data and improving data quality are increasingly gaining attention. (S8)

Sanae Chiba

More data…….

W3 – surprise at the increase in the number of people making their time series data freely available.



Strong habitat gradients were detected in many different ecosystems, with conspicuous changes in zooplankton communities and abundances, demonstrating the scientific value of high spatial resolution data for understanding ecological processes in the ocean (S8)

Long after our papers will stop being cited, our data, that is collected and made freely available, will continue to increase in value. Anthony Richardson.

Time series analysis has gone beyond Latin names and counts. Size, biomass, indices, ratios, and assessment by functional role give better insights into what is changing, why, and what its likely impact will be in the ecosystem and/or fisheries. (S6)

Data standardization and interoperability are key to advancing the field of Trait Based Approaches and the massive potential of vast image databases (W5)

Once upon a time, video killed a radio star, and more recently Netflix killed DVD…
New tech comes and goes quickly. Share your data before they are sucked into a data black hole.
Sanae Chiba

Jelly!

The 'rise (in knowledge) of gelatinous zooplankton' is upon us – clearly people are starting to get a handle on their importance in ecological and biogeochemical dynamics. Changing food chains due to warming suggests we may need to reconsider the representation and numbers of our "Z" boxes. (S16)

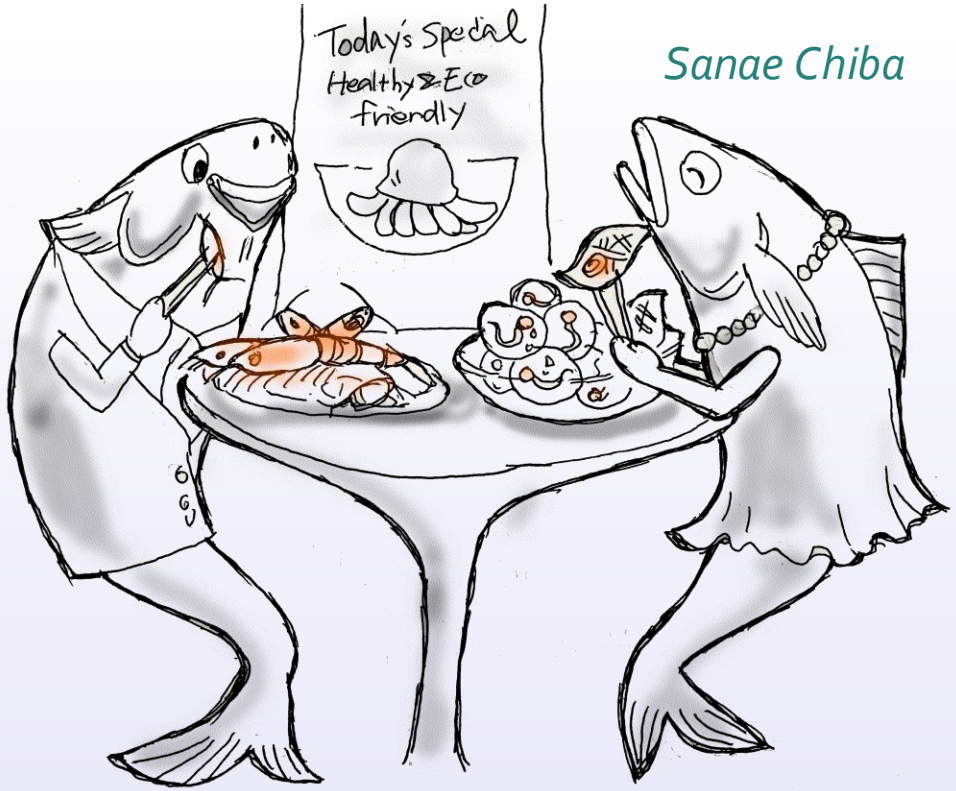
Gelatinous zooplankton are important in the diet of fish larvae (S9)

Salps increase POC flux 2-8 fold! (S3)

Increase in gelatinous zooplankton around France, China, North Atlantic, Gulf of Mexico, Gulf of Alaska…. (S1)

A need for integrating gelatinous data into ecological assessments for indicators of ecosystem health and to develop targeted management actions (S1)

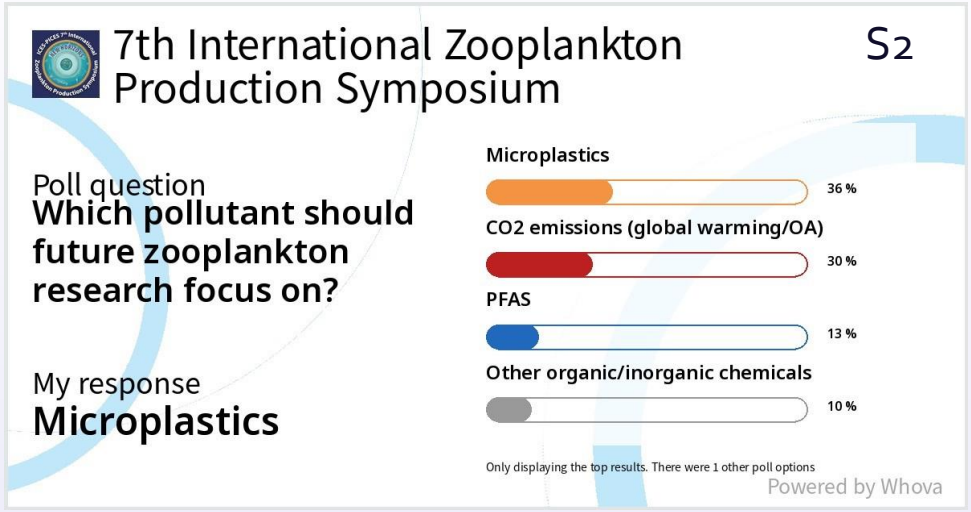
Gelatinous zooplankton comprise 35% of the Arctic's biovolume – many systems show inverted marine ecosystem pyramids (Fabien Lombard)



Sanae Chiba

Gelatinous zooplankton is not the end of the food web, maybe an alternative trophic pathway in a warming, oligotrophic world?

Other emerging issues/gaps:



Trait-based approaches are also gaining traction, not least because of the assembly of large (and growing) datasets (a la Patrick Pata) S16

From a genetics expert "We need [microzooplankton taxonomic] experts!" S7

Indian ocean remains poorly studied, lacking observational data (S1, S6)

Problematic taxa where molecular identification does not work yet (S10)

Increased collaboration between ichthyoplankton and zooplankton experts – will help with incorporating zooplankton data into stock assessment models (S9)

Need an international network of experts combining different fields of knowledge (morphological, molecular) (W4)

Maintaining observing programs and collecting essential data is a struggle (S14)

The varying effects of spatial and temporal environmental heterogeneity (including extreme events) on zooplankton community composition, production, and dynamics; and spanning local, regional, and global scales. (S18)

Euphausiids (except maybe Antarctic krill) are important and understudied (S14)

A few surprises!

Sanae Chiba

Swarming copepods are "noisy", releasing "a crunchy sound, similar to rice crispies….." (Kim Last, S14)

Kazutaka Takahashi's finding of elevated ammonia concentrations in *Pleuromamma xiphias* incubation experiments, suggesting efficient regeneration of nitrogen by diazotrophs.

Jaime Färber Lorda's and Patricia Thibodeau's findings of the presence of distinct plankton communities inside oxygen minimum zones (S18)

Stein Kaartvedt's exciting talk on the use of acoustics to observe the individual behavior of *Meganyctiphanes norvegica*, showing distinctly different behavior for different feeding modes and at different stages of the DVM. It was truly so cool! (S15)

Overwintering copepods are reproducing in deep waters (S10)

Video of fish larvae crawling up the wall of a cascade in Sao Tome island (Vânia Baptista, S9)

There is so much we still don't know! Diel Vertical Migration is a good example. What drives the pattern? What percentage of krill are involved? (S9)

Difference between males and females, differences in C:N ratios and respiration rate between deep and shallow males – surprising! (S3)

Being in an interactive workshop beats jetlag (S2)

A few (more) surprises!

Sanae Chiba
Is there such a thing as a global, ubiquitous species?

Regional vertical or temporal trends can be similar even when the detected community composition differs greatly between methods (i.e. the morphological vs. the genetic metabarcoding identification method) as demonstrated in the presentation by Agata Weydmann-Zwolicka (S4)

The biggest surprise came from the participants: *"I was worried when I saw 'data' in the title that this workshop would be really boring, but it was actually great!" Anonymous….W5*

In a field of advanced degrees, complex optical instrumentation, delicate molecular lab methods, and advanced statistical analyses … nothing is more fear inducing than a quirky presentation remote! (Attempts to use laser pointer, accidentally forwards the slide … panics when back button does not respond.) Todd O'Brien

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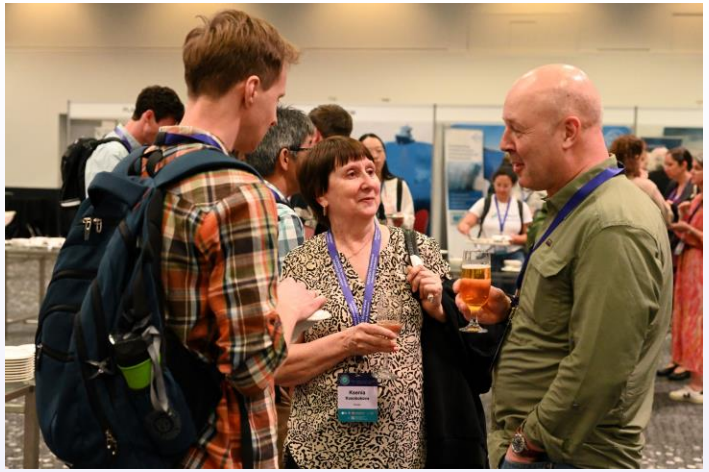

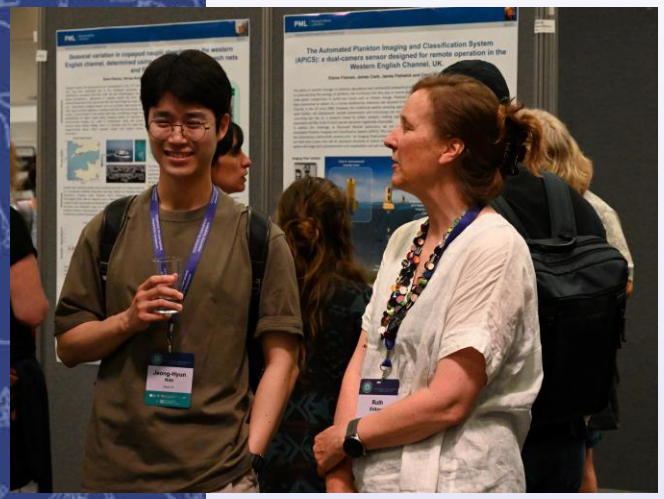

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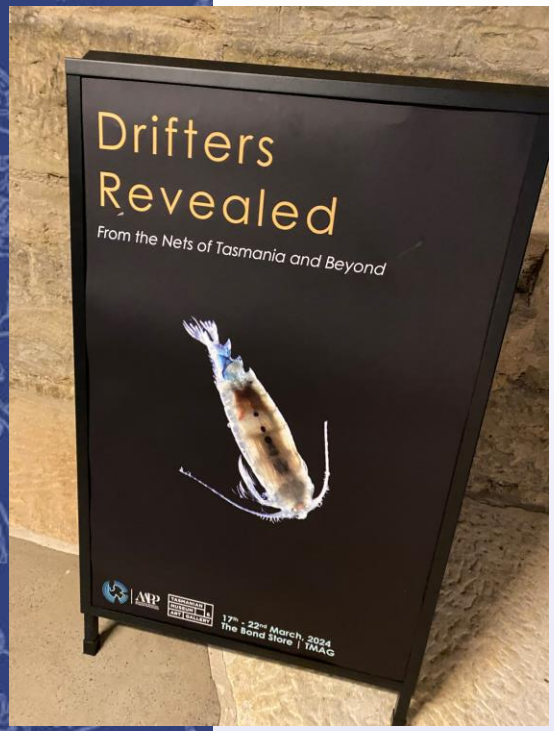
We've been well nourished this week!

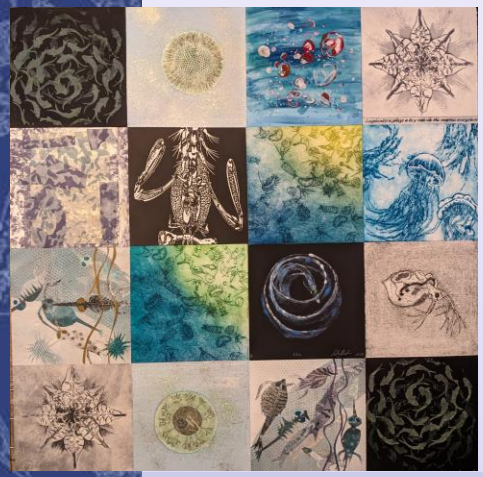






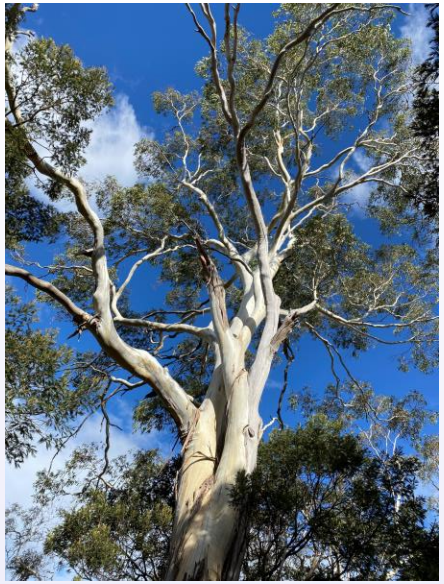


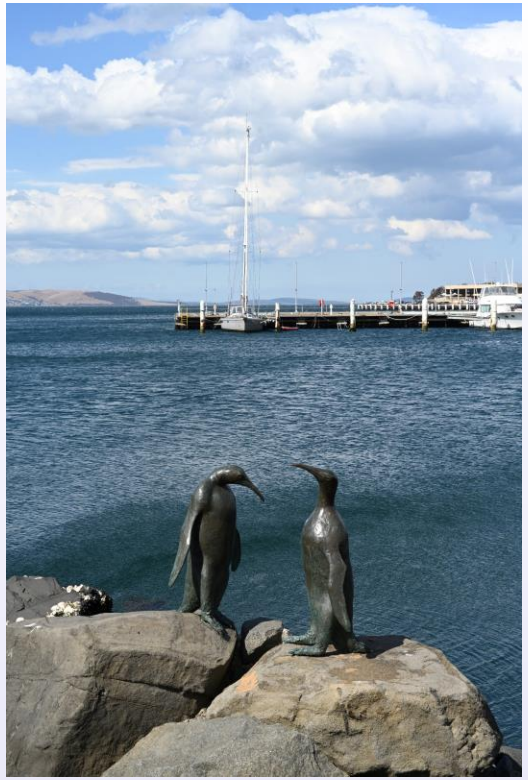




Dawn is light and growth and death
sun up - inhale -
One more breath.
Dusk is darkness and safe respite
sun down - exhale -
Out of sight.

From "A tale of light and fear" by Jen Freer





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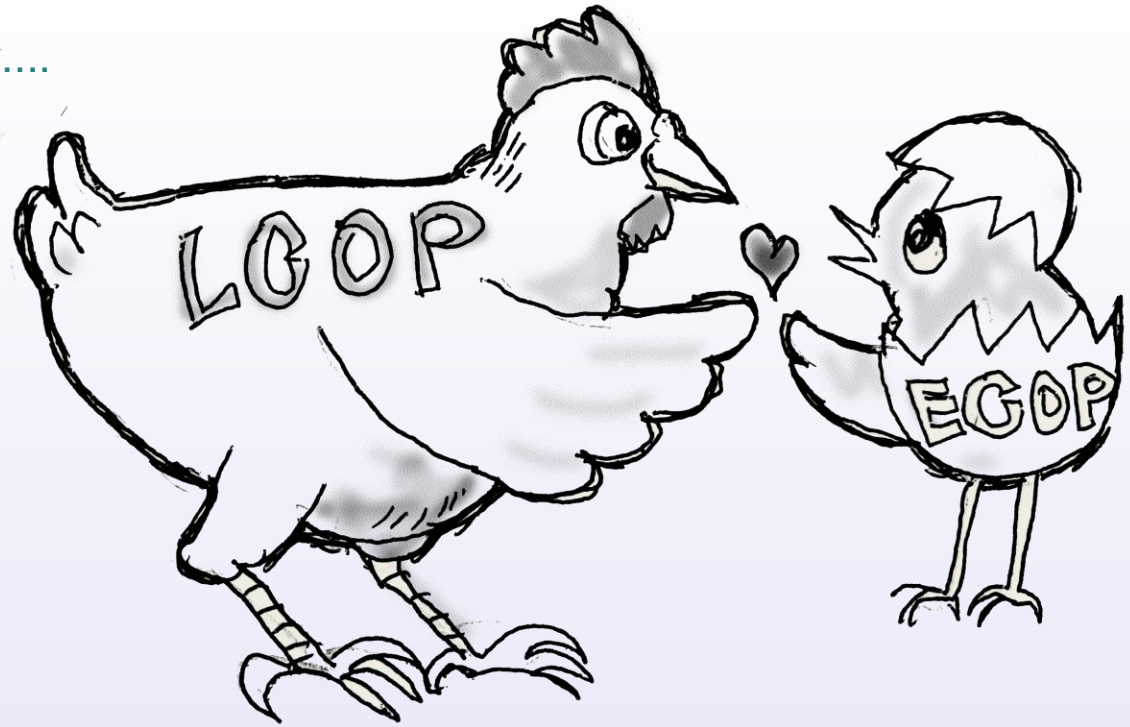
But finally……



Sanae Chiba

The fact that over 50% of our attendees are ECOP is **amazing**, and contributed enormously to the energy and quality of this conference! Thank you!

So, while new technologies are complementary and NOT replacing older technologies, ECOP are complementary and ARE replacing LCOP. And that's a good thing!