ICES Journal of Marine Science

ICES Journal of Marine Science (2017), doi:10.1093/icesjms/fsw252

Quo Vadimus

Managing marine socio-ecological systems: picturing the future

Olivier Thébaud[1]*, Jason S. Link[2], Bas Kohler[3], Marloes Kraan[4], Romain López[5], Jan Jaap Poos[4], Jörn O. Schmidt[6], and David C. Smith[7,8]

[1]*Ifremer, Univ Brest, CNRS, UMR 6308, AMURE, Unité d'Economie Maritime, IUEM, F-29280, Plouzane, France*
[2]*National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 166 Water Street, Woods Hole, MA 02543, USA*
[3]*Studio Bas Kolher, Binnenbantammerstraat 1, 1011 CH, Amsterdam, The Netherlands*
[4]*Wageningen Marine Research, PO Box 68, 1970 AB IJmuiden, The Netherlands*
[5]*University of Brest, France*
[6]*Environmental, Resource and Ecological Economics, Kiel Marine Science and Cluster of Excellence 'Future Ocean , Kiel University, 24118 Kiel, Germany*
[7]*CSIRO Oceans and Atmosphere, Castray Esplanade, Hobart, Tasmania 7001, Australia*
[8]*Centre for Marine Socio-ecology, University of Tasmania, Hobart, Tasmania 7001, Australia*

**Corresponding author: email: olivier.thebaud@ifremer.fr*

Thébaud, O., Link, J. S., Kohler, B., Kraan, M., López, R., Poos, J. J., Schmidt, J. O., and Smith, D. Managing marine socio-ecological systems: picturing the future. – ICES Journal of Marine Science, doi:10.1093/icesjms/fsw252.

Received 16 November 2016; revised 17 December 2016; accepted 19 December 2016.

What do you get when a lawyer, a modeller, an economist, a social scientist and an ecologist talk about the ocean? Besides an interesting conversation, it is likely there will be some consideration of how to solve many of the problems facing marine ecosystems around the world. That is precisely what the MSEAS 2016 symposium on understanding marine socio-ecological systems aimed to do. From 30 May to 3 June in Brest, France, the symposium gathered over 230 participants from around the world and from multiple disciplines to discuss the challenge of explicitly considering the human component in producing synoptic assessments of marine social-ecological systems. The symposium fostered dynamic debates on the inter-disciplinary collaborations needed to support management of ongoing and anticipated growth in multiple ocean uses, with particular consideration of the triple bottom line of ecological, economic and social sustainability. Building on the illustrations produced by a professional cartoonist during the meeting, this graphic novel summarizes the key challenges ahead in understanding marine socio-ecological systems and draws a path for future research endeavours in this domain.

Managing marine socio-ecological systems: picturing the future.

Olivier Thébaud, Ifremer, UMR AMURE, France

Jason Link, NOAA, USA

Bas Kohler, Studio Bas Kolher, The Netherlands

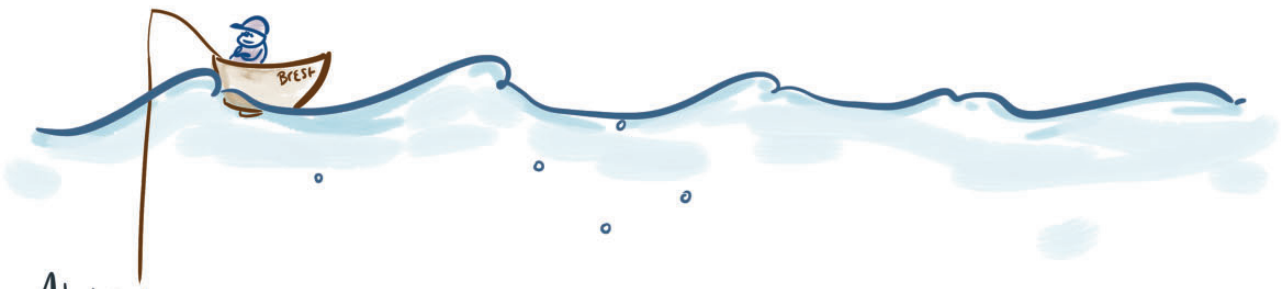
Marloes Kraan, Wageningen Marine Research, The Netherlands

Ronain López, University of Brest, France

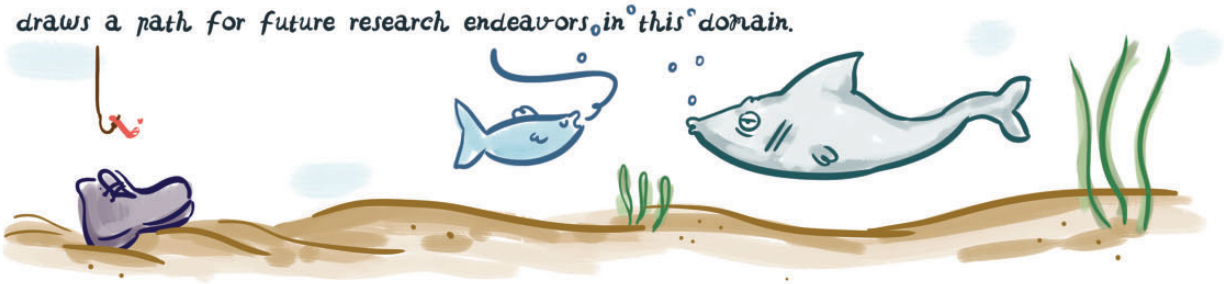
Jan Jaap Poos, Wageningen Marine Research, The Netherlands

Jörn Schmidt, University of Kiel, Germany

David Smith, CSIRO, Australia



Abstract: What do you get when a lawyer, a modeler, an economist, a social scientist and an ecologist talk about the ocean? Besides an interesting conversation, it is likely there will be some consideration of how to solve many of the problems facing marine ecosystems around the world. That is precisely what the MSEAS 2016 symposium on understanding marine socio-ecological systems aimed to do. From May 30th to June 3rd in Brest, France the symposium gathered over 230 participants from around the world and from multiple disciplines to discuss the challenge of explicitly considering the human component in producing synoptic assessments of marine social-ecological systems. The symposium fostered dynamic debates on the inter-disciplinary collaborations needed to support management of ongoing and anticipated growth in multiple ocean uses, with particular consideration of the triple bottom line of ecological, economic and social sustainability. Building on the illustrations produced by a professional cartoonist during the meeting, this graphic novel summarizes the key challenges ahead in understanding marine socio-ecological systems, and draws a path for future research endeavors in this domain.



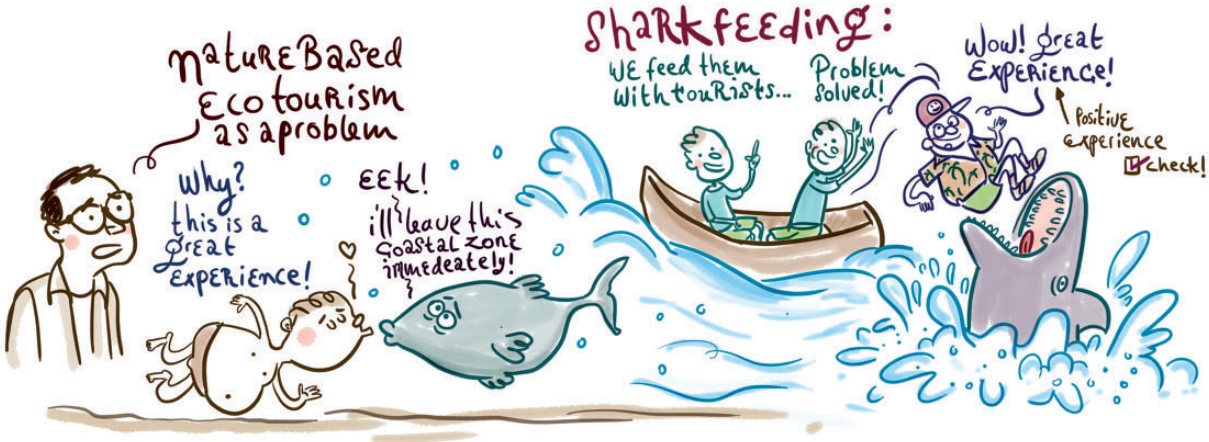
The Oceans offer many opportunities:

Be it Fishing,

Food Provision,

Seabed mining and the development of offshore constructions,

Tourism and cultural services



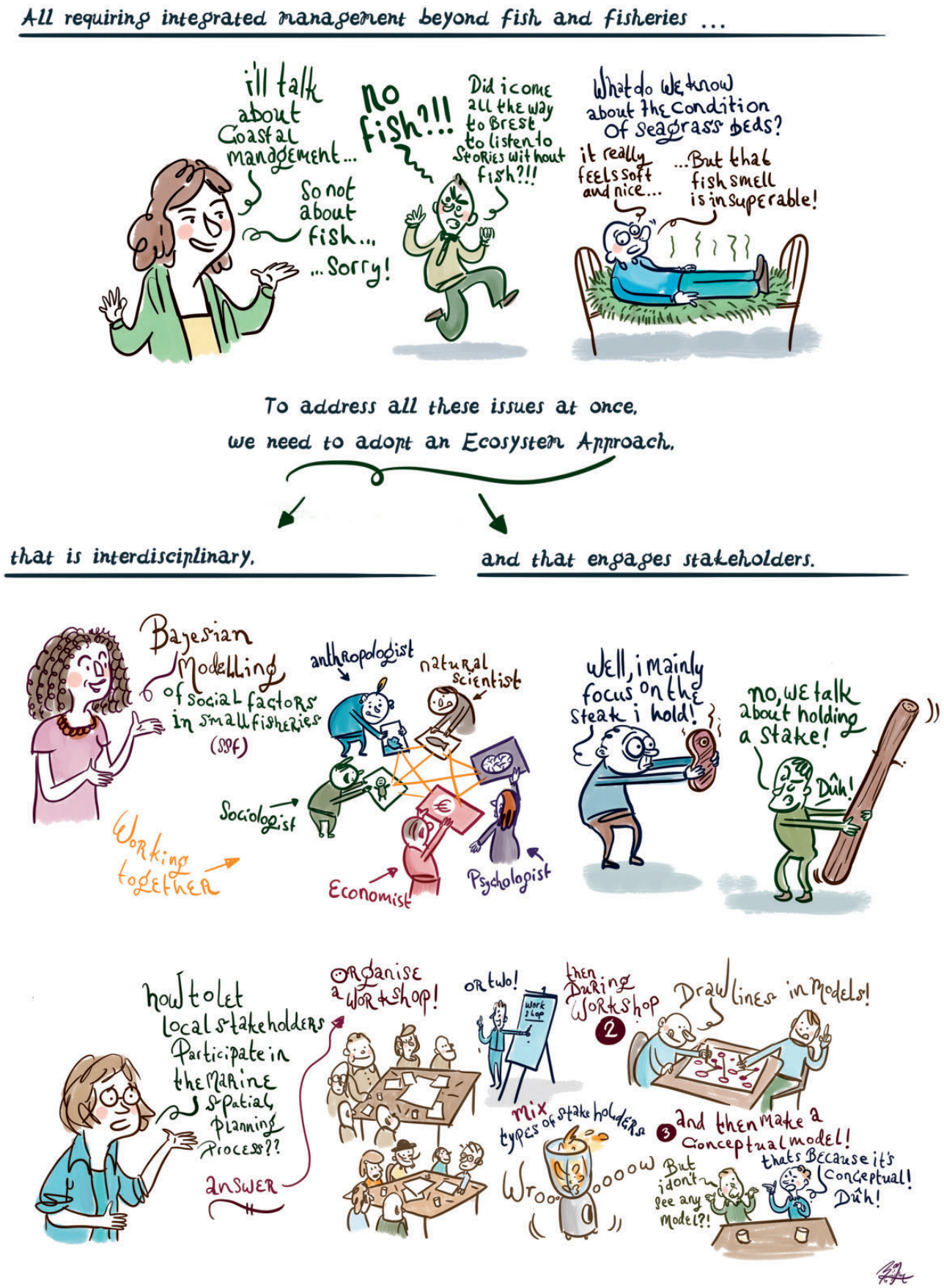
or shipping, energy, and many other sectors ...

But the Oceans also face many challenges.

Climate change,

pollution,

cumulative threats on ecosystem services,


All requiring integrated management beyond fish and fisheries ...
i'll talk about Coastal management...
So not about fish...
...Sorry!
No fish?!!
Did i come all the way to Brest to listen to stories without fish?!!
What do we know about the condition of seagrass beds?
it really feels soft and nice...
...But that fish smell is insuperable!
To address all these issues at once, we need to adopt an Ecosystem Approach,
that is interdisciplinary,
and that engages stakeholders.
Bayesian Modelling of social factors in small fisheries (SSF)
anthropologist
natural scientist
Sociologist
Economist
Psychologist
Working together
Well, i mainly focus on the steak i hold!
no, we talk about holding a Stake!
Duh!
how to let local stakeholders participate in the Marine Spatial Planning Process??
answer
Organise a workshop!
or two!
work in loop
Then During Workshop
2
Draw lines in Models!
mix types of stake holders
3
and then make a Conceptual model!
Wroooooow
But i don't see any model?!
that's Because it's Conceptual!
Duh!

Finding solutions to problems facing the ocean is complex and adventurous

because of the range and nature of the issues involved

Particularly because humans are part of the ecosystem too.

And scientists, policy-makers and other stakeholders are connected through social networks.

The solutions also need to be integrated across multiple dimensions:

the economic dimensions,

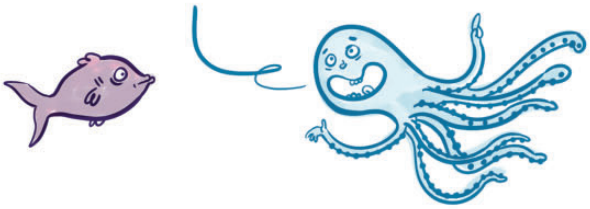
the social dimensions,

the governance dimensions,

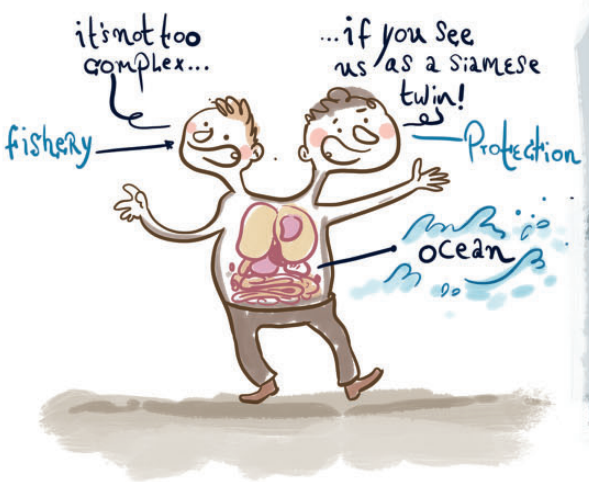

the political dimensions,
it's very important to us too...
...to make policy with all relevant actors!
Politics
industry
Eh... Eh...
ngo's! Public
academics
Making policy:
Ethics???
no, i think we didn't hear her well...
...she probably said Economics...
and the ecological dimensions,
it's a bit of a depressing story; "too little, too late" (the economic integration in the Chesapeake US
WE Measured almost everything in the Bay...
But we forgot what it was all about
Oops..
oh, yeah...
about living resources!
Everything we do on the land...
WE find it back in the water!...
such that all important
drivers are captured
...If a fish does not die within 24 hours the water is healthy?..
With this indicator we'll solve lots of environmental issues!
hake in South africa!
to the international market!
Real world
and the importance of DRIVERS
of course! who brings that hake to the market? ME, the Driver!
Dataworld

All need to be considered in ways more than just the usual set of expert opinions.

Certainly there will always be challenges facing research on marine socio-ecological systems.



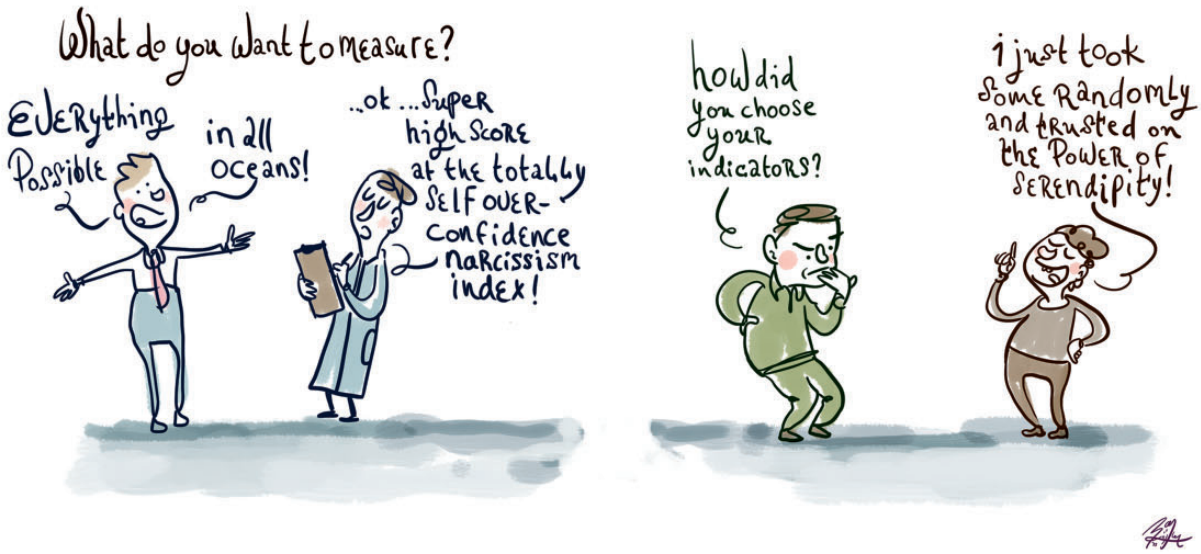
Even if just making sense of all the multiple objectives,



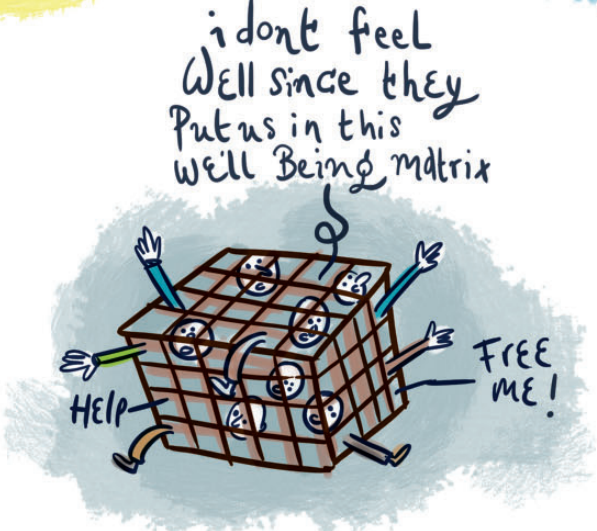
and collecting sufficient and relevant data

Data from the right places (geographically and disciplinarily)... and worth the effort.

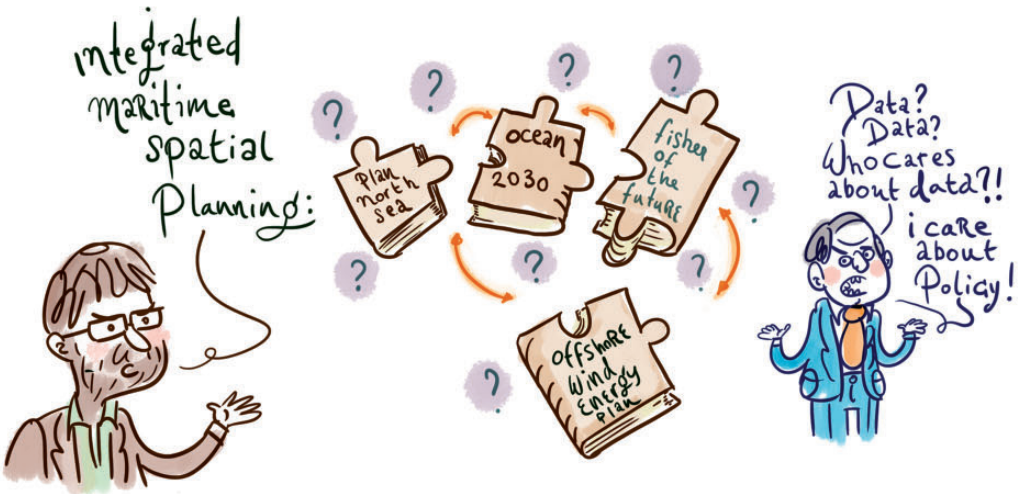
Where such data can be converted into indicators

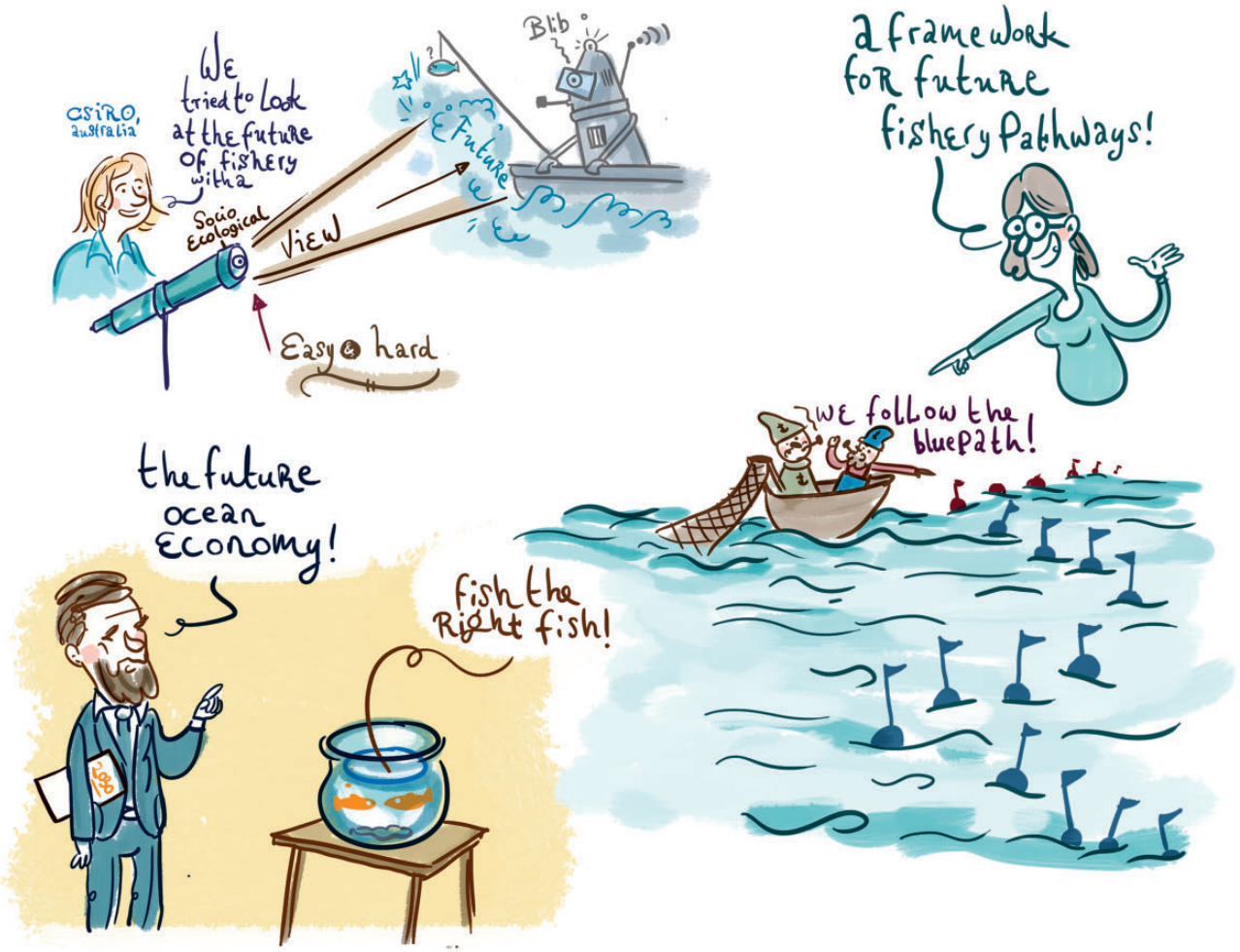


that can inform decisions.



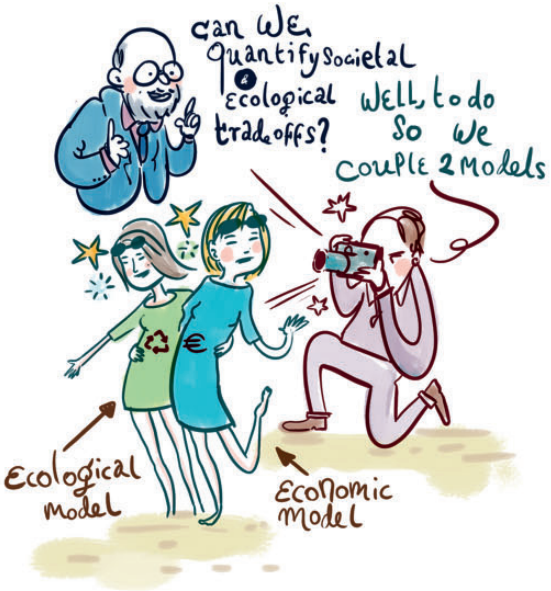
In the context of integrated maritime policies ...




But as we seek to manage uses of the ocean, we can envision a future
CSIRO, Australia
We tried to look at the future of fishery with a Socio Ecological View
Blib
Future
Easy
hard
a framework for future fishery Pathways!
we follow the bluepath!
the future ocean economy!
fish the Right fish!
that will use a wide range of models.


...to keep it simple, we didn't mention the influence of mood changes in our social ecological model!
he tries to capture nature...
OR an indicator for total madness...

Models that are highly coupled,



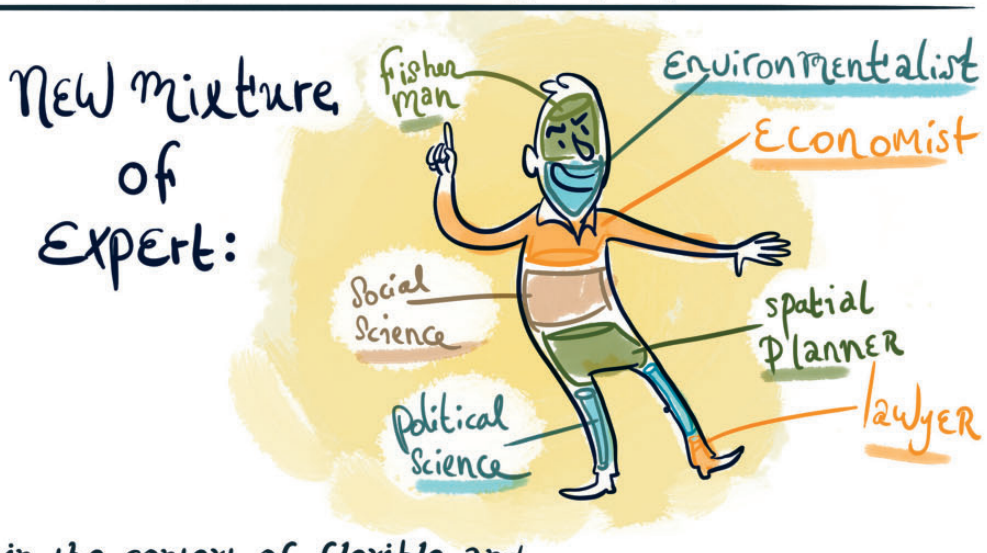
and that include human behavior.

Models that account for human diversity,

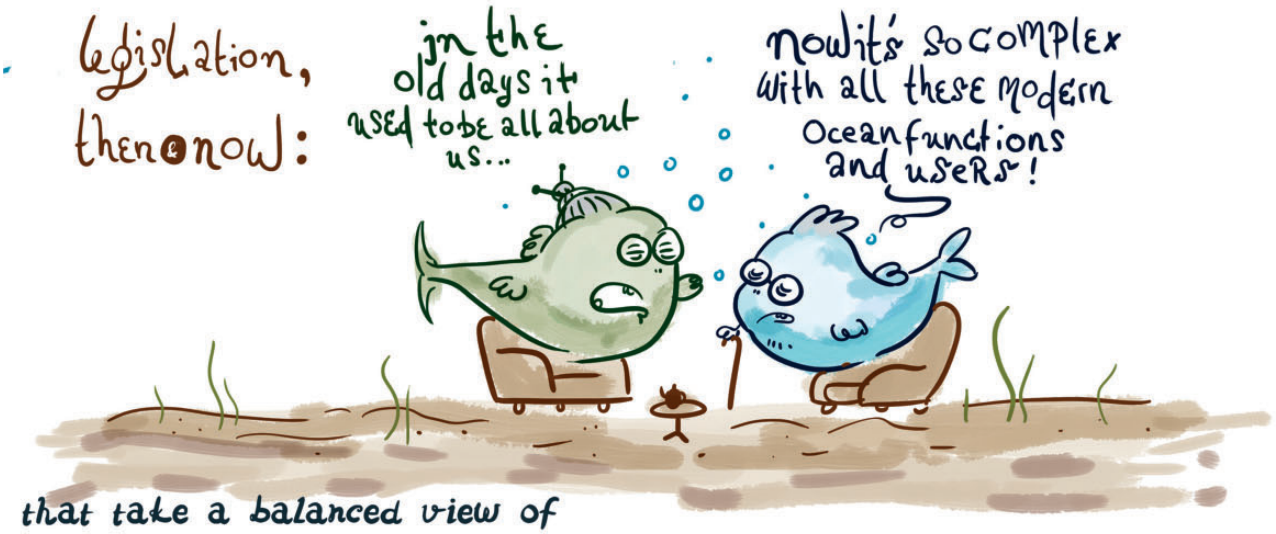
and that are easy to develop and communicate.


Models that are trusted and used by stakeholders,
Here i've got a tool to predict uncertainties!
Wow! Does it predict all uncertainties?!
that's uncertain, I suppose
...and we had 5 workshops! in which stakeholders interacted with the model output
model
while managing expectations ...
People who are too enthusiastic about models
WOW! now we'll know everything!!!
Well well, it's just a model...
People who are too skeptical about models
You! you stupid model builder...
We'll never be able to understand anything!..
Well well, it's just a model...
And models that are put into context.
I have been staring at this excell-sheet for hours now... ...not a single story!
Because you miss the social context!
go out!
experience!

This future will need to be highly interdisciplinary, with a wide range of expertise.



All in the context of flexible and adaptive governance systems and legislation.



that take a balanced view of individual versus collective outcomes.

and of trade-offs between
immediate and future outcomes.

Too much is at stake not to try
to achieve such a future ...
MSEAS 2016

Handling editor: Howard Browman