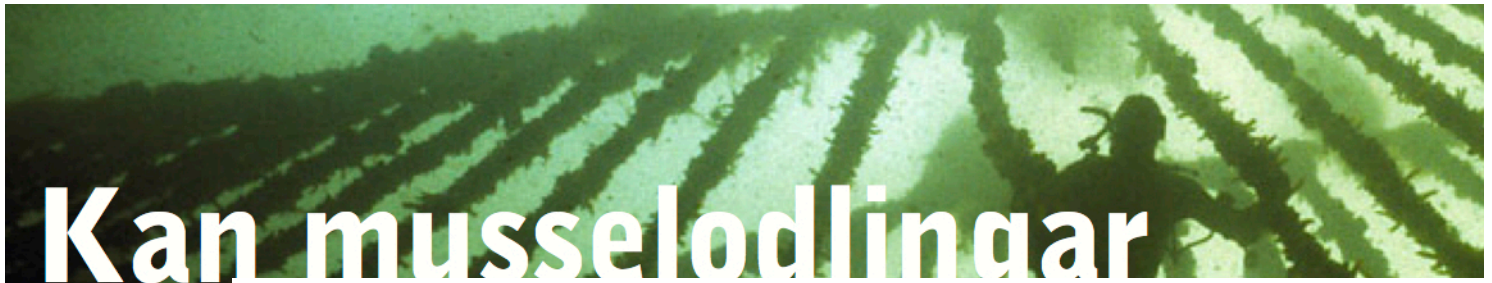
Communicating Your Science

(How to talk to your mother?)



Kan musselodlingar ren

Blåmusslan är b
lokalt bidra till e
gödande närings
organiskt materi
följd. Vad inneb
eller minus i vat
jämfört med and

MILJØ

Paleoøkologi som redskab for EU's va

Biologiske og kemiske indik referencetilstande i kystvan

Af Nina Reuss, Lunds Universitet; Mari Geologiske Undersøgelse; Daniel J. Con

pågår försök med att anlägga ödlingar som
de på mängden näringsämnen i Östersjöns

Syrebrist vid Östersjöns kuster

Foto: Nils Ryrholm/Azote

Döda bottnar på grund av syrebrist i bottenvattnet är
fenomen i Östersjöns öppna delar. Vi vet också att i
råden längs kusten så uppstår det syrebrist varje so
hur spridd är denna företeelse? Genom att samman
från de olika länderna kring Östersjön har vi försök
bild av syresituationen även i kustområdena.

t mer svårtill-
nställning har

om görs i Öst-
hitta två mil-

in the workplace,
y adaptable, and
equal rights are

only case in which I could not find the information I was seeking, I used a name finder to tell me the author's sex.

A balanced sex ratio is impossible to maintain in peer-reviewed publications, and indeed should not be a goal in peer-reviewed articles. But Insights are written by invitation only, so the editors can decide who they believe could best contribute. The editors should make more effort to promote equality in the process of publication.

Daniel Conley
Department of Marine Ecology, National Environmental Research Institute, DK-4000 Roskilde, Denmark, and Department of Marine Ecology, Aarhus University, DK-8200 Aarhus, Denmark

Network aims to make maths count in Africa

SIR — Your Editorial "Networks for Africa" (*Nature* **438,** 395; 2005) raises the question of how research and teaching in the mathematical and physical sciences in Africa can best be strengthened. A vital ingredient is surely that, with whatever assistance richer nations can provide, the broader scientific community across Africa should itself plan and manage its own scientific development.

It is in this spirit that the African Academy of Sciences and the International Mathematical Union support a distributed network of African mathematicians in the African Mathematics Millennium Science Initiative, or AMMSI (www.ammsi-maths.org). AMMSI supports research and postgraduate training in mathematics at universities in sub-Saharan Africa. Individual grants are awarded to students and faculty members whose low salaries, high teaching

Women's efforts are more than a drop in the ocean

SIR — As an oceanographer I enjoyed your

ECOLOGY

Controlling Eutrophication: Nitrogen and Phosphorus

Improvements in the water quality of many freshwater and most coastal marine ecosystems requires reductions in both nitrogen and phosphorus inputs.

Daniel J. Conley,[1]* Hans W. Paerl,[2] Robert W. Howarth,[3] Donald F. Boesch,[4] Sybil P. Seitzinger,[5] Karl E. Havens,[6] Christiane Lancelot,[7] Gene E. Likens[8]

The need to reduce anthropogenic nutrient inputs to aquatic ecosystems in order to protect drinking-water supplies and to reduce eutrophication, including the proliferation of harmful algal blooms (*1*) and "dead zones" in coastal marine ecosystems (*2*) has been widely recognized. However, the costs of doing this are substantial; hence, developing the appropriate nutrient management strategy is very important. Nitrogen (N), needed for protein synthesis, and phosphorus (P), needed for DNA, RNA, and energy transfer, are both required to support aquatic plant growth and are the key limiting nutrients in most aquatic and terrestrial ecosystems. However, a cascading set of consequences has been set in motion, arising from massive increases in fixed N additions to the biosphere, largely through the production of fertilizers and increases in fossil fuel emissions (*3*). P levels have also significantly increased because of fertilizer use, as well as from municipal and industrial wastewater.

term experimental manipulations at Lake 227 in the Experimental Lakes Area, Canada (*5*). These and other results (*6*) led to widespread reductions in P loading to North American and European lakes and consequent improvements in water quality (*7*). On the basis of lake examples, P controls were prescribed by environmental regulatory agencies for estuarine and coastal marine ecosystems as well (*8*). P-reduction programs improved water quality in many lakes, but broader water- and

environmental-quality goals were not achieved, particularly in estuaries and coastal marine ecosystems. This led to the general recognition of the need to control N input to coastal waters (*9*).

In lakes, the key symptom of eutrophication is cyanobacterial blooms (see figure, left). Planktonic N_2-fixing cyanobacteria bloom in fresh waters when P is replete and N availability is low. Such blooms are undesirable because cyanobacteria can be toxic, cause hypoxia, and disrupt food webs (*1*, *10*). N_2 fixation by cyanobacteria also can help to alleviate N shortages and hence maintain a lake in a P-limited condition (*5*).

N_2 fixation by planktonic cyanobacteria is much less likely in estuaries and coastal seas than in lakes. Significant coastal planktonic N_2 fixation has not been observed at salinities greater than 8 to 10 (ocean salinity is ~35), even in estuaries that are strongly N-limited, except in rare cases (*11*). If N limitation were the only factor governing

A Guide to Making Your Science Matter

ESCAPE from the IVORY TOWER

Foreword by Donald Kennedy

Nancy Baron

Leadership and Communication Training

COMPASS
COMMUNICATION PARTNERSHIP
for SCIENCE *and the* SEA

Havsmiljöinstitutet

BECC

MERGE

BALTIC SEA 2020

Baltic Sea Centre

Stockholm University


Better Than Before

ENVIRONMENTAL Science & Technology

ARTICLE

pubs.acs.org/est

Hypoxia Is Increasing in the Coastal Zone of the Baltic Sea

Daniel J. Conley,[*,†] Jacob Carstensen,[‡] Juris Aigars,[§] Philip Axe,[∥] Erik Bonsdorff,[⊥] Tatjana Eremina,[#] Britt-Marie Haahti,[⊥] Christoph Humborg,[$,@] Per Jonsson,[@] Jonne Kotta,[%] Christer Lännegren,[▽] Ulf Larsson,[¶] Alexey Maximov,[○] Miguel Rodriguez Medina,[$] Elzbieta Lysiak-Pastuszak,[■] Nijolė Remeikaitė-Nikienė,[○] Jakob Walve,[¶] Sunhild Wilhelms,[††] and Lovisa Zillén[†]

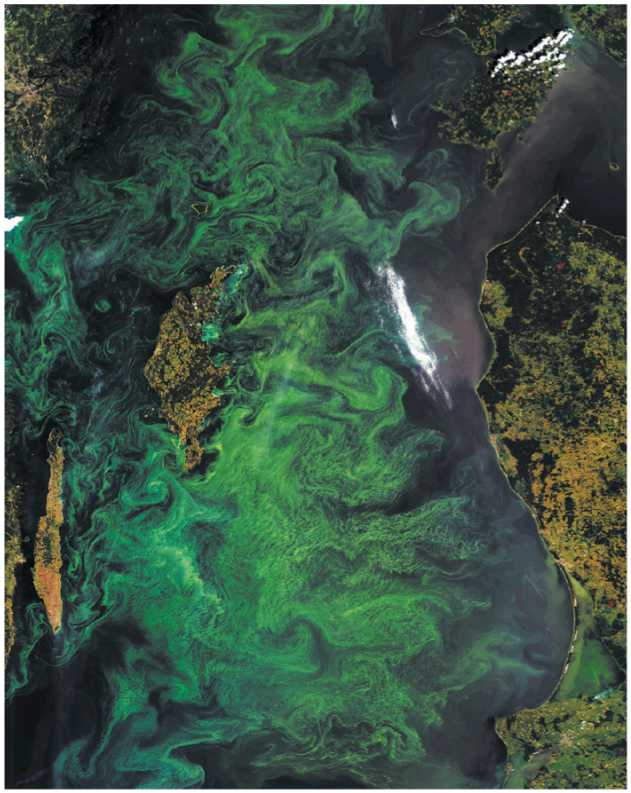
COMMENT

HEALTH How to cut antibiotic use in livestock to help stop resistance in humans **p.465**

BIOGRAPHY A life of Hans Bethe, Nobelist and veteran of the Manhattan project **p.468**

FICTION Author David Brin on sci-fi giant Ray Bradbury **p.471**

OBITUARY Nobel biophysicist Andrew Fielding Huxley, remembered **p.474**



Cyanobacteria cover the Baltic Sea in green slime, spurred by flows of nitrogen and phosphorous.

Save the Baltic Sea

Geoengineering efforts to bring oxygen into the deep Baltic should be abandoned, says **Daniel J. Conley**.

The Baltic Sea holds the world's largest human-induced dead zone: a body of water that has all the symptoms of nutrient overload and oxygen deprivation. Dumping from sewage-treatment plants, farming and industry has poured about 20 million tonnes of nitrogen and 2 million tonnes of phosphorus into the Baltic over the past 50 years[1], spurring algal blooms.

In summer, cyanobacteria cover the beaches in green slime. As these blooms die, they fall to the sea floor and decay, using up available oxygen in the process. The oxygen-deprived bottom waters can no longer support higher forms of life, and the viable habitat for fish such as cod is greatly reduced. Over the past decade, an average of 60,000 square kilometres of the Baltic Sea has been 'hypoxic' each year: lacking enough oxygen to support its normal ecosystem.

Several large-scale geoengineering interventions have been proposed as solutions to this problem. Such radical remediation measures promise impressive improvements in water quality on short timescales. They are popular in the media and politically attractive. But they could also be dangerous. We should not let such schemes detract from the action plan that is already in place to reduce nutrient flows into the Baltic. Models predict that this plan will greatly reduce hypoxia (see 'Breathing life into the Baltic').

STIFLED SEAS

The problem of hypoxic waters is on the rise around the globe. Climate warming is likely to exacerbate matters — warmer temperatures speed up algal decomposition and reduce the rate at which oxygen from the air seeps into ocean surface waters[2]. Low oxygen levels kill sea-floor organisms and change how elements cycle through the system. In hypoxic conditions, the phosphorus-bearing iron oxyhydroxides in sediments dissolve, increasing the release of phosphate into the water. At the same time, low oxygen inhibits denitrifying bacteria in the sediments, boosting nitrogen levels. The net effect is an excess of phosphorous, which fuels nitrogen-fixing cyanobacteria and algal blooms. These decay and lead to ever more hypoxia — a vicious circle.

One potential countermeasure entails using pumps to mix the water[3]. This comes with significant challenges. About ▶

Correspondence

A call to commission more women writers

We have analysed the gender distribution of authors of News & Views articles in *Nature* and of Perspectives in *Science* for 2010 and 2011. Our numbers indicate that both journal sections under-represent women scientists.

We divided the articles into three broad subject categories: biological and chemical sciences (which includes medical sciences); physical sciences; and Earth and environmental sciences. We compared the proportion of women authors with the proportion of women scientists employed in 2006 in the United States in science and engineering in each of the three categories (see go.nature.com/bkechu).

We found that the proportion of women commissioned to write *Nature* News & Views articles was much lower than the proportion of women scientists overall: female authorship was 17.3% for the biological and chemical sciences, 8.1% for physical sciences and 3.8% for Earth and environmental sciences, with the proportion of women authors of Perspectives in *Science* being slightly larger. However, the pool of women scientists in these disciplines was significantly higher than the proportion of female authorship at 32%, 16% and 20%, respectively.

It should be pointed out that a large proportion of invited News & Views authors are full professors, and the percentage of full professors who are women is lower than that for all scientists. Also, the proportion of women full professors is smaller in the European Union than in the United States. However, the present proportion of women authors of News & Views and of Perspectives is very low, and we believe that it is still fair to conclude that fewer women than men are offered the career boost of invitation-only authorship in each of the two leading science journals.

In response to earlie
Nature increased the p
of women authors in it
section (D. Conley *Nat*
1078; 2005). It is time t
gender parity for comr
writers across *Nature* a
Daniel Conley, Johan
Stadmark *Lund Unive*
Sweden. daniel.conley@

Competing int
expanding rap

It is biased reports, not
taint of scandal", that ar
danger in scientific res
(*Nature* **488,** 5; 2012). V
full disclosure of confli
interest (COI), univers
journals cannot begin t
the problem — but a di
conflict is still a conflic

Declarations of conf
interests shift to the re
responsibility that sho
borne by the editors to
whether reported find
have been warped by b
reader, even when fore
is not always in a posit
judge the extent to whi

(D. F. Horrobin *Br. Med. J.* **318,** 466; 1999).

Arguably, anyone who writes in a scientific journal may be biased in some way or another. Authors who are tempted not

THIS WEEK

EDITORIALS

ENVIRONMENT Europe must protect species before calamity strikes **p.496**

WORLD VIEW Countries must gather hard data to assess their disaster risks **p.497**

HEAVY LIFTING Nanotube yarns as artificial muscles **p.498**

Nature's sexism

The editors of this publication need to improve how we reflect women's contributions to science. For this, we must inject an extra loop into our thinking.

Earlier this year, we published a Correspondence that rightly took *Nature* to task for publishing too few female authors in our News and Views section (D. Conley and J. Stadmark *Nature* **488,** 590; 2012). Specifically, in the period 2010–11, the proportions of women News and Views authors in life, physical and Earth sciences were 17%, 8% and 4%, respectively. The authors of the Correspondence had taken us to task in 2005 with a similar analysis for the authorship of our Insight overview articles, and gave us slight credit for having improved that position.

Our minds were further focused on the problem by a much-discussed paper published in September (C. A. Moss-Racusin *et al. Proc. Natl Acad. Sci. USA* http://doi.org/jkm; 2012). The disturbing message of this blinded, randomized study was that US academics discriminated in hiring decisions and in salary against women who applied for a lab-manager position. Notably, female faculty members were as significantly discriminatory as males.

So here is a fuller litany of facts about *Nature*'s performance in this arena, based on internal surveys.

Of the 70 editors and reporters around the globe who commission, select, write or oversee *Nature*'s daily and weekly content, 38 (54%)

about who is doing interesting or relevant work, for all of the social factors already mentioned, and possibly for psychological reasons too, men most readily come to editorial minds. The September paper speculated about an unconscious assumption that women are less competent than men. A moment's reflection about past and present female colleagues should lead most researchers to correct any such assumption.

"There is a need for every editor to ask themselves, 'Who are the five women I could ask?'"

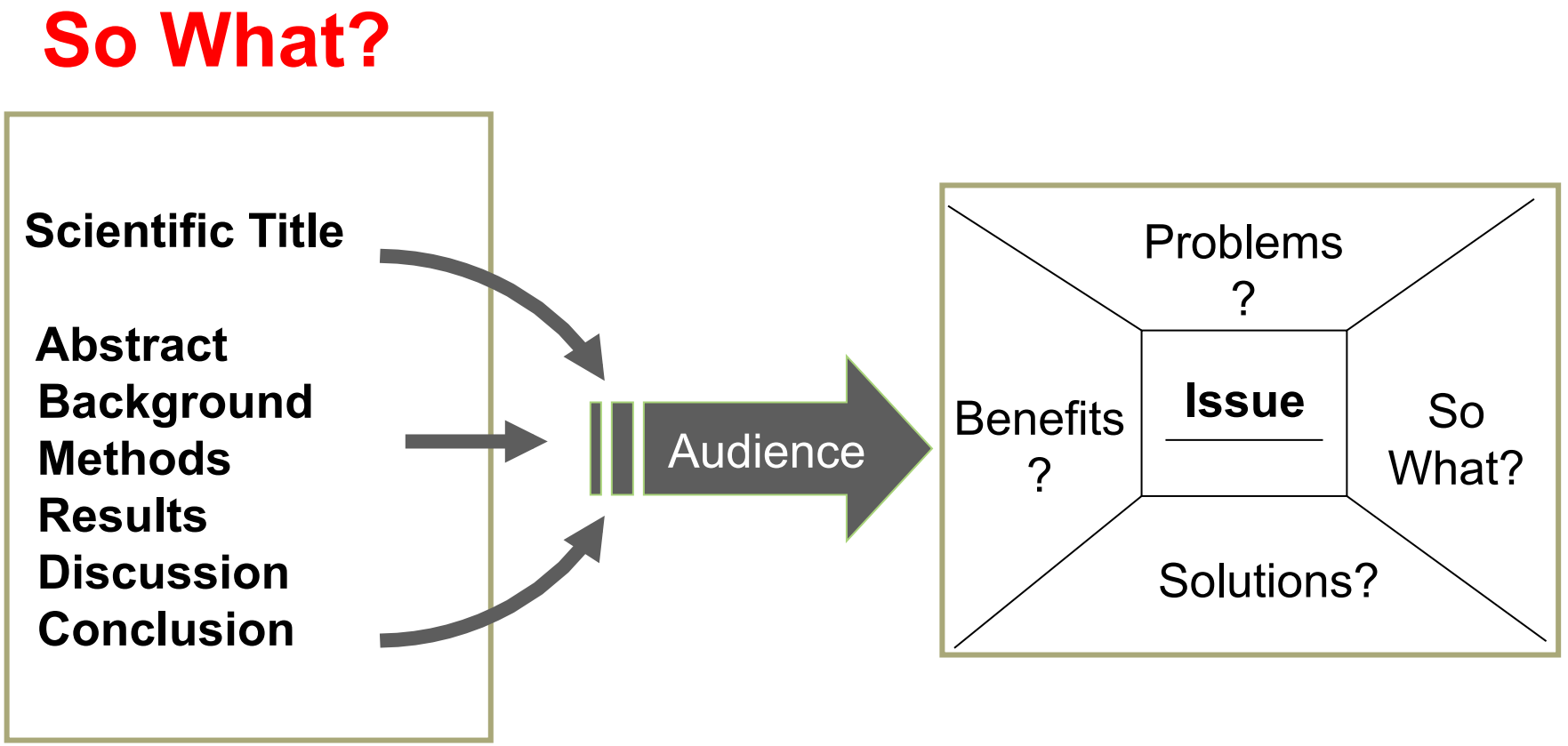
We therefore believe that there is a need for every editor to work through a conscious loop before proceeding with commissioning: to ask themselves, "Who are the five women I could ask?"

Under no circumstances will this 'gender loop' involve a requirement to fulfil a quota or to select anyone whom we do not know to be fully appropriate for the job, although we will set ourselves internal targets to help us to focus on the task. It is not yet clear just what difference this workflow loop will make. But it seems to us to be a step towards appropriately reflecting in our pages the contributions of women to science. ■


#OUROCEAN2014
#OUROCEAN2014
OUR OCEAN

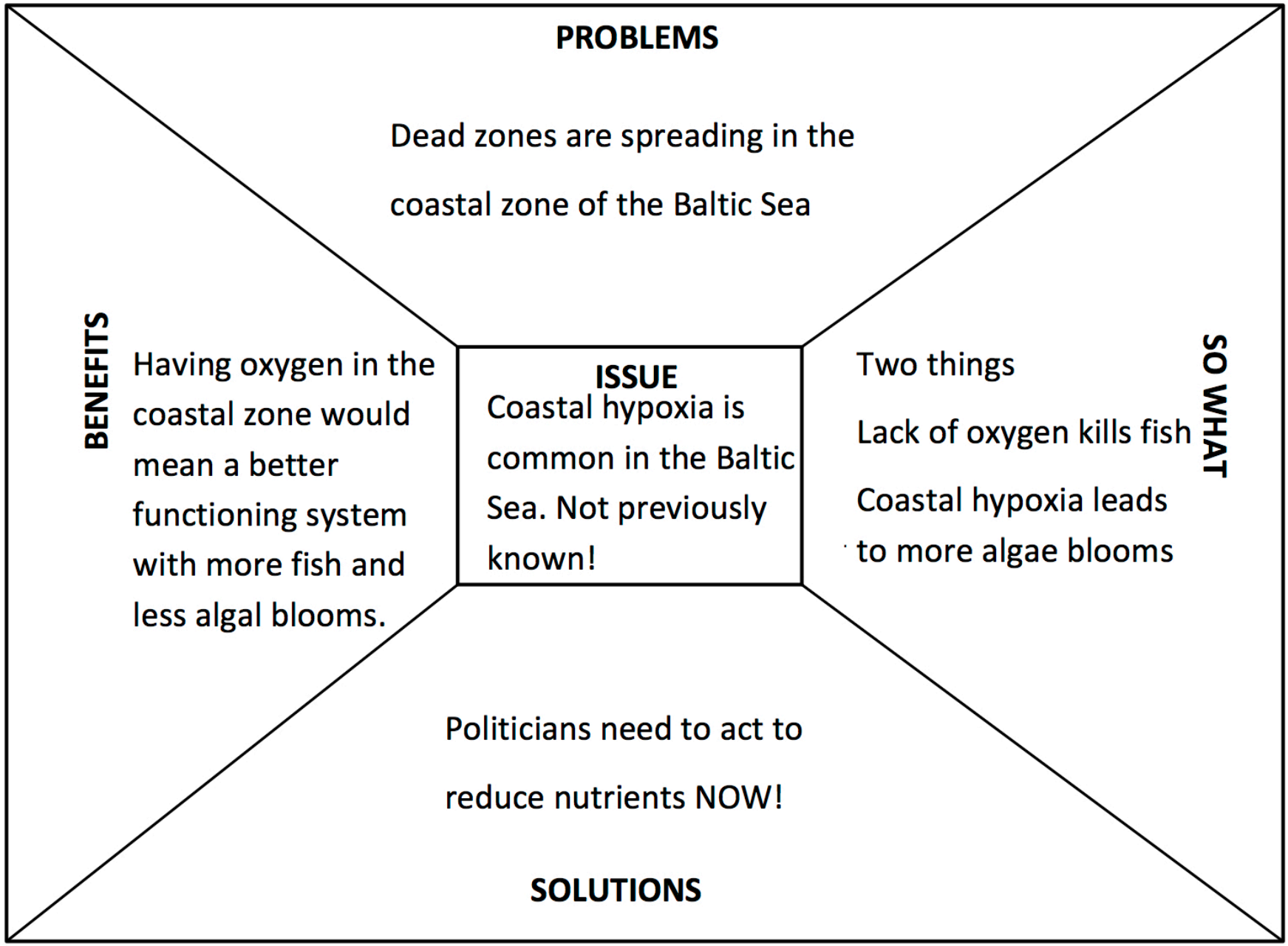

The solutions are at our finger tips
HELCOM Baltic Sea Action Plan
Daniel Conley
Lund University
Sweden

Message Box: Translation Tool



Work on your message

1. Simplify, get it onto the paper, avoid jargon (audience=public)
2. Try it out, are you understood?
3. Rewrite and try it out again
4. Happy?
5. Think of analogies and metaphors? Real life examples are great when talking to the public
6. Think of catchy phrases – very important when talking to journalists
7. Try to do it without the message box


PROBLEMS
Dead zones are spreading in the coastal zone of the Baltic Sea
BENEFITS
Having oxygen in the coastal zone would mean a better functioning system with more fish and less algal blooms.
ISSUE
Coastal hypoxia is common in the Baltic Sea. Not previously known!
SO WHAT
Two things
Lack of oxygen kills fish
Coastal hypoxia leads to more algae blooms
Politicians need to act to reduce nutrients NOW!
SOLUTIONS