Design, data, and statistics

- numerical skills for BSc-students in biology

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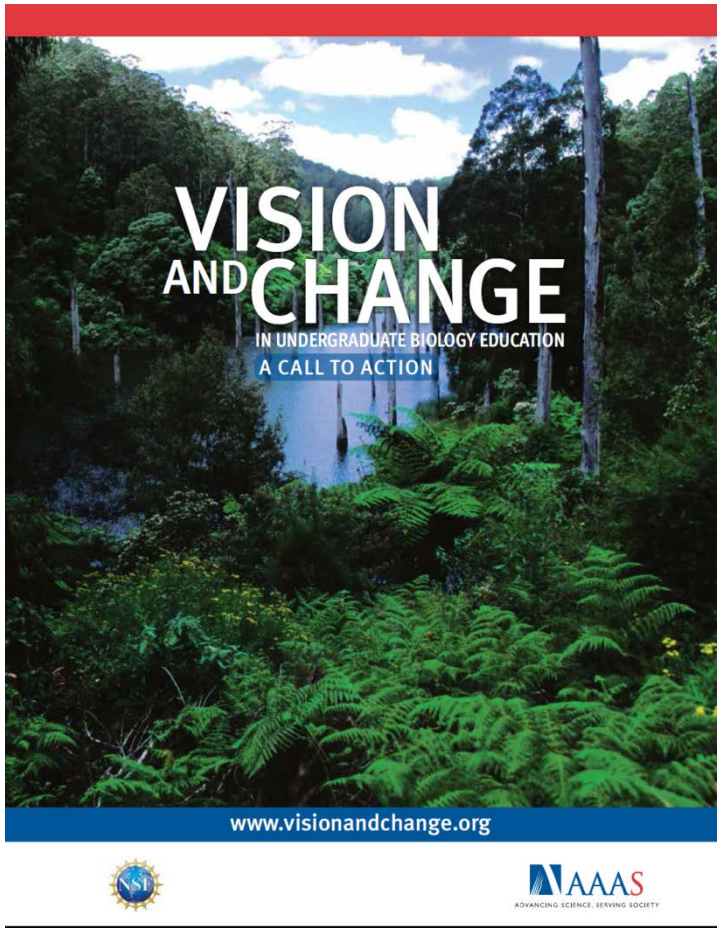
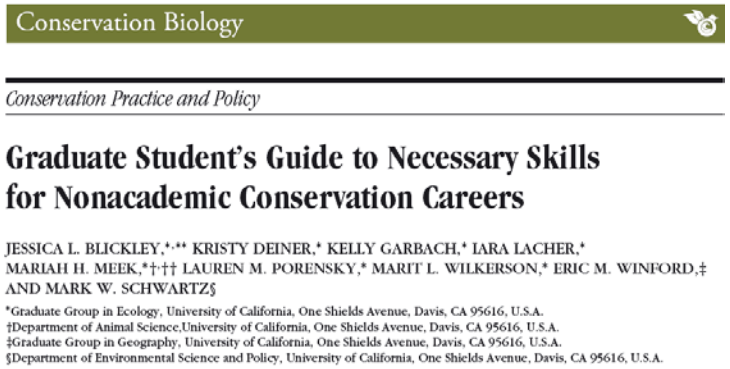




Biologists need math

- …to understand biology
- …to make biological inferences
- …to communicate, discuss biological questions
- …to be 'numerate' scientists
- …in the workforce

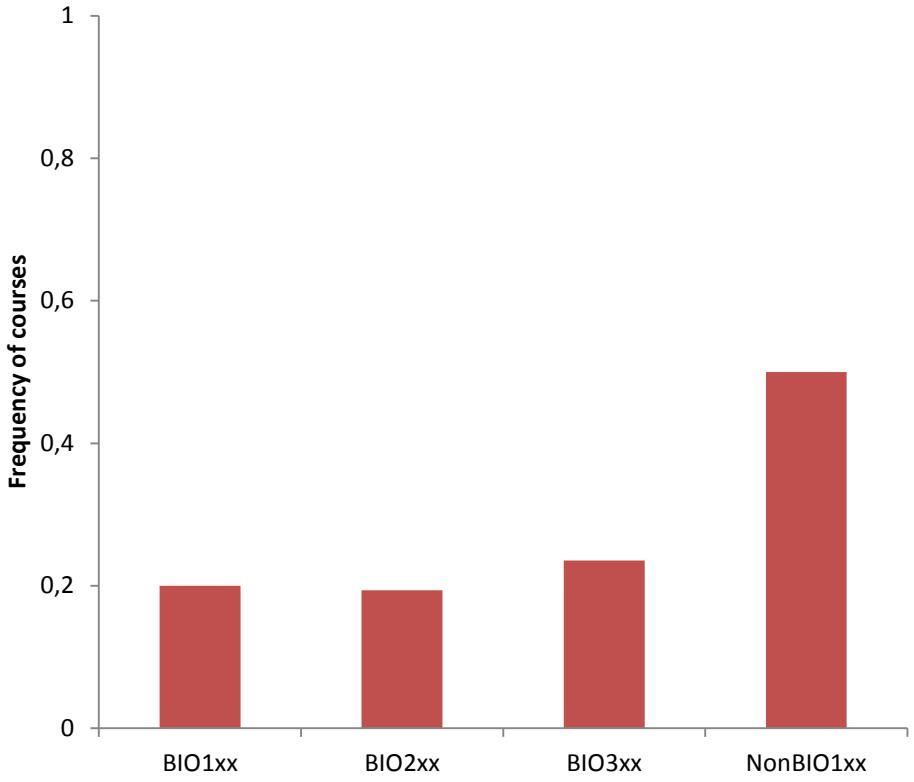
Intended learning outcomes
– all biology courses

Most intended learning outcomes focuses on **subject-specific topics** or biological **concepts**

BIO1XX – **1/4** of learning outcomes concerns **transferable skills**

Intended learning outcomes
– all biology courses and mandatory non-BIO courses

- Courses that mention numerical or quantitative aspects in their intended learning outcomes



Results – teacher survey

Challenges highlighted:

1. The increasingly **uneven background skills** of new students
2. The lack of an **aligned understanding** of numeric biological data handling from design, collection, storage and coding, to statistical treatment and tests.

Bachelor program in biology

Vår 6. sem	Optional subjects		
Høst 5. sem			
Vår 4. sem	MOL100 Introduction to Molecular Biology	BIO103 Cell Biology and Genetics	BIO104 Comparative Physiology
Høst 3. sem	PHYS101 Basic Course in Mechanics and Thermodynamics	STAT101 Elementary Statistics/ STAT111 Statistical Methods	BIO102 Organismal Biology 2
Vår 2. sem	KJEM130 Organic Chemistry/ KJEM202 Environmental Chemistry	Ex.phil BIO	BIO101 Organismal Biology 1
Høst 1. sem	KJEM110 Chemistry and Energy/KJEM100 Chemistry in Nature	MAT101 Elementary Calculus I/ MAT111 Calculus I	BIO100 Introduction to Evolution and Ecology

Visions to change

- **Alignment** between method courses and bio courses
- **Cross-referencing**
- **Explicitly** formulate learning outcomes for quantitative skills and highlight these during curriculum
- Numerical **pedigree**
- Common **tool-box**