The Ocean Health Index 2012-2015

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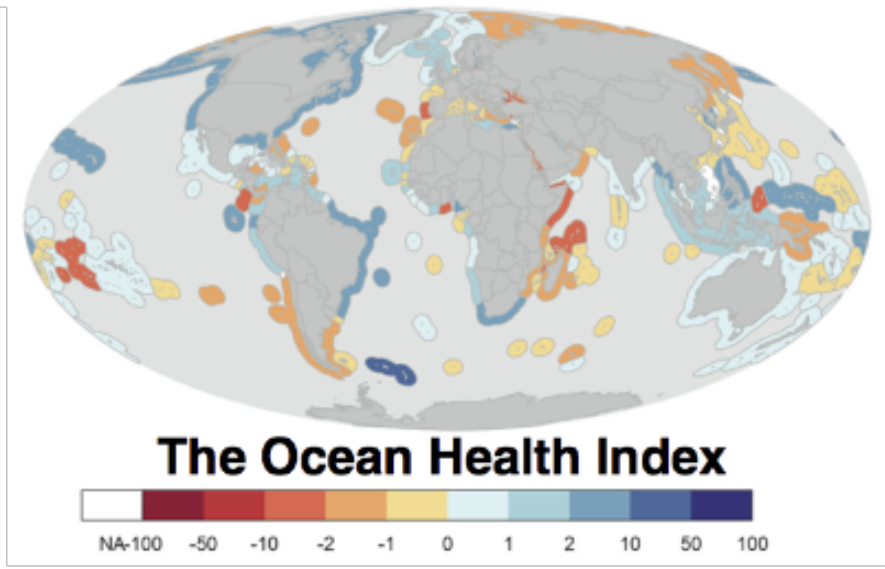
The Ocean Health Index 2012

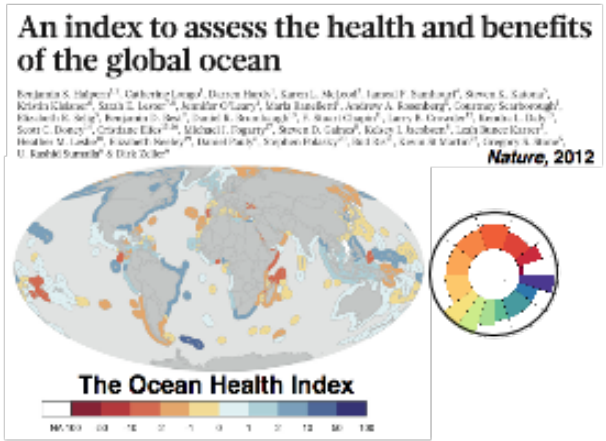
An index to assess the health and benefits of the global ocean

Benjamin S. Halpern[1,2], Catherine Longo[1], Darren Hardy[1], Karen L. McLeod[3], Jameal F. Samhouri[4], Steven K. Katona[5], Kristin Kleisner[6], Sarah E. Lester[7,8], Jennifer O'Leary[1], Marla Ranelletti[1], Andrew A. Rosenberg[5], Courtney Scarborough[1], Elizabeth R. Selig[5], Benjamin D. Best[9], Daniel R. Brumbaugh[10], F. Stuart Chapin[11], Larry B. Crowder[12], Kendra L. Daly[13], Scott C. Doney[14], Cristiane Elfes[15,16], Michael J. Fogarty[17], Steven D. Gaines[8], Kelsey I. Jacobsen[8], Leah Bunce Karrer[5], Heather M. Leslie[18], Elizabeth Neeley[19], Daniel Pauly[6], Stephen Polasky[20], Bud Ris[21], Kevin St Martin[22], Gregory S. Stone[5], U. Rashid Sumaila[6] & Dirk Zeller[6]

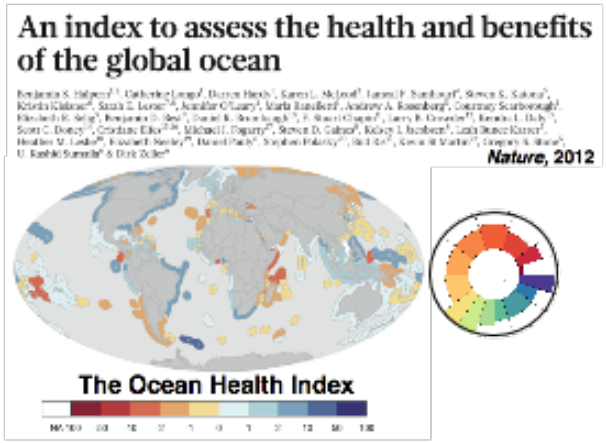
***Nature*, 2012**

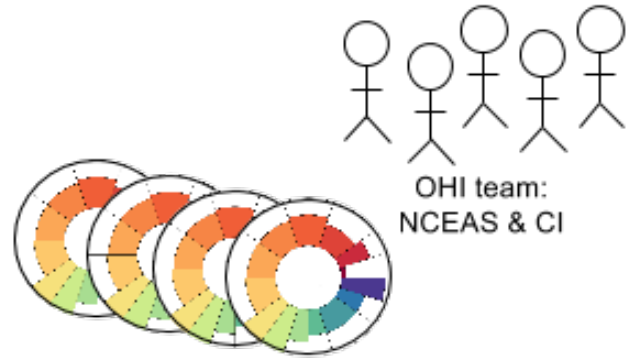


The Ocean Health Index 2012



The Ocean Health Index 2012-2015

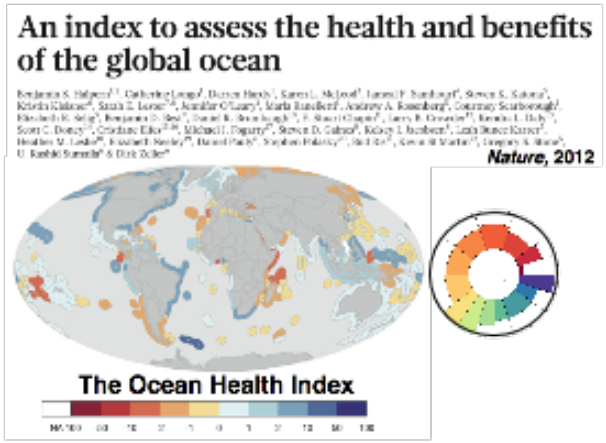


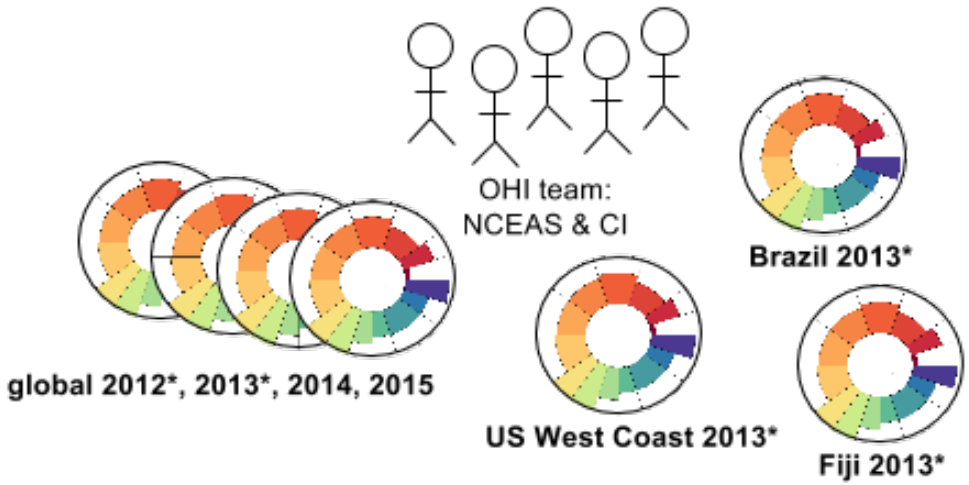


global 2012*, 2013*, 2014, 2015

* published

The Ocean Health Index 2012-2015





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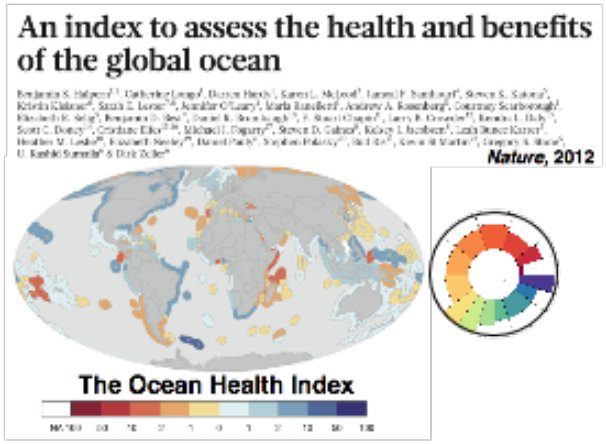

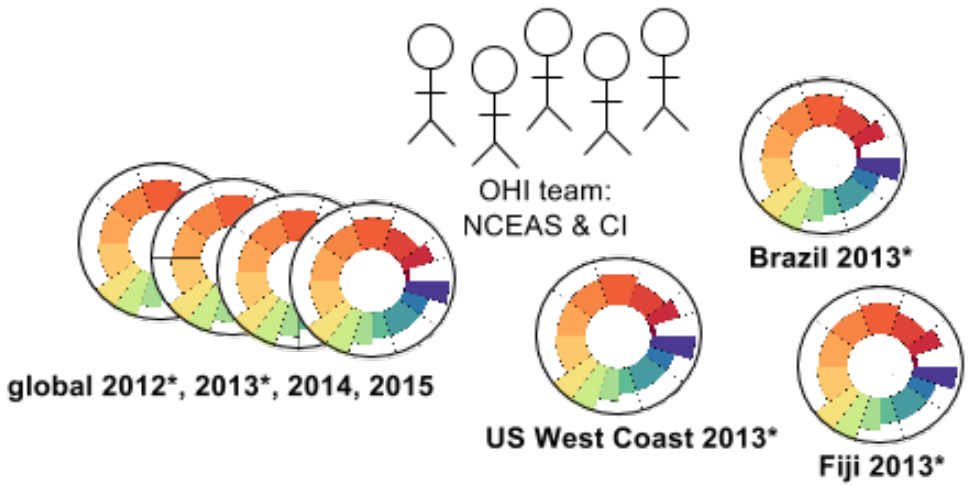

Toolbox and resources to enable independent assessments (OHI+)

- open-source software
- visualization tools
- training program

* published

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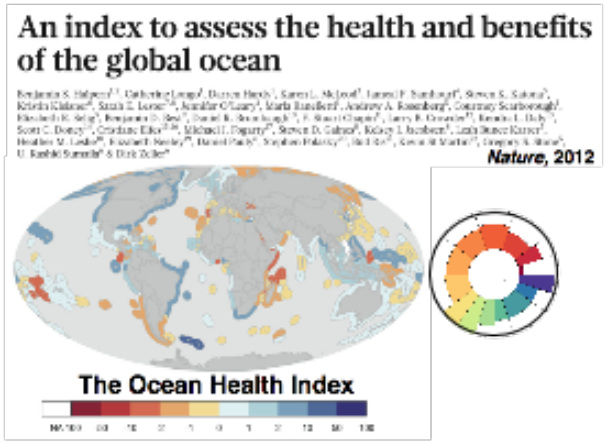
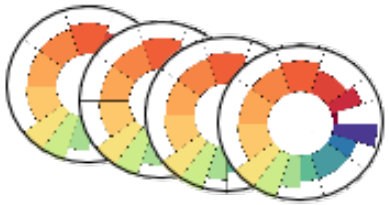
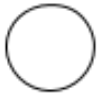
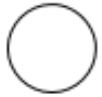
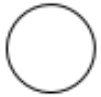




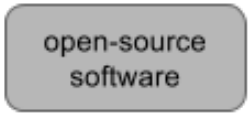
independent assessments (OHI+)

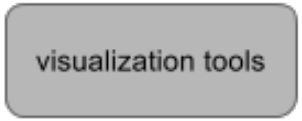


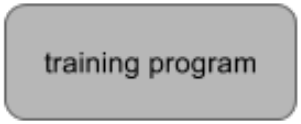




Toolbox and resources to enable independent assessments (OHI+)







* published

Outline

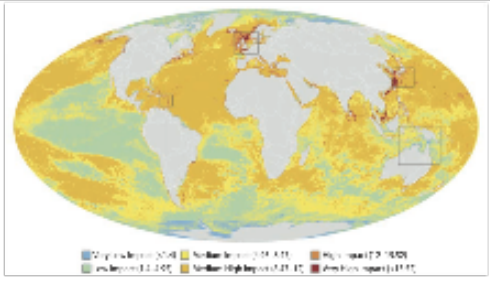
- Motivation for developing OHI
- OHI: an assessment framework
- OHI Toolbox
- Support for independent assessments

Motivation for developing OHI

A Global Map of Human Impact on Marine Ecosystems

Benjamin S. Halpern,[1]‡ Shaun Walbridge,[1]* Kimberly A. Selkoe,[1,2]*‡ Carrie V. Kappel,[1] Fiorenza Micheli,[3] Caterina D'Agrosa,[4]† John F. Bruno,[5] Kenneth S. Casey,[6] Colin Ebert,[1] Helen E. Fox,[7] Rod Fujita,[8] Dennis Heinemann,[9] Hunter S. Lenihan,[10] Elizabeth M. P. Madin,[11] Matthew T. Perry,[1] Elizabeth R. Selig,[6,12] Mark Spalding,[13] Robert Steneck,[14] Reg Watson[15]

Science, 2008



Cumulative Human Impacts

An index to assess the health and benefits of the global ocean

Benjamin S. Halpern[1,2], Catherine Longo[3], Darren Hardy[3], Karen L. McLeod[3], Jameal F. Samhouri[4], Steven K. Katona[5], Kristin Kleisner[6], Sarah E. Lester[7,8], Jennifer O'Leary[1], Marla Ranelletti[1], Andrew A. Rosenberg[3], Courtney Scarborough[1], Elizabeth R. Selig[9], Benjamin D. Best[10], Daniel R. Brumbaugh[10], F. Stuart Chapin[11], Larry B. Crowder[12], Kendra L. Daly[13], Scott C. Doney[14], Cristiane Elfes[15,16], Michael J. Fogarty[17], Steven D. Gaines[8], Kelsey I. Jacobsen[6], Leah Bunce Karrer[3], Heather M. Leslie[18], Elizabeth Neeley[19], Daniel Pauly[20], Stephen Polasky[21], Bud Ris[22], Kevin St Martin[23], Gregory S. Stone[3], U. Rashid Sumaila[20] & Dirk Zeller[20]

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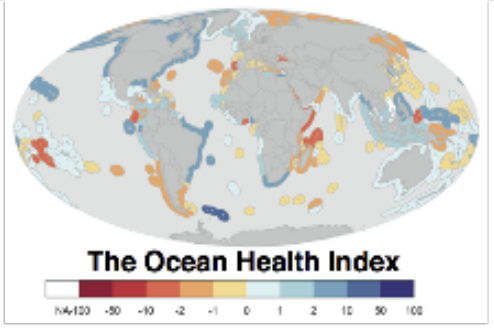

- Cumulative Human Impacts is only the negatives, what about the positives?

Motivation for developing OHI

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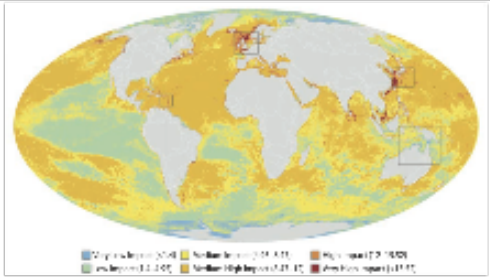
Science, 2008



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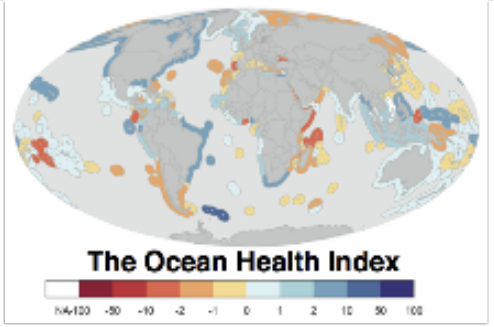
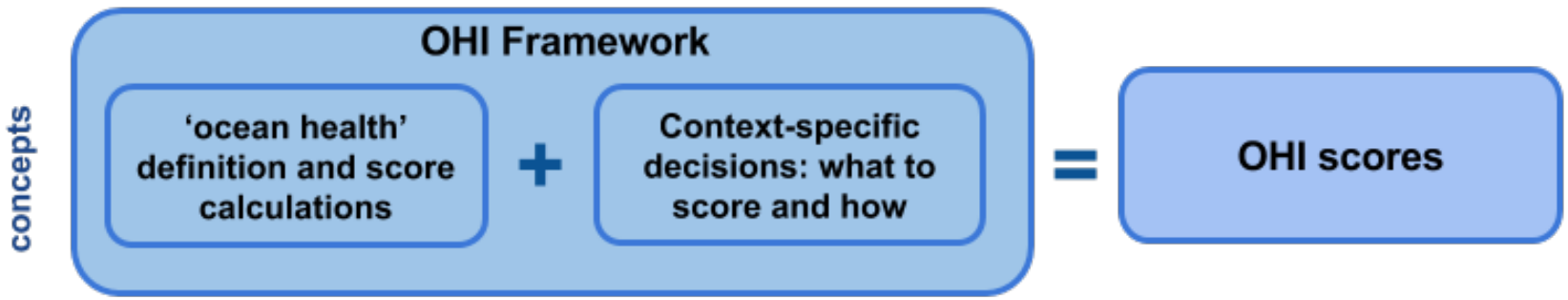
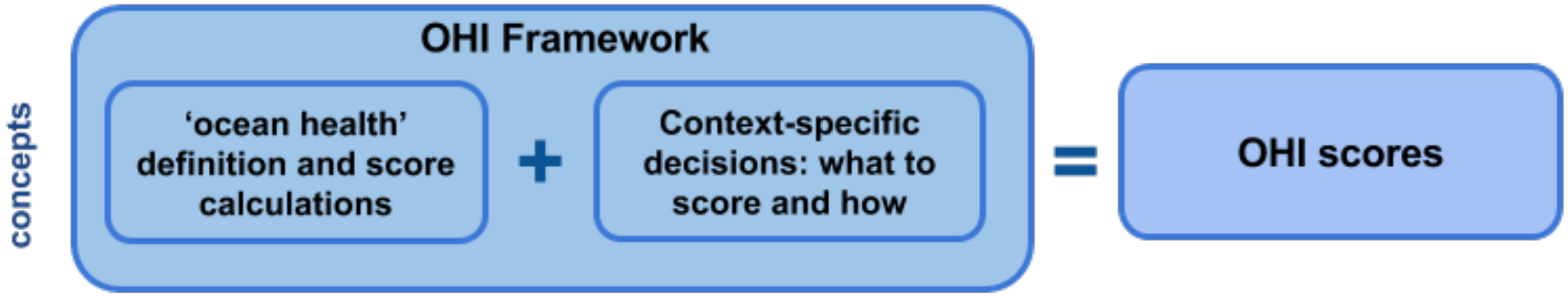


- Cumulative Human Impacts is only the negatives, what about the positives?
- Policy mandates to 'keep oceans healthy'
- What is a 'healthy ocean'? Must define in order to measure

OHI Framework



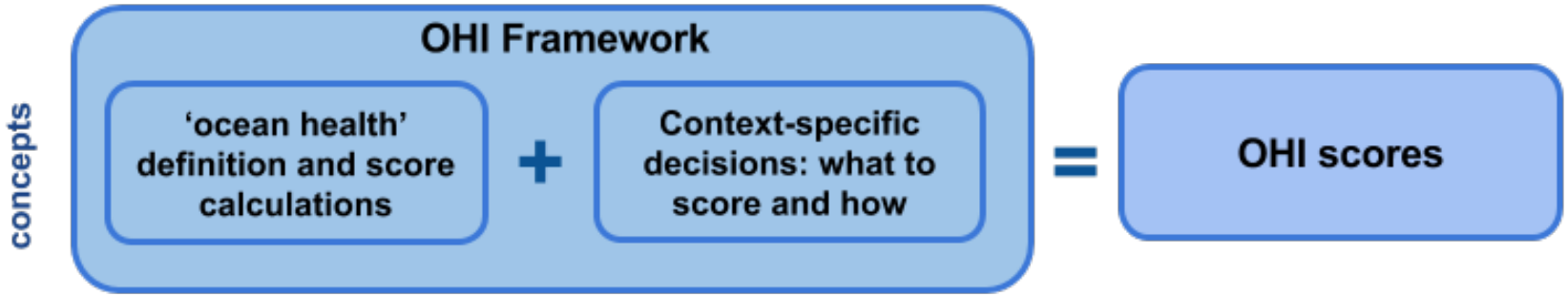
OHI Framework: definition



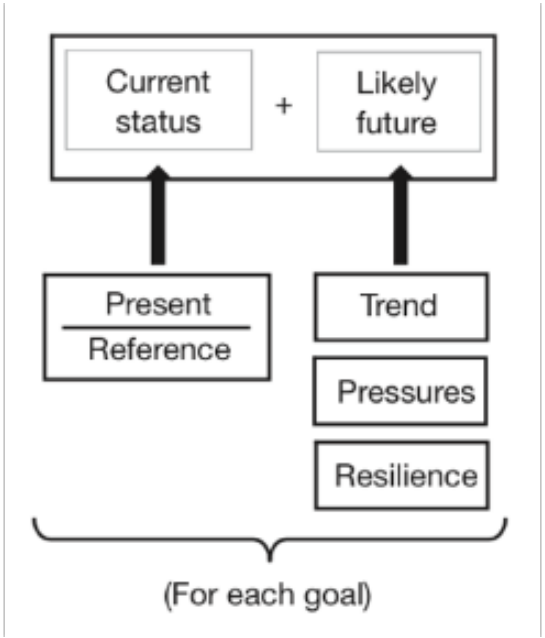
'A healthy ocean sustainably delivers a range of benefits to people now and in the future'

- a healthy ocean is not necessarily 'pristine'
- human priorities are explicit
- assesses a range of benefits, categorized as 'goals'

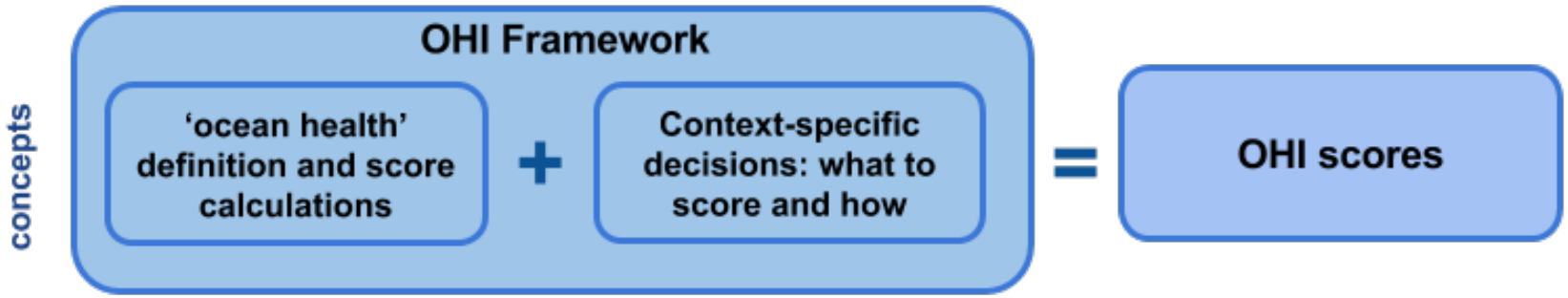
OHI Framework: score calculations



- score calculations: **current status** + **likely future state**



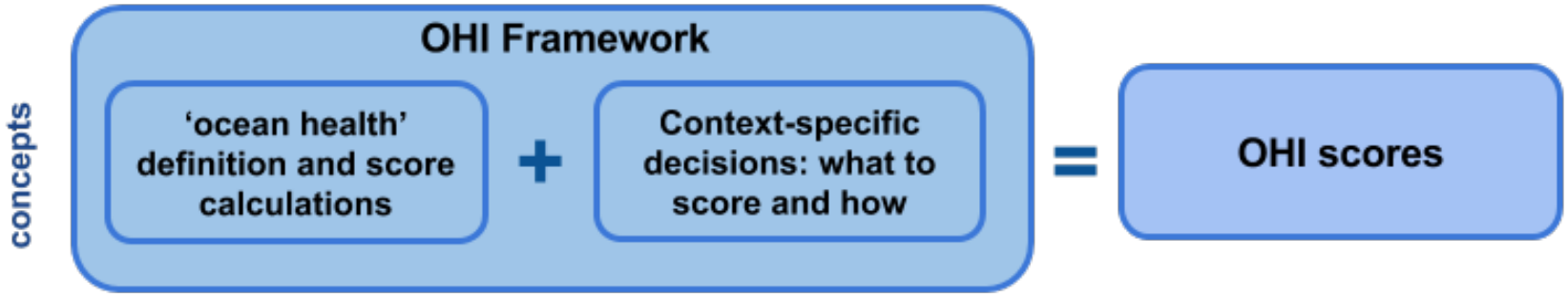
OHI Framework: context-specific



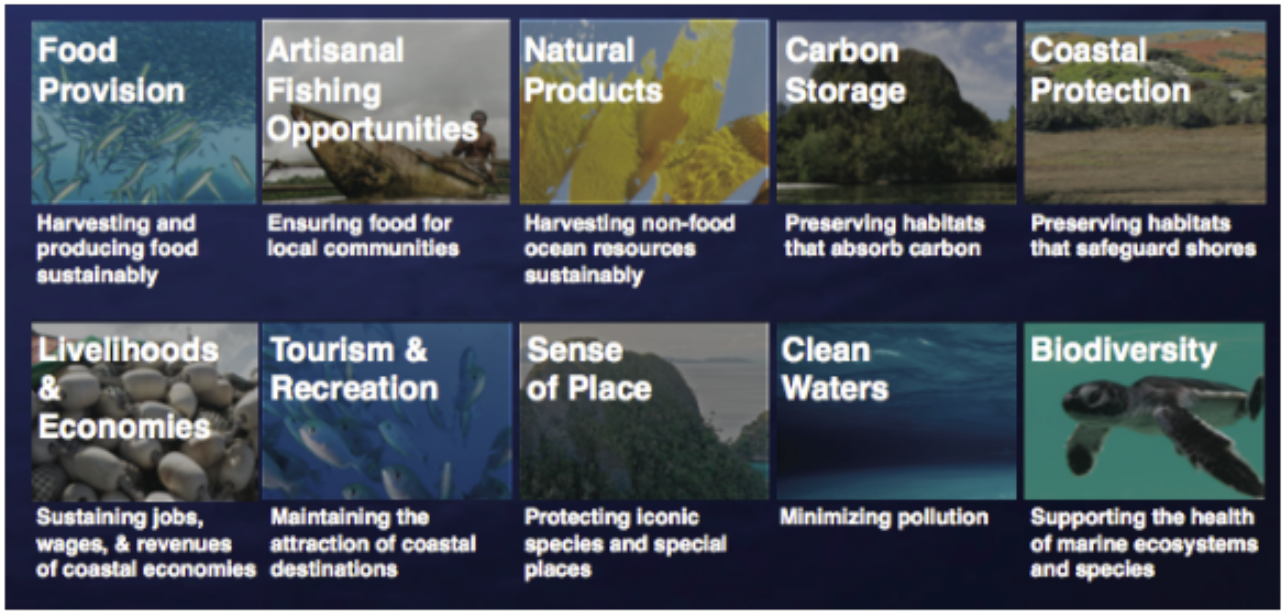
Context specific decisions:

- which goals are important?
- how should they ideally be measured?
- what are key characteristics of the area?
- what are cultural priorities?
- what are pressures affecting these goals?
- what mitigates these pressures (resilience)?

OHI Framework: context-specific



Ten goals were identified as important for global assessments:



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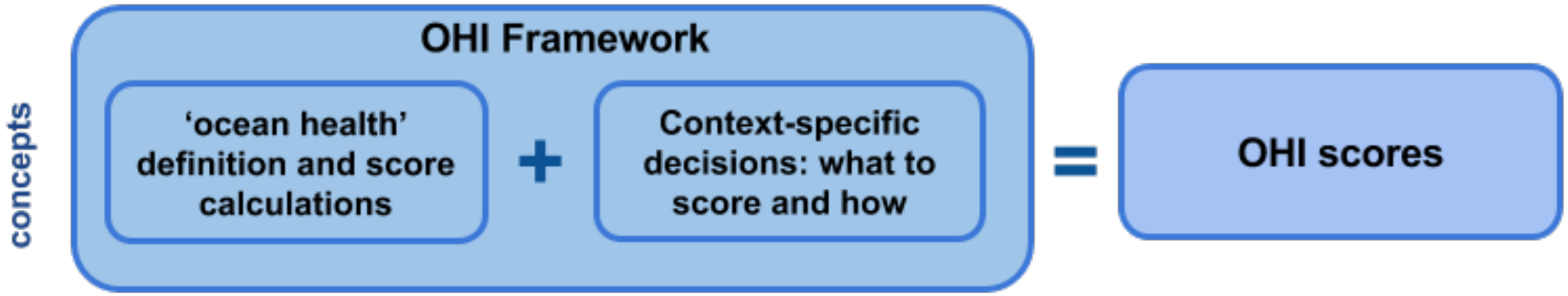
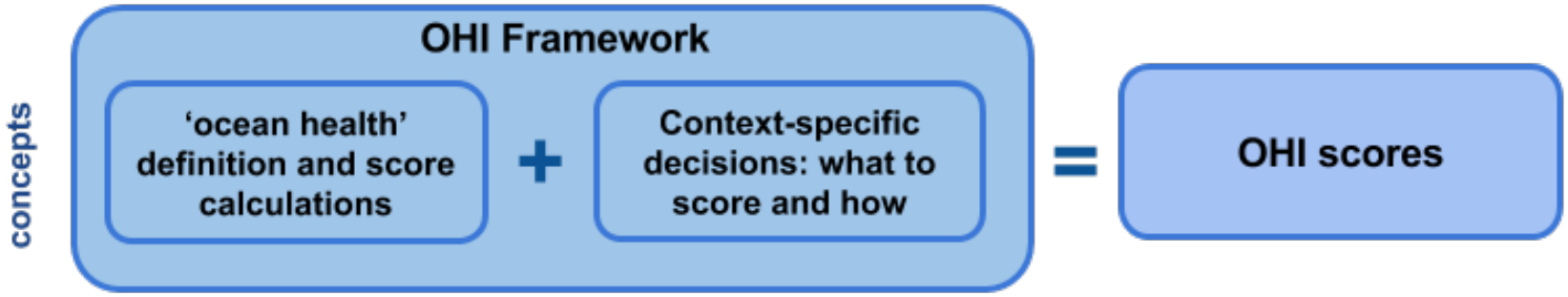


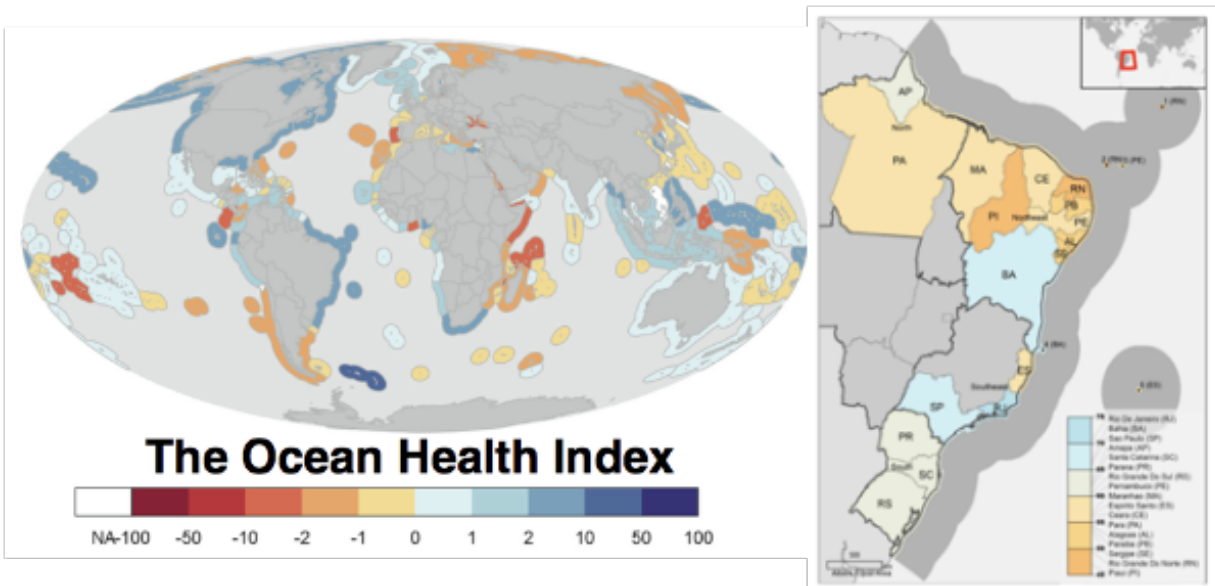
Make context-specific decisions BEFORE gathering information (data/indicators).

- information should fit into the framework; the framework should not be built around available information (biases)
- remain true to the planned goals
  - include indirect (proxy) information
  - highlight knowledge gaps

OHI Framework: scores

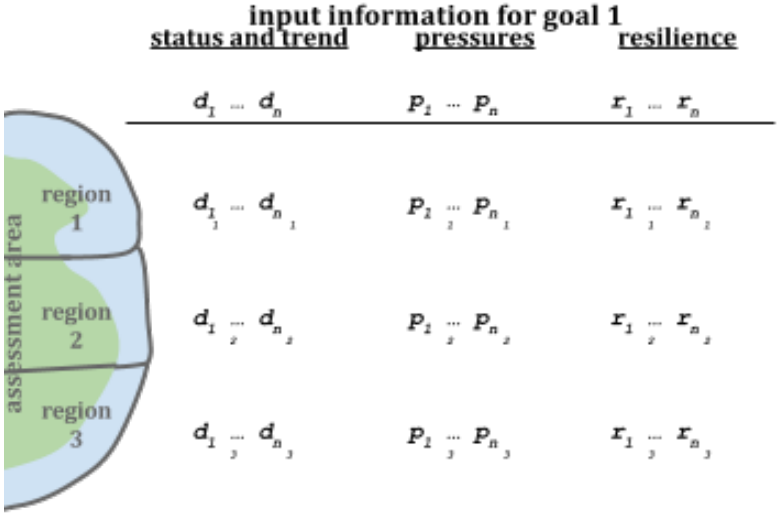


- OHI scores are on a unitless scale from 0-100
- visualized with maps and flower plots



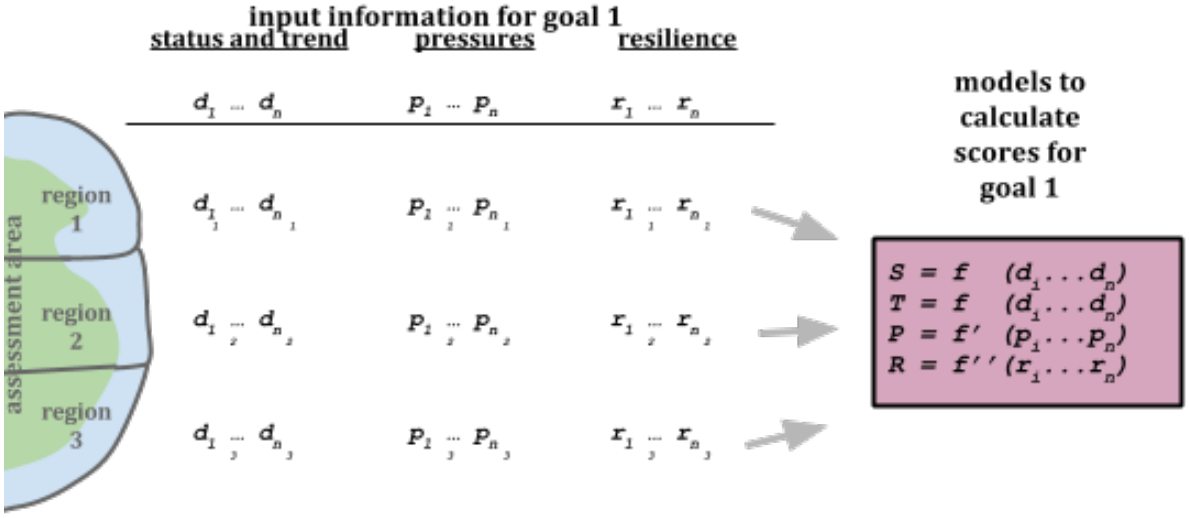
OHI calculations overview

Information is required for all regions in an assessment area



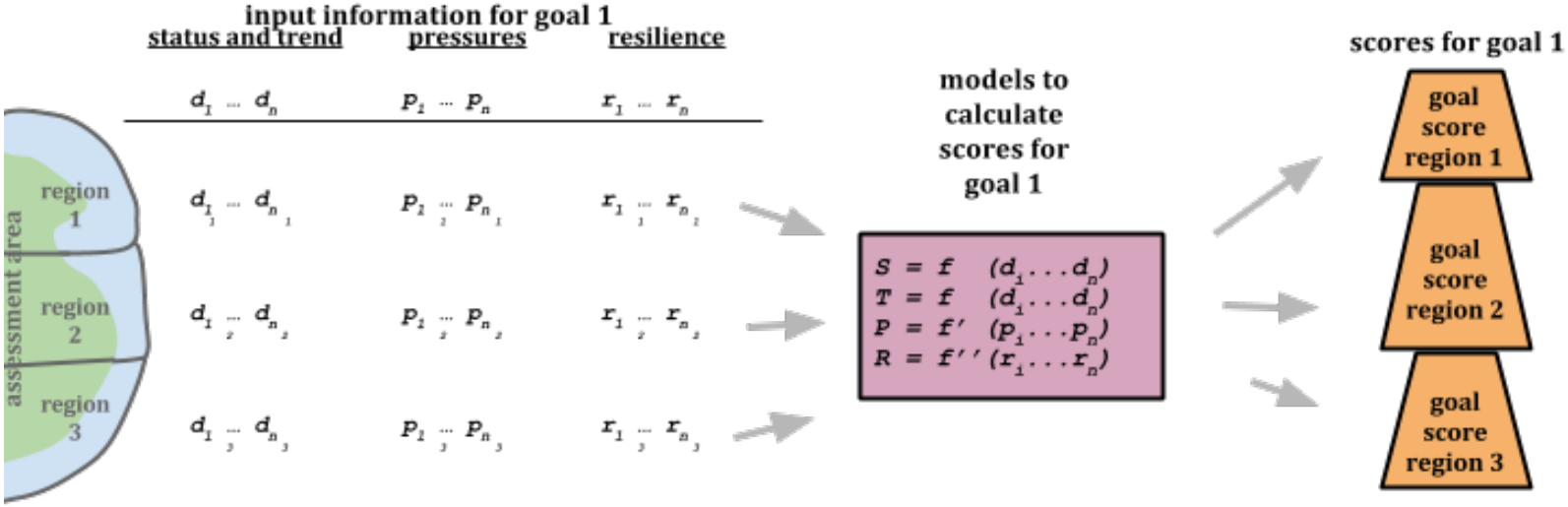
OHI calculations overview

The same model is used for all regions



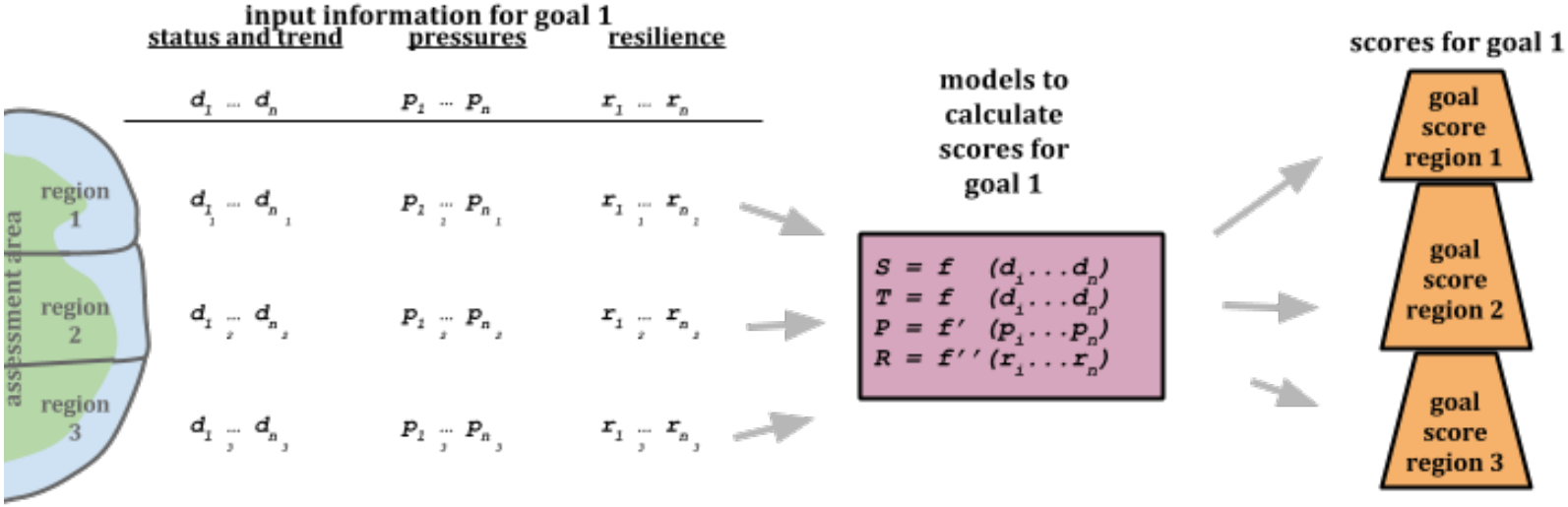
OHI calculations overview

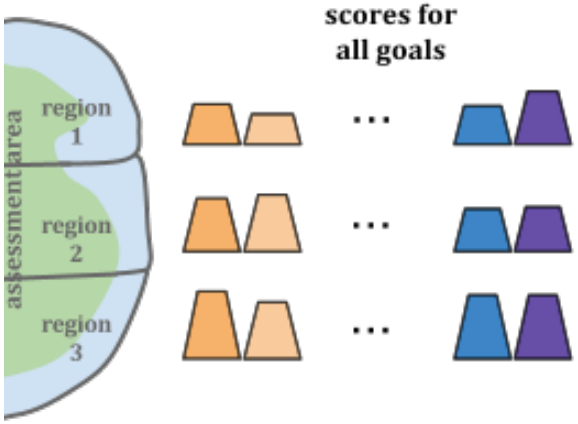
Scores are calculated for each region for a single goal



OHI calculations overview

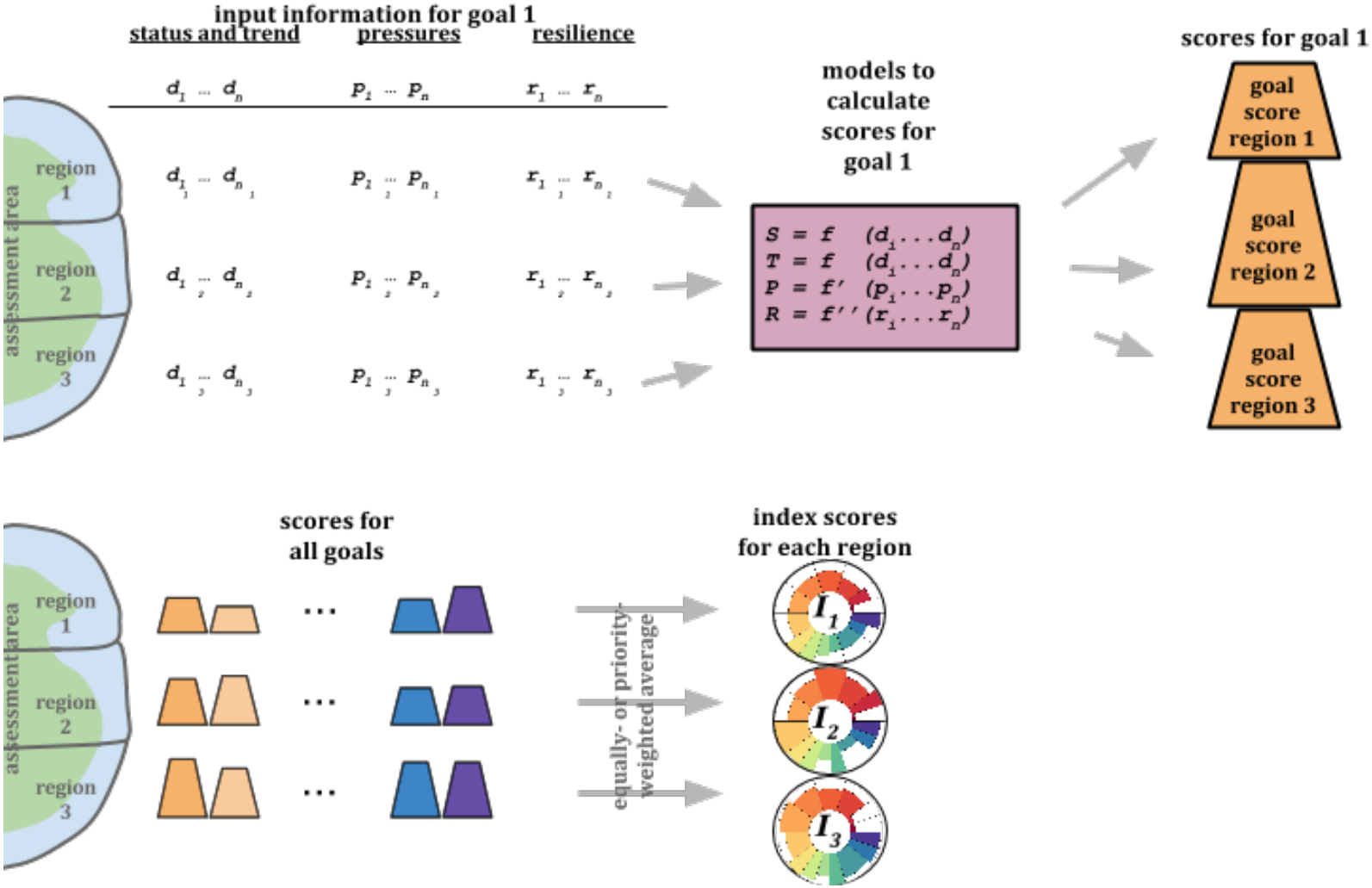
Scores are calculated for each region for all goals





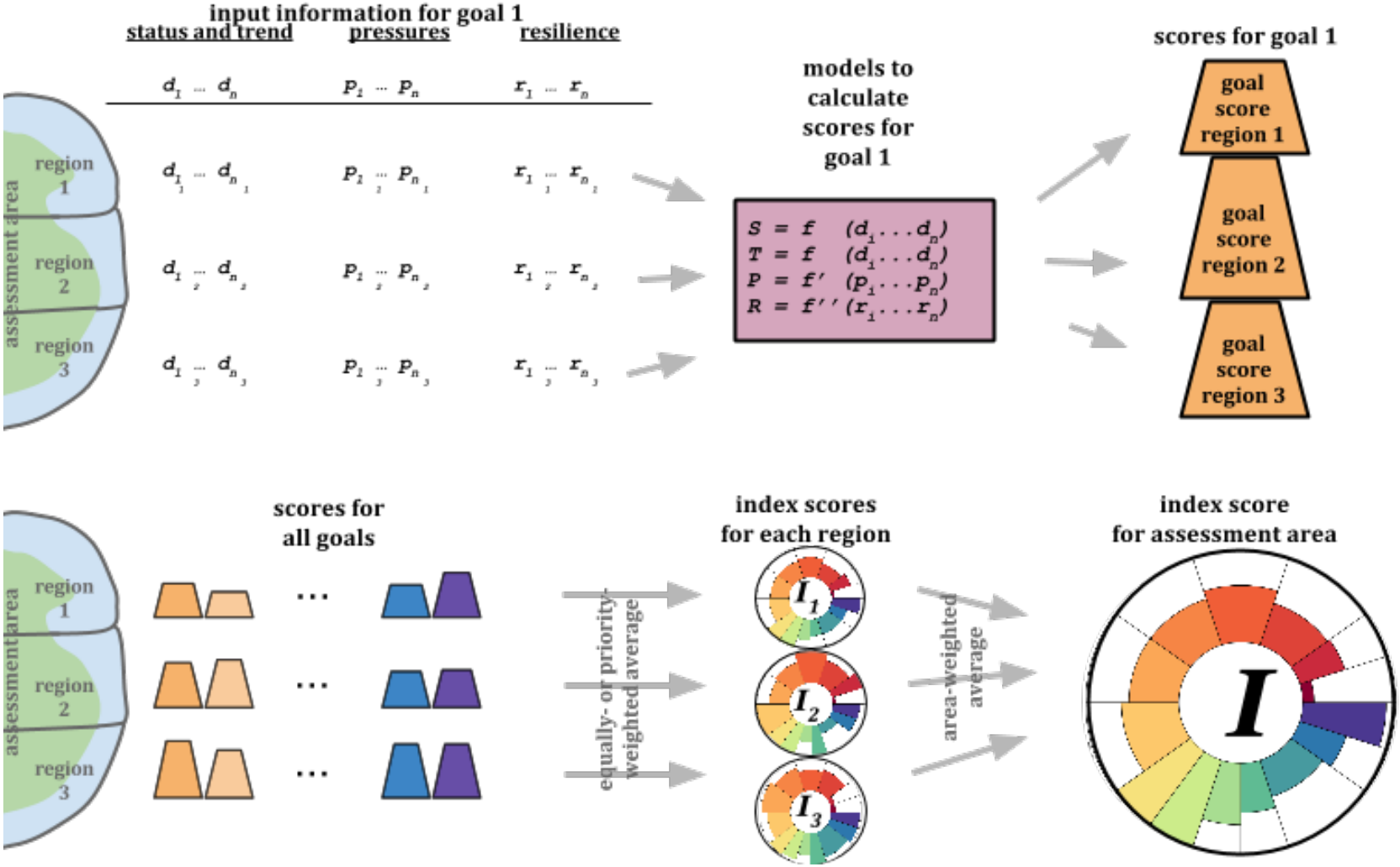
OHI calculations overview

Goal scores are averaged into index scores for each region

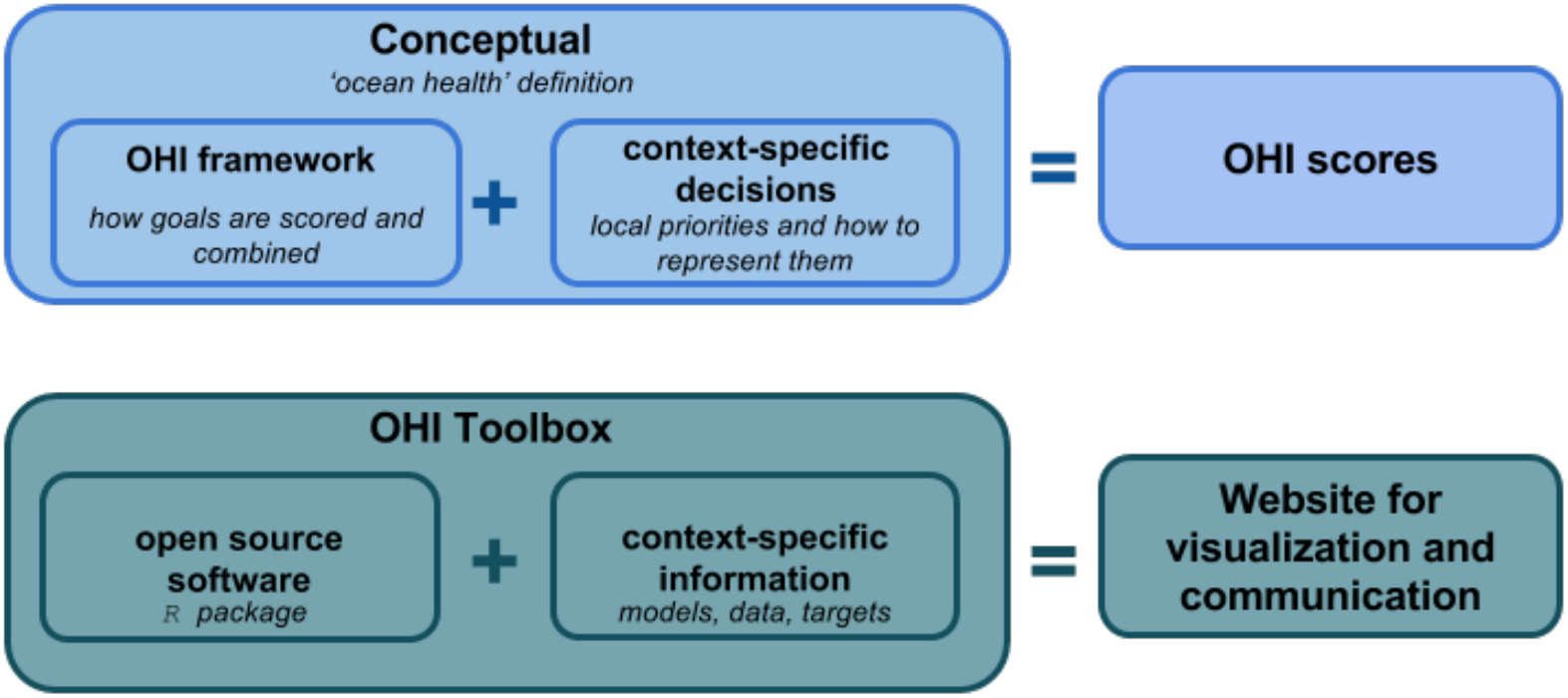


OHI calculations overview

Assessment index score is the average of region index scores

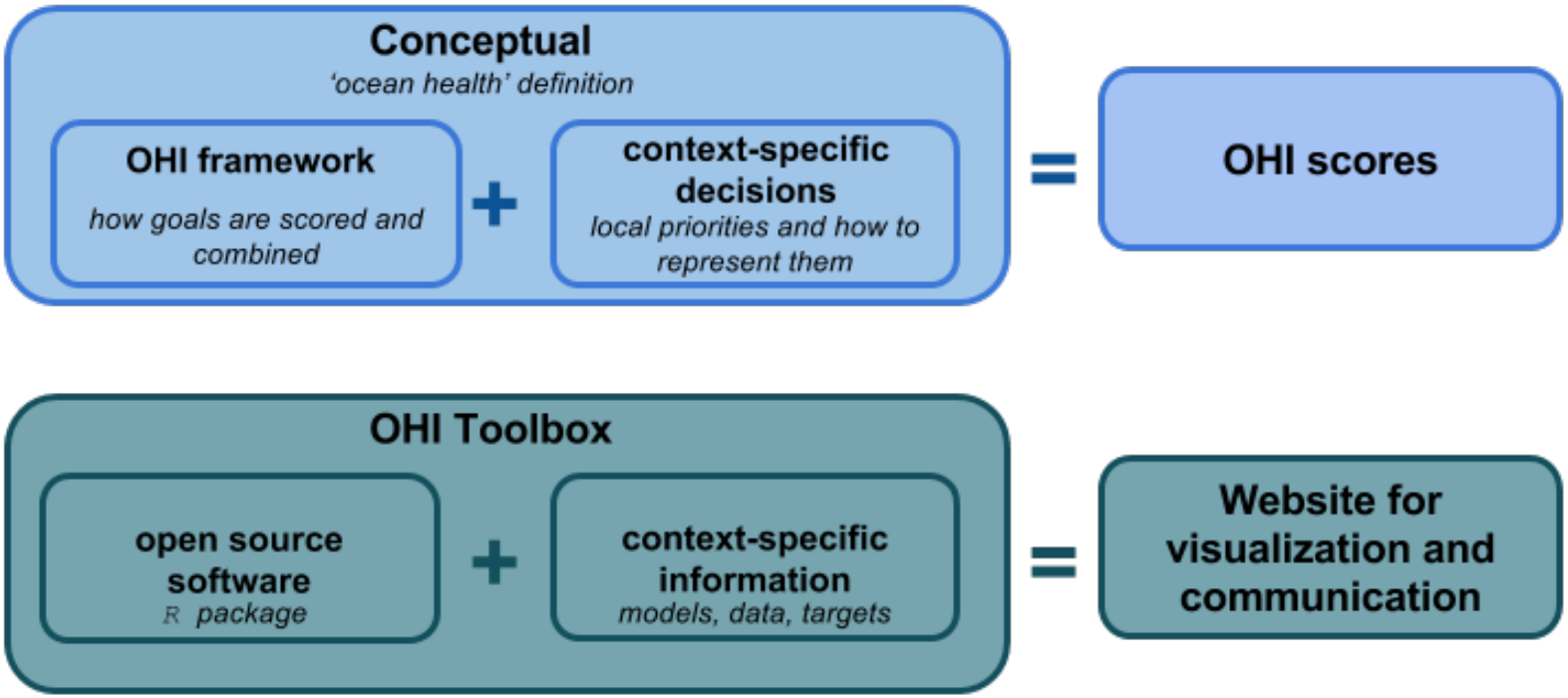


OHI Toolbox



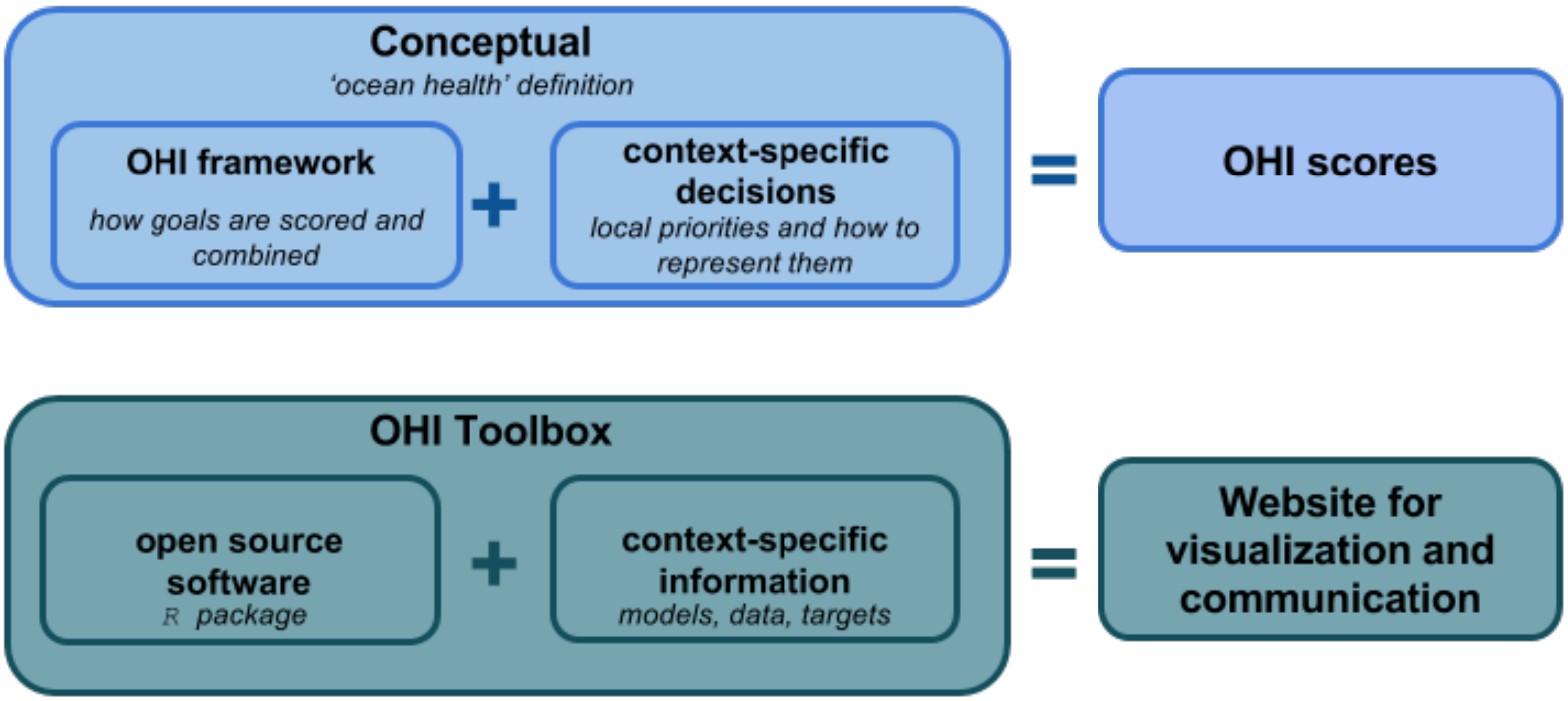
- open-source tools for analysis, visualization + communication
- tools are shared through the collaborative platform **GitHub**

OHI Toolbox: R package



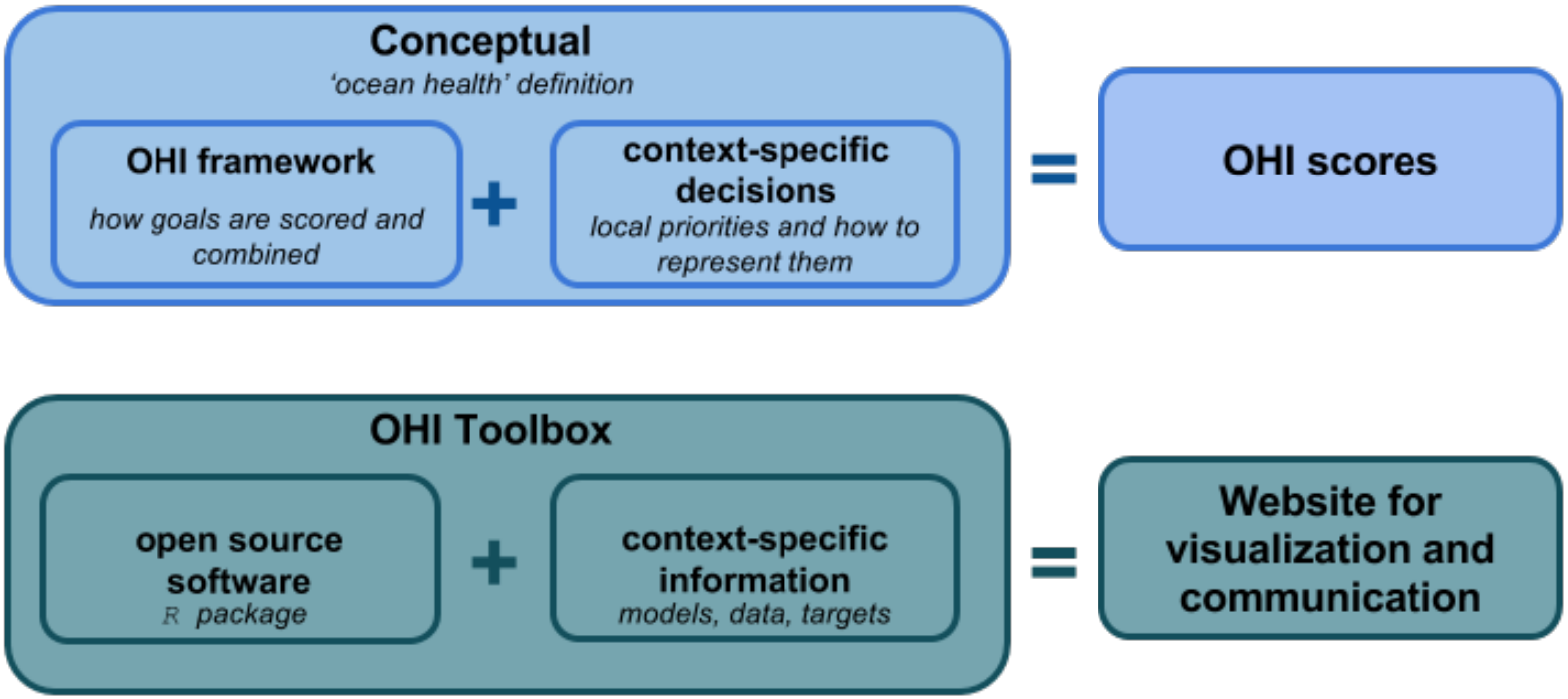
- Open-source software (R package) to calculate scores
  - github.com/ohi-science/ohicore

OHI Toolbox: context-specific



- Context-specific info stored in a structured GitHub repository
  - Ecuador ex: github.com/ohi-science/gye
  - Chile ex: github.com/ohi-science/chl

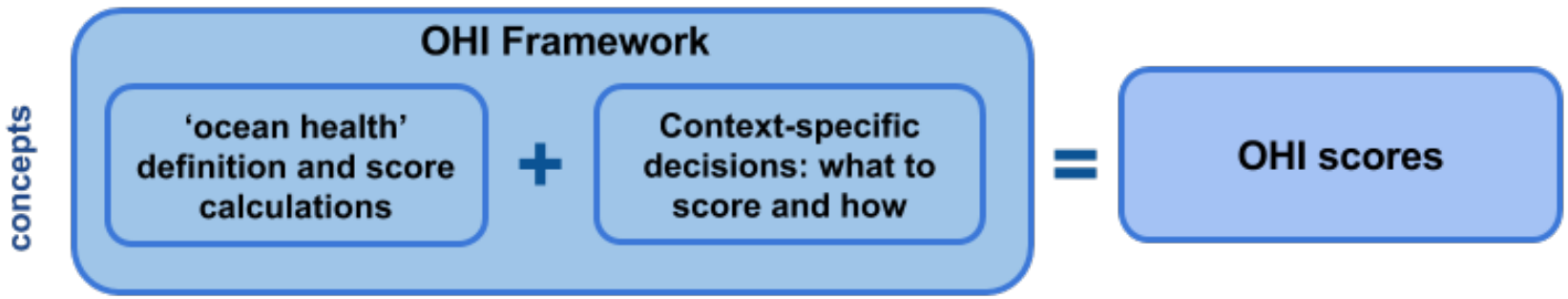
OHI Toolbox: website



- Website to display methods and scores
  - Ecuador ex: ohi-science.org/gye
  - Chile ex: ohi-science.org/chl

OHI Assessments

The OHI framework is standardized, yet modifiable to suit assessments in different contexts.



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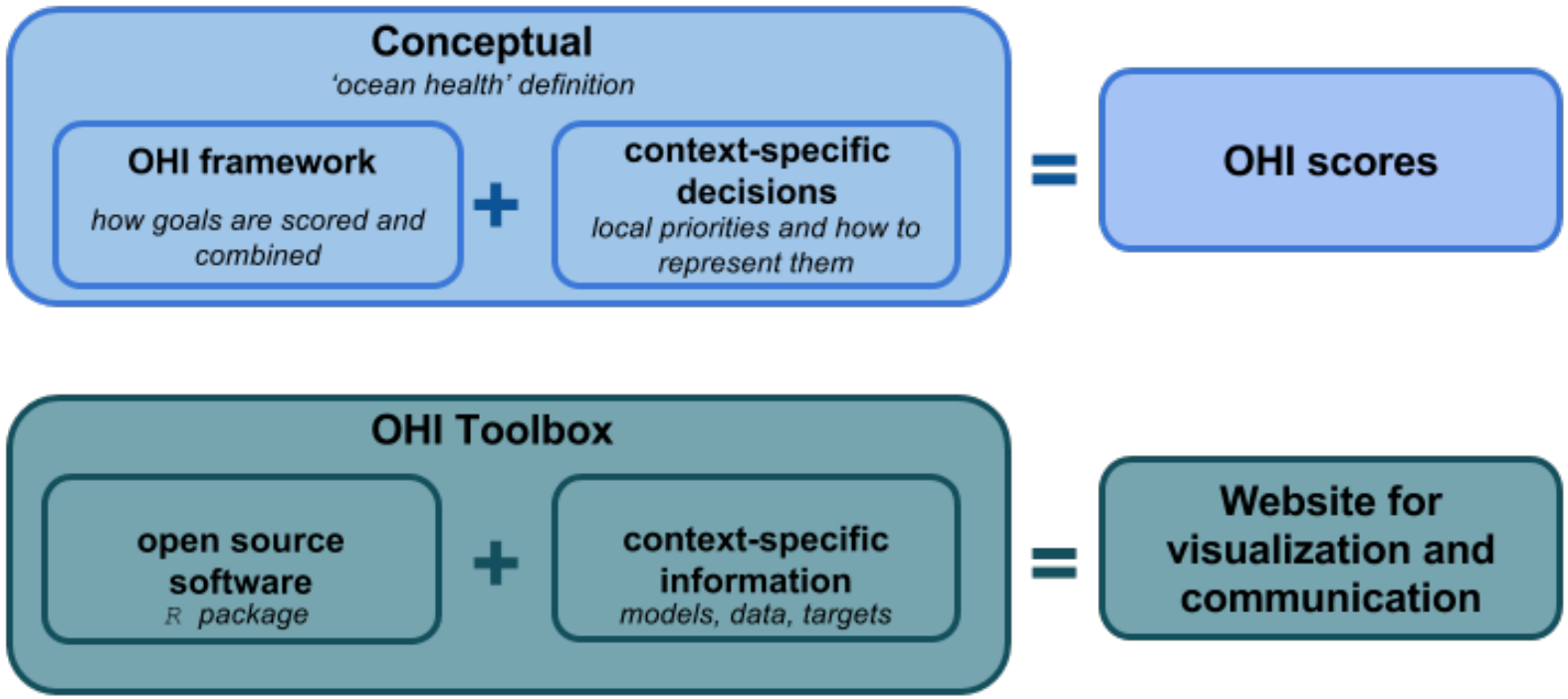
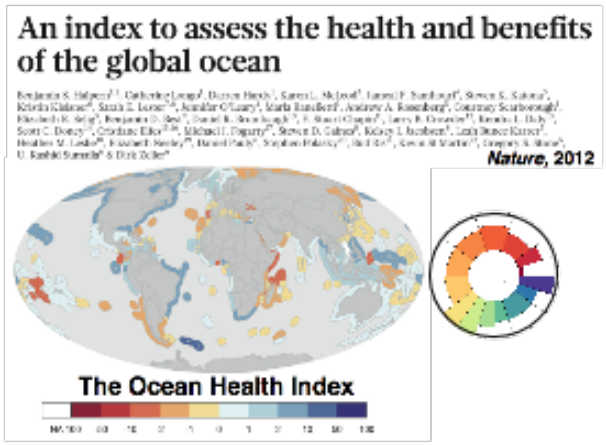
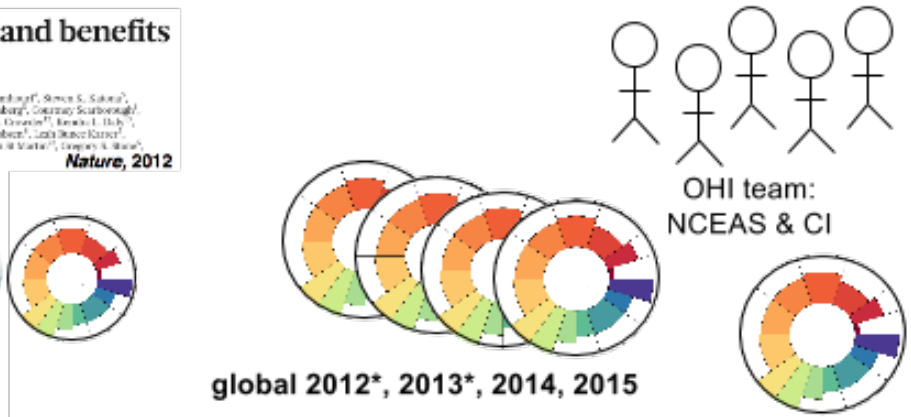


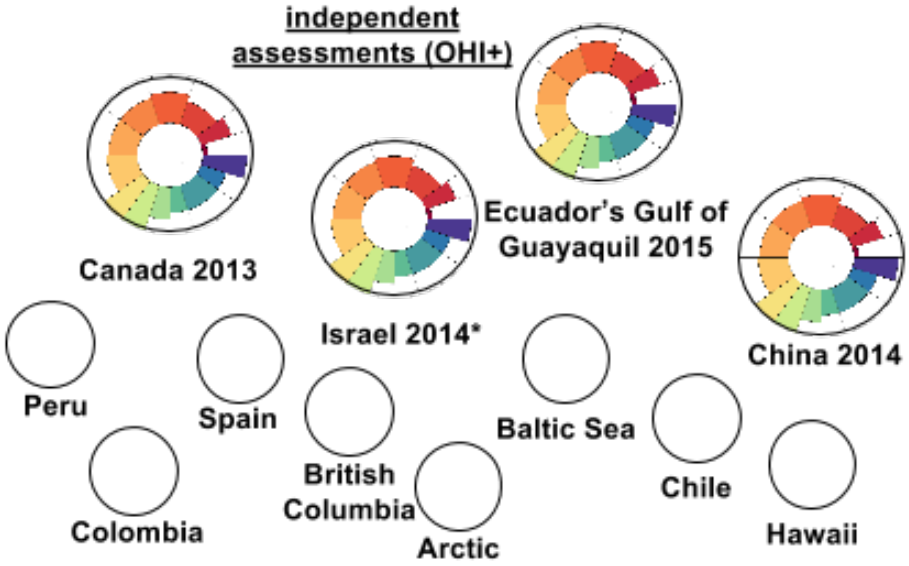
The Toolbox and GitHub facilitate assessment calculations, but also organization, remote collaboration, and documentation.

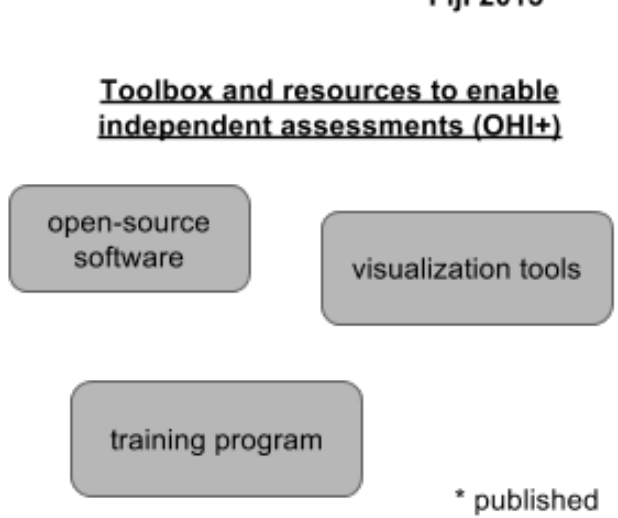
Support for independent assessments

All resources are at **ohi-science.org**

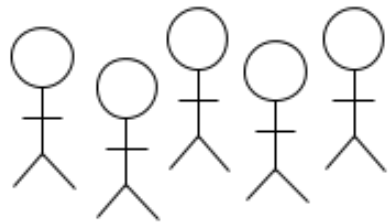








Support for independent assessments



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