

NASEM Space Studies Board and Board on Physics and Astronomy Joint Meeting Fall 2024

Bipartisan Commission on Biodefense Interest in Astrobiodefense

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Executive Director





BIPARTISAN COMMISSION ON BIODEFENSE

- Privately funded
- Established in 2014
- Comprehensively assesses the state of U.S. biodefense
- Issues recommendations to foster change



Governor Tom Ridge
Co-Chair



Secretary Donna Shalala
Co-Chair



Senator Tom Daschle
Commissioner



Congressman Fred Upton
Commissioner



Congresswoman Susan Brooks
Commissioner



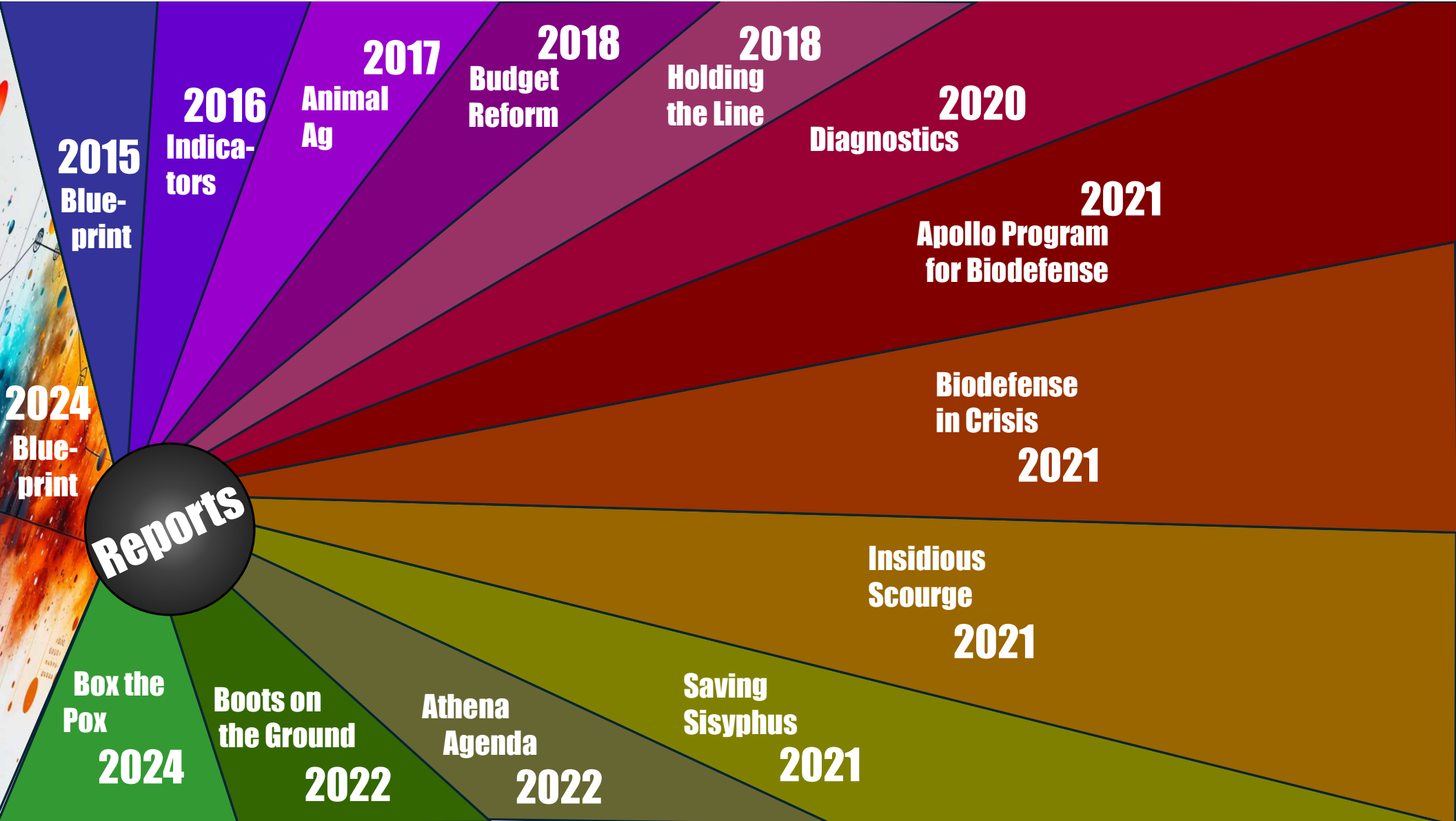
Congressman Jim Greenwood
Commissioner



The Honorable Peggy Hamburg
Commissioner



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Reports

2015
Blue-print

2016
Indica-tors

2017
Animal Ag

2018
Budget Reform

2018
Holding the Line

2020
Diagnostics

2021
Apollo Program for Biodefense

2021
Biodefense in Crisis

2021
Insidious Scourge

2021
Saving Sisyphus

2022
Athena Agenda

2022
Boots on the Ground

2024
Box the Pox

2024
Blue-print



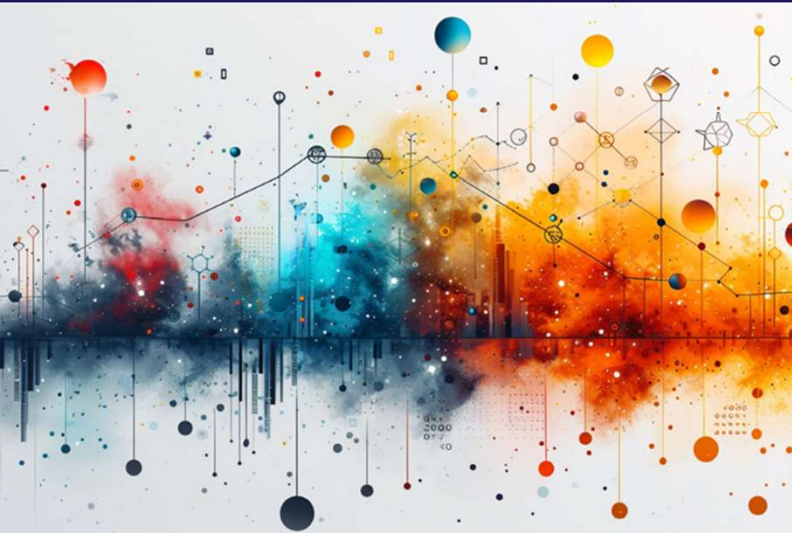
**Blueprint
for
BioDefense**

THE NATIONAL BLUEPRINT FOR BIODEFENSE

IMMEDIATE ACTION NEEDED TO
DEFEND AGAINST BIOLOGICAL THREATS

REPORT OF THE BIPARTISAN COMMISSION ON BIODEFENSE

April 2024



Recommendation 15: Defend against astrobiological threats.

ACTION ITEMS:

- a. **Authorize the Office of Planetary Protection.** Congress should amend the National Aeronautics and Space Act of 1958 (P.L. 85-568) to authorize the NASA Office of Planetary Protection to (1) prevent forward contamination (contamination of celestial bodies by Earth terrestrial organisms, organic materials, and organic volatile materials carried or released by spacecraft); and (2) prevent backward contamination (contamination of Earth and the Moon by extraterrestrial life, organisms, organic materials, organic volatile materials, and bioactive molecules in returned samples and spacecraft from celestial bodies) in accordance with the US Space Priorities Framework.⁹⁰
- b. **Establish a planetary biodefense board.** The Administrator of the National Aeronautics and Space Administration should establish a Planetary Biodefense Board, co-chaired by the NASA Planetary Protection Officer and Chief Health and Medical Officer, to (1) review standards and requirements for sample return missions; (2) inform the National Space Council and other parts of the White House of biodefense issues and concerns; and (3) collaborate with DOD, HHS, DHS, Federal Aviation Administration, and other federal departments and agencies on astrobiological research and other efforts.

Commission OpEd,
April 12, 2024

**Is the US ready for
extraterrestrials? Not if
they're microbes: How
to defend Earth from
space bugs**

- By Donna Shalala and
Susan Brooks
- Published in the
Houston Chronicle



Extra-terrestrial Life

Microbial life on other planets poses significant risks to public health and national security

Mutations in Space

Microbes are likely to mutate in space conditions and could cause harm to Earth

Biological Attacks in Space

Possibility of biological attacks upon contained environments

Compromise and Disruption

Extraterrestrial biological threats could compromise health and safety of space travelers and disrupt space exploration and discovery



Potential Threats to National and Global Security

Need to Replace BioWatch

BioWatch is a non-functional biodetection system distributed throughout the United States by the Department of Homeland Security

Originally for Space Flight

E-Nose developed originally to detect airborne contaminants in crew cabins

First nanotechnology-based device in space in 2007

Modified Three Times

2012 – to detect chemical leaks and attacks (DHS)

2018/2019 – to monitor deep space and help protect warfighters

2020 – to detect COVID-19 (HHS)

Technology Transfer Mandate

Fulfills congressional intent, or would if DHS, DOD, and HHS would pick up the technology and implement it to fulfill their own missions



Commission Interest : Biodetection

Built Environments

Need to reduce pathogen transmission in built environments

Anti-microbial Coating

To inhibit the growth of microbes to protect crew members and equipment on spacecraft



Commission Interest: Indoor Air Quality

Environmental Monitoring

Routine environmental monitoring of ISS air, surfaces, and water systems

Background Activity

Ensures microbiological safety and compliance

Critical to eliminating over-dependence on vaccines, masks, etc., during pandemics of unknown or unclear etiology



**Commission
Interest :
mcm
Develop-
ment**

**Micro-
gravity and
Virulence**

Increased virulence in microgravity

Requires research to develop MCM and enable continued space exploration

**Research &
Develop-
ment**

R&D to develop MCM required to enable continued space exploration

**In-Flight
Investi-
gations**

Identifies key components of organisms that elevate virulence, enabling the development of targeted treatments and therapeutics

**Towards
Eradication**

The outcomes of these research efforts could lead to the eradication of pathogens on Earth, recognizing that the environments are different



Commission Interest : Personal Protective Equipment

N95 Replacement

Designed to meet or exceed N95 performance

Multiple Designs

Designed for different situations

Especially important when trying to ensure population coverage and compliance

Compatible

Compatible with existing cartridge filters

In keeping with current medical supply chains

Streamline & Simplify

This PPE far exceeds standard that is widely available and possibly compromised

Could be the key to widespread compliance

Congressional Champions

- Rep. Carbajal (D-CA)
- Rep. Crow (D-CO)
- Rep. Horsford (D-NV)
- Rep. Moulton (D-MA)

- Rep. Waltz (R-FL)
- Sen. Kelly (D-AZ)
- Sen. Wicker (R-MS)
- Sen. Cramer (R-ND)



Policy Proliferation

- Strategies
- Policy Directives
- Study Directives
- Doctrine
- White House Fact Sheets
- Vision Documents
- Reports
- Memos
- Treaties
- International Agreements
- Statements
- Speeches
- Statute
- Grey Literature
- White Literature
- Classified documents

White House

- National Space Council
- National Security Council
- Domestic Policy Council
- National Economic Council
- Office of Management and Budget
- Office of Pandemic Preparedness and Response Policy
- Office of Science and Technology Policy

Departments & Agencies

- NASA
- Department of State
- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Health and Human Services
- Department of Homeland Security
- Department of the Interior
- Department of Justice
- Department of Labor
- Department of Transportation
- Federal Aviation Administration
- Federal Communications Commission
- National Oceanic and Atmospheric Administration
- National Telecommunications and Information Administration

Committees

House

- Appropriations
- Armed Services
- Science, Space and Technology
- Transportation and Infrastructure
- Permanent Select Committee on Intelligence

Senate

- Appropriations
- Armed Services
- Commerce, Science and Transportation
- Select Committee on Intelligence

Plus the Committees with jurisdiction over all of the departments and agencies on the previous slide



**ASTRO-
BIO-
DEFENSE**



**BIPARTISAN
COMMISSION
ON BIODEFENSE**

It's not over...