

## Group 3 Notes

Moderator: pull people back to Big picture level.

***Please develop a consensus list of at least 5 priorities an action center could achieve.***

***(More than 5 is permissible)***

***Record Priorities here:***

***[Priorities Powerpoint Slides](#)***

## **Day 1: What does the action center win the Nobel Prize for? 5 Key Ideas/Priorities.**

Nobel Prize:

“Building the platform (network of data and people) to **supercharge the bioeconomy.**”

Applications for:

- a. Agriculture
- b. Livestock: anticipating diseases, invasive species
- c. One Health-Human health and its basis in biodiversity
- d. Biomanufacturing, including pharma
- e. Biosecurity & defense

Sustaining the planet through biodiversity monitoring - has economic implications.

5 Key Priorities:

- Provide the cyberinfrastructure that links the vast types of data involved and people to enable a wide variety of applications and uses.
- Promoting and advocating for the importance of collections on the national and local levels – “PR firm”
  - Getting policymakers on board
  - Engaging key partners & stakeholders to solve problems or create a needed product.
- Cogeneration/co-production of science priorities and needs with different sectors and their stakeholders – listening to various communities
  - Continually documenting the value proposition of biodiversity collections from a broad range of stakeholders agriculture, industry, banking, resource extraction
  - Establish co-production process before forming the Action Center - stakeholder engagement integral to vision, design, operations and implementation.
- Strategic collection:
  - Short-term: 10-year strategic plan for collecting biodiversity in a systematic/holistic way (revised every 10 years).
    - This would be supplementary to the everyday collecting efforts
  - Long-term: Collections plans spread out over 50 or 100 years to ensure long term

- sustainability
- Gap analysis for taxa and geography It would also help to have a better sense of what we have now and where are the gaps? Using AI for gap analysis.
- **United Collections of America:** Promoting this endeavor as a common purpose (the whole is greater than sum of its parts, unified and collaborative approach to biodiversity documentation)
  - The Inventory/Index of Collections: where are they, what do they have, what's lacking?
  - Gap analysis: we need a better sense of what we have now and where are the gaps in types and locations of collections
  - Combination of voluntary data contribution and AI-enabled search (possibly with some provided financial support to incentivize).

### ***IndexHerbariorum* → *IndexOmnium* (index of everything)**

#### **Day 2: Flesh out action center details**

1. Organizational structure (staffing, resources, infrastructure)
2. Activities or actions to pursue (bullets) and the planned outcomes

#### **Core Values:**

- Standard bearer of biodiversity, while supercharging the bioeconomy
- Global collections: *Replacing ownership with stewardship*
  - Collections can move around if needed; Redistribution of power/ownership; Collective responsibility to ensure they don't fall into disrepair
- Network of data, people, places, institutions
- Team Science
- **Vision: Empowering and incentivizing actions into measurable impacts to sustain the planet, its biodiversity, and human wellbeing.**

#### **Organizational structure**

- Freestanding organization supported (at least initially) by funding from NSF and other agencies, but ability to accept funds from other sources, such as foundations and corporations.
- Leveraging expertise: contracts with groups across country—considered every 5 years, with clear articulation of goals (for eg. SI's AI group for AI work; societies such as AIBS/NSCA could serve the policy envisioning/convening role)
- Bring in visionary members from the broader community for the Advisory Board – artists, business professionals, economists, etc.

**Leadership:** Accountable leadership that operates with internal and external input. Potential features:

- Board and Director with fiduciary responsibilities, high level decision making and planning responsibilities.
- Rotating Leadership at the Advisory Board level
- External evaluators/auditors
- Rotator staff positions (1-year terms) from institutions around the country

Departments or Divisions:

Teams/Units	Expertise/People	Outcomes
Cyber and Data Infrastructure	Data scientists Computer scientists	Integrated data network that is infinitely extensible as new data become available – network of data, people and places
Biodiversity Inventory and Monitoring	Collections managers Curators Data scientists	Global collections representing biodiversity of all taxa, biomes, geographical regions, over time. <ul style="list-style-type: none"> <li>● Goal: Indexing 50 or x% of global collections by 2050</li> <li>● <a href="#">Maturity model</a>/AI-enabled gap analysis: how do we know what we know/have?</li> </ul>
Communications and Outreach	Social scientists Policy experts Communicators Artists	<ul style="list-style-type: none"> <li>● Elevating the importance of collections by sharing successes and metrics</li> <li>● Advocacy</li> </ul>
Training and Education	Science of Team Science experts Educators Data Literacy experts (other experts in program mgmt, leadership, etc.)	<ul style="list-style-type: none"> <li>● Collections workforce pipeline</li> <li>● Future data-literate workforce, experts in team science</li> <li>● Professional Development: Training in networking, fundraising, partnership building, communications, leadership development, strategic positioning of collections within broader institutions</li> </ul>

Division of Strategic Partner Engagement	Leadership, Board Staff Stakeholders	<ul style="list-style-type: none"> <li>engaged regional partners</li> <li>strong partnerships with collections and collections data users across the country</li> <li>coordination/alignment with global partners</li> </ul>
Division of Entrepreneurship	Economists Business experts	<ul style="list-style-type: none"> <li>Sustainable business model for the center</li> <li>Fundraising</li> <li>Business park for spinoffs and startups that AC provides resources for</li> </ul>
Discovery and Innovation Hub	Researchers (interdisciplinary)	<ul style="list-style-type: none"> <li>Sparking novel research and use-inspired ideas</li> </ul>
Legal Counsel	Lawyers Policy experts	<ul style="list-style-type: none"> <li>Policy, legal guidance</li> <li>Ethics, decolonization</li> <li>Permitting</li> </ul>
Strategic Plan for Collecting	Leadership, Board Staff Stakeholders	Short (5-10 year) and Long (100 year) term plans for strategic, holistic collecting

Group Discussion Notes:

Prompt: Pick a year in the future....Your Organization wins a Noble Prize.....

Framework: for economics because the world to finally realize that biology/Bioeconomy is very important

Need to engage large part of public

Important for the medical community: biodiversity at large: How organisms evolved over time to help combat disease and viruses.

Topics discussed:

1. Continually identify needs and priorities - gap analysis - stakeholders, educators, public, society
2. One Health
3. Engaging key stakeholders - Bioeconomy
4. Permanent CyberInfrastructure
5. Promoting and advocating collections - PR on national level

## 6. Bioeconomy - Intersection of livestock, insect disease carriers, etc.

Economics structure:

Finance

Health

Education

Agriculture

Defense

Biosecurity

Manufacturers

Broad goal: Show how biodiversity is connected to the economy.

Figure out what distinguishes the collections as being valuable - time data.

If monitoring over long term, you need collections to look back on the materials in order to answer questions differently - the original sample can be referenced.

Are we being too narrow - how do we interact to be part of the big picture?

AC should create Key partnerships: global at UN level

30 by 30 framework/model

Collections provide global coverage through time - have potential to drive decision making/policy making.

Can look at GenBank as a model for infrastructure -it is the standard for sequencing -

Genotype/Phenotype priority - most of public do not know that GenBank exists - can utilize - AC should expand has the capacity to expand on something like

We need to be so much more to so many more - need to catalyze needs of all the communities

Vast amount of data - collection community figures out how the rest of the needs are linked through a cyberinfrastructure

What are your stakeholders needs?

Environmental data has impacts - on plants and animals that have concern for...

Bioinformatic data issues because of storage, digital

No one has emerged as all digital data is related -

Linking the data but in own disciplines

A network of network

ESOL - organization meeting in May  
great first step of extending - what is your scope?

Challenge is limited time of funding.....

Genbank is permanent

Model is problematic when funding cycle are limited to time period (5 yrs)

Biodiversity Genbank - can make a NIH pitch to throw an idea to phenotype

Economic Part.....award is given in economic theory....is there one related to biological interactions....creating a tool for the economy that wouldn't exist...how does that turn into user interaction

Nobel Peace Prize to diversify and broaden .....like natural capital.....

Interesting models in resilient economies, can be used to resilient ecology.... idea of externalized costs

Hard to engage large part of public  
iSample - tech. Infrastructure to linking data

Citizen science

Ecology - understanding what is there and monitoring over time that is provided by the collected specimens

Every site has a collection that they know nothing about....

Historical aspect - citizen science data that can be included  
GBIF ingest all data into e-bird

iNaturalist -  
Carnegie - putting examples of specimens -

Not acting as great sentinels for collecting....

Another consideration of the economic model...the actual organizations themselves....what is their value? Can they be a cure?

Move manufacturers to explore biodiversity to profit.

NGOYA action protocol -  
Companies that incorporate to biodiversity scientists... to talk about how they handle  
global - multinational -efforts

Nobel prize for resilience, for sustaining the earth

economists are intangible assets

Evolutionary biology, ecology, climate change  
impact on biodiversity translate on economic costs

Charismatic specimens - doesn't justify the need for all collections

Monitoring aspect of climate change -  
Systematic collections of globe -

genotype/phenotype argument - if you could go back and look at phenotype data

NSF put out a 10 year national protocol of collecting standards....

Systematic collections?

Special effort placed on areas of concerns

What are the important questions?

Gap analysis in what is needed?

Change mindset to determine priorities - of the entire country

Biological Collections

Try to get basics about all collections/projects

**What organizational structure would your center have?**

- **Staffing**
- **Leadership**
- **Activities the action center would pursue**

**Day 2:**

**Review and prioritize the Action Center Components from the slide decks completed on Day 1 and to expand each component into one or more explanatory paragraphs**

## 5 Key ideas/priorities:

- Provide the cyberinfrastructure that links the vast types of data involved and people to enable a wide variety of applications and uses.
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  - Getting policymakers on board
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## Actions/activities geared towards outcome of Action Center:

### JAG notes:

- Look at collections at a global level, not national, etc.
- Collective responsibility to maintain collections
- Index Herbarium Concept
- AI could be useful if finding collections that aren’t recognized
- Advocate group in each state and making the contacts with the stakeholders/groups within

the state

- Have to engage everyone in order to create global network
- Science communicators within the AC to reach out to
- Bioeconomists
- AI contingent focused on leveraging the function for the needs of the collection community
- Provide expertise that make the connections that already exist - to set up framework
- 6 contracts with group across the country and renew every 5 years. Reassess goals every 5 years
- Policy lead - driven by bioeconomy?
- What will work to bring this all together globally?
- Non for profit with Board? With members are outside the institutions.
- What to do beforehand?
- Vision of success - bring in people to add to vision statement
- Effort of cultivating ideas of moving away from ownership and move towards stewardship.
- Everything the government owns, the public owns -
- Deepening community relationship among science and society
- Finding the gaps in the community to sharing the resources
- Building the tools - business model?
- Not enough of connectivity among the nation - regional approach
- Connecting museums and NEON domains
- Possible Funding: Regional innovation engines around the country
- Collections derived from research -
- NatureServe - how we connect to these groups that have data
- Observational data and collection data
- Bioinformatics
- Training courses that teach how to use data as a source of income
- Subscriptions/donations
- Does NEON charge
- Assignable assets revenue streams
- Emerging pathogens in America
- Create broader sense that "we are in it together"
- Determine priorities
- Economy piece is not central but is encompassed
- Biodiversity is the center of value - are we interested in preserving or rebuilding (restoration): rewilding, revegetation, etc.
- Standard of Biodiversity
- Stated specific goals: Indexing 50% of known global collections
- Monitoring: Change over time, all taxa are all represented
- Priority of determining what will lead to outcomes -
- Need for maturity models: ex. for understanding the Flora of Long Island - How to think about collections and collection success
- Leadership:
  - other structures to consider rather than traditional hierarchy?
  - Rotating leadership?
  - Board members - on rotating basis
  - Team Leader?
  - Board that monitors outcomes/visions, funding, understands the state of things
  - nonprofit model?
  - Accountable leadership with internal and external input
  - rotating members of institutions at AC as mentoring/training
  - Digitization Academy courses focus on training development

Structure:

- Cyberinfrastructure - network of data - global availability of data that is maintained and increased
- Strategic Partner Engagement: Internal and External - Unit involved in engagement with Community, stakeholders, researchers.
- Outreach/Education
- Monitoring -
- Discovery and Innovation Hub - Sparking ideas -
- Division of Entrepreneurship - Goods for service - how many new business types emerged
- Leadership -
- Team Science
- Biodiversity Inventory and Monitoring
- Professional Training/Development
- Legal - Permits,

Core Value:

Stewardship, not ownership;

network of data, people, organizations;

team science; actions have to be measurable (metrics);

ensuring the community has what it needs;

empowering and incentivizing;

Human health - well being

Commitment to Biodiversity;

Bioeconomy - part of entrepreneurship - showing value to overall society.

KNB notes:

- No ownership, we are stewards of the collections
  - Can move if makes sense, less territorialism
- Partnership with universities? Undergraduates in US make connections to collections in order to index them (IndexOmnium)→building workforce by encouraging that networking and gaining important data
- Could we have rotating staff from various institutions to make sure no one area is being overly focused on?
- Overfocused on action center for the data—should be catalyst (action center) for bringing people together in a common interest, connecting communities (data, people, places, institutions)
- United Collections of America: Stewards of the Future
- Diaspora collections—repatriating the data (as a first step)
- Internal and external
- Strategic stakeholder—Natureserve, iNaturalist, GBIF full time jobs to maintain key partners
- Needs to be fundraising and entrepreneurship—NSF will not fund endlessly, must self-generate some income
- Director of entrepreneurship there to ensure you're on the right path, give the first push
- Incentivizing community, providing what is necessary to solve global problems (not necessarily the action center directly solving these problems)
- [side note—collecting project on Long Island to monitor revegetation efforts? Not always biodiversity in its “pristine” form]

- Maturity models—how to assess success→apply to taxa to prioritize known unknowns—how do we know when we know?
  - Gap analysis could be complemented by maturity model
- Rotating subordinate leadership would provide training for future directors of natural history collections