



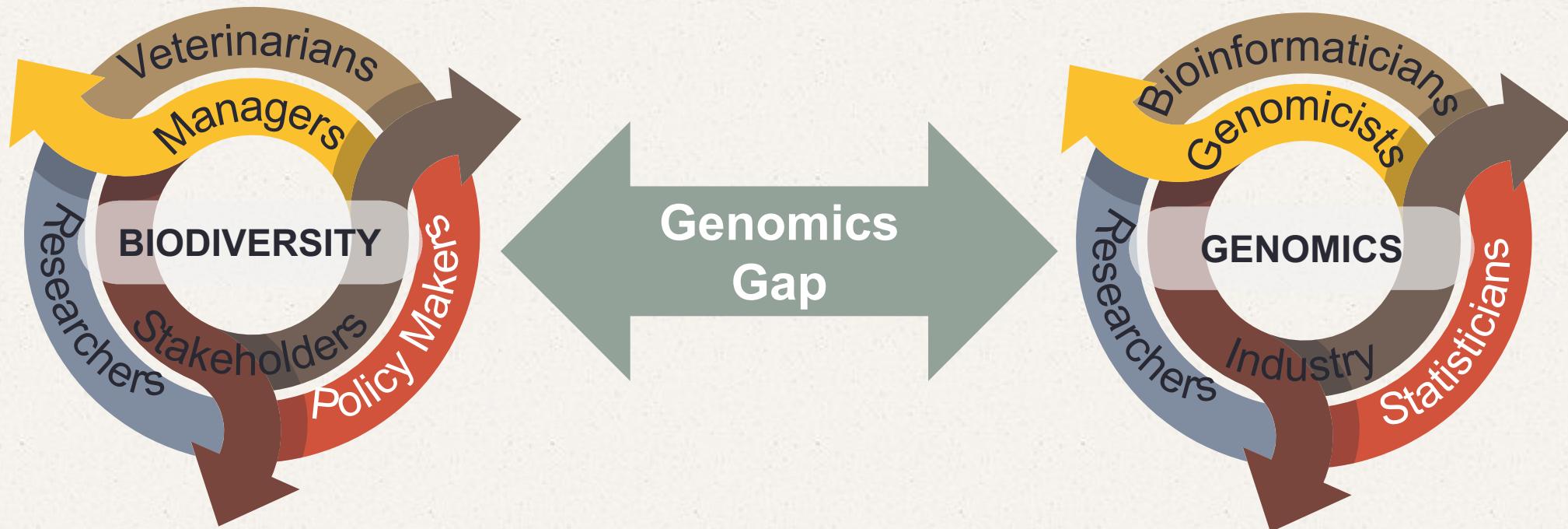
THE EXPECTATIONS AND CHALLENGES OF WILDLIFE DISEASE RESEARCH IN THE ERA OF GENOMICS: FORECASTING WITH A HORIZON SCAN

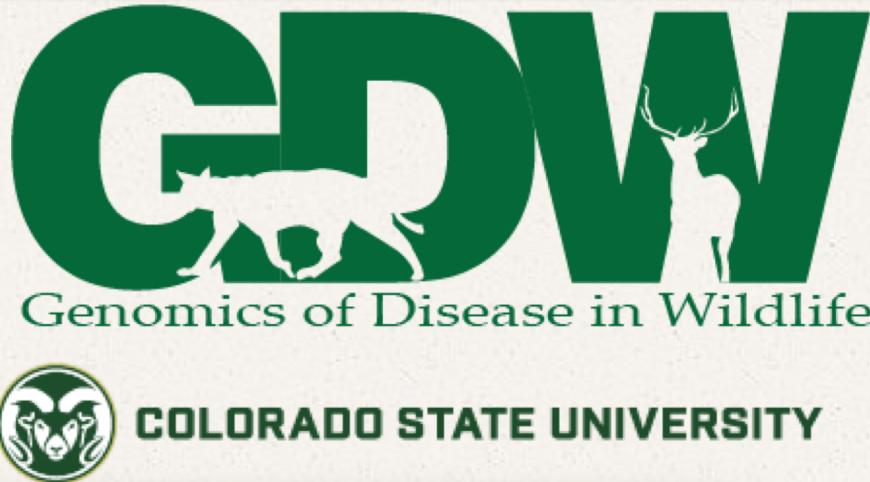
Robert (Bob) Fitak

Department of Biology, Duke University



The Genomics Gap





- 24 Participants
 - 6 countries
 - 15 women + 9 men
 - 11 faculty & professionals
 - 2 postdocs
 - 11 DVM/PhD students

Horizon scanning

- “*the systematic examination of potential threats, opportunities, and likely future developments, including those at the margins of current thinking and planning*”



Helen Davis, North West Medicines Information Centre



Horizon scanning

Trends in Ecology & Evolution

CelPress REVIEWS

Review

A 2018 Horizon Scan of Emerging Issues for Global Conservation and Biological Diversity

William J. Sutherland,^{1,*} Stuart H.M. Butchart,^{1,2} Ben Connor,³ Caroline Culshaw,⁴ Lynn V. Dicks,⁵ Jason Dinsdale,⁶ Helen Doran,⁷ Abigail C. Entwistle,⁸ Erica Fleishman,⁹ David W. Gibbons,¹⁰ Zhigang Jiang,^{11,12} Brandon Keim,¹³ Xavier Le Roux,^{14,15} Fiona A. Lickorish,¹⁶ Paul Markillie,¹⁷ Kathryn A. Monk,¹⁸ Diana Mortimer,¹⁹ James W. Pearce-Higgins,^{1,20} Lloyd S. Peck,²¹ Jules Pretty,²² Colleen L. Seymour,^{23,24} Mark D. Spalding,^{1,25} Femke H. Tonneijck,²⁶ and Rosalind A. Gleave¹

THE ECOLOGICAL SOCIETY OF AMERICA

**Frontiers in Ecology
and the Environment**

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Review

Emerging threats in urban ecosystems: a horizon scanning exercise

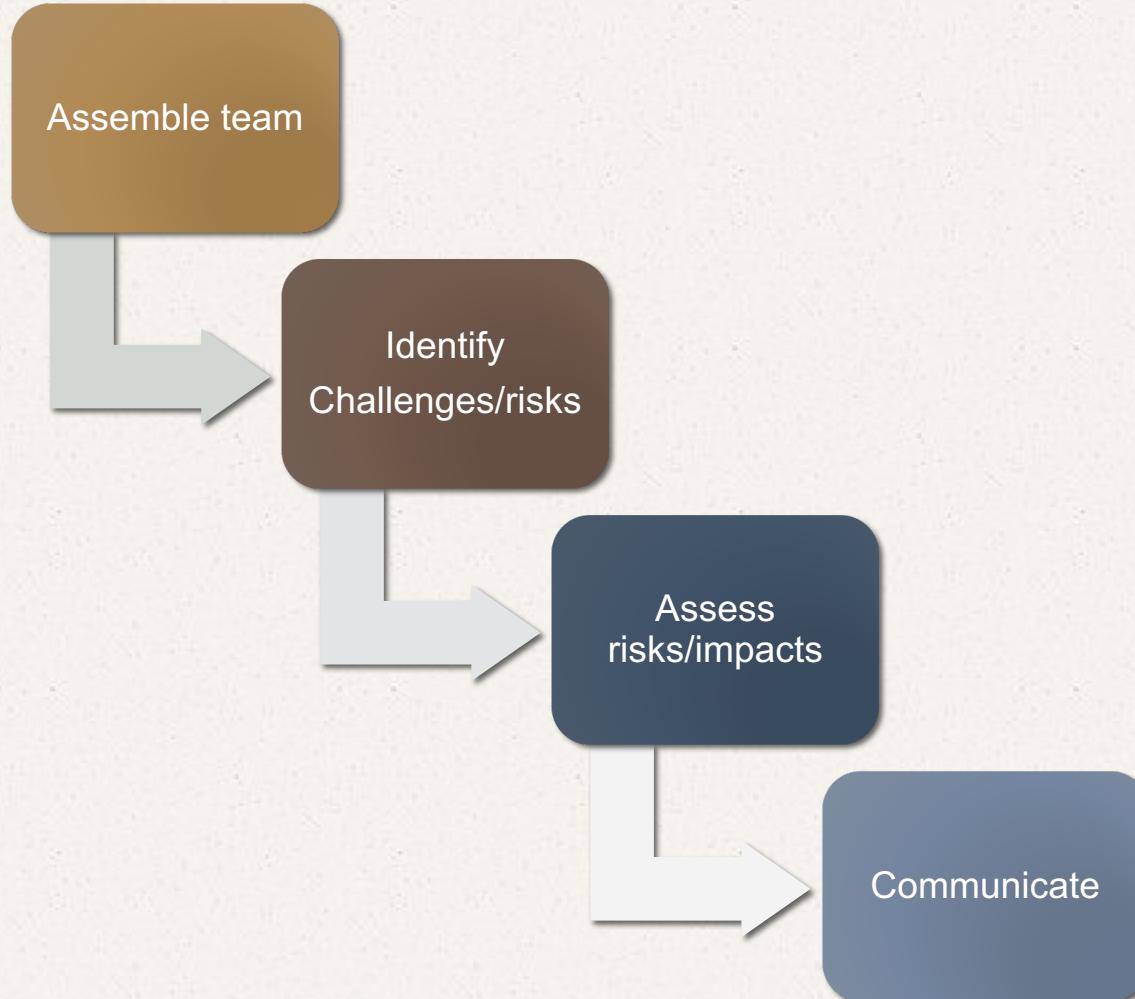
HYPOTHESIS & THEORY ARTICLE

Front. Genet., 21 October 2015 | <https://doi.org/10.3389/fgene.2015.00314>

Prospects and challenges for the conservation of farm animal genomic resources, 2015–2025

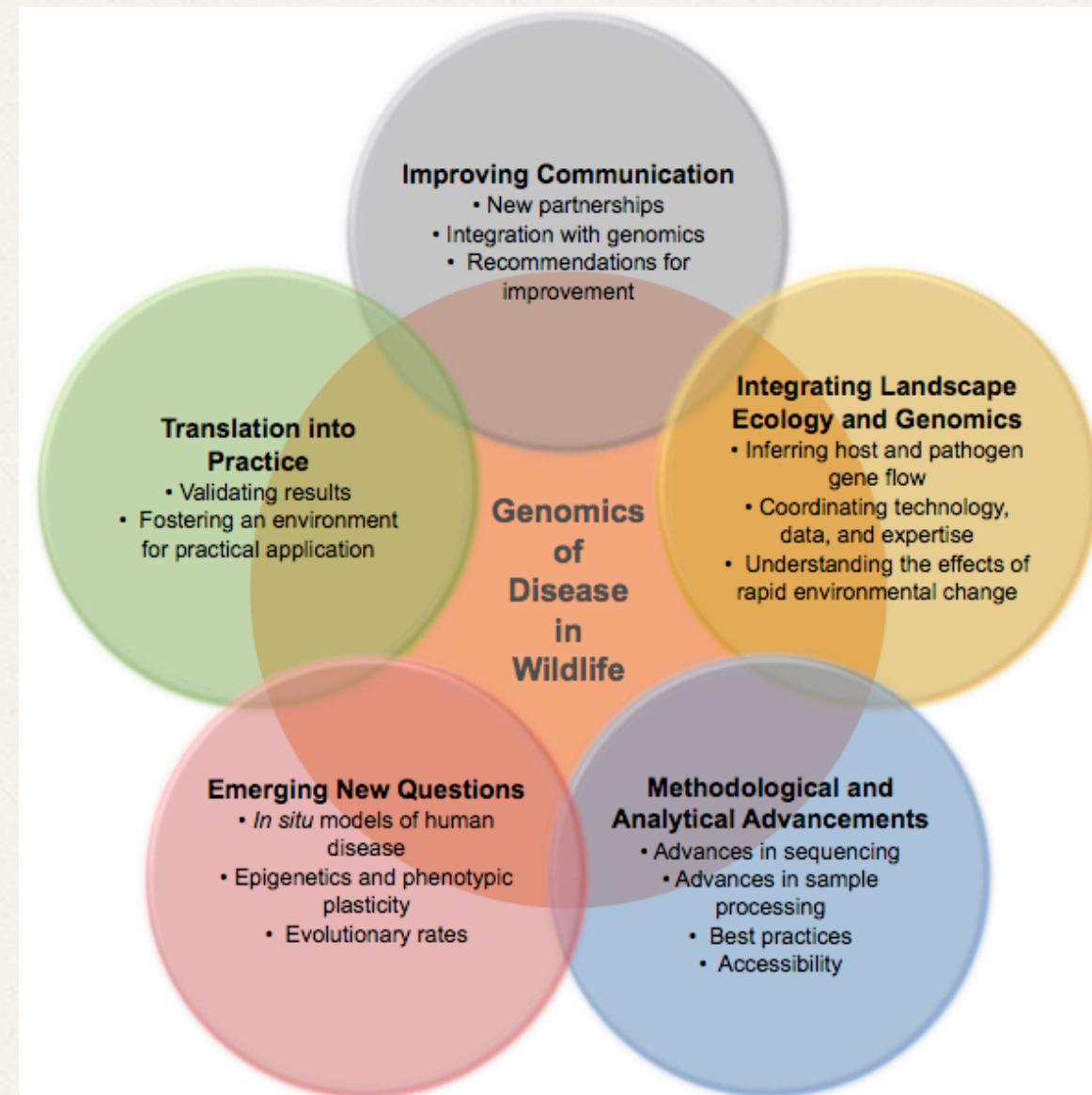


Horizon scanning

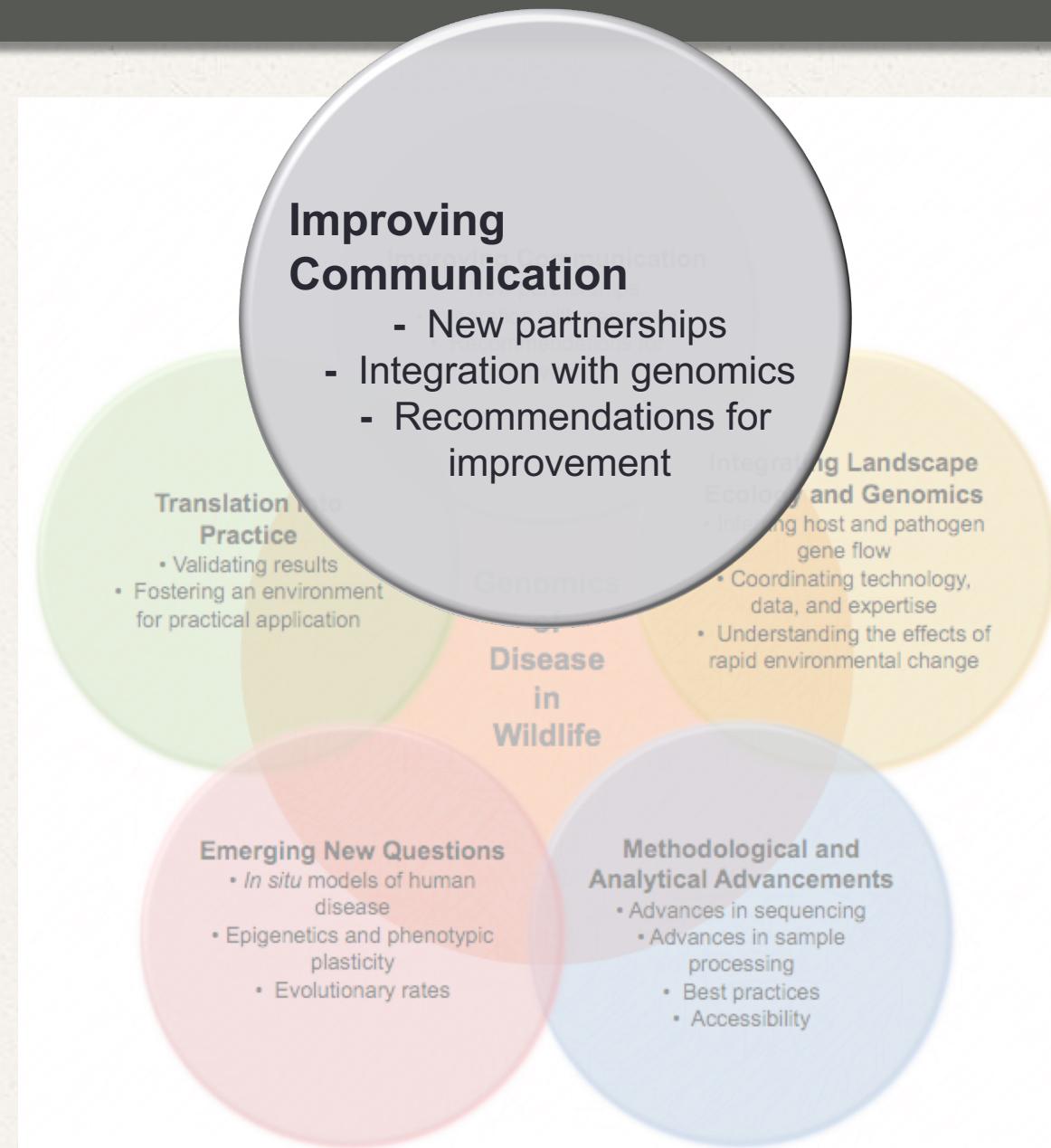


Results

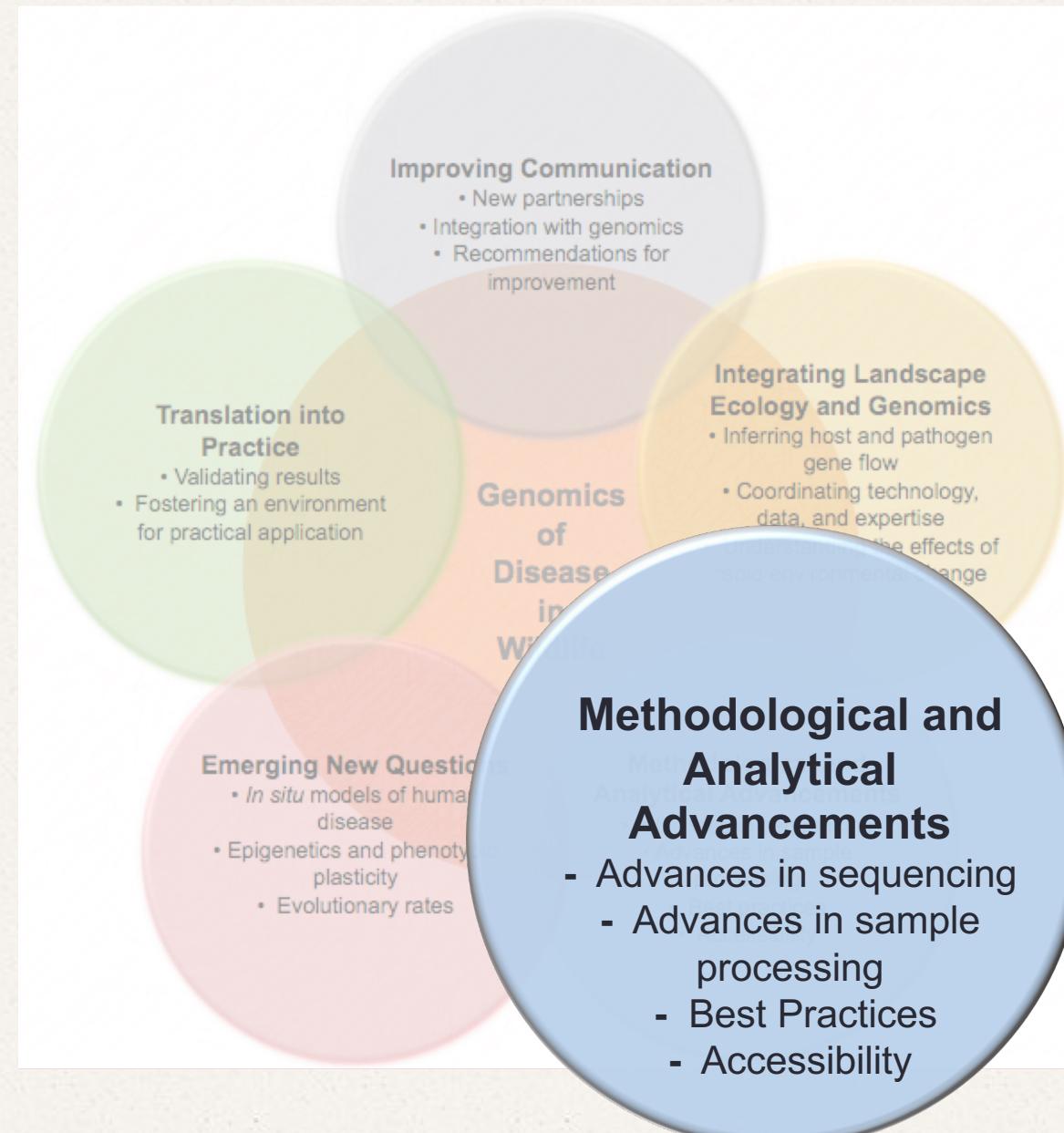
- 48 contributions



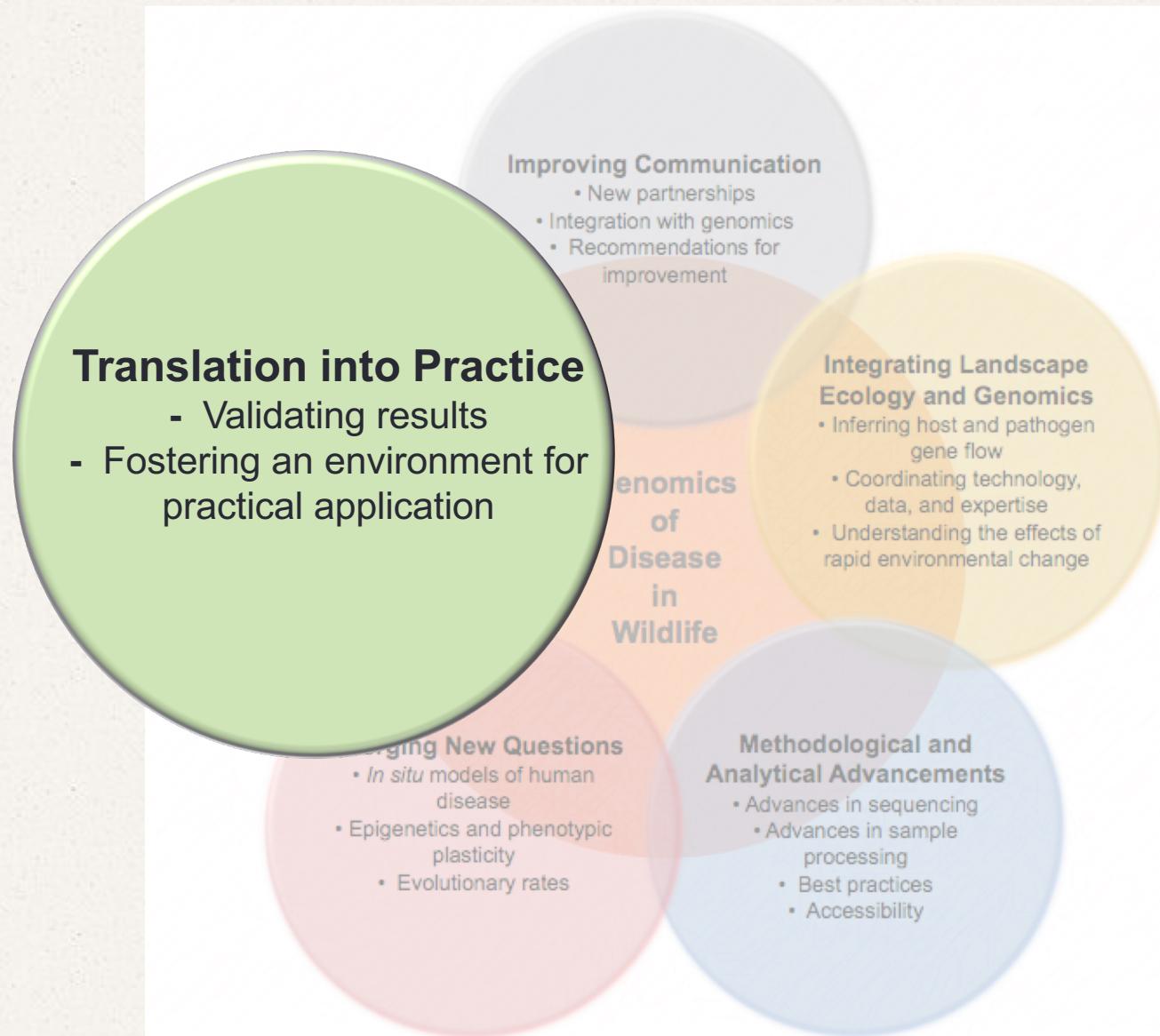
Results



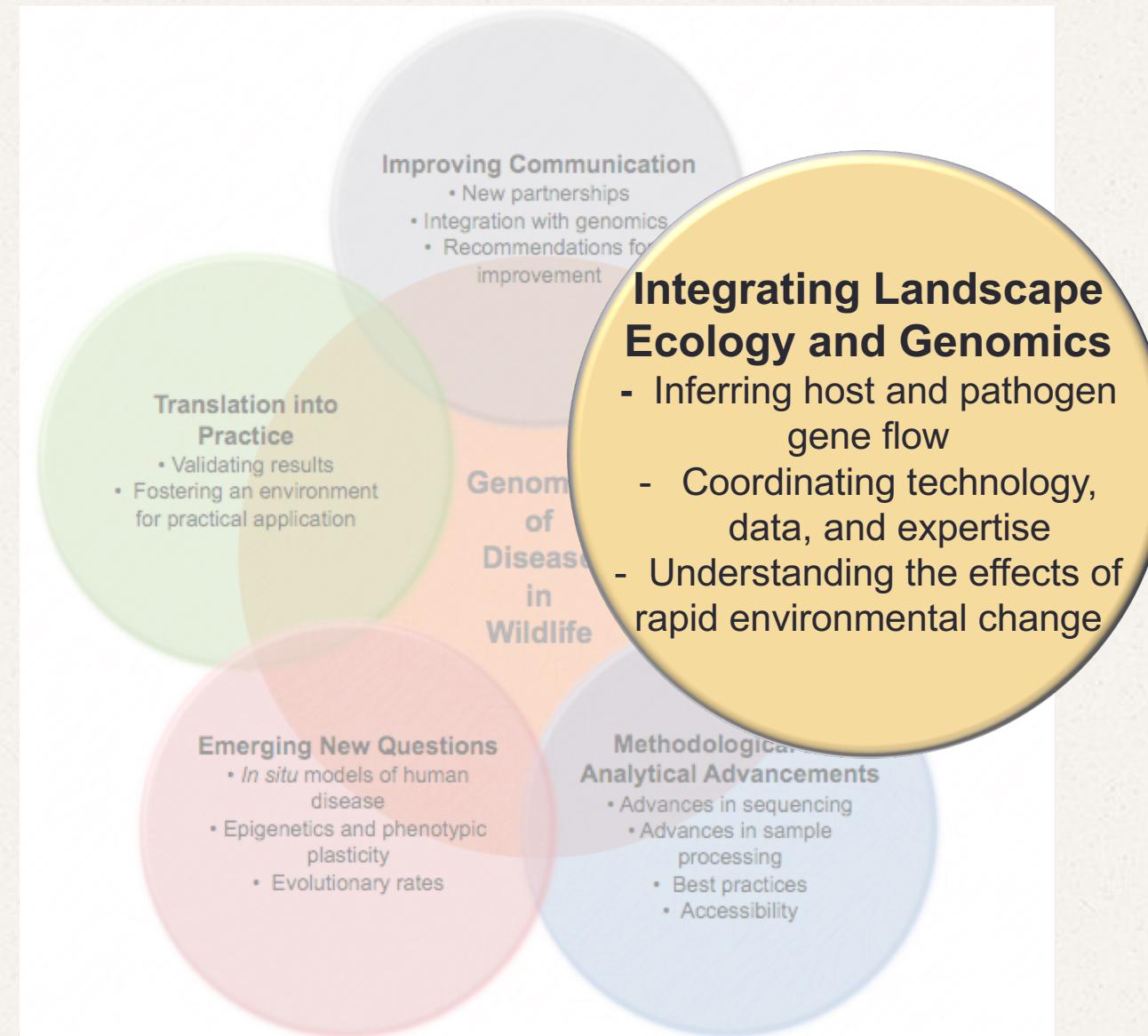
Results



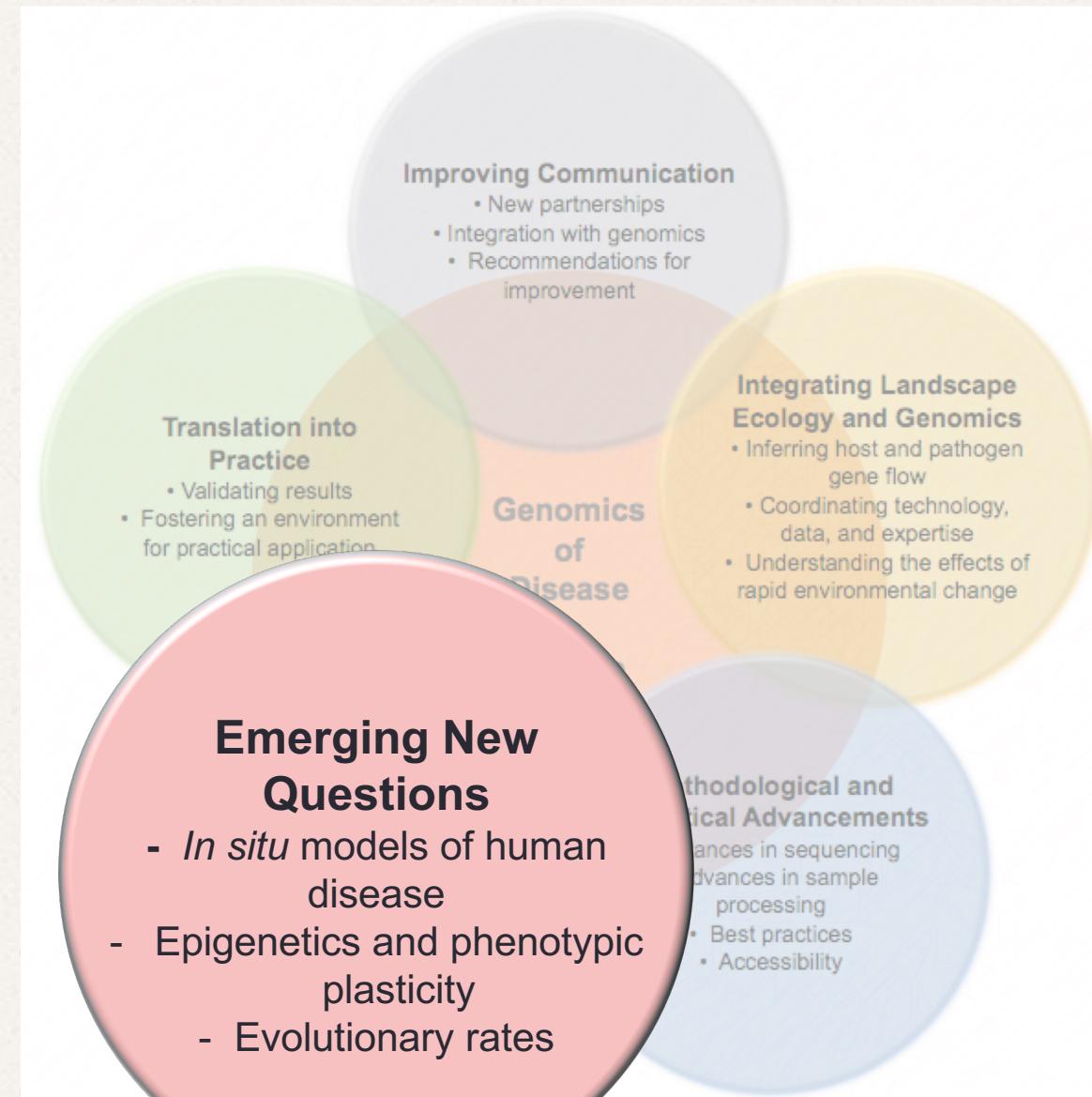
Results



Results



Results



Conclusions

Communication

- Continually maintain communication through workshops, training modules, etc.

Horizon scan

- Useful approach to fuel discussion and assess the future of the field
- Future monitoring with additional horizon scans (or similar approaches)

Best Practices

- Or minimum requirements necessary to assist in interpretation of findings



GROUP ACTIVITY

Best practices and recommendations for genomics research
in wildlife diseases.



Best Practices

Clinical Chemistry 55:4
611–622 (2009)

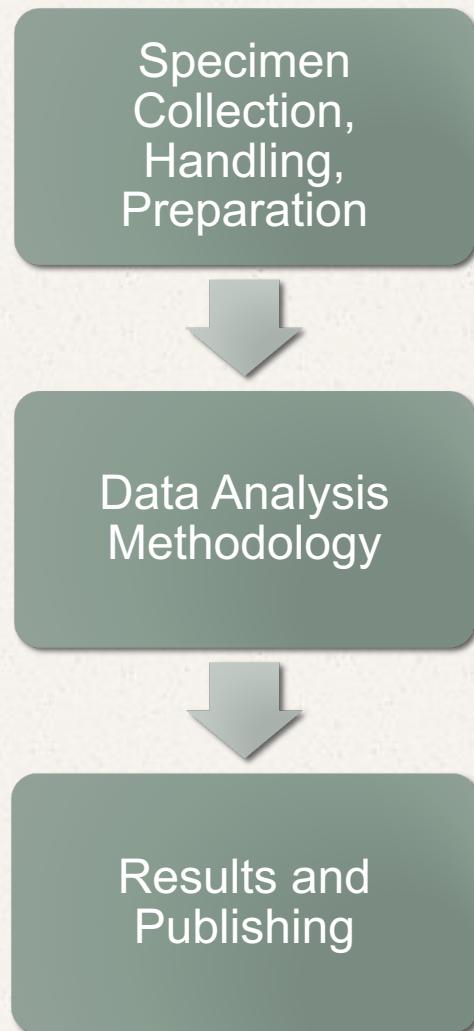
Special Report

The MIQE Guidelines: *Minimum Information for Publication of Quantitative Real-Time PCR Experiments*

Stephen A. Bustin,^{1*} Vladimir Benes,² Jeremy A. Garson,^{3,4} Jan Hellemans,⁵ Jim Huggett,⁶
Mikael Kubista,^{7,8} Reinhold Mueller,⁹ Tania Nolan,¹⁰ Michael W. Pfaffl,¹¹ Gregory L. Shipley,¹²
Jo Vandesompele,⁵ and Carl T. Wittwer^{13,14}



Best Practices



Best Practices Group Activity Outline

- Sunday June 3
 - Break into 4 groups
 - Meet your ‘project’
 - Determine speaker/note taker
- June 5, 8, 9
 - Break into groups
 - 30 minute discussion of ‘Best Practices’ in that day’s topic
 - Reconvene and hold Group summaries
- Saturday morning, June 9
 - 30-60 minute overall summary of best practices
 - Assess recommendations ‘shared’ across projects, and those unique to different projects



Best Practices: Projects

Retroviral resistance in a re-discovered tarsier species

- Manandhar, Pruvot, Shury, Hudon, Sánchez Romano

Vector-borne bacterial outbreak in indigo snakes

- Hulse, Cavalcante, Buckley, Prada, Catalano

Permafrost pathogen outbreak!

- Rondon Robayo, Herrmann, Nova, Sondgeroth, Wolf

Viral biocontrol of an invasive rat species

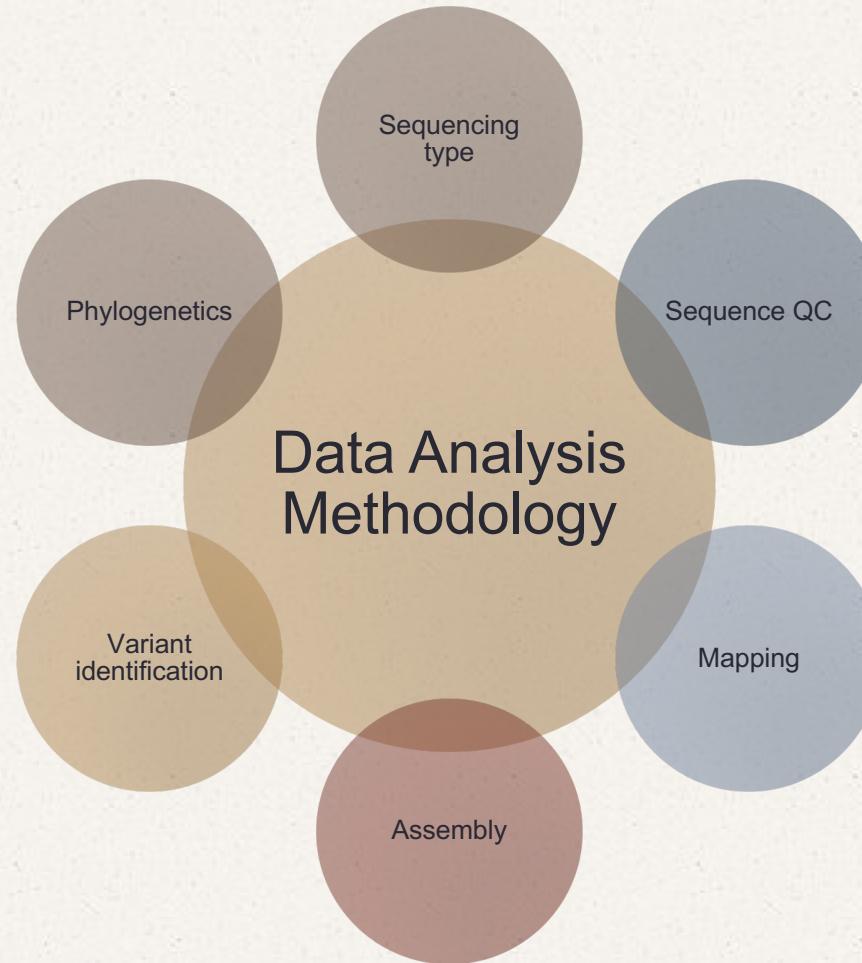
- Mumma, Cleveland, Vogt, Balasubramanian, Gerhold



Best Practices: Day 1



Best Practices: Day 2



Best Practices: Day 3



Best Practices Summary Day

Shared Best Practices

- Specimen Collection, Handling, Preparation
 - TBD
 - TBD
 - TBD
- Data Analysis Methodology
 - TBD
 - TBD
 - TBD
- Results and Publishing
 - TBD
 - TBD
 - TBD

Unique Best Practices to Each Project

- Project 1
 - TBD
 - TBD
 - TBD
- Project 2
 - TBD
 - TBD
 - TBD
- Project 3
 - TBD
 - TBD
 - TBD
- Project 4
 - TBD
 - TBD
 - TBD



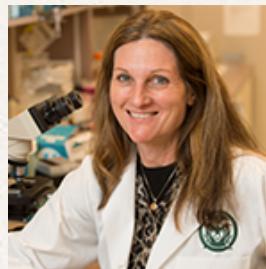
Acknowledgements

Organizer



Dr. Jill Pecon-Slattery,
Smithsonian Conservation
Biology Institute
& Colorado State University

Host



Dr. Sue VandeWoude
Colorado State University

Instructors

Mark Stenglein
Justin Lee
Jim Wilgenbusch (2017)
Jen Malmberg
Chris Funk
Daryl Trumbo
Bob Fitak

Support Staff

Joe Strecker
Tyson Claffey (2017)
Tyler Eike (2018)
Edit Szalai

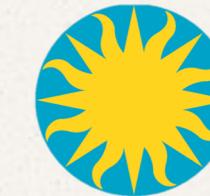
All Participants

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