Navigating NSF's Directorate for Biological Sciences (BIO)

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U.S. National Science Foundation

Types of Proposals and Solicitations

Search for funding opportunities: https://new.nsf.gov/funding/opportunities

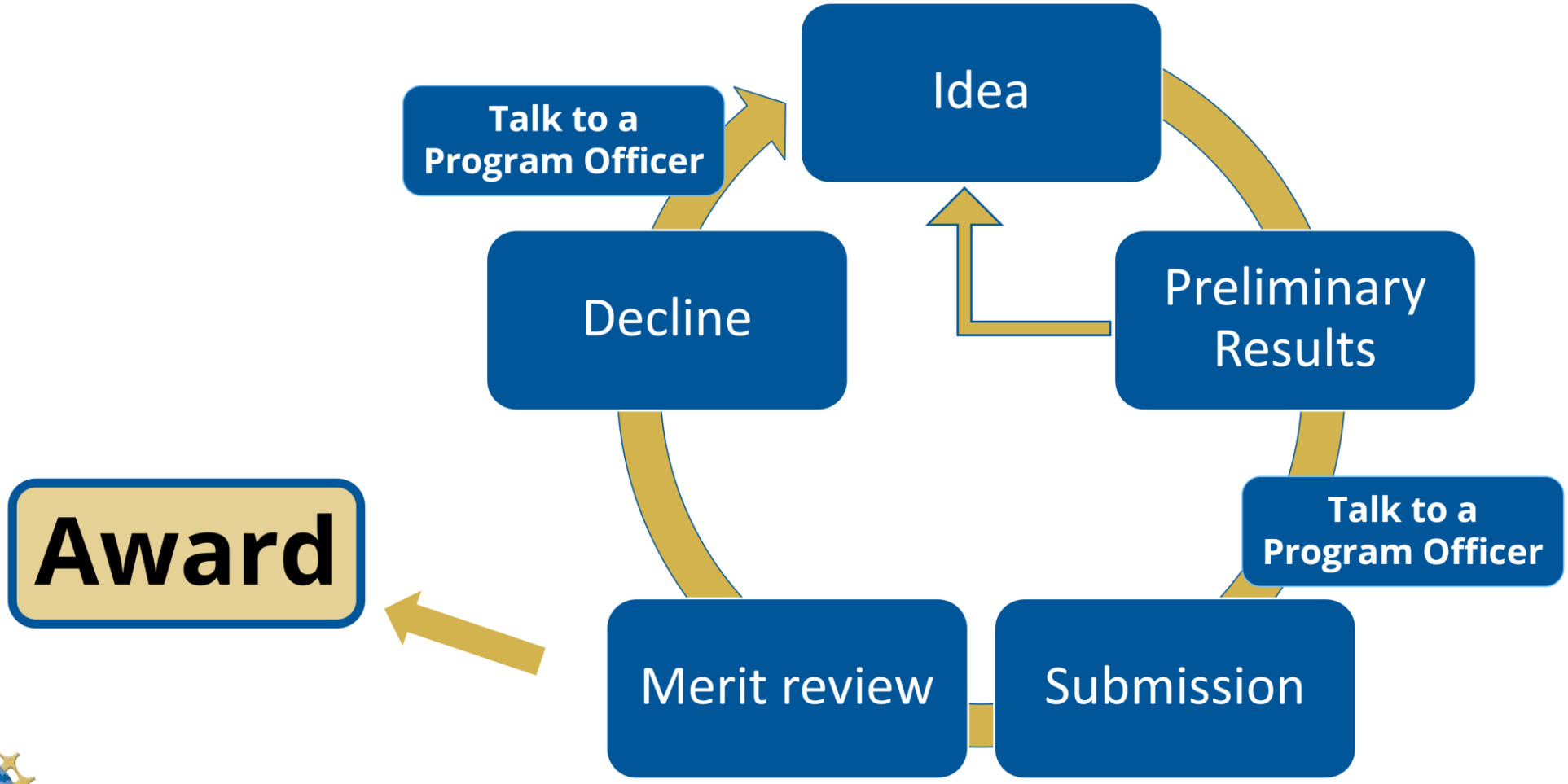
Solicited vs. Unsolicited Proposals

- A solicitation describes a specific funding program, including some that are general in topic (i.e., BIO core programs)
- Other proposals are submitted in response to the general NSF Proposal & Award Policies & Procedures Guide (PAPPG)

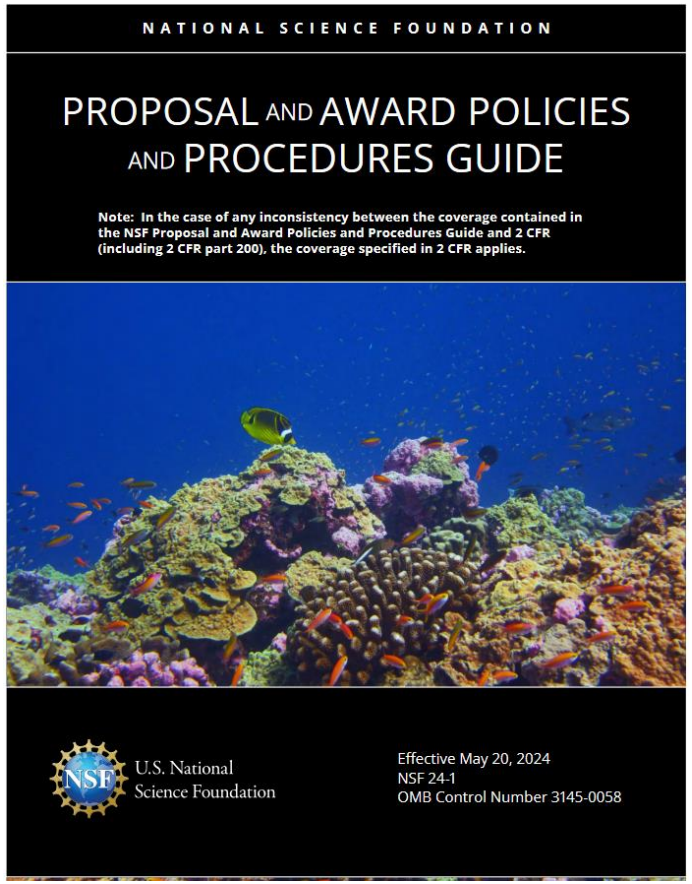
Dear Colleague Letters (DCLs)

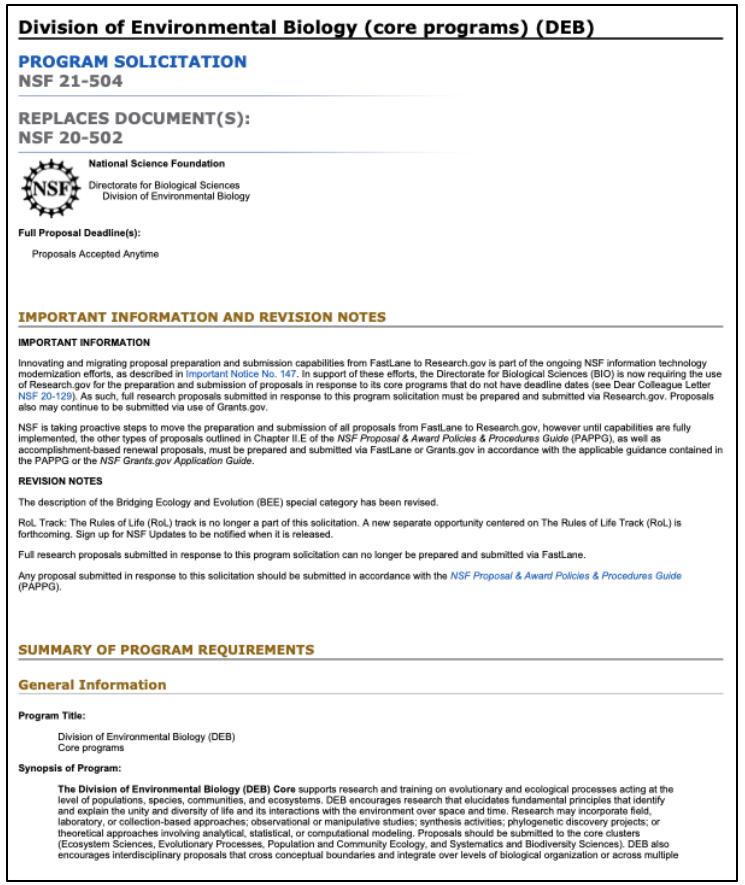
- Highlights NSF's interest in receiving proposals on specified topical areas, planned program changes, or supplement opportunities
- Often includes which specific existing funding programs are relevant to the DCL

Proposal Submission Process: PI Perspective



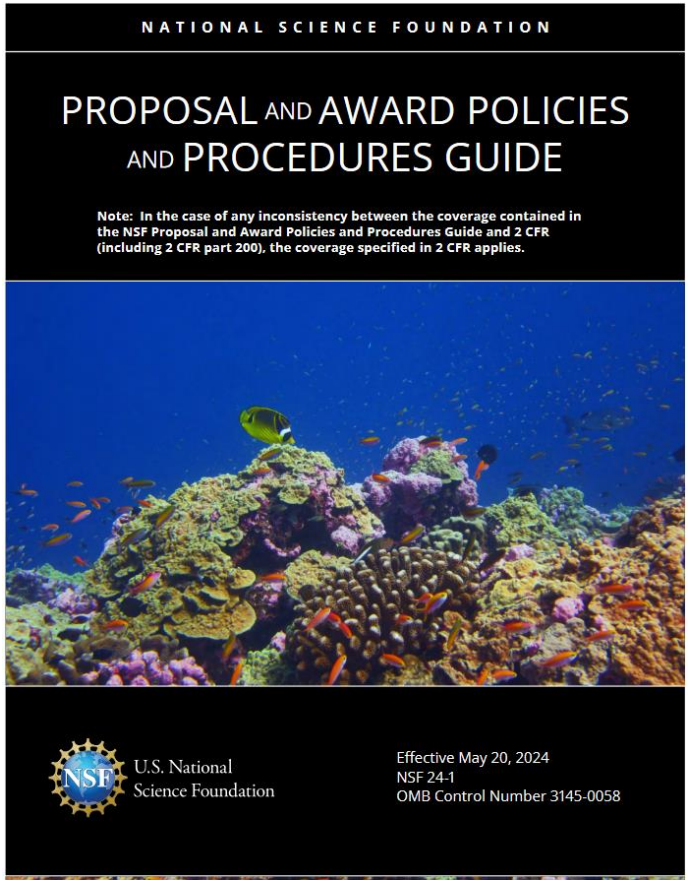
2 Essential Documents





PAPPG + **Solicitation**

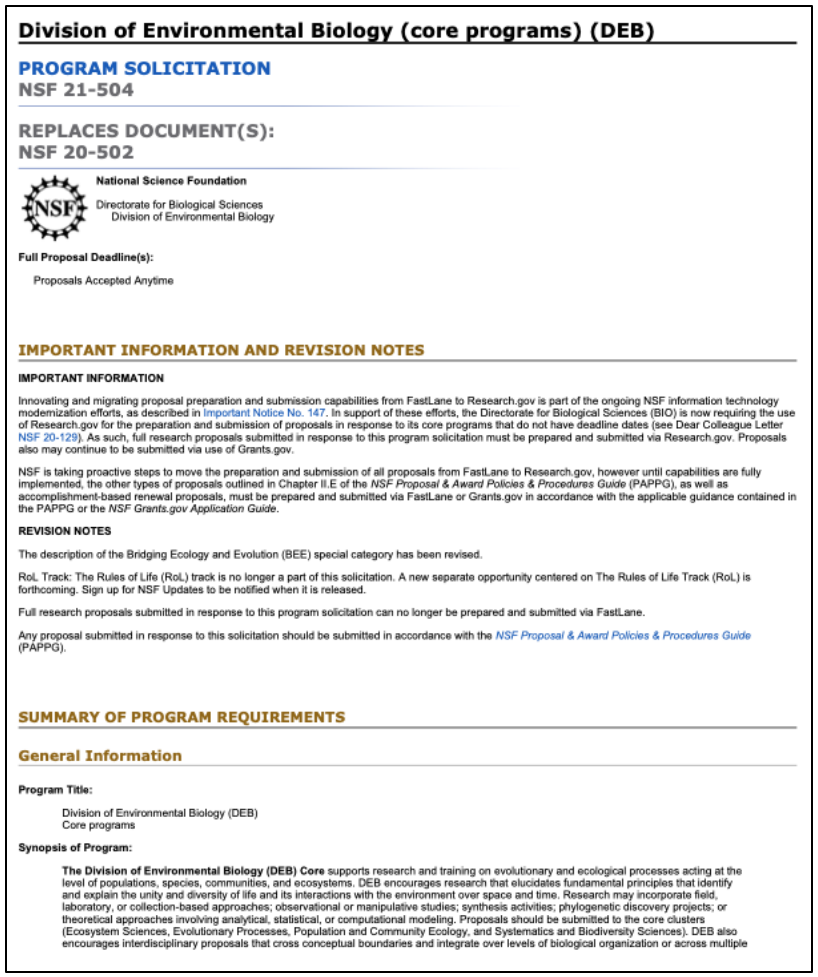
Essential Documents - PAPPG



- Provides guidance for proposal preparation and submission to NSF
  - Who can submit proposals?
  - What is allowed in the budget?
  - Format + required documents
- Describes the merit review process by which proposals will be reviewed
- Outlines reasons why a proposal may be returned without review

NSF 24-1

Essential Documents - Solicitation



Division of Environmental Biology (core programs) (DEB)

PROGRAM SOLICITATION
NSF 21-504

REPLACES DOCUMENT(S):
NSF 20-502

National Science Foundation
Directorate for Biological Sciences
Division of Environmental Biology

Full Proposal Deadline(s):

Proposals Accepted Anytime

IMPORTANT INFORMATION AND REVISION NOTES

IMPORTANT INFORMATION

Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in Important Notice No. 147. In support of these efforts, the Directorate for Biological Sciences (BIO) is now requiring the use of Research.gov for the preparation and submission of proposals in response to its core programs that do not have deadline dates (see Dear Colleague Letter NSF 20-129). As such, full research proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov. Proposals also may continue to be submitted via use of Grants.gov.

NSF is taking proactive steps to move the preparation and submission of all proposals from FastLane to Research.gov, however until capabilities are fully implemented, the other types of proposals outlined in Chapter II.E of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), as well as accomplishment-based renewal proposals, must be prepared and submitted via FastLane or Grants.gov in accordance with the applicable guidance contained in the PAPPG or the *NSF Grants.gov Application Guide*.

REVISION NOTES

The description of the Bridging Ecology and Evolution (BEE) special category has been revised.

RoL Track: The Rules of Life (RoL) track is no longer a part of this solicitation. A new separate opportunity centered on The Rules of Life Track (RoL) is forthcoming. Sign up for NSF Updates to be notified when it is released.

Full research proposals submitted in response to this program solicitation can no longer be prepared and submitted via FastLane.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Division of Environmental Biology (DEB)
Core programs

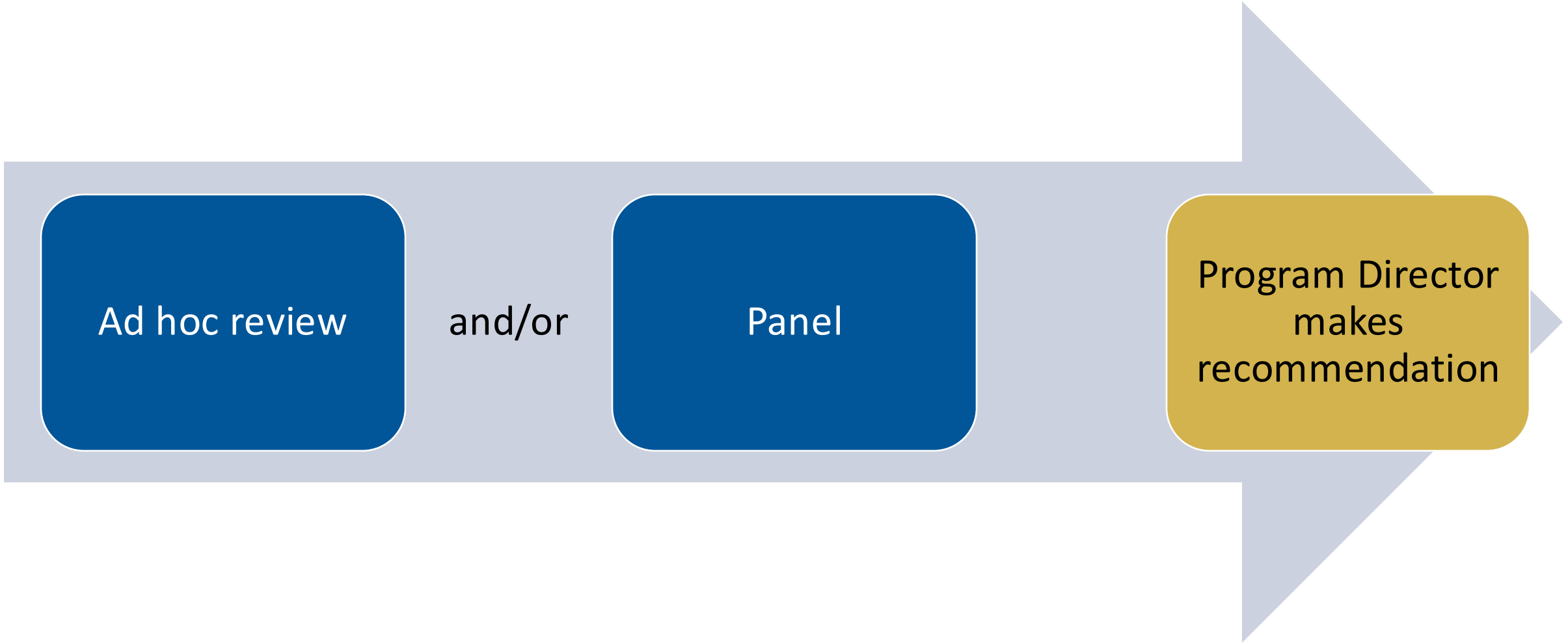
Synopsis of Program:

The Division of Environmental Biology (DEB) Core supports research and training on evolutionary and ecological processes acting at the level of populations, species, communities, and ecosystems. DEB encourages research that elucidates fundamental principles that identify and explain the unity and diversity of life and its interactions with the environment over space and time. Research may incorporate field, laboratory, or collection-based approaches; observational or manipulative studies; synthesis activities; phylogenetic discovery projects; or theoretical approaches involving analytical, statistical, or computational modeling. Proposals should be submitted to the core clusters (Ecosystem Sciences, Evolutionary Processes, Population and Community Ecology, and Systematics and Biodiversity Sciences). DEB also encourages interdisciplinary proposals that cross conceptual boundaries and integrate over levels of biological organization or across multiple

- Deadline / Target Date
  - Firm vs. flexible
  - No deadlines for some programs/proposal types (small grants, workshops, supplements)
- Synopsis
- Program Directors (who to ask questions)
- Eligibility (do you/your institution qualify?)
- Budget limitations
- Do you need a Pre-Proposal or Letter of Intent?
- How much money is available, how many awards are expected?
- **Additional Solicitation Specific Review Criteria**

Remember: BIO Core Programs don't have deadlines!

Merit Review Process



Note that this process varies across NSF

Merit Review Criteria

- **Intellectual Merit (IM):**
  the potential to advance knowledge

- **Broader Impacts (BI):**
  the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

5 Review Elements

IM BI

1. Will the work advance knowledge, and benefit society?
2. Is the work creative or potentially transformative?
3. Is the work plan sensible, and how will they know if they're successful?
4. Is the team qualified?
5. Do they have adequate staff support and facility resources?

Addressing The 5 Review Elements

Build a compelling introduction and project description

RE1: how will this advance science?	• this is basically a statement of the Intellectual Merit. Catch the reader's attention immediately. State up front what you want to do, and why it's exciting and important
RE2: is the work creative/ transformative?	• lay out your specific **hypothesis** to be tested. Explain your compelling observations and the work it will take to develop a hypothesis (a 'pilot' type study) • explain why previous studies have been insufficient to address this research question and how your research methods are different.
RE3: is the work plan clear?	• explain why your field site (or experiment or model) was chosen for the study.

Addressing The 5 Review Elements

Lay out a clear work plan, timeline, and role for each participant

RE3: is the work plan clear?	• draw out a timeline, with tasks • explain how each analysis or model connects to your hypothesis
RE4: is the team qualified to do this?	• clarify the specific role of each investigator + student + postdoc • show that the work is feasible within your timeline
RE3+5: do they have the right lab and collabs?	• include letters of collaboration and money in the budget if needed • use the Facilities, Equipment, & Other Resources section wisely

Broader Impacts: Benefitting Society

Teaching, training, and learning (*undergrads + grad students*)

Broaden participation of underrepresented groups

Build or enhance partnerships (*internationally, or with other agencies*)

Broad dissemination to enhance scientific + technological understanding

Enhance infrastructure (*labs, equipment, + work in developing countries*)

Local impacts (*policies @ state + local level*)

NSF BIO Support Across Career Stages

K-12	**Research Assistantships for High School Students (RAHSS) Supplemental Awards**				
Undergrad	**Research Experiences for Undergraduates Sites (REU Sites)**	**Research Experiences for Undergraduates (REU) Supplemental Awards**	**Research Coordination Networks in Undergraduate Biology Education (RCN-UBE)**	**Opportunities for Primarily Undergraduate Institutions (PUIs)** Research in Undergraduate Institutions (RUI) and Research Opportunity Awards (ROA)	**Opportunities for Minority Serving Institutions (MSIs)** Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP) and Tribal Colleges and Universities Program (TCUP)
Postbacc	**Post-Baccalaureate Research and Training (PBRT) Supplemental Awards**				
Grad	**Graduate Research Fellowship Program (GRFP)**	**National Research Traineeship (NRT)**	**Non-Academic Research Internships for Graduate Students (INTERN)**		
Postdoc	**Postdoctoral Research Fellowships in Biology (PRFB)**				
Early Career Faculty	**Faculty Early Career Development Program (CAREER)**	**Building Research Capacity of New Faculty in Biology (BRC-BIO)**			
Mid-Career Faculty	**Mid-Career Advancement (MCA) Program**				

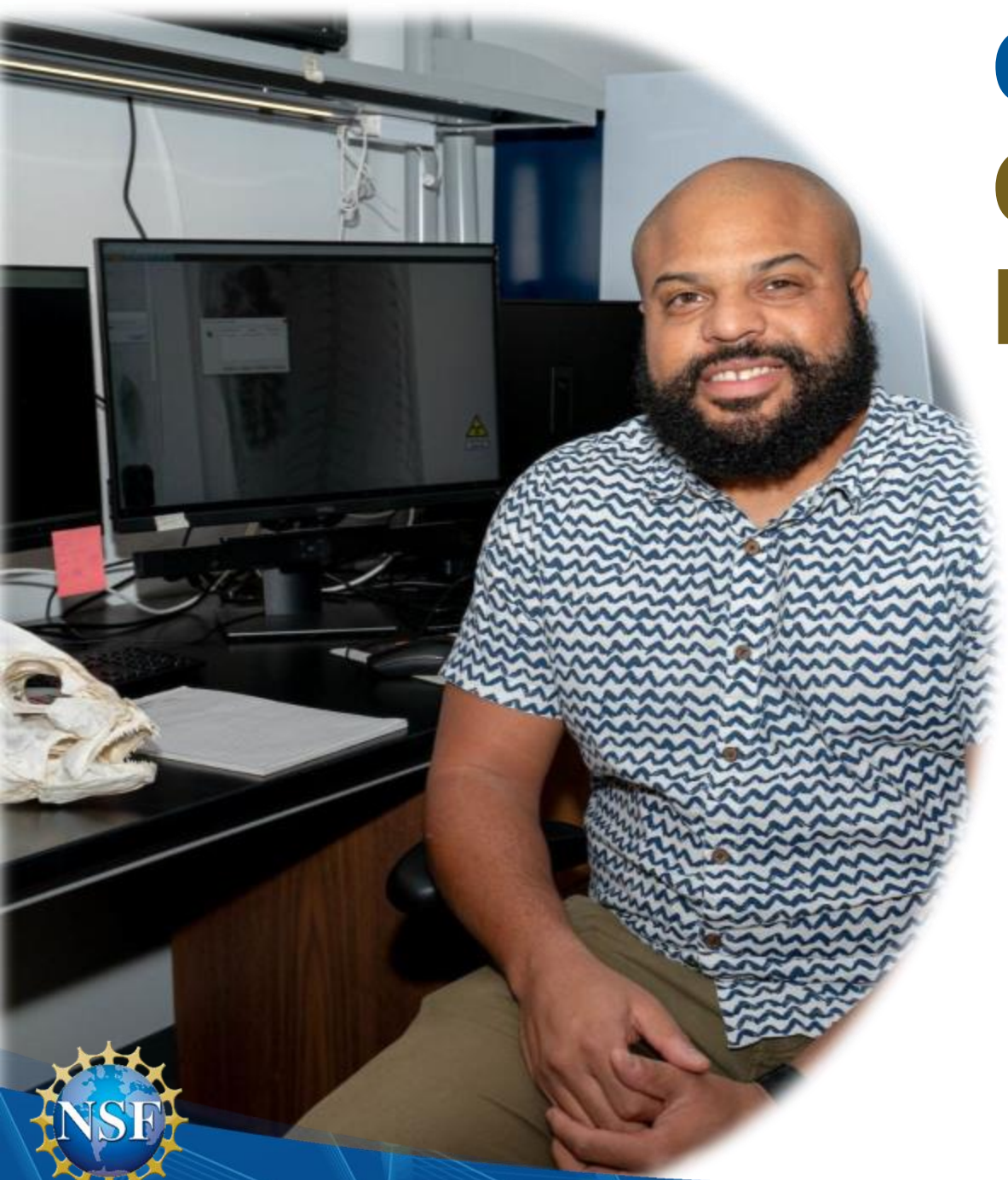
BRC-BIO Building Research Capacity of New Faculty in Biology

Who: PIs must:

- hold at least a 50% tenure-track (or tenure-track equivalent) position as an assistant professor (or equivalent rank)
- be untenured
- have both research and teaching components to their appointment
- be within the first three years of their appointment

What: Proposed projects should enable the establishment of research programs for new faculty to position them to apply for future grants to sustain their research and should also enrich undergraduate research experiences and thereby grow the STEM workforce.

Where: MSIs, PUIs, and other universities and colleges that are not among the nation's most research-intensive and resourced institutions.



CAREER Faculty Early-Career Development Program

Who: Tenure track faculty members at assistant professor level, or equivalent

What: Designed to help junior faculty members develop activities that can effectively integrate research and education within the context of his/her organization.

Where: At any U.S. Institution of Higher Education or non-profit organization

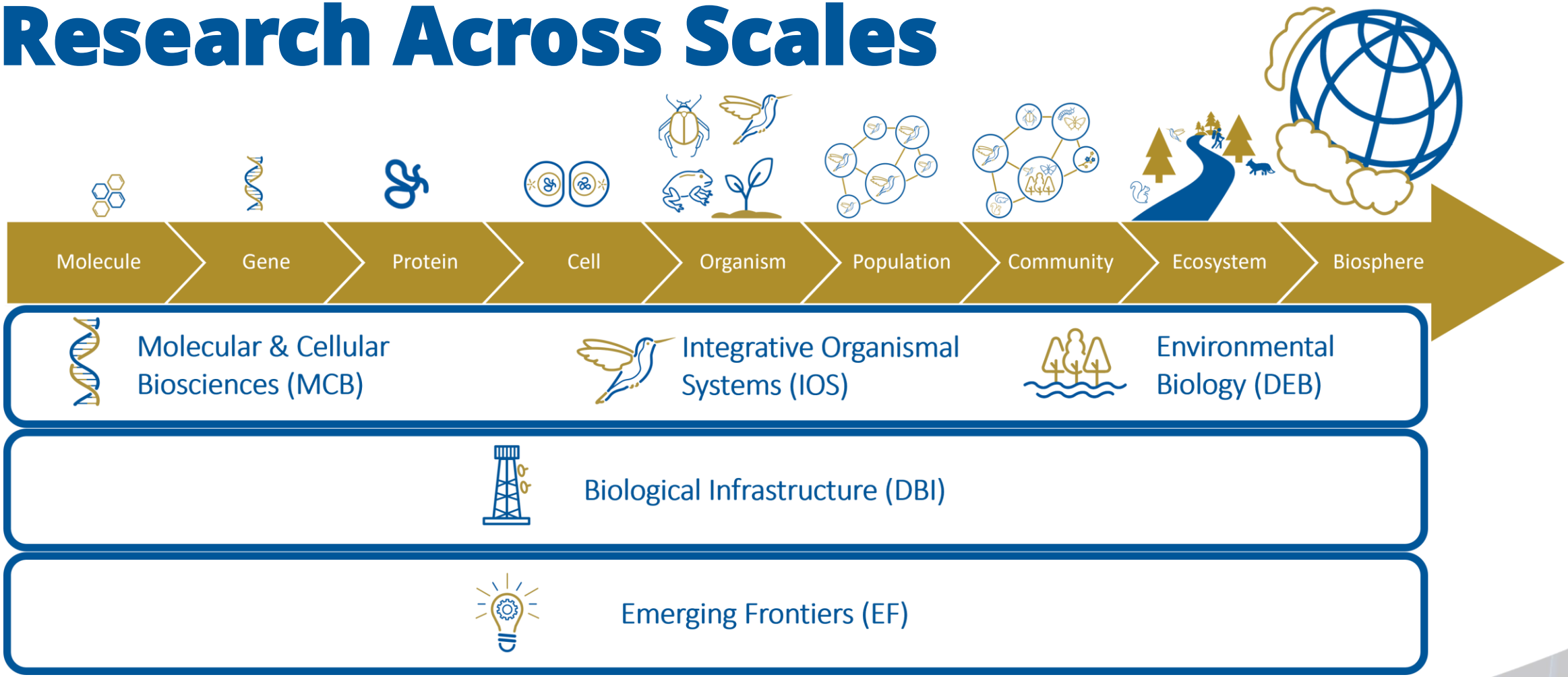
When: July 23, 2025

Credit: Gustavo Raskosky/Rice University

NSF Science Directorates and Offices

- **Directorate for Biological Sciences (BIO)**
- **Directorate for Computer and Information Science and Engineering (CISE)**
- **Directorate for STEM Education (EDU)**
- **Directorate for Engineering (ENG)**
- **Directorate for Geosciences (GEO)**
- **Directorate for Mathematical and Physical Sciences (MPS)**
- **Directorate for Social, Behavioral and Economic Sciences (SBE)**
- **Directorate for Technology, Innovation and Partnerships (TIP)**
- **Office of Integrated Activities (OIA)**
- **Office of International Science and Engineering (OISE)**

How the BIO Divisions Support Research Across Scales



Division of Integrative Organismal Systems

IOS Core Programs

Behavioral Systems
Animal Behavior

Developmental Systems
Plant, Fungal, and Microbial Developmental Mechanisms
Animal Developmental Mechanisms
Evolution of Developmental Mechanisms

Neural Systems
Organization
Activation
Modulation

Physiological and Structural Systems
Symbiosis, Infection, and Immunity
Physiological Mechanisms and Biomechanics
Integrative Ecological Physiology
Plant Biotic Interactions (NSF-NIFA)

Plant Genome Research Program

IOS Special Programs & Tracks

Enabling Discovery through GEnomics **(EDGE)**

Organismal Response to Climate Change **(ORCC)**

Partnership to Advance Conservation Science and Practice **(PACSP)**

Division of Molecular and Cellular Biosciences

MCB Core Programs

Cellular Dynamics and Function

Genetic Mechanisms

Molecular Biophysics

Systems and Synthetic Biology

MCB Special Programs & Tracks

Accelerating Innovations in Biomanufacturing Approaches through Collaboration Between NSF and the DOE BETO- funded Agile BioFoundry
(NSF-DOE/ABF Collaboration)

Building Synthetic Microbial Communities for Biology, Mitigating Climate Change, Sustainability and Biotechnology
(Synthetic Communities)

Reproducible Cells and Organoids via Directed-Differentiation Encoding
(RECODE)

Designing Synthetic Cells Beyond the Bounds of Evolution
(Designer Cells)

Division of Environmental Biology

DEB Core Programs

Ecology
Ecosystem Sciences
Population and Community Ecology

Evolution
Evolutionary Processes
Systematics and Biodiversity Science
PurSUiT and ARTS

DEB Special Programs & Tracks

Biodiversity on a Changing Planet **(BoCP)**	Ecology and Evolution of Infectious Diseases **(EEID)**	Long-Term Ecological Research **(LTER)**	Long-Term Research in Environmental Biology **(LTREB)**	Opportunities for Promoting Understanding through Synthesis **(OPUS)**	Organismal Response to Climate Change **(ORCC)**	Partnership to Advance Conservation Science and Practice **(PACSP)**

Dear Colleague Letters

LIFE DCL: Leveraging Innovations From Evolution

Projects that use comparative approaches to identify evolutionary convergent adaptations to life's challenges and the mechanisms that underlie them. Proposals should include relevance of the proposed work to inform applications towards a sustainable global bioeconomy.

ULTRA-Data DCL: Using Long-Term Research Associated Data

Projects that use/reuse long-term environmental data to advance understanding of ecological and evolutionary questions.

IUSC DCL: Innovative Use of Scientific Collections

Projects that foster Innovative Use of Scientific Collections and/or associated digital data for novel research, education, and training applications within and across STEM disciplines.

Division of Biological Infrastructure

DBI Core Programs

Human Resources

Postdoctoral Research Fellowships in Biology (PRFB)
Research Coordination Networks in Undergraduate Biology Education (RCN-UBE)
Research Experiences for Undergraduates (REU)
Building Research Capacity for New Faculty in Biology (BRC-BIO)
Research Experiences for Teachers Sites in Biological Sciences (BIO-RETS)
Leading Culture Change through Professional Societies of Biology (BIO-LEAPS)

Research Resources

Infrastructure Innovation for Biological Research (Innovation)
Infrastructure Capacity for Biological Research (Capacity)
Sustaining Infrastructure for Biological Research (Sustaining)
Major Research Instrumentation Program

Centers, Facilities, and Additional Research Infrastructure

Biology Integration Institutes (BII)
Center for Advancement of Synthesis of Open Environmental Data and Sciences
Management of Operations and Maintenance of the National Ecological Observatory Network (NEON)
Mid-scale Research Infrastructure-1
Mid-scale Research Infrastructure-2

Writing a one-page project summary (a.k.a. concept outline)

One-pagers are the easiest way to ask for helpful feedback from NSF Program Directors!

- Is my proposed research a good fit to your NSF program?
- Are there other programs I might consider?

Please Note: Program Directors will help you figure out the best "home" for your ideas at NSF, but they will not provide the type of detailed feedback on your proposal that you would expect from a mentor or colleague.

Writing a one-page project summary (a.k.a. concept outline)

A one-pager often helps you organize your thoughts.

The format should mirror the Project Summary for an NSF proposal:

- Brief overview
- Statement of intellectual merit
- Statement of broader impacts of the proposed work
- Relevance to any solicitation-specific review criteria mentioned in the program solicitation

Tips for writing one-pagers

WRITE TO A SPECIFIC PROGRAM

- One-pagers should be specific to the program.
- Read the solicitation thoroughly and be sure that your project aligns with the scope of the program.
- If you aren't sure if it is a fit, point this out when you write to the Program Director and note any other programs you might be considering.

Tips for writing one-pagers (cont.)

USE YOUR SPACE STRATEGICALLY There is a lot to fit on one page!

- Good one-pagers include your overarching question, the big picture of your research area and knowledge gaps you plan to address, your hypothesis, brief descriptions of specific aims, and any preliminary data.
- Keep background information to a minimum; briefly describe why the research is important and how it advances current knowledge.
- **Use most of the page to explain your hypotheses and your approach(es) to addressing them.**

Tips for writing one-pagers (cont.)

ADDRESS SOLICITATION-SPECIFIC CRITERIA

- Many programs evaluate proposals using additional solicitation specific review criteria described in the program solicitation. To be competitive, this additional information must be addressed in your proposal.

DON'T FORGET BROADER IMPACTS

- Don't forget the Broader Impacts in your one-pager. They are part of the review criteria, so address them without providing extensive details.

Tips for writing one-pagers (cont.)

BE PATIENT WHEN AWAITING FEEDBACK

- Responses to one-pager queries typically take a week as they may need to be discussed in program meetings and/or sent to Program Directors in other programs.
- If you don't hear back within two weeks, please send a gentle reminder; we all get busy and don't want things to fall through the cracks!

FOLLOW UP AFTER YOU GET FEEDBACK

- After you hear back, you may want to consider scheduling a meeting with a Program Director to ask specific clarifying questions about the solicitation, your proposal ideas and preparation, and about other NSF funding opportunities that may be appropriate for your project.

Follow Us!

Learn more about funding opportunities, NSF proposal and award system updates, and preparing proposals.

NSF BIO News by Email

https://service.govdelivery.com/accounts/USNSF/subscriber/new

BIO Blogs

BIO Buzz (OAD): https://oadblog.nsfbio.com/

DBI: https://dbiblog.nsfbio.com/

DEB: https://debblog.nsfbio.com/

IOS: https://iosblog.nsfbio.com/

MCB: https://mcbblog.nsfbio.com/

BIO Virtual Office Hours

Topics announced monthly on the BIO Division Blogs.

DBI: 3rd Tuesday 3-4 p.m.

DEB: 2nd Monday 1-2 p.m.

IOS: 3rd Thursday 1-2 p.m.

MCB: 2nd Wednesday 2-3 p.m.

Join Us!

Become a Proposal Reviewer

- We need your advice on the merits of proposed projects!
- Learn about NSF's peer review process and strategies for writing strong proposals.

Share research and broader impacts successes with your program directors and on social media! #NSFstories

NSF BIO Contact Information

https://new.nsf.gov/staff/org/bio

NSF at SICB

join our roundtables now and/or
sign up to meet with us one-on-one at our booth!

Division of Integrative Organismal Systems (IOS)

Behavioral Systems: Jodie Jawor, Kim Hoke
Neural Systems: Melissa Coleman, Paul Forlano
Physiological and Structural Systems: Kathy Dickson, Ted Morgan
Science Advisor: Julie Kellner

Division of Environmental Biology (DEB)

Evolutionary Processes: Matthew Heron