



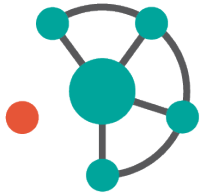
# USGS - Next Generation Water Observing System Technology Transfer Opportunities

November 14, 2019

USGS Office of Policy and Analysis

USGS Water Mission Area, Water Observing Systems Program

# Request for Information



- RFI issued on Oct. 17 on “Partnership Opportunity with USGS Next Generation Water Observing System”



- Goal: seek help in identifying promising technologies or interested partners capable of jointly developing water observing technologies that can integrate with USGS monitoring



- Request: briefly describe the proposed technology, including the type of data collected, potential applications for the data, and the technology readiness / product maturity level by Dec. 31 to [gs-w\\_ngwos\\_rfi@usgs.gov](mailto:gs-w_ngwos_rfi@usgs.gov).



# Contract Opportunities Are Here!!!

Effective November 12th, FBO.gov is retired, and Beta.SAM.gov is now the authoritative source for Contract Opportunities. Visit the Learning Center for videos, FAQs and other information!

[More alerts](#)



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## Contract Opportunity

- General Information
- Classification
- Description
- Attachments/Links
- Contact Information
- History

What you think matters!

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# Partnership Opportunity with USGS Next Generation Water Observing System

ACTIVE

Contract Opportunity

Notice ID  
11\_7\_2019\_OPA

### Related Notice

Department/Ind. Agency  
 INTERIOR, DEPARTMENT OF THE  
 Sub-tier  
 US GEOLOGICAL SURVEY  
 Office  
 OFC OF ACQUISITION GRANTS-NATIONAL

## General Information

Contract Opportunity Type: Special Notice (Original)  
 All Dates/Times are: (UTC-05:00) EASTERN STANDARD TIME, NEW YORK, USA  
 Original Published Date: Nov 07, 2019 03:11 pm EST  
 Original Response Date: Jan 01, 2020 03:59 am EST  
 Inactive Policy: Manual  
 Original Inactive Date:  
 Initiative:  
 o None



# Topics / Speakers

1. **Next Generation Water Observing Systems** (Chad Wagner, Water Observing Systems Program Coordinator, USGS Water Mission Area)
2. **Technology Transfer** (Esther Eng, Tech Transfer Specialist, USGS Office of Policy and Analysis)
3. **Patents and Licensing** (James Mitchell, Technology Enterprise Specialist, USGS Office of Policy and Analysis)

# Advanced Water Models Require High-Density Data

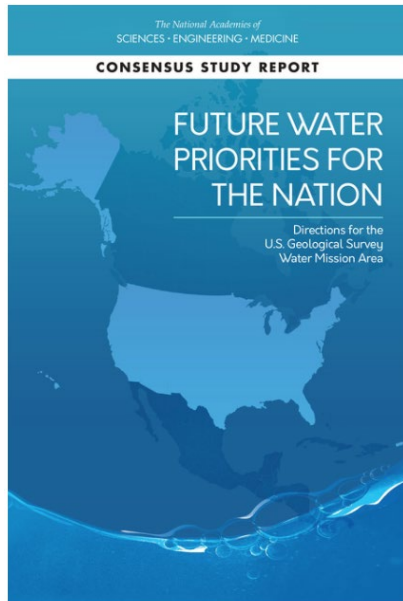
***Nearly 30 million stream reaches in U.S.***

USGS operates about 10,000 streamgages  
(about 3/100 of one percent of reaches)

- Modern models require high-density data describing all of the major hydrologic characteristics that the models represent, such as streamflow, evapotranspiration, water storage in snowpack, soil and groundwater, and many others
- The density of our current monitoring networks limit the ability to accurately understand and predict water-resource conditions with these advanced models (i.e. National Water Model)

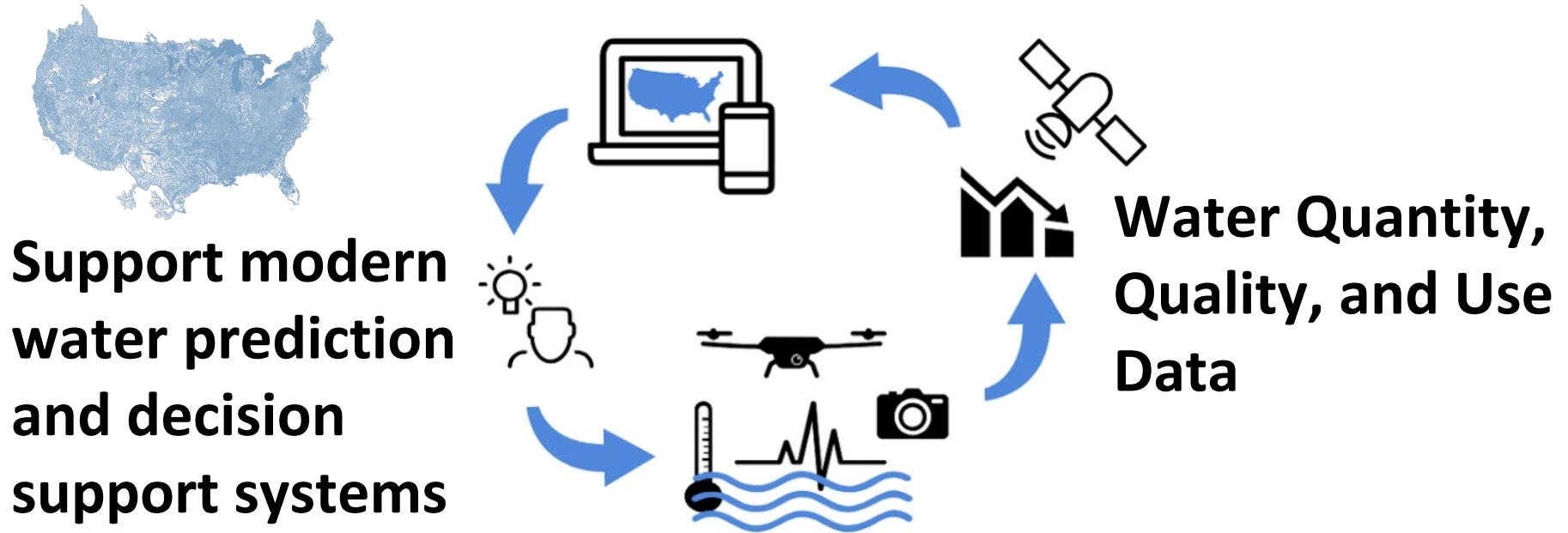
# National Academy of Science - Future Water Priorities for the Nation

Over the next 25 years, new opportunities will emerge that will allow for observations that.....



- come from an array of sources,
- are more affordable,
- offer data from previously inaccessible locations,
- provide “fit-for-purpose” temporal and spatial resolution, and
- deliver continuous measurements of new parameters.

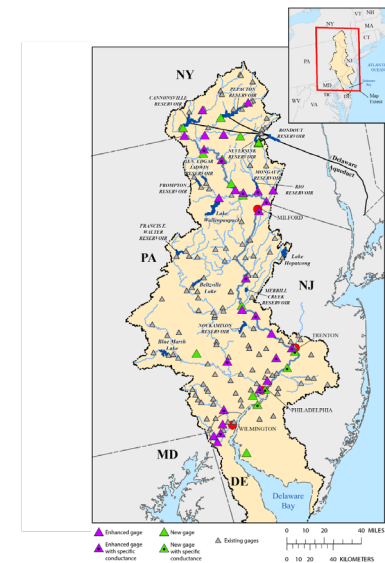
# Next Generation Water Observing System (NGWOS)



Integrated set of fixed and mobile monitoring assets in the water, ground, and air

# NGWOS Design Strategy

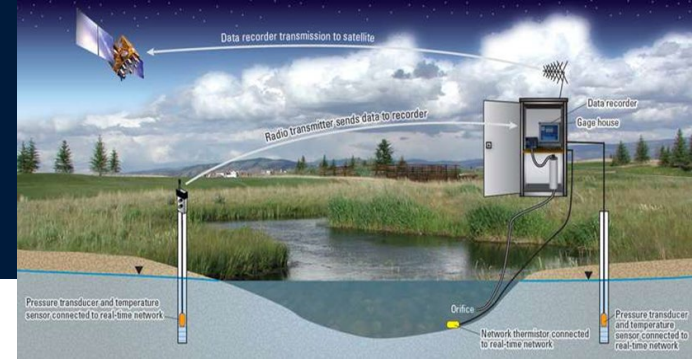
- We can't afford to monitor everywhere...
- Implement NGWOS in ~10 medium-sized watersheds (10,000-20,000 mi<sup>2</sup> each) that are representative of larger water-resource regions and augment the existing streamgauge network elsewhere in the region with modest enhancements.



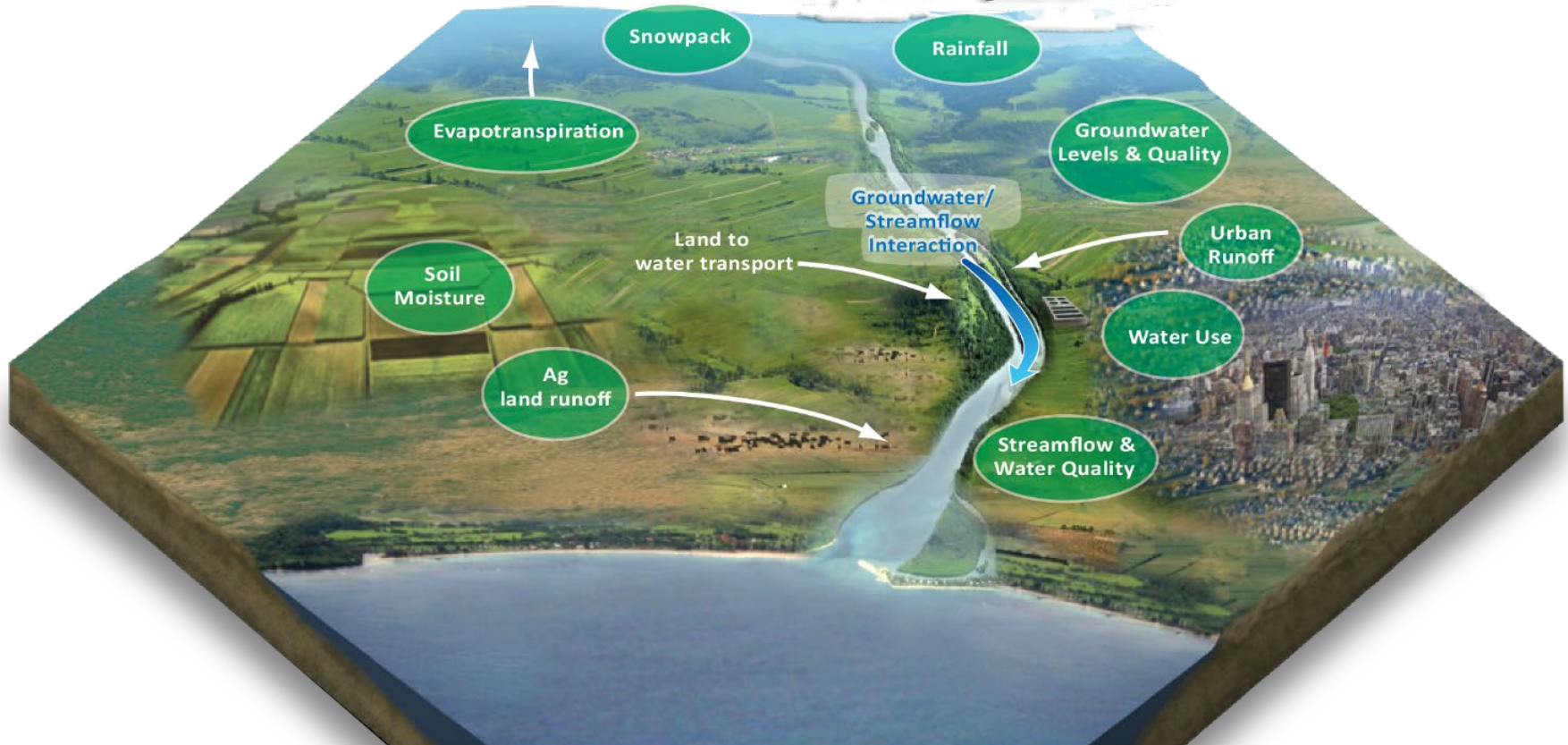
- Leads to more accurate predictions of streamflow, aquifer levels and water-quality conditions at unmonitored locations across the nation.



# Next Generation Water Observing System (NGWOS)



When fully implemented, NGWOS will provide high temporal and spatial resolution real-time field and remote-sensing data on:



# What can NGWOS help answer?

- What are the near-term and long-term risks of floods and droughts, and what scenarios change these risks?
- Are we in the early stages of a drought? How long will recovery take?
- How much water is stored in seasonal snow packs, and how will changes affect water supplies?
- How much does groundwater contribute to streamflow, or vice-versa?
- What is the quality of water and how does it change during wet/dry periods?
- How long will it take for a spill to reach a location?

# WMA Priorities

## Integrated Water Availability Assessments



IWAAs evaluate water availability in terms of the spatial and temporal distribution of water quantity and quality in both surface and groundwater, as related to human and ecosystem needs and as affected by human and natural influences.



## Water Prediction Work Program

ZWP model predictions will support daily to decadal forecast-based management of water supplies and infrastructure at a regional and National extent through improvement of existing tools and development of new capacity supported by our observational data and data collected by other monitoring organizations.



## NexGen Water Observing System

The next generation observing systems (NGWOS) is an integrated set of fixed and mobile assets --in the water, on the ground and in the air-- that will measure, collect and deliver data that can help address water resource challenges and decision-making needs of the future.



## NWIS Modernization

NWIS data systems that house water information will be modernized to accommodate current workflows and leverage latest technology. NWIS modernization will maximize data integrity, reliability, and accessibility while simplifying data delivery to the general public.

# Technologies of Interest

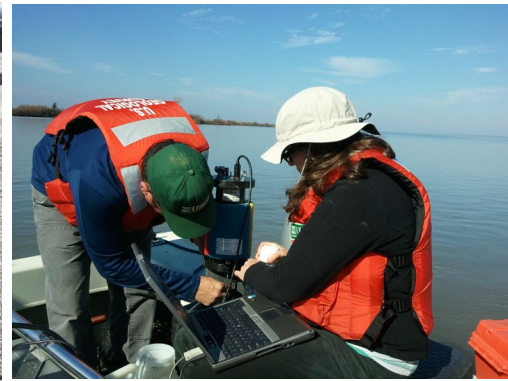
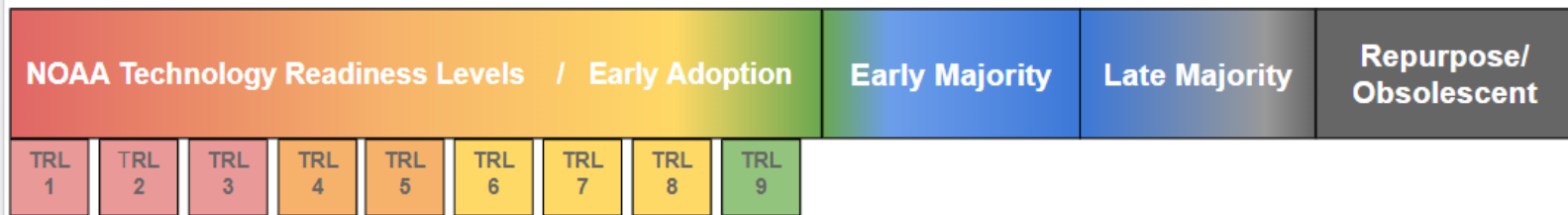
## Include but are not limited to:

- Non-contact sensing for velocity, stage, and water temperature,
- Long range, low power observation network technologies,
- Instrumentation for monitoring hydrologic budgets (ET, soil moisture, snowpack and water-use),
- New sensors for monitoring continuous water-quality, including sediment, nutrients, contaminants, and environmental DNA,
- Mobile autonomous underwater vehicles (AUVs) and drifters for water quality and flow monitoring,
- Webcams and drone-mounted sensors for operational and science applications,
- Innovative technologies for detecting and monitoring hazards such as spills and harmful algal blooms (HABs),
- ???

# Fostering Innovation

## USGS Adoption of TRL / PML Framework

- Will help us evaluate opportunities and risks for NGWOS
- Will facilitate communication with partners and industry
- Will improve the time-to-market, cost and adoption



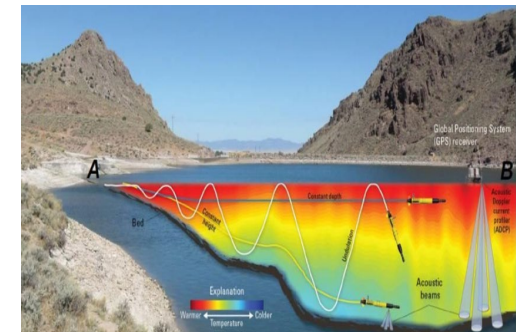
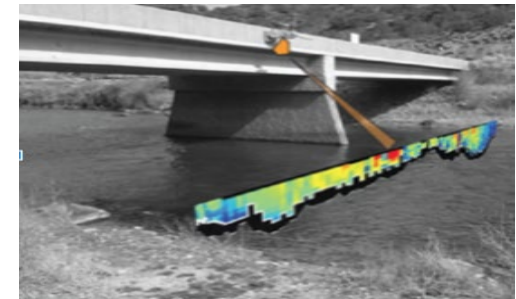
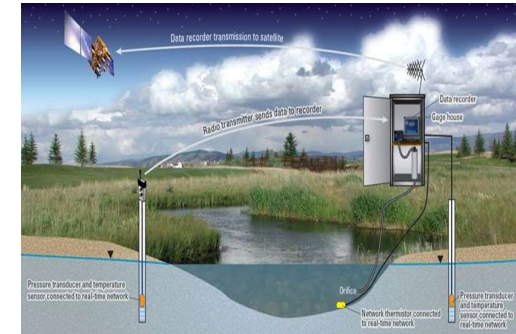
# Request for Information

## We seek:

- Help identify promising technologies that should be considered as part of a next generation water observing system, *and*
- Interested partners capable of jointly developing water observing technologies that can integrate with USGS monitoring

## Next steps:

1. We will evaluate information when received with a small team of USGS experts and seek follow up discussions
2. Schedule “deep dive” discussions with vendors as requested and/or appropriate
3. Schedule follow up on tech transfer opportunities

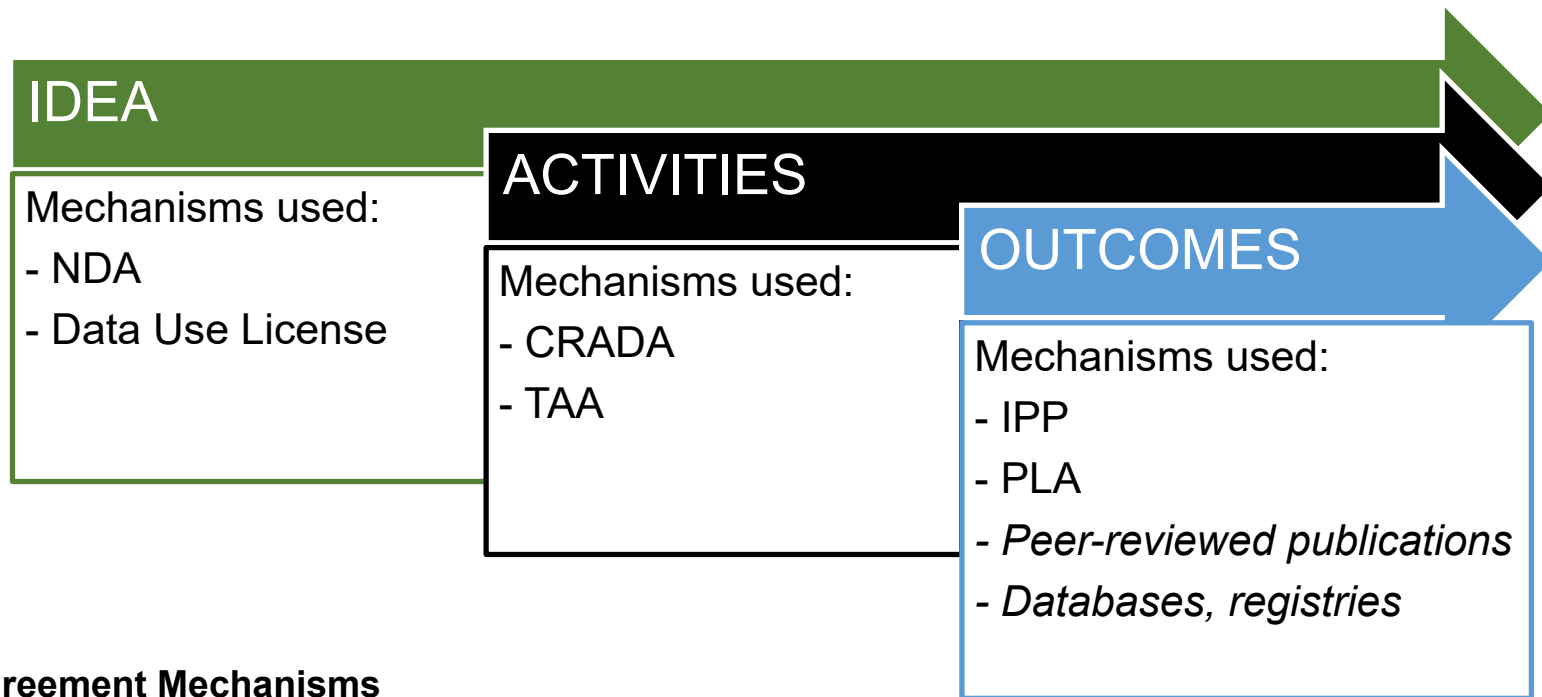


# Federal Technology Transfer Act

## 15 USC 3710a

- Cooperate with Partners
  - Federal agencies
  - Private entities (for-profit and non-profit)
    - E.g. Vendors
  - State, local, tribal governments
    - Includes state universities
  - International entities
- USGS may ***not*** provide funds to non-federal entities

# Tech Transfer Continuum



## Agreement Mechanisms

NDA: Non-Disclosure Agreement

CRADA: Cooperative Research and Development Agreement

TAA: Technical Assistance Agreement

PLA: Patent License Agreement

IPP: Intellectual Property Plan



# Non-Disclosure Agreement (NDA)

- Confidentiality agreement, confidential disclosure agreement
- Legal contract to **discuss** confidential knowledge or information
- Restricts access to or by third parties
- Collaboration or exchange of materials (e.g. equipment, data, samples, etc.) cannot occur
- 3 avenues for exchanging proprietary information
  1. USGS receives information
  2. USGS provides information
  3. USGS receives and provides information

# Data Use License

- When receiving another party's data or dataset that includes trade secrets, proprietary, or confidential information for use
- Authority protects the collaborator's confidential, proprietary, trade secret information forever
- Confidential information from study will remain confidential for up to 5 years after development
- Applicability:
  - Typically when information is shared with no ongoing R&D
  - Receiving site specific species habitat information, and
  - Information warrants protection

# CRADA

- Exchange technology and expertise
- Collaboration anticipates patentable results
- Data produced protected up to 5 years
- Contains extensive intellectual property provisions
  - Partners can negotiate patent and intellectual property rights
  - Protects the partner's trade secrets and proprietary data
- Mutual benefit
- USGS cannot transfer funds to non-Federal parties

# TAA

- Similar to a CRADA
- Allows exchange of more focused technical or research
- Does not anticipate intellectual property
  - Does not contain extensive intellectual property provisions
- Mutually beneficial
- Must have a mission value to the USGS

# Intellectual Property Plan (IPP)

- Specifies which organization is the lead on
  - Patent prosecution
    - Including entity who pays cost
    - While USGS can not provide direct funding, it can cover expenses that help support commercialization of R&D
  - Marketing
  - Licensing
  - Commercialization
  - Distribution of royalties

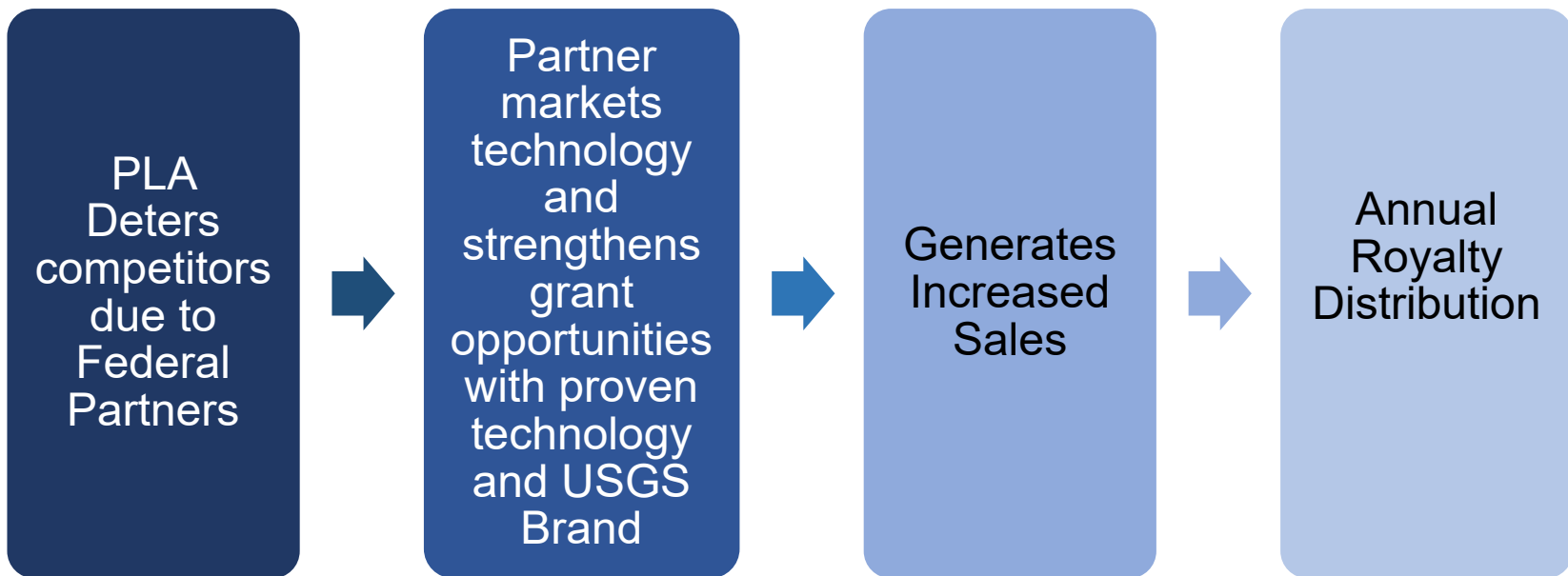
# Patent License Agreement (PLA)

- Business agreement between the owner of a patent or intellectual property and another party
- Interest in using the owned property or protected invention
- USGS can grant licenses to a party to
  - Practice
  - Make, and/or
  - Sell a patented invention

# PLA (cont.)

- Licenses may be granted in specific fields-of-use
- Requires that the party develop and execute a plan for commercializing the invention
- Agree that any products developed will be manufactured substantially in the US
- Patents owned by the USGS are offered for licensing through OPA

# Commercialization Flow Diagram





# Completing Agreement Packages

1. Interactions between USGS and partners
  - Interest on both sides
  - Draft Scope of Work (roles, responsibilities, milestones)
  - Share template agreements
2. USGS Ethics review
  - Must not be a conflict of interest
3. Inform OPA of potential action
4. USGS will consult U.S. Trade Representative if foreign partner
5. Negotiations with partner and OPA
6. Approvals and execution

# Questions



# Contact Information

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- gs\_usgs\_patents@usgs.gov
- Chad Wagner, [cwagner@usgs.gov](mailto:cwagner@usgs.gov), 919-571-4021
- James Mitchell, [jmmitchell@usgs.gov](mailto:jmmitchell@usgs.gov), 703-648-4344
- Esther Eng, [eeng@usgs.gov](mailto:eeng@usgs.gov), 703-648-7550
- Brian Pellerin, [bpeller@usgs.gov](mailto:bpeller@usgs.gov), 703-648-6865

# Resources

- USGS Technology Transfer site
  - <https://www.usgs.gov/about/organization/science-support/technology-transfer>
- CRADA and TAA Templates
  - <https://www.usgs.gov/about/organization/science-support/technology-transfer/cooperative-research-and-development>
- Federal Technology Transfer Act of 1986 as amended: Title 15, United States Code, section 3701 et seq.
  - <http://www.gpo.gov/fdsys/browse/collectionUScode.action?collectionCode=USCODE&searchPath=Title+15%2FCHAPTER+63&oldPath=Title+15%2FCHAPTER+63&isCollapsed=true&selectedYearFrom=2013&ycord=3251>
- Department of the Interior Manual, 207 DM 8 Technology Transfer
- Technology transfer legislation and related policies: Federal Laboratory Consortium for Technology Transfer, <http://www.federallabs.org/>
- SM 453.1, Inventions by Employees <http://www.usgs.gov/usgs-manual/410/453-1.html>
- USGS List of Patents and Opportunities: [http://www.usgs.gov/tech-transfer/available\\_patents.html](http://www.usgs.gov/tech-transfer/available_patents.html)