

# Science Communication & Impact

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**Steven B. Roberts**

School of Aquatic and Fishery Sciences  
University of Washington

[robertslab.info](http://robertslab.info)

@sr320



2014 Annual Conference  
JUNE 8-10 Vancouver

# Science Communication & Impact

*What ~~faculty~~ I think about*

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# Open Science

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- You are free to share!
- Our lab practices open notebook science.
- We use a variety of platforms for communication.

robertslab.info

sr320@uw.edu

@sr320

## Bio

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- ★ 2014 Associate Professor - University of Washington
- 2007 Assistant Professor
- 2003 Research Scientist - Marine Biological Laboratory
- 2002 Post-doc
- 1998 PhD Student - University of Notre Dame

# Bio

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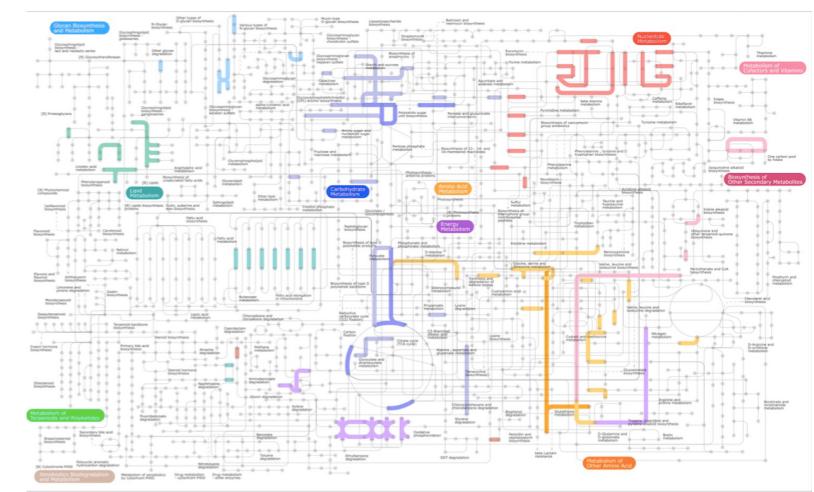
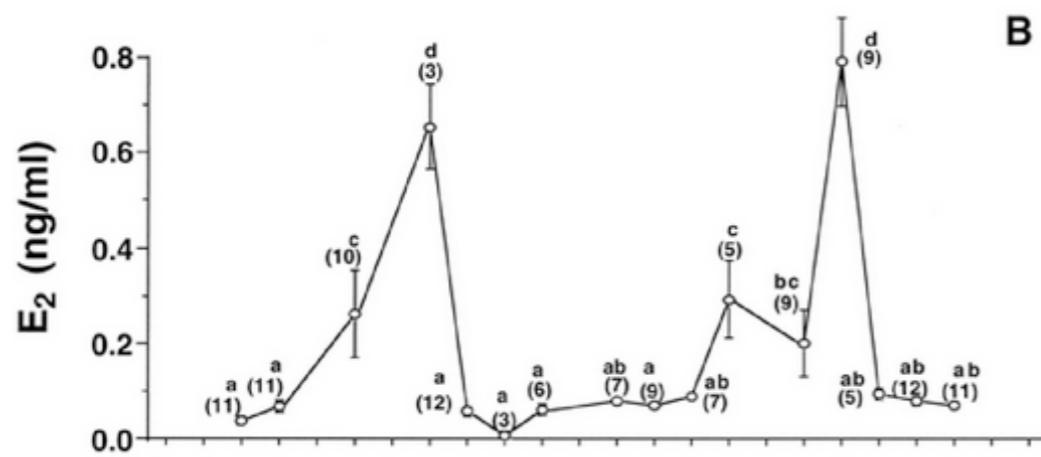
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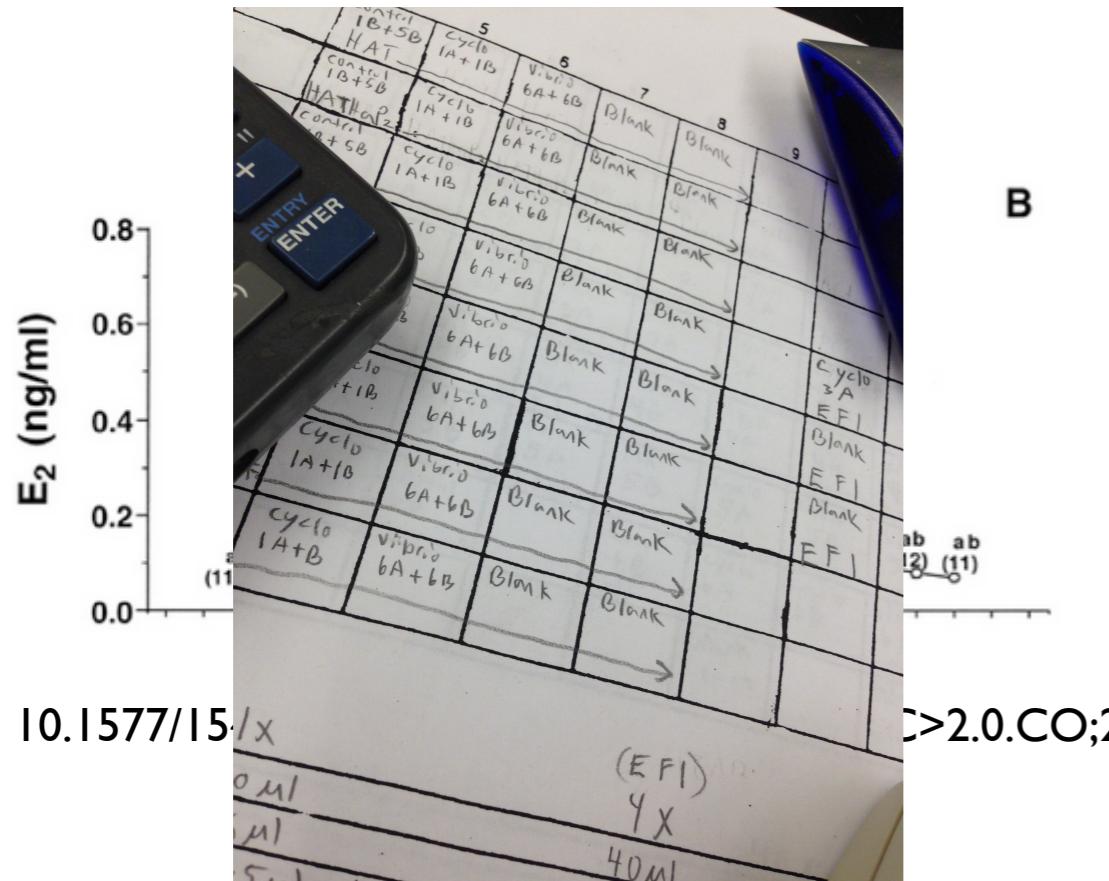
1998 PhD Student - University of Notre Dame



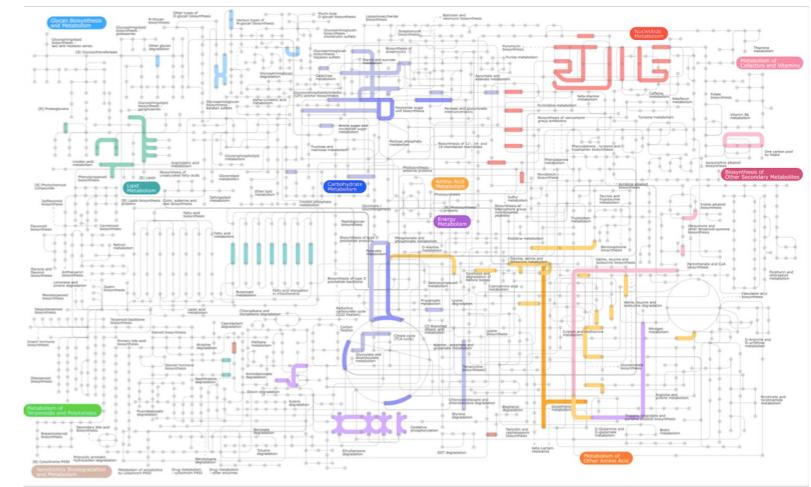
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B

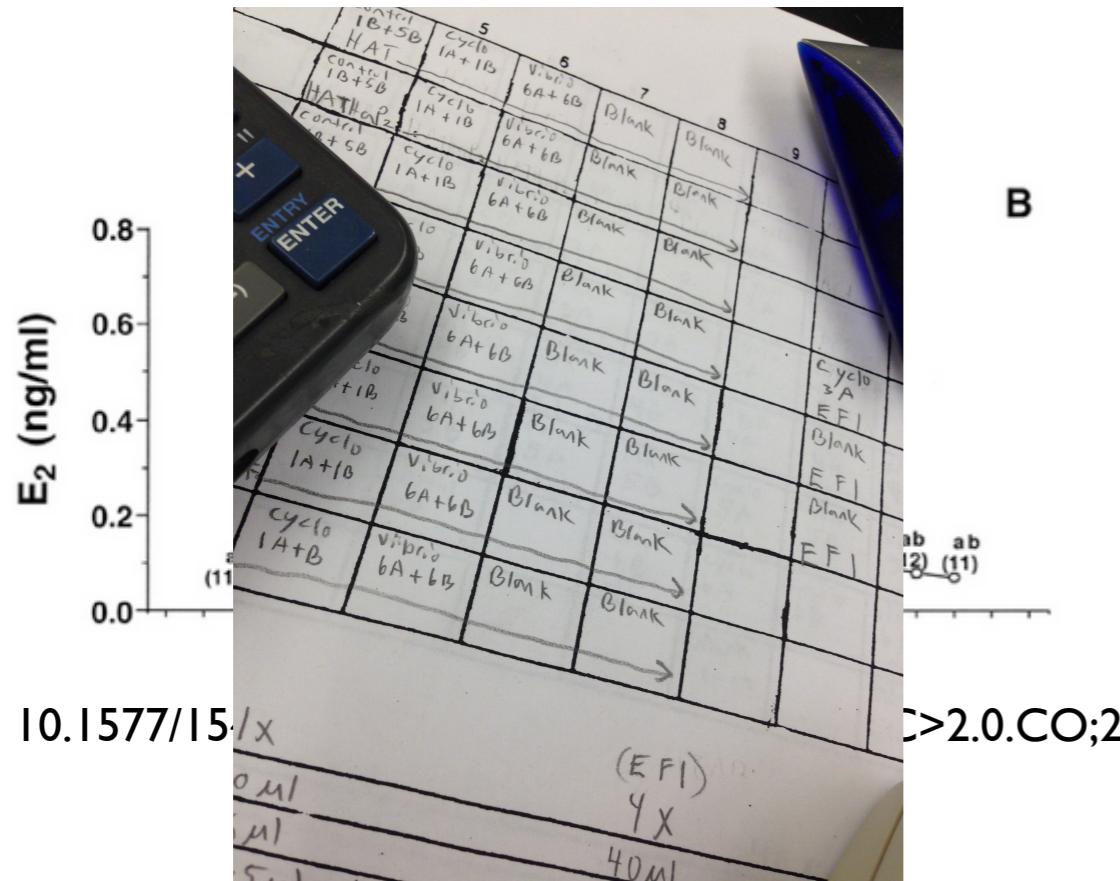


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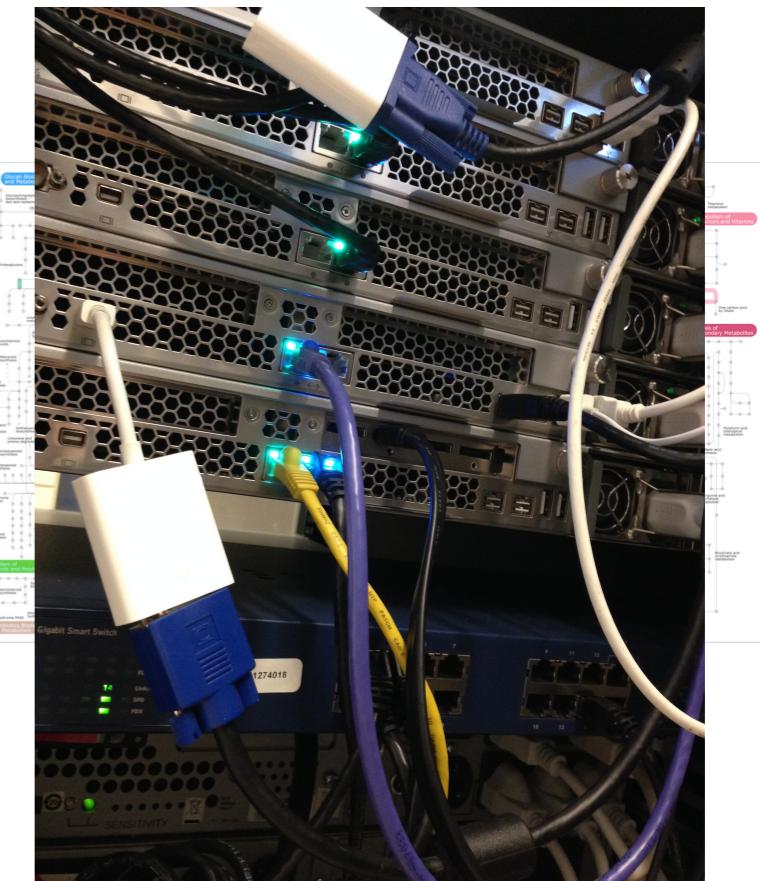
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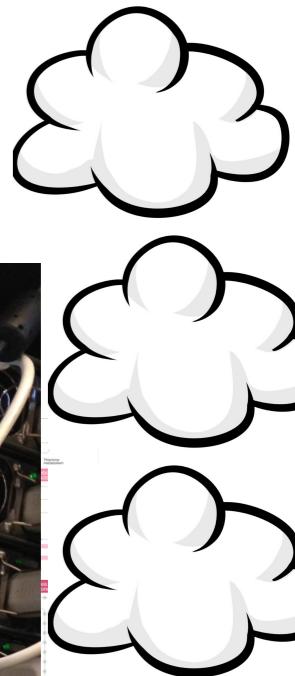
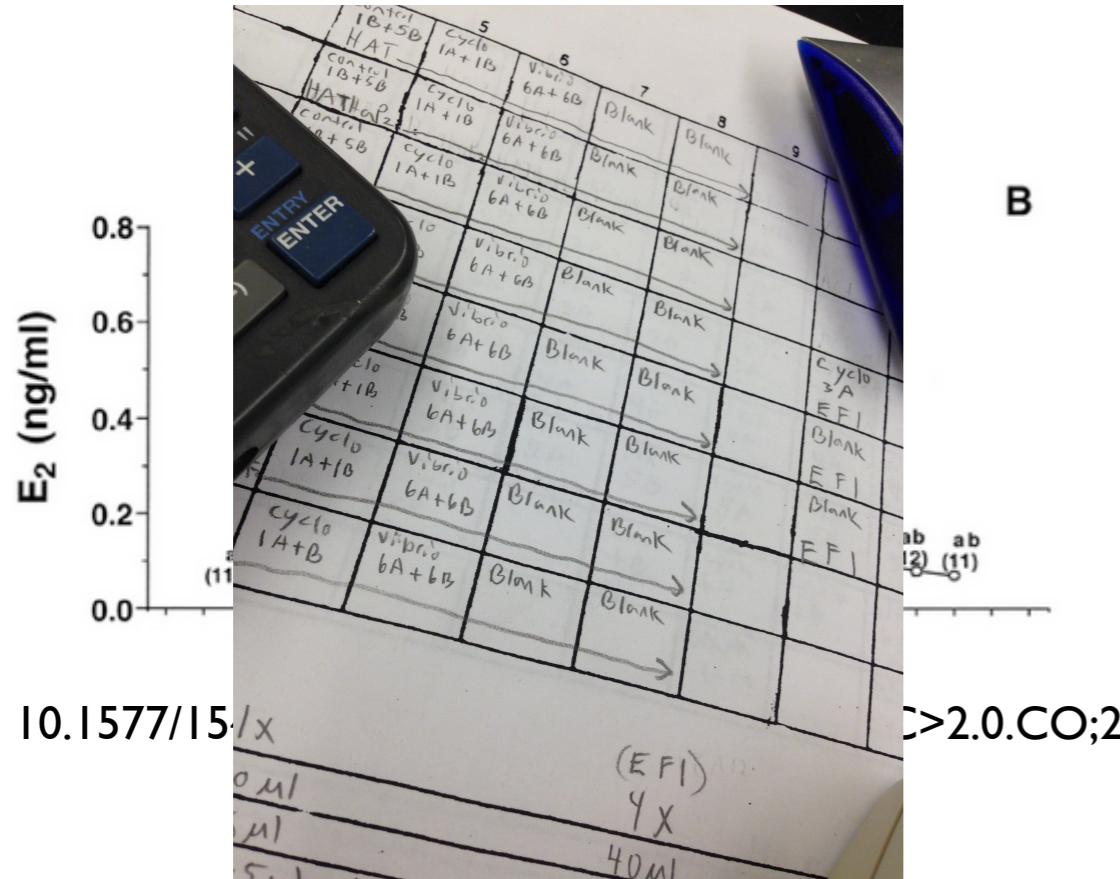


B



# Bio

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Idea Generation  
Data Acquisition  
and Analysis  
Publication

Publication  
Publication  
Publication  
Publication

# Idea Generation Data Acquisition and Analysis

Publication  
Publication  
Publication  
Publication

# Idea Generation

Publication

# Data Acquisition and Analysis

Publication

Publication

Publication

# Idea Generation

## Data Acquisition and Analysis

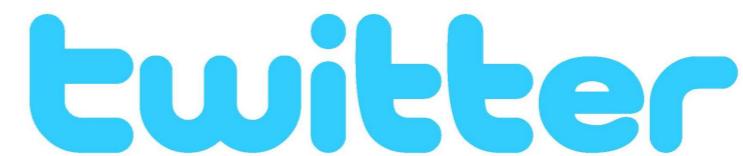
PLE  
continually  
evolving

Publication

Publication

Publication

Publication



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social bookmarking

Delicious

The Diigo logo, featuring the word "diigo" in a blue, lowercase, sans-serif font with a yellow swoosh underneath.

Pinboard



Idea Generation

Publication

# Data Acquisition and Analysis

Publication

Publication

Publication



lab notebooks



IP[y]: IPython  
Interactive Computing

Open  
Notebook  
Science



# Idea Generation Data Acquisition and Analysis



## lab notebooks



IP[y]: IPython  
Interactive Computing



Publication  
Publication  
Publication  
Publication

## Automating a Workflow: Beyond Blast - to GO Slim

The concept is that you can take a fasta file in a working directory and end up with GO slim information all within a single notebook that is automated. Current writing (and overwriting) as scratch file to SQLShare. Assumptions are that you are working in a directory with fasta file named query.fa. And blast algorithms are

```
In [13]: #allows plots to be shown inline
%pylab inline

Populating the interactive namespace from numpy and matplotlib

In [4]: #Setting Working Directory
wd="/Volumes/web/whale/fish546/qpx_go_val"
#Setting directory of Blast Databases
dbd="/Volumes/Bay3/Software.ncbi-blast-2.2.29\+/db/"
#Database name
dbn="uniprot_sprot_r2013_12"
#Blast algorithm
ba="blastx"
#Location of SQLShare python tools: you can empty ("") if tools are in PATH
spd="/Users/sr320/sqlshare-pythonclient/tools/"

In [5]: cd {wd}
/Volumes/web/whale/fish546/qpx_go_val

In [5]: !{ba} -query query.fa -db {dbd}{dbn} -out {dbn}_{ba}_out.tab -evalue 1E-50 -num_threads 4 -max_hsps_per_
BLAST Database error: No alias or index file found for protein database [/Volumes/Bay3/Software.ncbi-bla
/db/uniprot_sprot_r2013_12] in search path [/Volumes/web/whale/fish546/pipeline_test_dir4::]

In [6]: !head -1 {dbn}_{ba}_out.tab
QPX_transcriptome_v1_Contig_2    sp|P52712|CBPX_ORYSJ    43.75    416    213    12    2095    869
7      3e-98      326

In [17]: #Translate pipes to tab so SPID is in separate column for Joining
!tr '\t' '\t' <{dbn}_{ba}_out.tab> {dbn}_{ba}_out2.tab

In [18]: !head -1 {dbn}_{ba}_out2.tab

In [8]: #Uploads formatted blast table to SQLshare; currently has generic name and meant to be temporary: Warning
!python {spd}singleupload.py -d scratchblast_out {dbn}_{ba}_out2.tab
...
In [9]: !python {spd}fetchdata.py -s "SELECT * FROM [sr320@washington.edu].[scratchblast_out]blast Left Join [sr
In [10]: !head -2 {dbn}_join2goslim.txt
...
In [11]: !python {spd}singleupload.py -d scratchjoin_slim {dbn}_join2goslim.txt
processing chunk line 0 to 18037 (0.0718240737915 s elapsed)
pushing uniprot_sprot_r2013_12_join2goslim.txt...
parsing 9A18D989...
finished scratchjoin_slim

In [12]: #Sets GO aspect
!python {spd}fetchdata.py -s "SELECT Distinct Column1 as query, Column3 as SPID, GOSlim_bin FROM [sr320@w
In [13]: !head justslim.txt
...
In [15]: from pandas import *
```

# Idea Generation

Publication

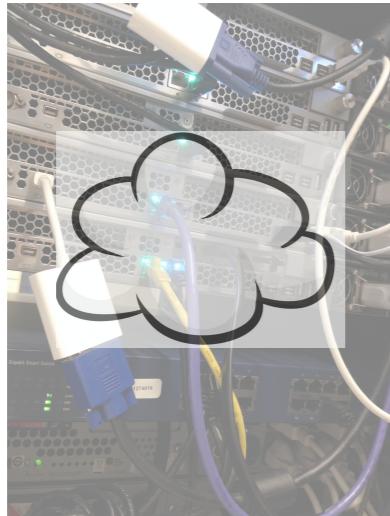
# Data Acquisition and Analysis

Publication

Publication

Publication

***universal challenges***



archiving

metadata

version control

simple sharing

data management

self-discoverability

provenance

collaboration

# Idea Generation

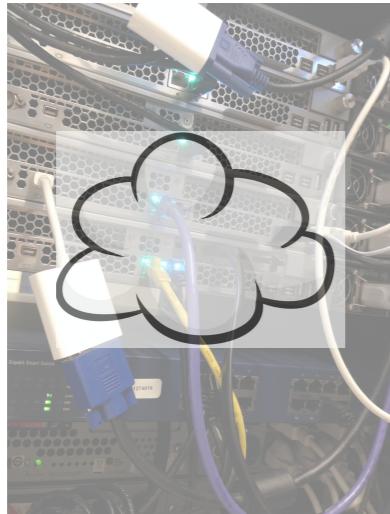
Publication

# Data Acquisition and Analysis

Publication

Publication

Publication



***universal challenges***

archiving      metadata

version control      simple sharing

data management

self-discoverability      provenance

collaboration

our current ~~solution~~ - analyses on local web server (NAS)

# Idea Generation Data Acquisition and Analysis

# Publication

# Publication

# Publication

# Publication



# Idea Generation Data Acquisition and Analysis



Authorea

Write science together.

Authorea is the collaborative platform for research.

PeerJ PrePrints - where biology is heading

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Publication

Publication

Publication

Publication

JBLIC sr320 / qdod

Home

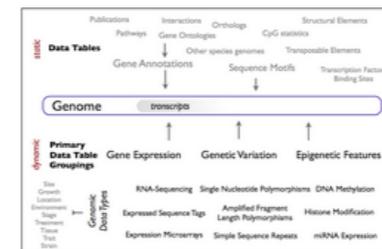
sr320 edited this page on Feb 7 · 23 revisions

This wiki serves as the *primary means for documentation* for project qdod: querying disparate oyster datasets.

In brief, data in the form of delimited text files is aggregated into SQLShare where they can be easily queried. The simplest way to start exploring the uses for this system is to interact with SQLShare using the simple web interface. All you need to get started is a Google account. Please see this page for a beginner's guide to SQLshare.

There is a python client for advanced users.

Below is schematic representation of the different types of datasets.



Reference Genome Sequence files are described on [this page](#).



Steven Roberts

Associate Professor (Marine Biology)  
University of Washington



## Research statistics

10556 views

114 shares

cites coming soon

## Active categories

- Marine Biology
- Molecular Biology
- Bioinformatics
- Physiology
- Genetics

## Related authors

Emma Timmins-Schiffman  
Claire Olson  
Mackenzie Gavery  
Samuel White  
Michael O'Donnell

## Recently used tags

• thraustochytrid • qpx • clam  
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## Most popular uploads

26 uploads in total - view all

Herring Hepatic Transcriptome 34300 contigs.fa

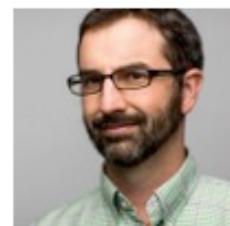
dataset

4923 views  
16 shares

Herring Testicular Transcriptome 31545 contigs.fa

dataset

758 views  
18 shares



# Steven Roberts

[figshare](#) [GitHub](#) [Google Scholar](#)

Open Access

## Bronze level award

Steven has made 33% of 61 listed articles free for anyone to read.

[Products \(112\)](#) > [with metrics \(79\)](#) > [this week \(30\)](#)

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## Article

### Is There a Relationship between DNA Methylation and Phenotypic Plasticity in Invertebrates?

[highly cited](#)[highly saved](#)

+2

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### Development of Genomic Resources for Pacific Herring through Targeted Transcriptome Pyrosequencing

(2012) Roberts, Hauser, Seeb et al.. *PLoS ONE*[highly cited](#)[highly saved](#)[highly discussed](#)[viewed](#)

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### RNA-Seq Reveals an Integrated Immune Response in Nucleated Erythrocytes

(2011) Morera, Roher, Ribas et al.. *PLoS ONE*[highly saved](#)[highly discussed](#)[cited](#)[viewed](#)

+4

[viewed](#)

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### Elevated pCO<sub>2</sub> causes developmental delay in early larval Pacific oysters, *Crassostrea gigas*



(2012) figshare.

[highly discussed](#)[highly discussed](#)[highly viewed](#)

### Genomic resource development of shellfish of conservation concern

(2012) figshare.

[highly discussed](#)[highly discussed](#)[highly viewed](#)

### Rank and Order: Evaluating the Performance of SNPs for Individual Assignment in a Non-Model Organism

(2012) Storer, Pascal, Roberts et al.. *PLoS ONE*[highly saved](#)

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[cited](#)[viewed](#)[discussed](#)[viewed](#)

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### DNA methylation as a mechanism to increase adaptive potential in invertebrates

(2012) figshare.

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# metrics

FigShare

Steven Roberts @sr320 · May 8

Stein: "#reproducibility is just a synonym for actually right" #uwrepro modular.math.washington.edu

3 3 3 ...

## Twitter

Steven Roberts @sr320 · May 8

Stark: "key to reproducibility is in the training" #uwrepro

3 3 3 ...

Steven Roberts @sr320 · May 8

Freire: noWorkflow -supporting infrastructure to run scientific experiments w/o workflow management system  
github.com/gems-uff/nowor... #uwrepro

3 3 3 ... View summary

	Post	Total Reach?
	Roberts Lab shared a link.	--
	#TBT #wayback	--
	Who is doing Science today?	17
	Who is doing Science today?	16
	Roberts Lab shared a link.	38

## Facebook

### Subject areas

Aquaculture, Fisheries and Fish Science

Marine Biology

Molecular Biology

66

Visitors

111

Views

24

Downloads

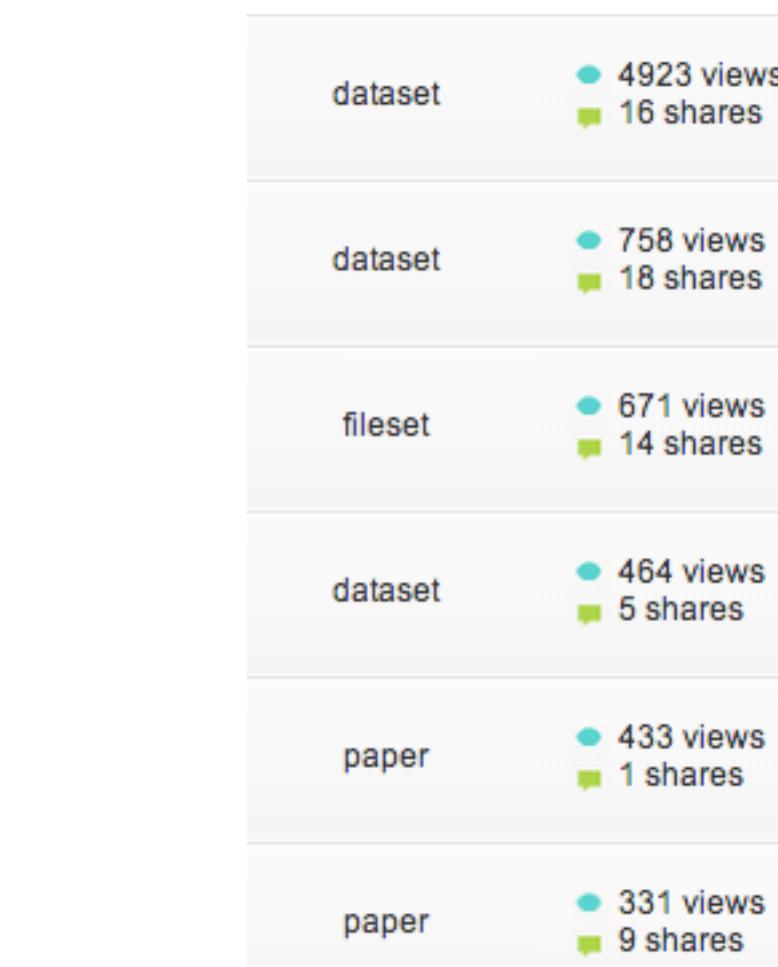
View all metrics + mentions on the Web

## PeerJ altmetrics

### Top referrals unique visitors

news-oceanacidification-icc.org

18



## Web Analytics





# metrics

FigShare

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Bronze level award

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## ImpactStory

**changes behavior, for the better.**

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Roberts Lab shared	
#TBT #wayback	--
Who is doing Science today?	17
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highly discussed

highly cited

highly saved

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viewed

+1

viewed

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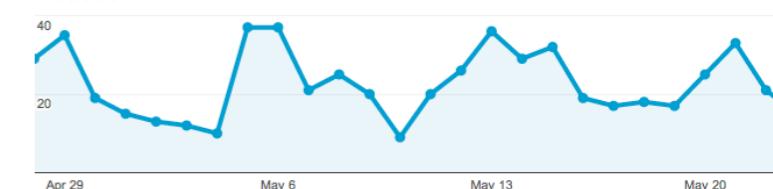
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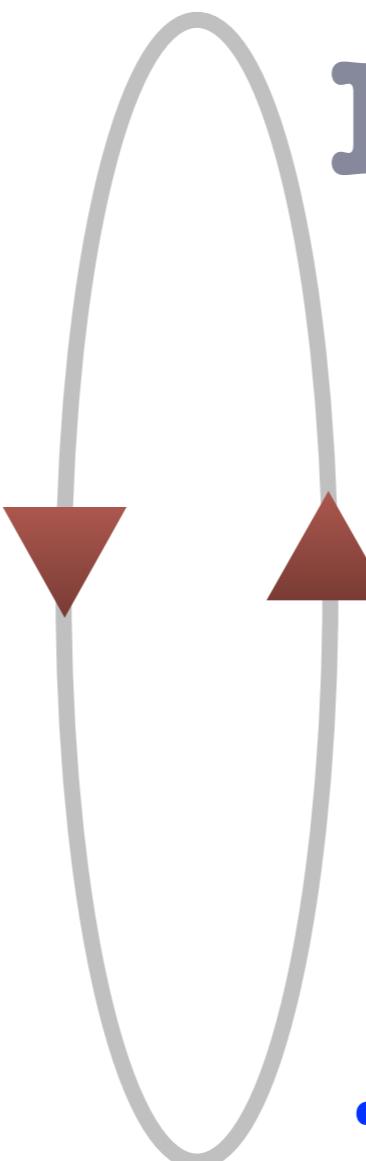


# *Open Science*

# Getting Information

Idea Generation  
Data Acquisition  
and Analysis

Publication  
Publication  
Publication  
Publication



## Sharing Information

- 1) Ease of Effort
- 2) Greatest Impact
- 3) *Self Discoverability*

# thanks

Steven Roberts

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robertslab.info

@sr320