

Sustainable Solutions Workshop

March –September 2015



Draw upon Nature's
genius to solve
persistent
environmental
challenges and create
life-friendly,
sustainable solutions

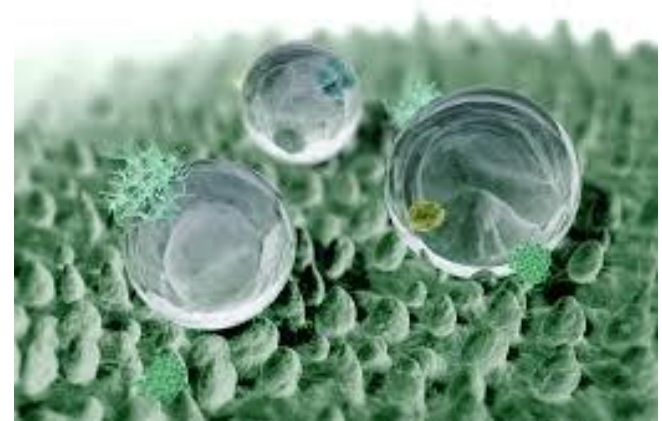
Do you want to... **SOLVE** Persistent Challenges? **EXPAND** Your Solution Space?
CREATE Long-lasting Sustainable Solutions?

Sustainable Systems Workshop

March 18, 2015 webinar

Agenda:

- ✓ Introduce workshop leaders
- ✓ Workshop goals and syllabus review
- ✓ Introduce Team challenges and participants
- ✓ Workshop logistics
- ✓ In person session
- ✓ Introduction to biomimicry
- ✓ Homework for 1st webinar
- ✓ Questions and comments



Workshop Instructors



Marie Zanowick Bourgeois
Civil Engineer with EPA Region 8
Certified Biomimicry Professional



Diana Hammer
Life Scientist with EPA Region 8
MS in Biomimicry (fall 2015)

Workshop Goals

- Create long-lasting, sustainable solutions
- Learn how to use the biomimicry framework and honor traditional ecological knowledge
- Expand the solution space around 4 environmental challenges
- Practice using web-based tools
- Experience working in multi-disciplinary team
- Return to Nature

Sustainable Solutions Workshop 2015 Schedule and Syllabus

Environmental challenges usually cross traditional media lines and addressing these problems using a system approach is necessary in order to discover the most appropriate solution.



The value, both economic and environmental, of using a systems-based approach to solve these challenges is widely recognized. We are offering this free Sustainable Solutions Workshop to use systems-thinking and the Biomimicry methodology to seek nature-based solutions to persistent environmental challenges identified by the teams. Participants will also have the opportunity to incorporate Traditional Ecological Knowledge to refine the solutions to the individual team challenges.

February 26, 2015
March 2, 2015

Application deadline
Teams formed and participants notified

Date	Class	Topics Covered
March 18	Webinar 1	INTRODUCTION: Overview of workshop; Introduction to Biomimicry; History, ethics, philosophy of Biomimicry; How Traditional Ecological Knowledge (TEK) enriches the discussion; Introduction to team challenges; Questions.
April 15	2	BIOMIMICRY METHODOLOGY: Biomimicry Design approach; Importance of identifying function; Scoping: TEK and Biomimicry methodology.
May 20	3	BIOMIMICRY METHODOLOGY - Next steps: Discovering, Creating and Evaluating.
June 17	4	DESIGN PRINCIPLES: Abstracting Design Principles from the strategies found in Nature.
July 15	5	LIFE'S PRINCIPLES: Incorporating the language of Biomimicry and TEK into your written work and thinking.
Mid-August (exact dates/location TBD)	In-person Session	MEETING: Gather in-person with your team to continue the work on your challenge. Dive deeper into the Biomimicry methodology, draw upon TEK. Learn from Nature's strategies in the local ecosystem to gain a better understanding of Life's Principles.
Fall 2015	6	SHARING AND REPORTING: The workshop will continue in one (or two, if needed) final webinars so the Teams can report on their findings and share the experience of solving challenges and creating sustainable solutions using the Biomimicry methodology and incorporating TEK.

Sustainable Solutions Workshop 2015

Challenges

- How does Nature collect, distribute and store water with minimal energy use?
- How does Nature manage disturbance?
- How does Nature adapt to seasonal changes in precipitation and drier conditions?
- How does Nature communicate and how can these strategies help us communicate about sustainability?

2015 Sustainable Solutions Workshop

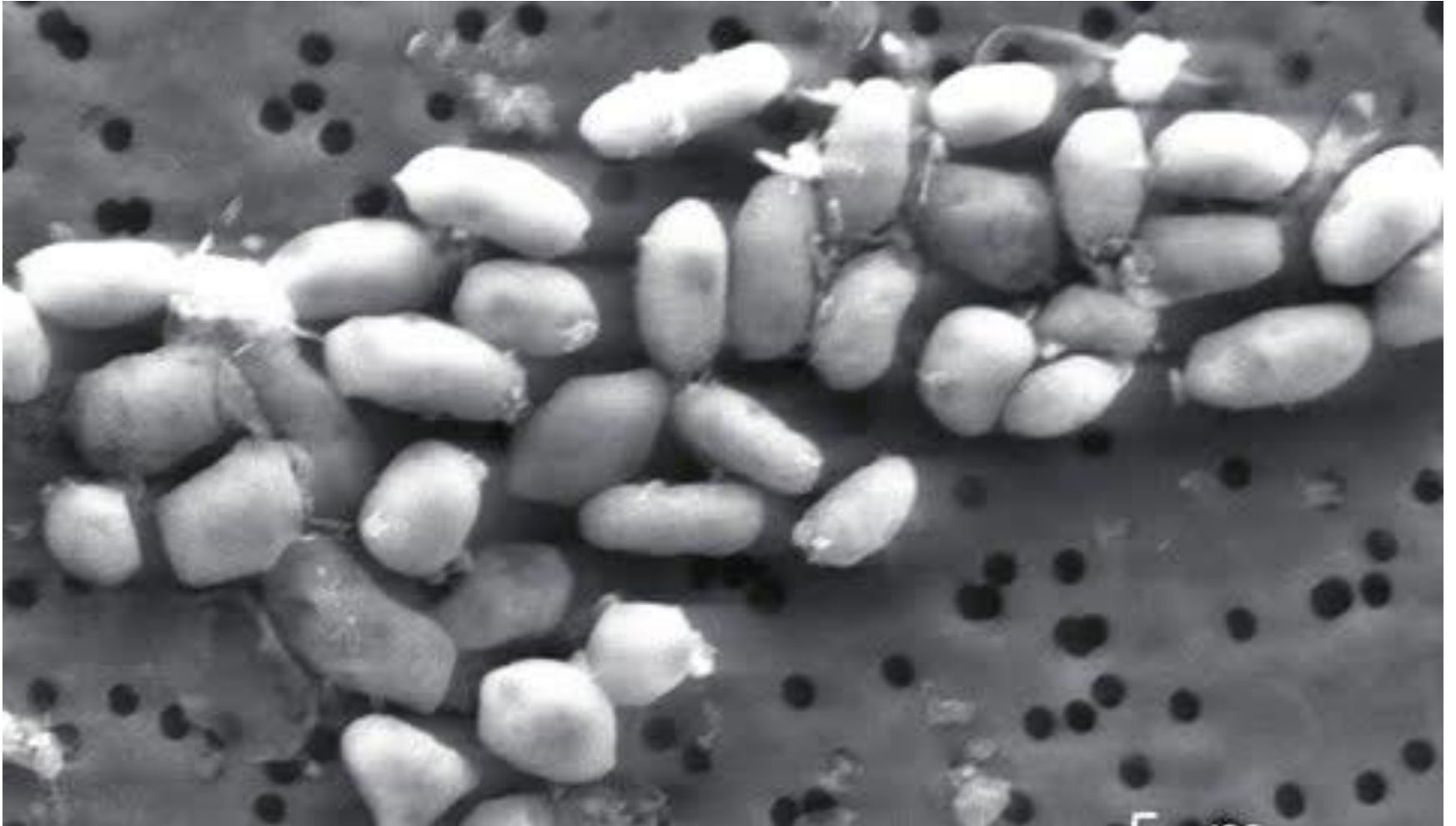
Challenge Teams	Climate Change	Sustainability	Water	Disturbance
Challenge Question: How does Nature...	...adapt to seasonal changes in precipitation and drier conditions?	...communicate?	...collect, store, and distribute water with minimal energy?	...manage disturbance?
Anticipated Outcome:	Use recommendations to inform a climate change adaptation plan for the Fort Belknap Reservation	Recommendations for science/sustainability publications?	Recommendations specific to the Flathead Basin	Resiliency planning and recovery post-disaster, -fire, -flooding, and post-drought
Area of focus:	Fort Belknap Indian Community	Children and Nature?	Flathead Reservation	Post-disaster Plan for Northern Rockies?
Specific area of focus:				
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	Eliot Kersgaard eliot.kersgaard@colorado.edu (303) 304-4659		Laurel Dygowski Dygowski.laurel@epa.gov (303) 312-6144	



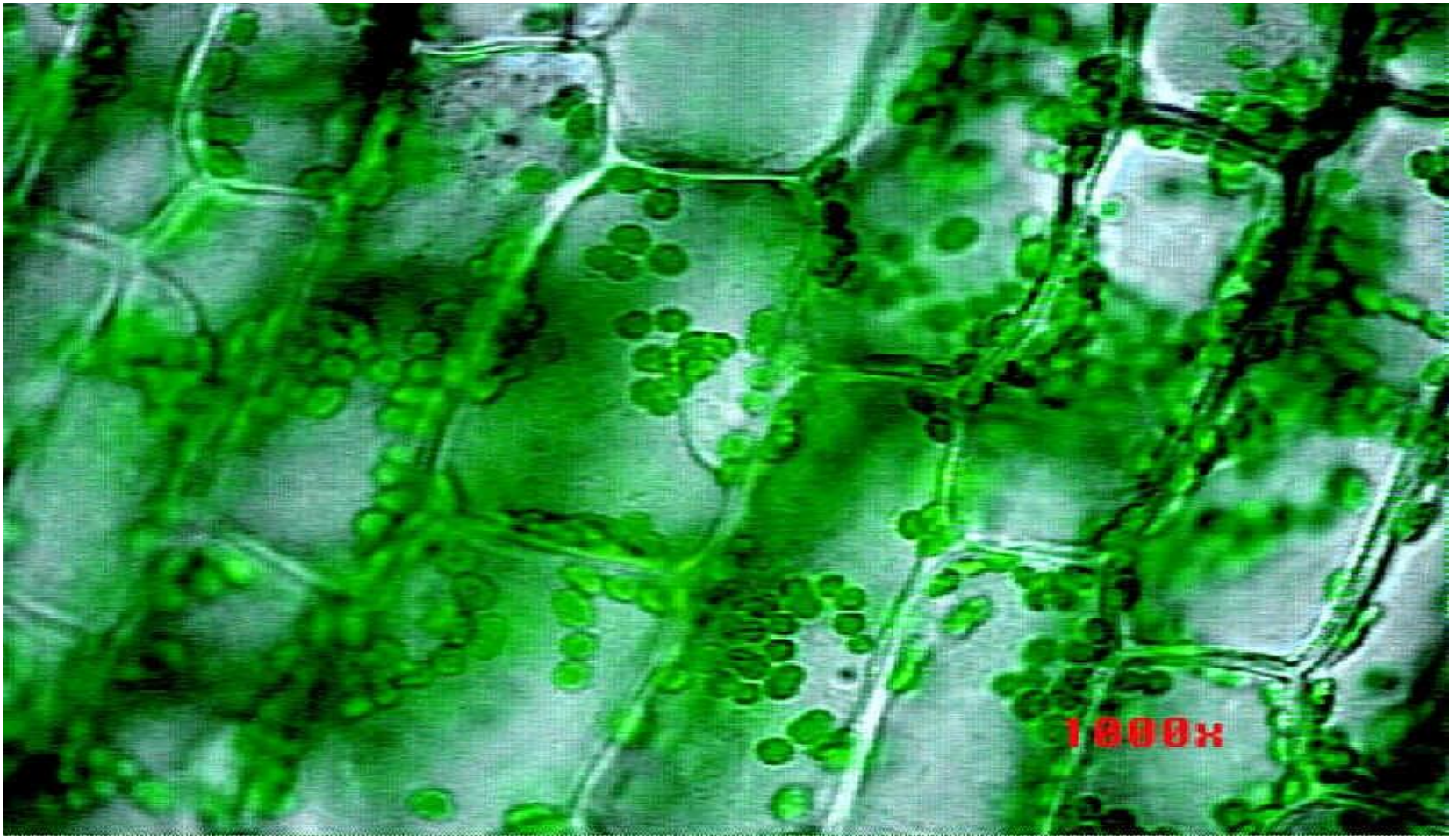


we are the young ones

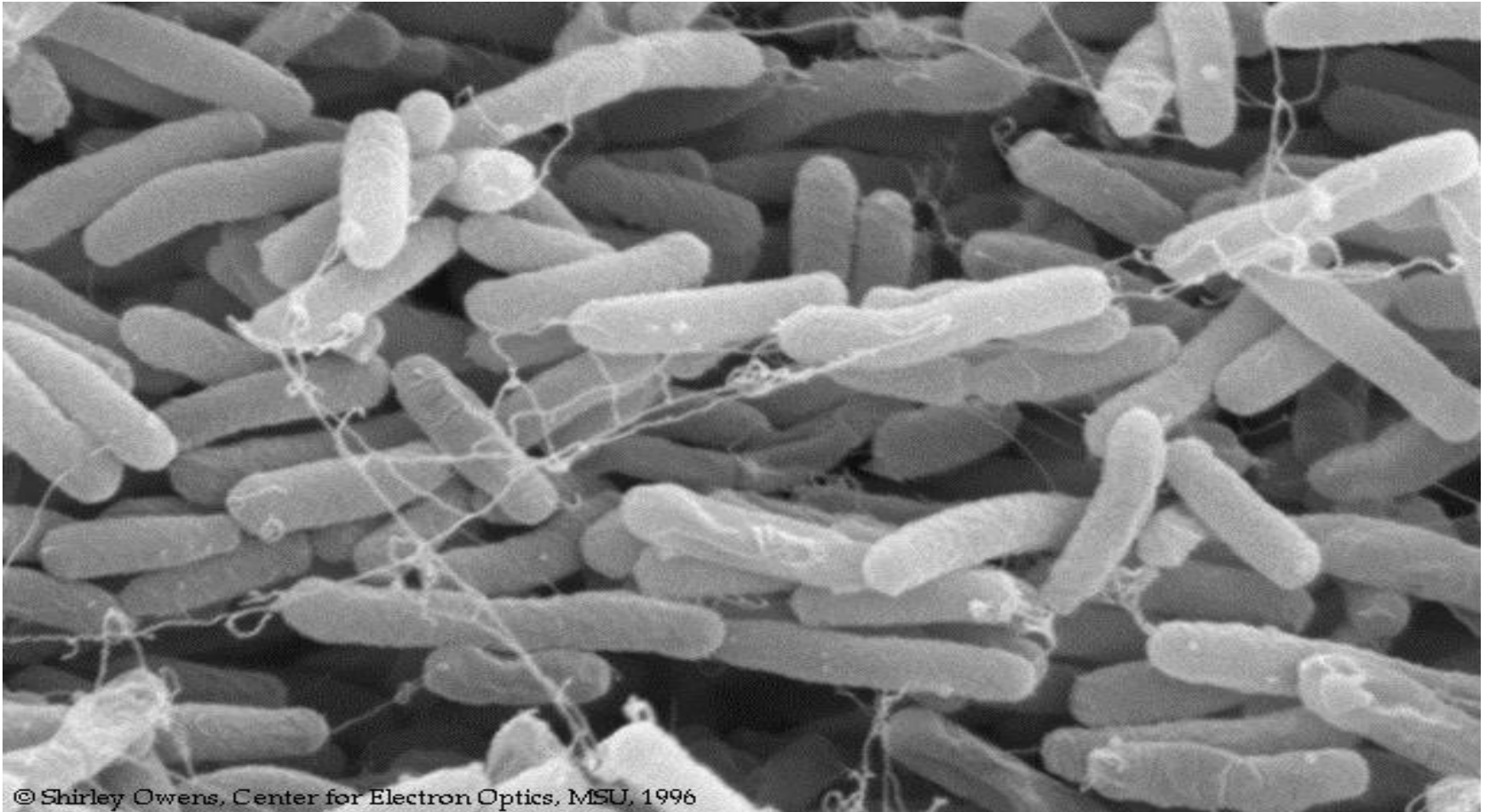
february



march



september



© Shirley Owens, Center for Electron Optics, MSU, 1996

december



december 22nd



december 25th

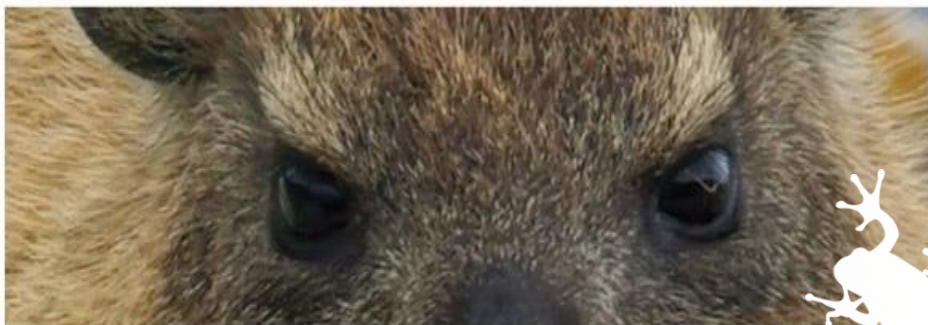
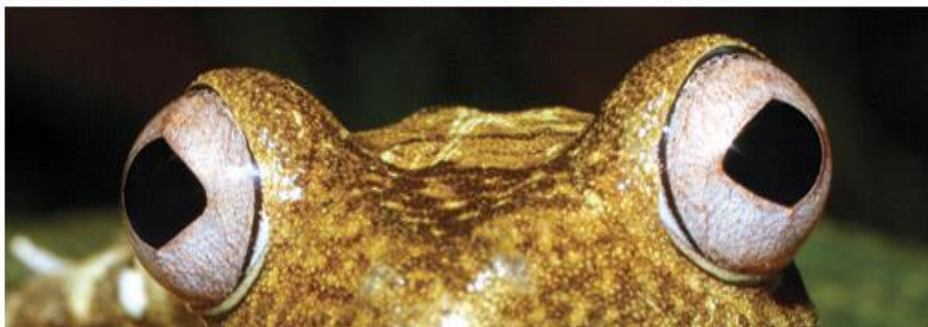
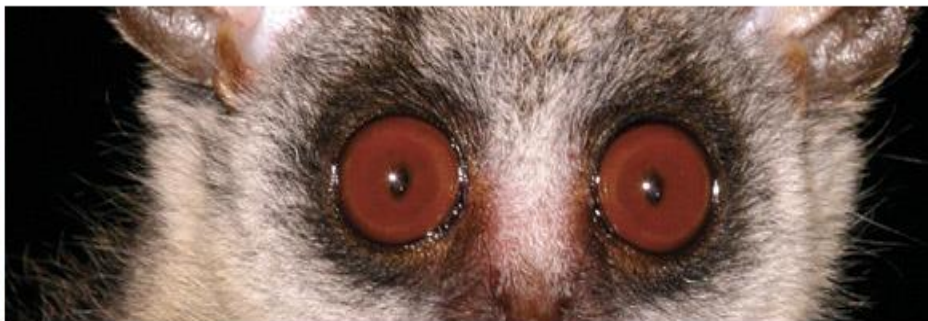


twelve hours ago

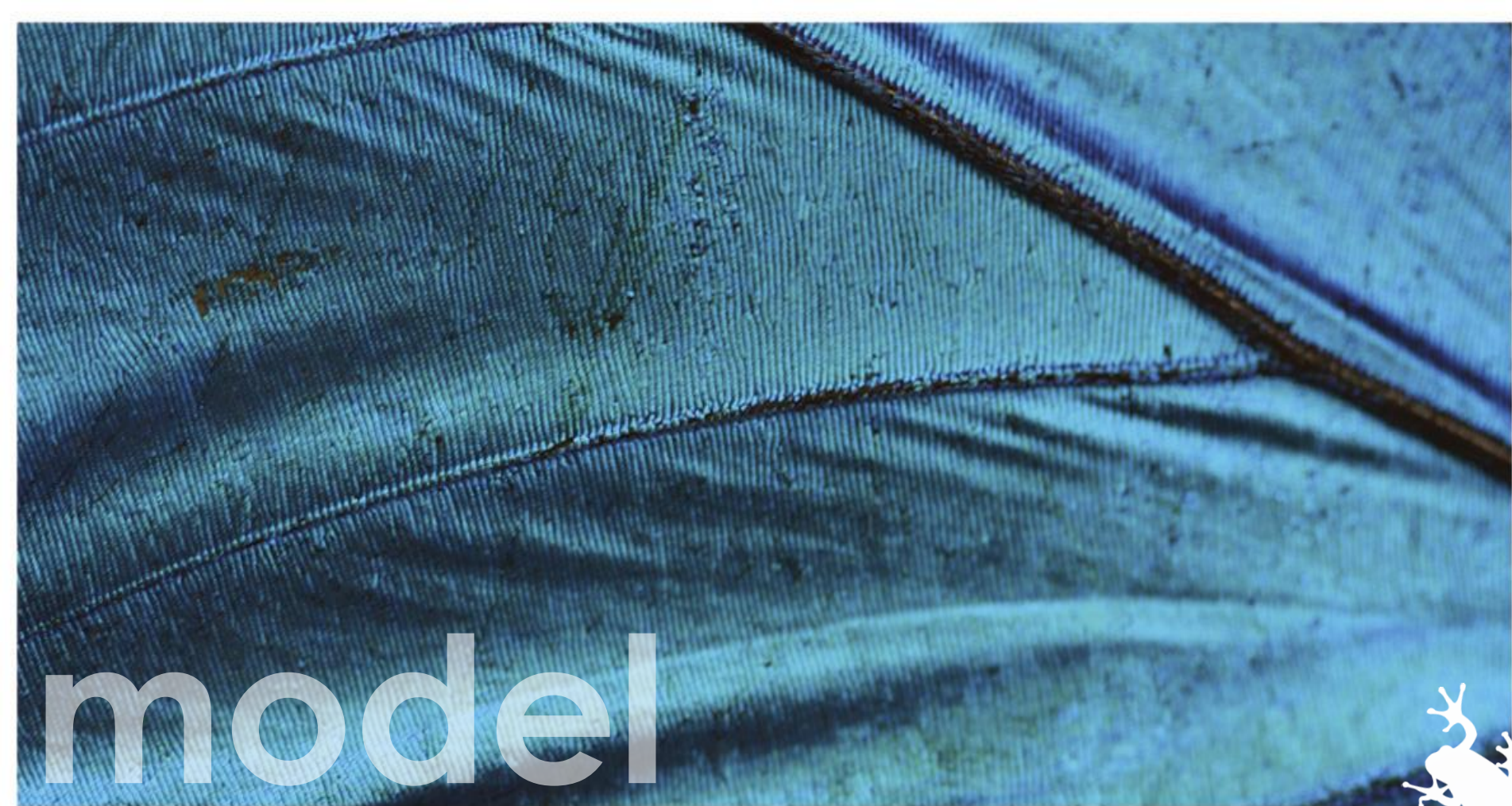


24 minutes to midnight



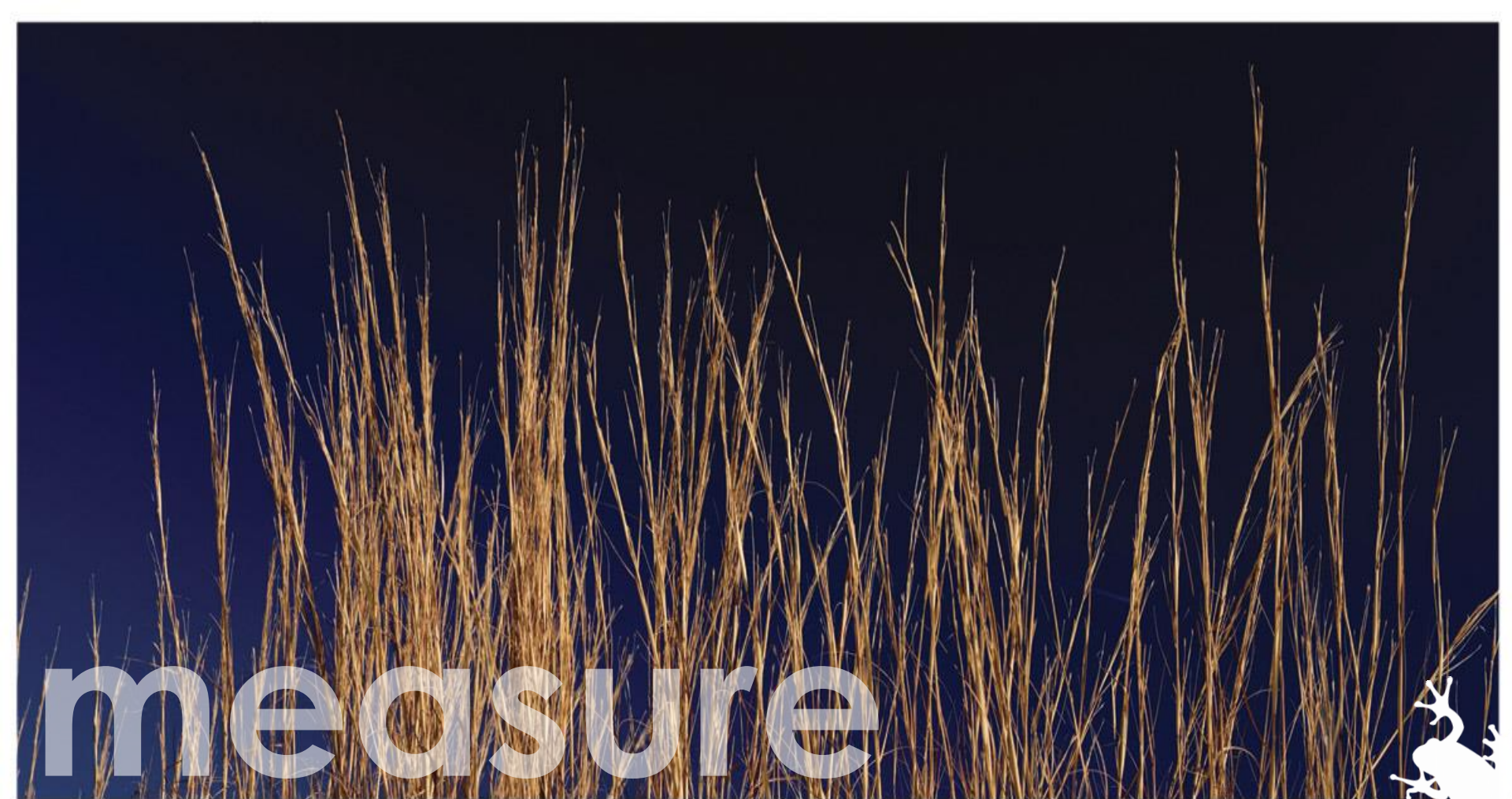


we are nature



model

design **from** nature



measure

design **with** nature

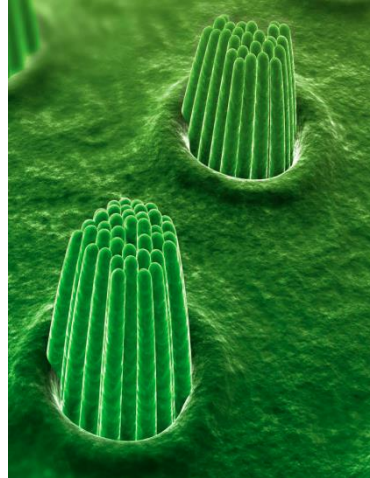
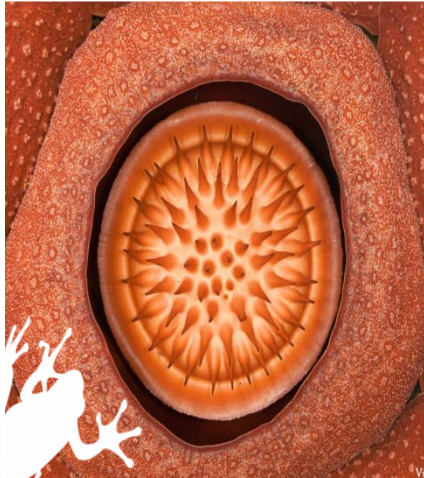
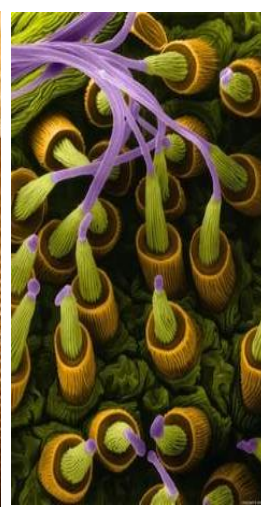
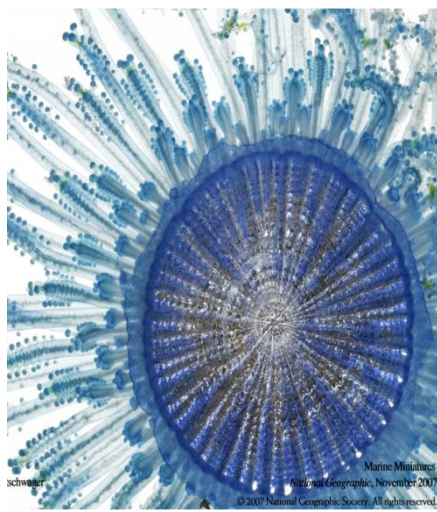


design **for** nature





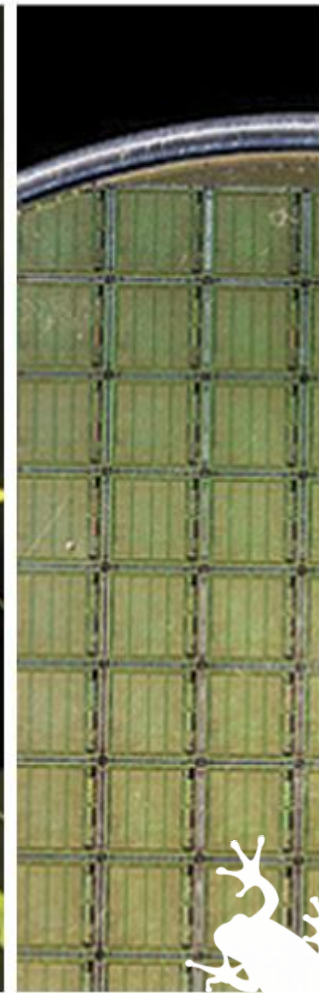
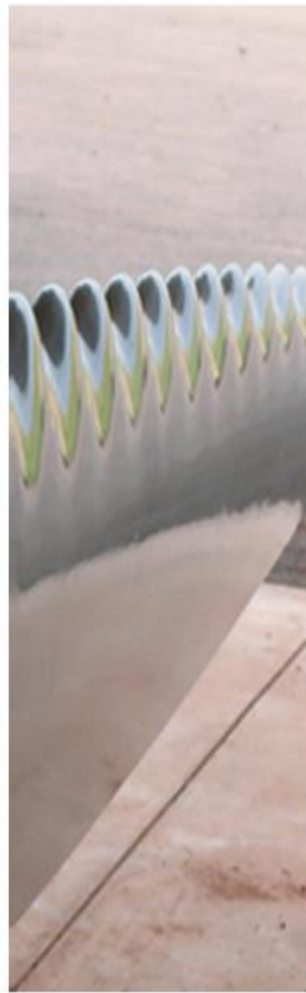
Life is subject to dynamic non-equilibrium



the consummate architects, engineers, designers
(3.8 billion yrs of R&D)

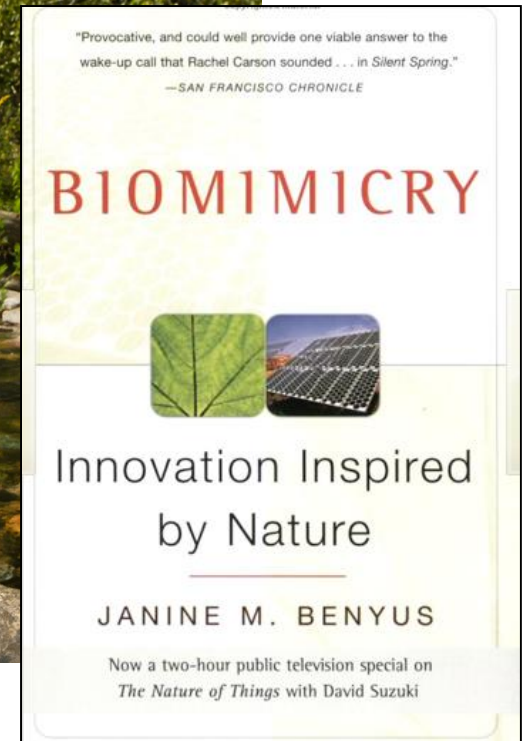


organisms and ecosystems face the same challenges that we humans do



the conscious emulation of nature's genius

What is Biomimicry About?

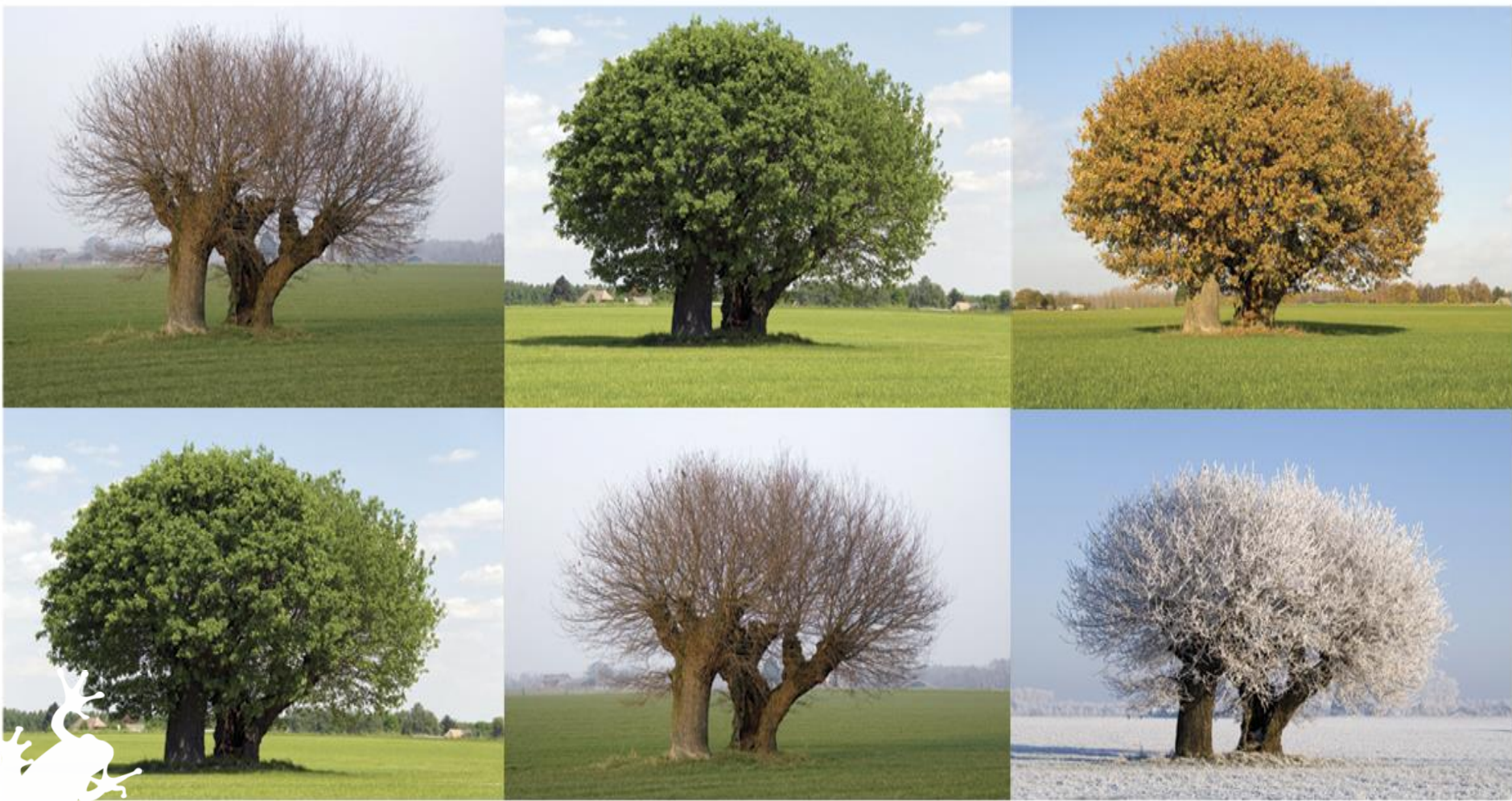




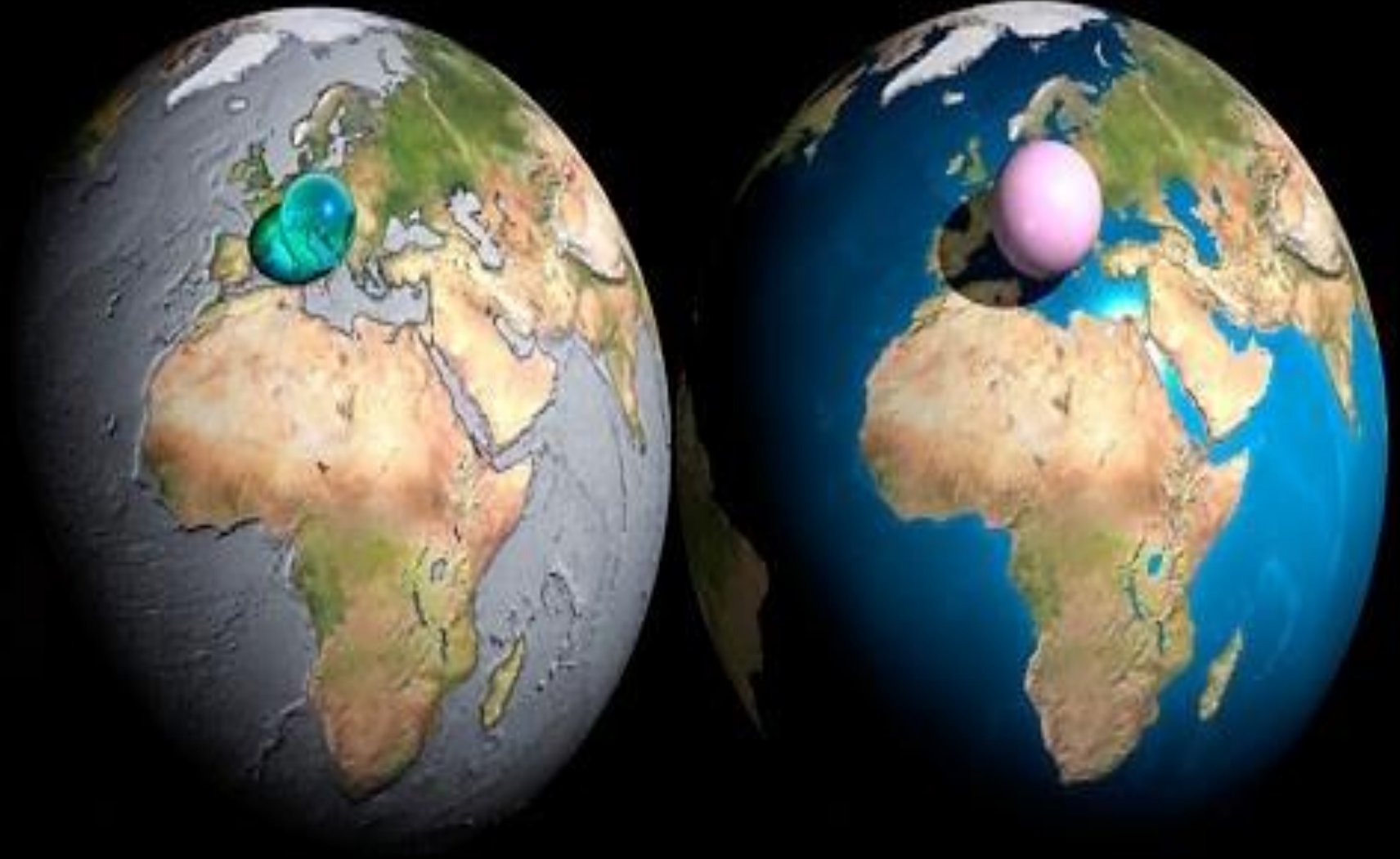
gravity,
sunlight,
water

earth's operating conditions





life on earth is subject to cyclic processes



earth is subject to limits and boundaries



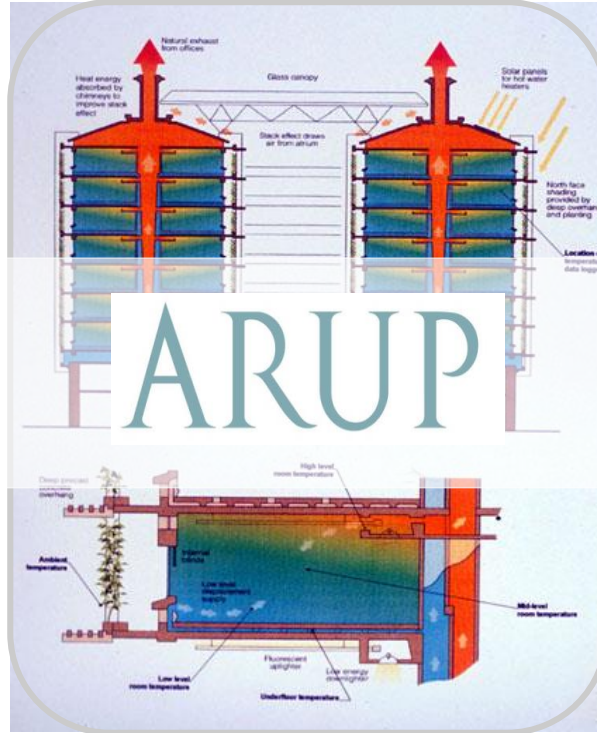
form



process



ecosystem



Eastgate

How does Nature cool with low energy?



Shinkansen bullet train

How does Nature move between substances without disturbance?




Green Cement

How does Nature create hard substances with low energy?

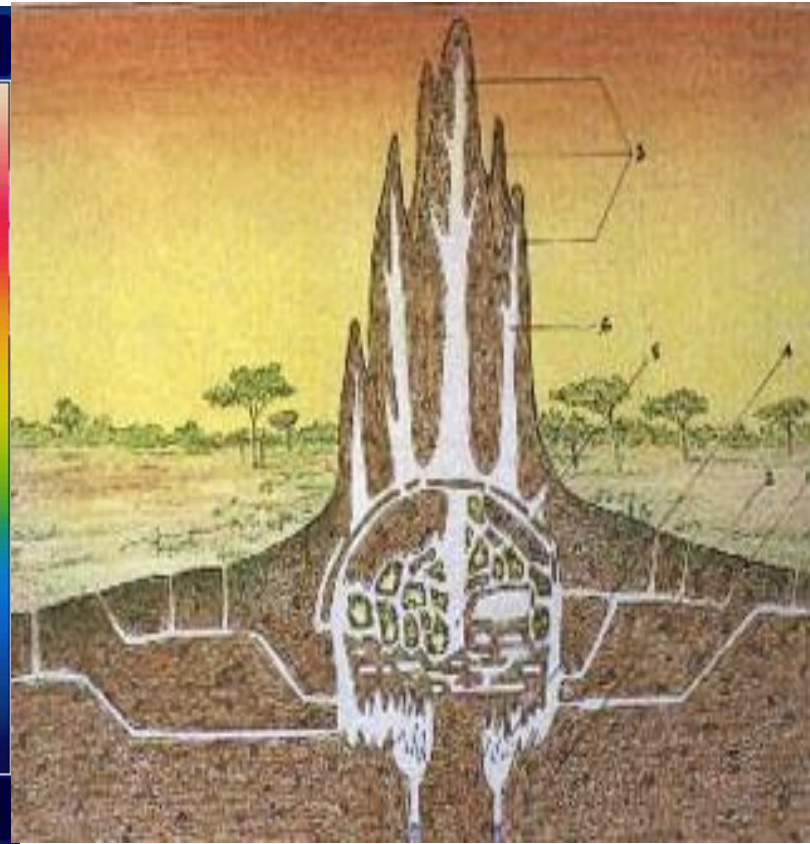
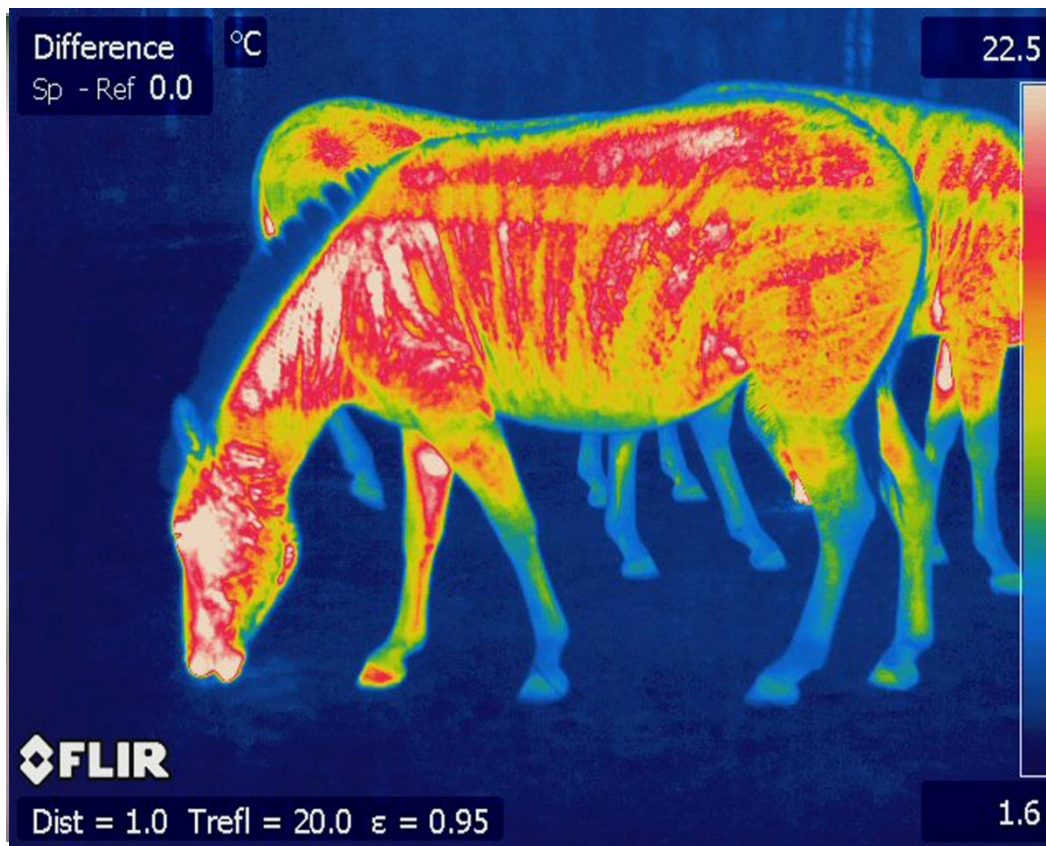


How does Nature create strong materials?



Arnold Glass
Ornilux.com

How does Nature avoid a collision?

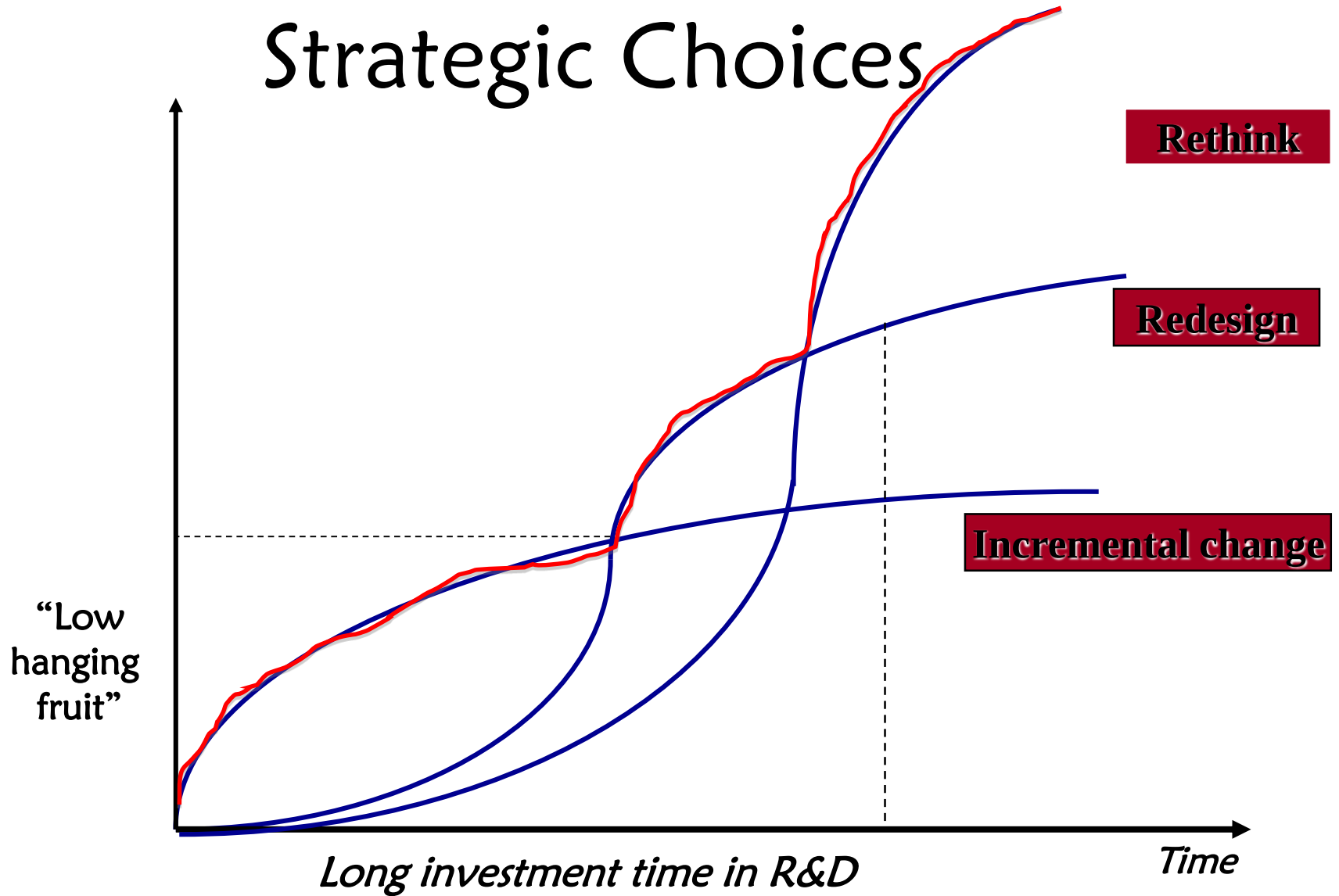


Do you want: **an air conditioner?** (a noun)

Or do you want a design solution that **regulates temperature** (a verb)?

HOW DOES NATURE...regulate temperature?

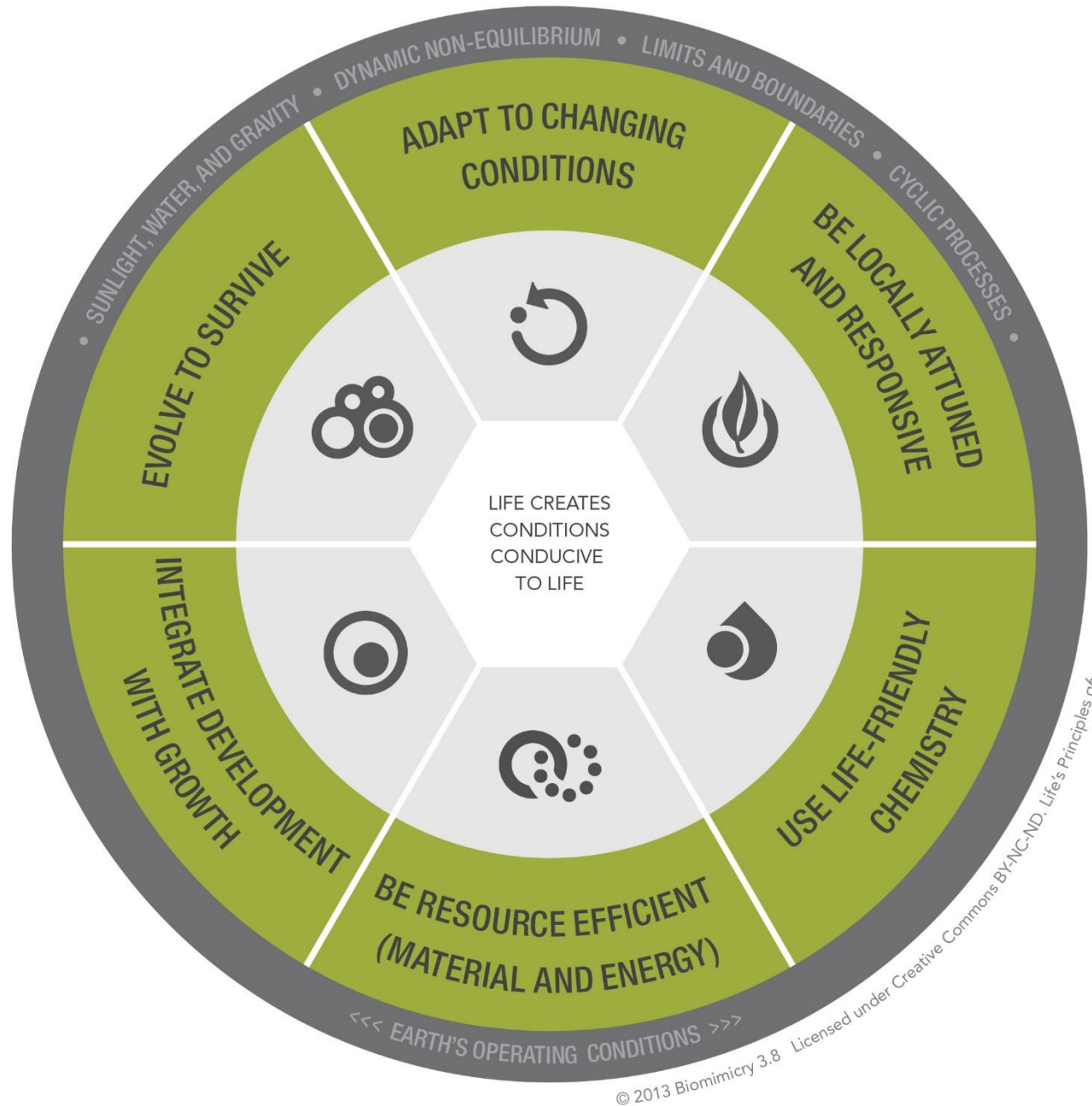
Strategic Choices



From Arthur D Little - Sustainable Industrial Development 1996



Biomimicry strives to emulate general patterns and processes found in Nature.
We refer to these as Life's Principles.





quiet our cleverness

Challenge to Biology

Biomimicry Workshop 2012

- How does Nature collect, use distribute and store water with minimal energy use?
- How does Nature develop communities that thrive?
- How does Nature organize?
- How does Nature adapt to changes in climate?
 - Flood
 - Fire
 - Drought

<http://peakstoprairies.org/library/webinar>



Sustainable Solutions Workshop

March homework

1. Form your groups, decide on a Team name, & determine meeting times to discuss and complete future homework.

Challenge Team #1: How does Nature adapt to seasonal changes in precipitation and drier conditions?

Team Lead for assignment #1: Ina Nez Perce

Challenge Team #2: How does Nature communicate?

Team Lead for assignment #1: Martin Ogle

Challenge Team #3: How does Nature collect, store, and distribute water with minimal energy?

Team Lead for assignment #1: Craig Stevenson

Challenge Team #4: How does Nature manage disturbance?

Team Lead for assignment #1: Raina Turner

Ideas for team meetings

Examples of how to connect:

- Skype or google hangouts
- Conference calls
- Internet share sites
- Adobe Connect or Goto meeting
- Others?

Estimated team meetings each month:

- One session to discuss assignment and assign roles.
- One session to collect, discuss, and finalize assignments.
- More sessions if needed.

Sustainable Solutions Workshop 2015

March homework

2. Readings about viewing Nature

3. Experience Nature: Our ability to find and learn from Nature's mentors depends upon our observation skills.

- Select an iSite
- Use a journal
- Visit at different times of day (throughout year)
- Draw and record – use all your senses

A scenic landscape photograph featuring rolling hills under a clear blue sky. The sun is positioned in the upper left, creating a bright lens flare. The foreground shows a dirt road winding through a field of dry grass and shrubs. The middle ground is filled with dense forests of trees displaying vibrant yellow autumn foliage. The background shows more distant, forested hills.

Questions or comments?