WISDM
Watershed Integrated System Dynamics Modeling

Washington State University
World Class. Face to Face.

Washington State University

CEREO

Clark University 1887

CWU Central Washington University
Learn. Do. Live.

University of Idaho

Oregon State University OSU

Pacific Northwest National Laboratory

NCAR National Center for Atmospheric Research

State of Washington Water Research Center

NSF

USDA

NIFA

BioEarth

Biosphere-relevant earth system model

Academic science vs Agency science

- [illegible]
  - [illegible]
- [illegible]
- [illegible]
  - [illegible]
  - [illegible]

Current Projects in the SCC

- u(Cu g D l S D l D s S D 1 s 1 S – O e – Ca 1 S l
- u(CC e – l D g e – SW l i l O t D l D E s S D 1 1 – O e – Ca 1 S l

- u(Cu g D D S l – D

- u(Cu i g t e – al S – O t l – 1 D Oa l S D e – 1 W r
  1 – a D O S W S D t a 0 l E Ds D – t l – 1 D O y

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  – l l – ly

- u(Cu t – SW – la S 1 l O h M – 2 M S – 1 W l S – e – O D D E S S – Ct
  W – SW – la S E S S – Ct e – l D – t a D D 1 – t O a Ds y
- u(Cu t a e – E S S – Ct W – SW – la S 1 – O a O l – l 1 e – O D
  e – t O E Ds

Washington State University & University of Idaho: Pending Proposals

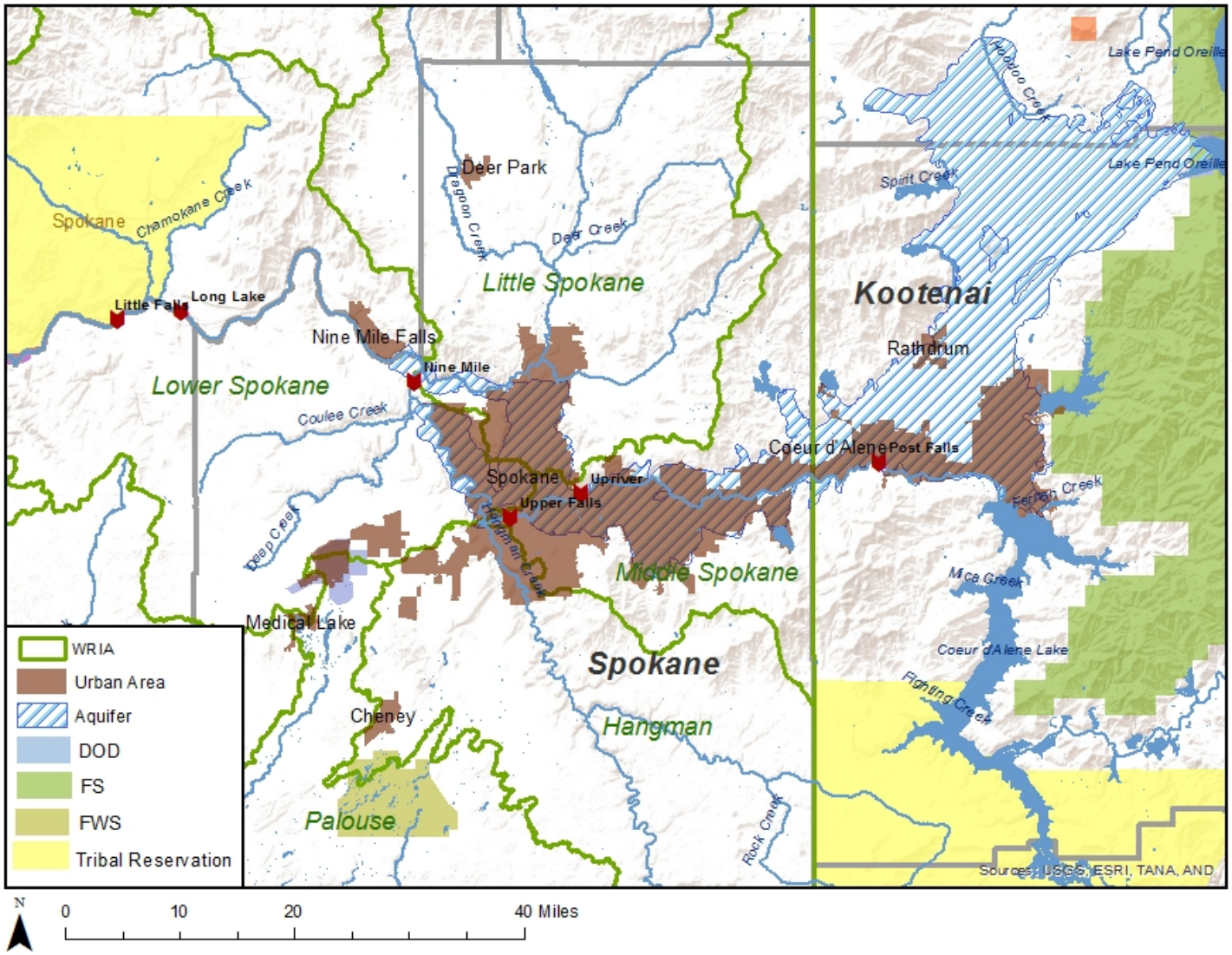
WISDM and BioEarth Stakeholder components

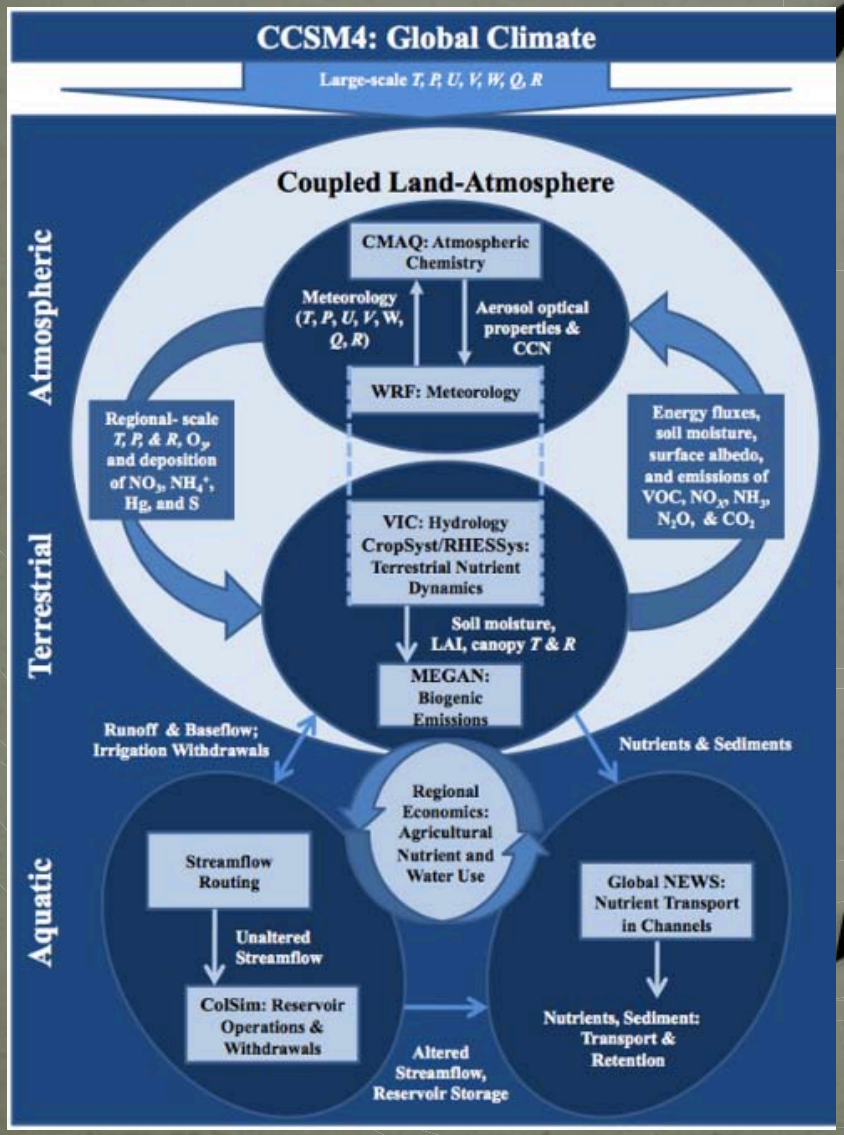
- [illegible]
  - [illegible]
- [illegible]
  - [illegible]

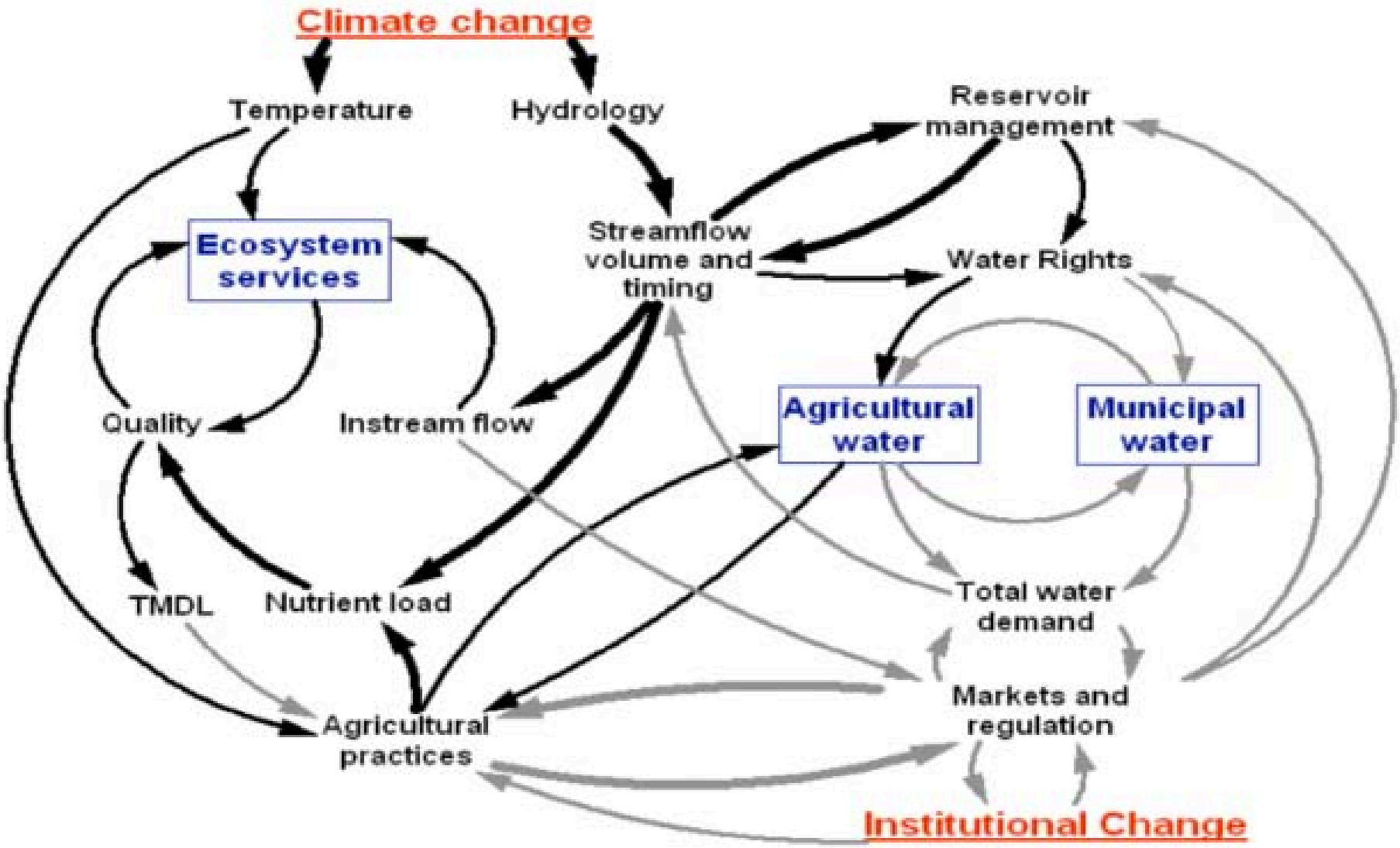
The WISDM mission

- [illegible]
- [illegible]
- [illegible]
- [illegible]

Collaborative modeling in the SCC
Envision a simulating Atlas




CCSM4: Global Climate
Large-scale T, P, U, V, W, Q, R
Coupled Land-Atmosphere
Atmospheric
Terrestrial
Aquatic
CMAQ: Atmospheric Chemistry
Meteorology (T, P, U, V, W, Q, R)
Aerosol optical properties & CCN
WRF: Meteorology
Regional- scale T, P, & R, Oy, and deposition of NO3, NH4+, Hg, and S
Energy fluxes, soil moisture, surface albedo, and emissions of VOC, NOx, NH3, N2O, & CO2
VIC: Hydrology
CropSyst/RHESSys: Terrestrial Nutrient Dynamics
Soil moisture, LAI, canopy T & R
MEGAN: Biogenic Emissions
Runoff & Baseflow; Irrigation Withdrawals
Nutrients & Sediments
Regional Economics: Agricultural Nutrient and Water Use
Streamflow Routing
Unaltered Streamflow
ColSim: Reservoir Operations & Withdrawals
Altered Streamflow, Reservoir Storage
Global NEWS: Nutrient Transport in Channels
Nutrients, Sediment: Transport & Retention


Climate change
Temperature
Hydrology
Reservoir management
Ecosystem services
Streamflow volume and timing
Water Rights
Quality
Instream flow
Agricultural water
Municipal water
TMDL
Nutrient load
Total water demand
Markets and regulation
Agricultural practices
Institutional Change

Research and outreach

- [illegible]
- [illegible]
  - [illegible]
- [illegible]
- [illegible]

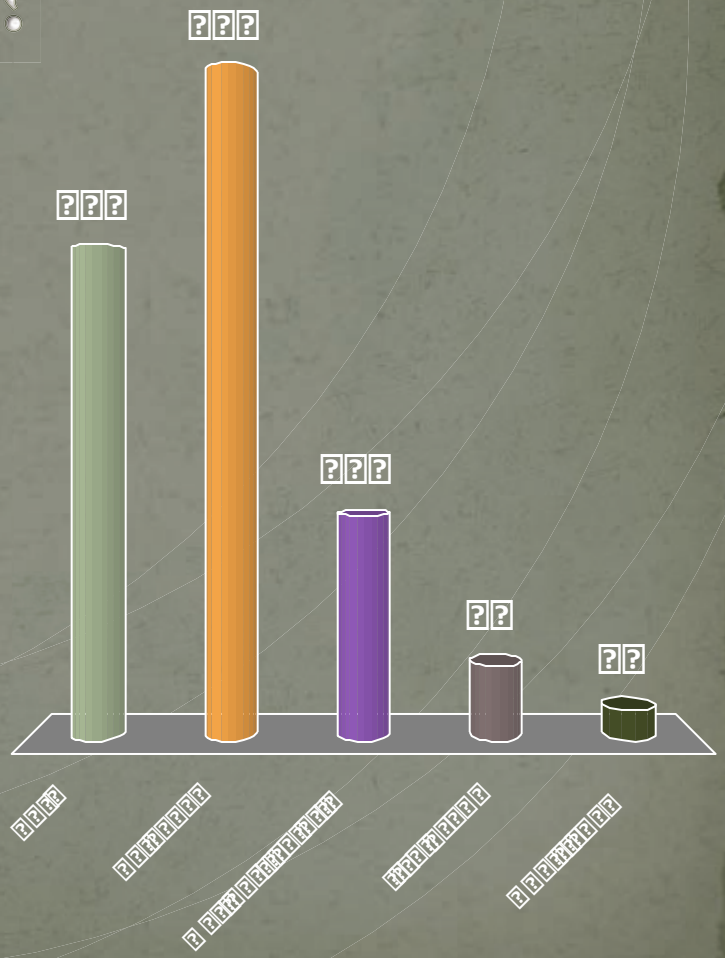
What is important to you?

1. Which of these professional categories are you primarily associated with?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

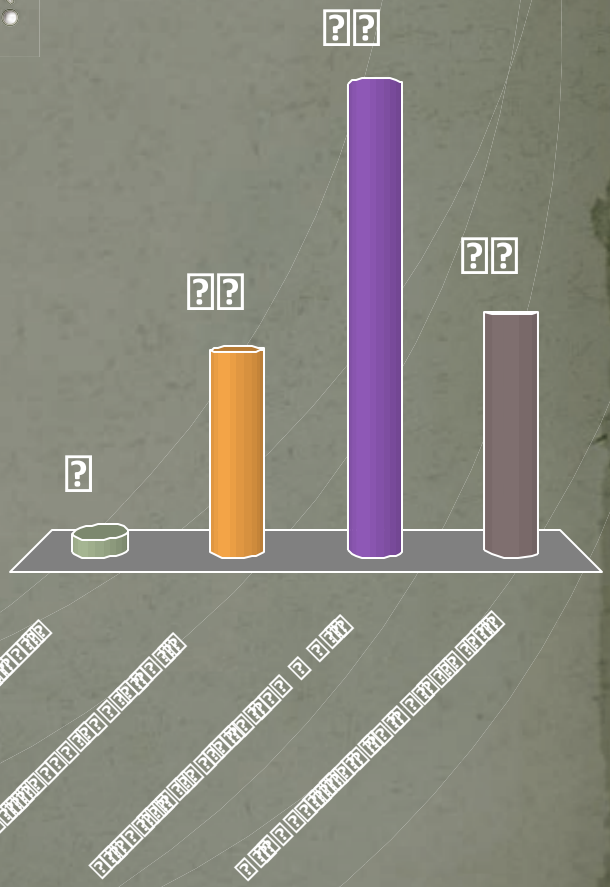
2. How relevant do you think academic research is to solving problems in this basin?

a. Very?
b. Relevant?
c. Not particularly?
d. Irrelevant?
e. Don't know?



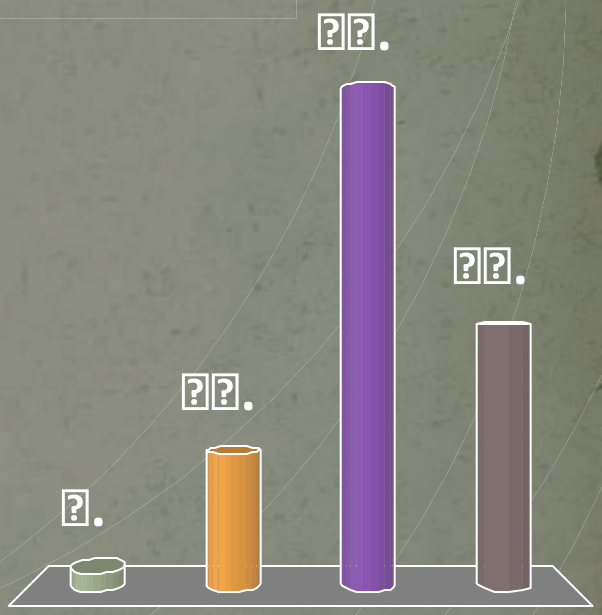
3. How well do you think researchers in academia communicate their findings to stakeholders?

- [illegible]
- [illegible]
- [illegible]
- [illegible]



4. How well do you think researchers in academia communicate with each other?

- [illegible]
- [illegible]
- [illegible]
- [illegible]

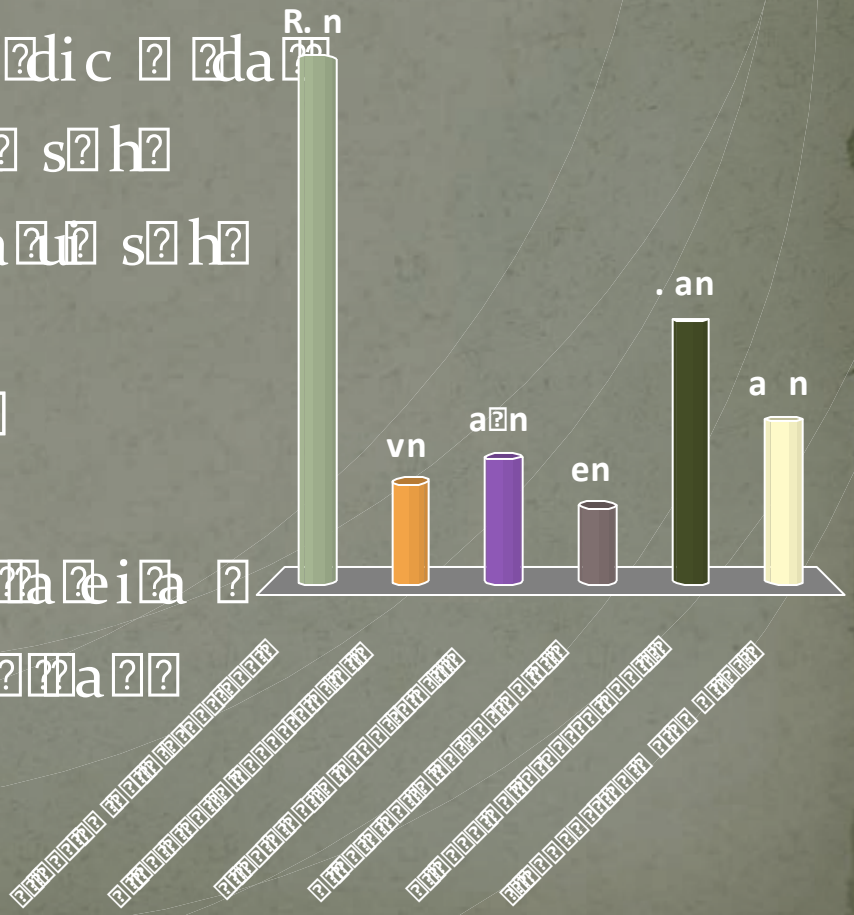


5. Which best characterizes your thoughts on the value of academic research in your decision-making processes?

- [illegible]
- [illegible]
- [illegible]

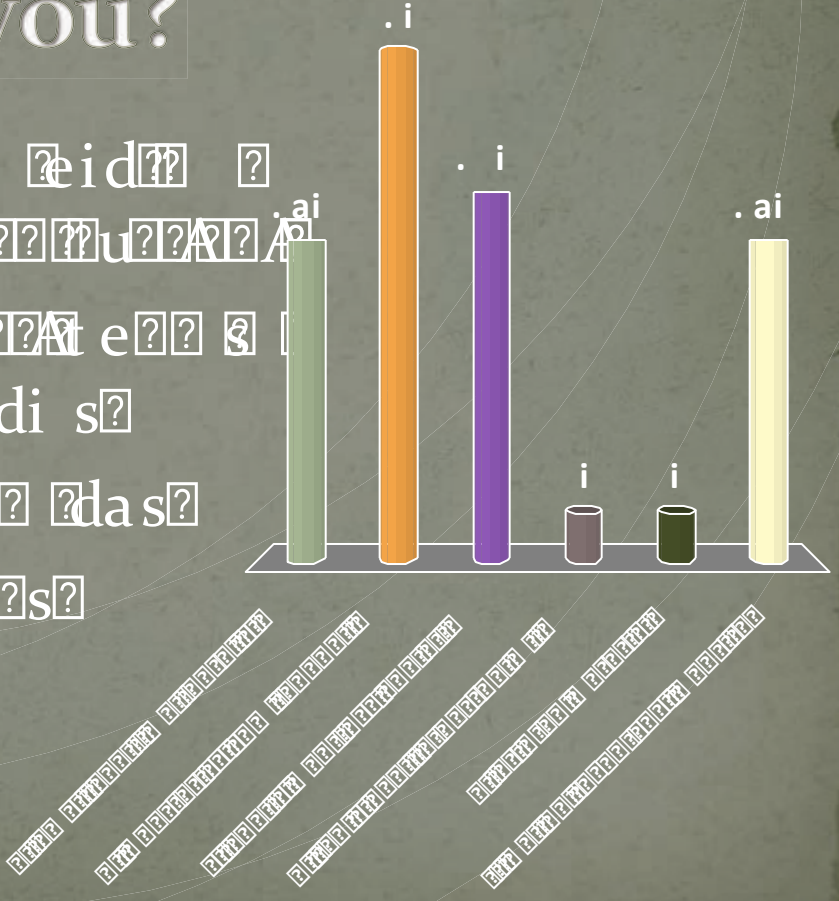
6. Where do you generally learn about academic research and scientific information?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



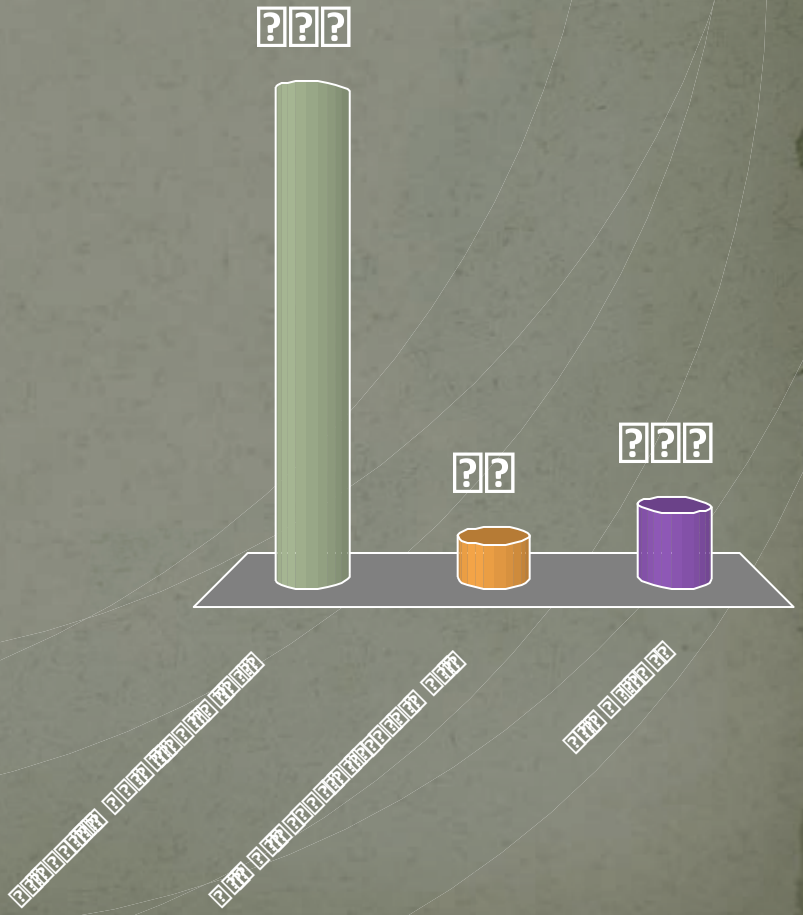
7. How could academic researchers at WSU and UI who are working in the Spokane River Basin best communicate with you?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



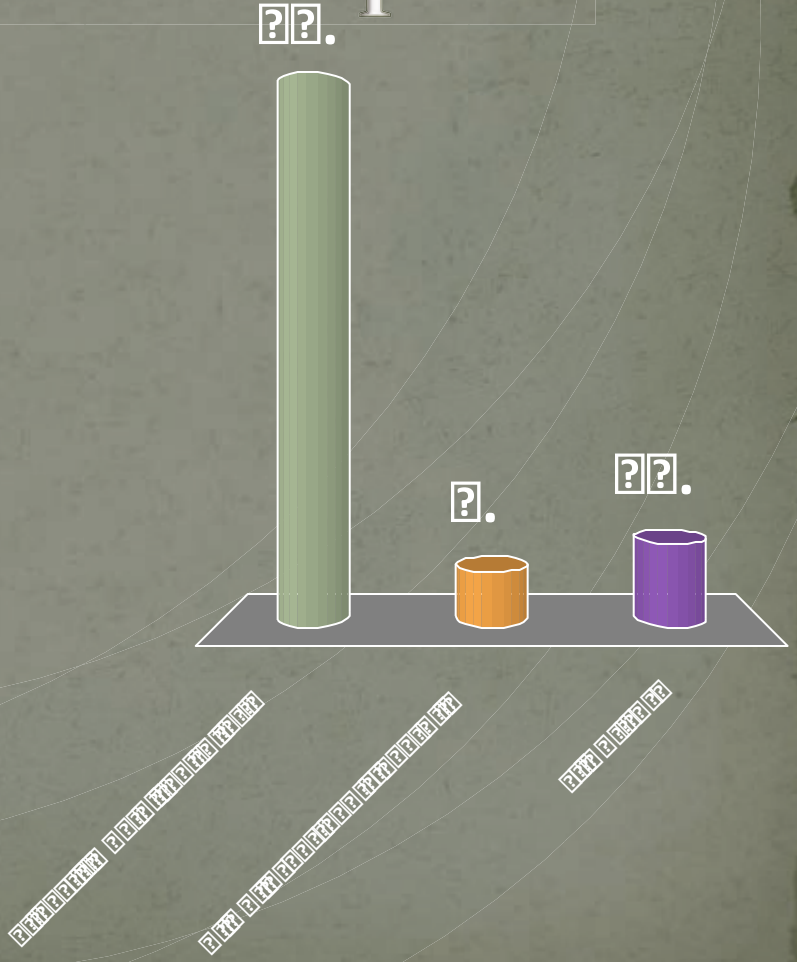
9. Are you interested in learning more about bi-state water management agreements used in the US?

- [illegible]
- [illegible]
- [illegible]



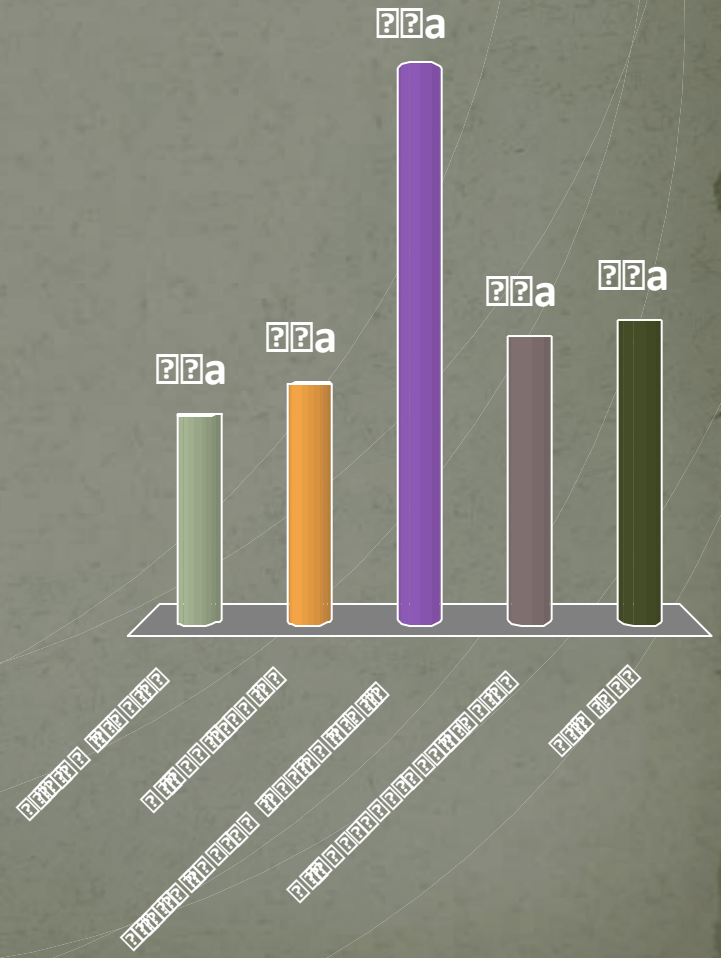
10. Are you interested in learning more about PCB and or toxics clean-up plans used in other parts of the US?

- [illegible]
- [illegible]
- [illegible]



8. Where should future research efforts in the Spokane River Basin be focused?

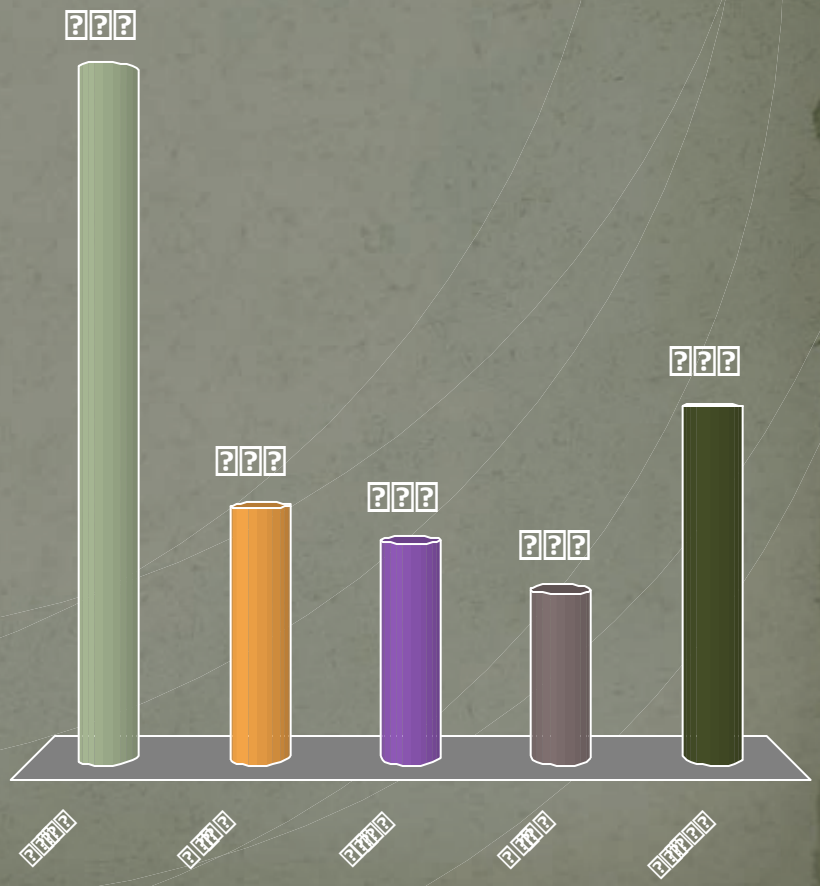
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



II. In-stream Flows and Water Availability:

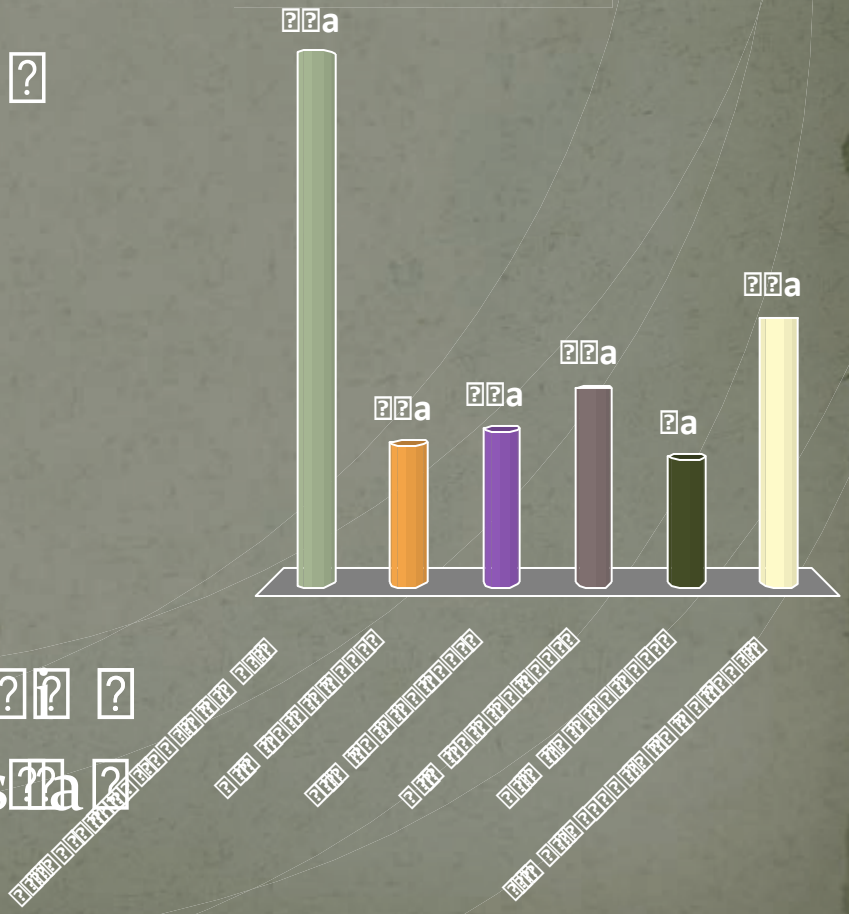
1. How much are you paying for 1000 gallons of water?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



2. When do you predict there will be a surface water availability crisis in the Spokane River Basin?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

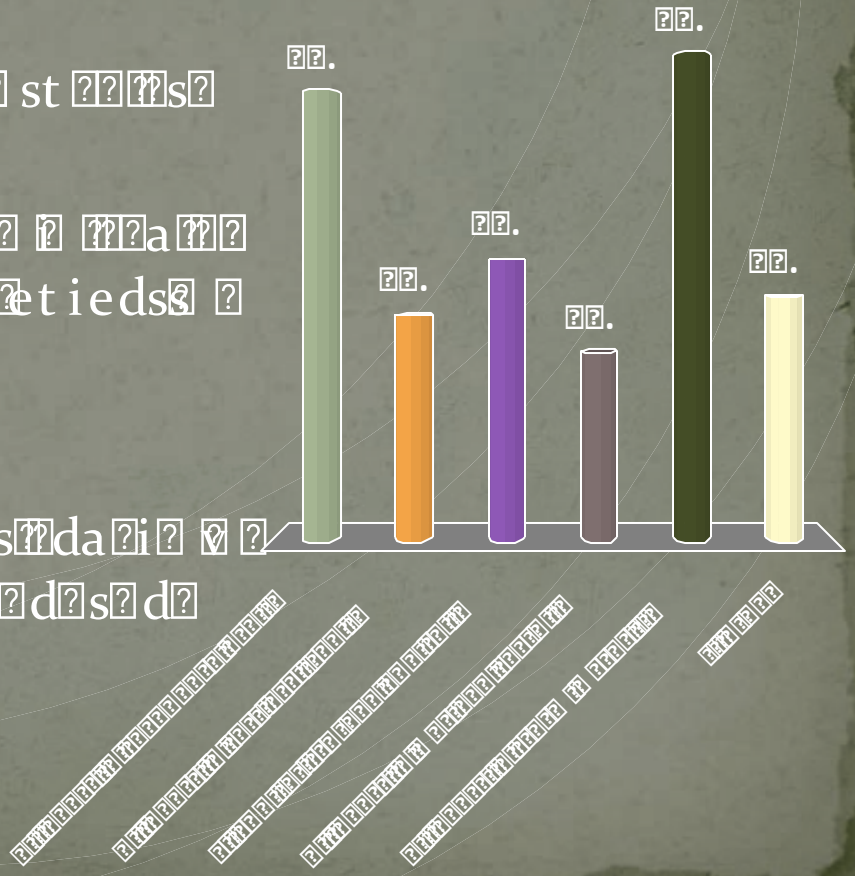


3. When do you predict there will be a ground water availability crisis in the Spokane River Basin?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

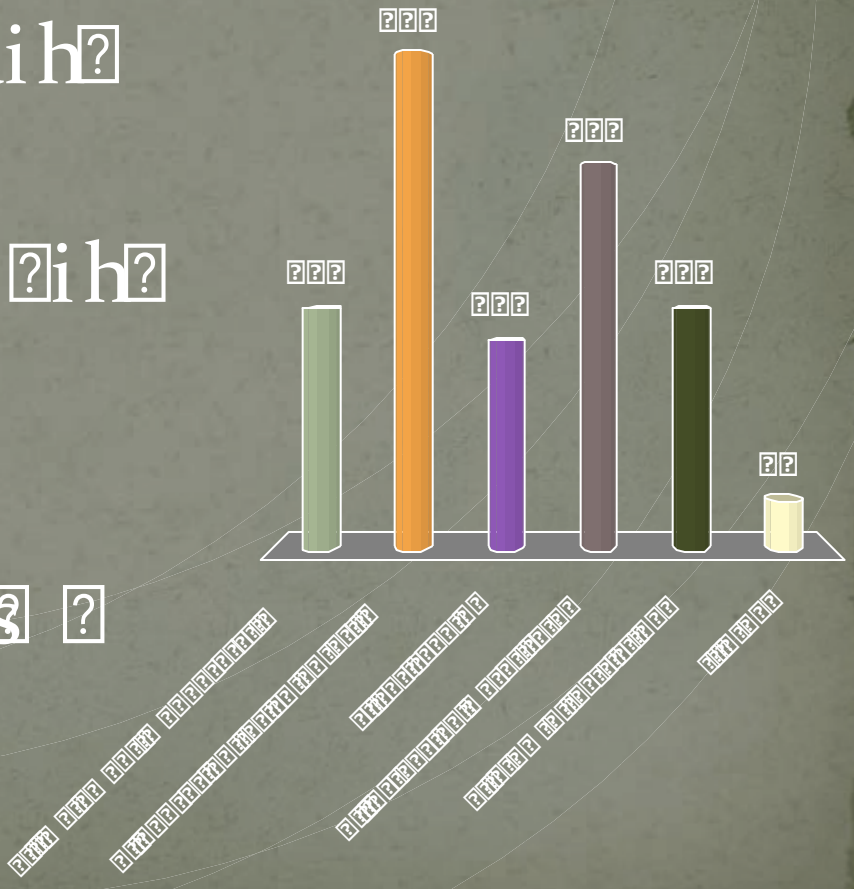
4. If a water supply crisis is imminent, which of these infrastructure measures should we take to address it?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



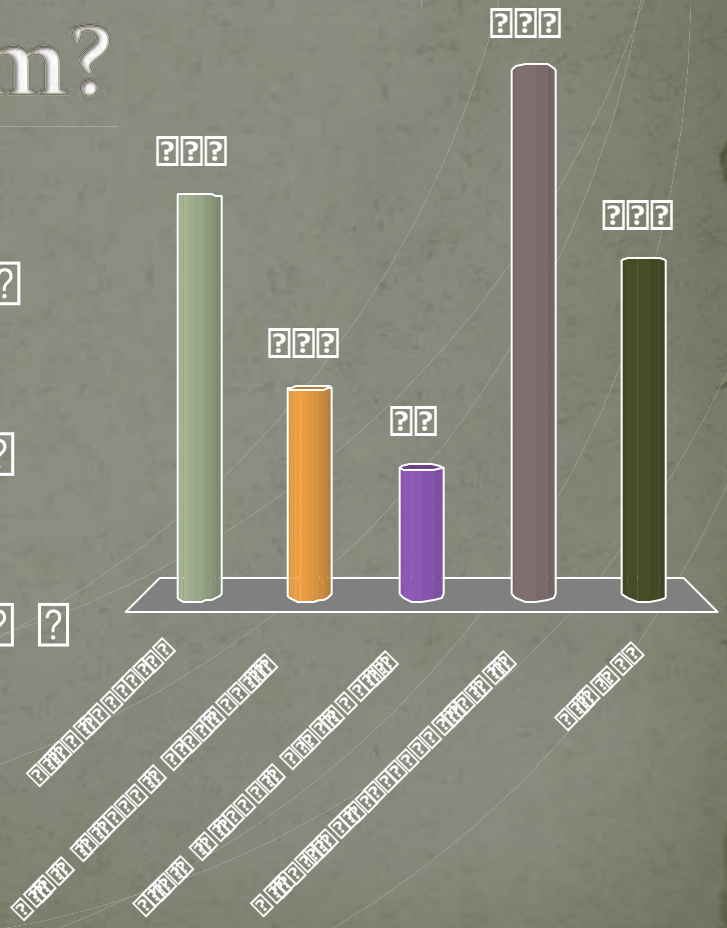
5. If a water supply crisis is imminent, which of these behavior measures should we take to address it?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



6. What is your biggest concern about augmenting the SVRP aquifer with ground water from the Pend Oreille system?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

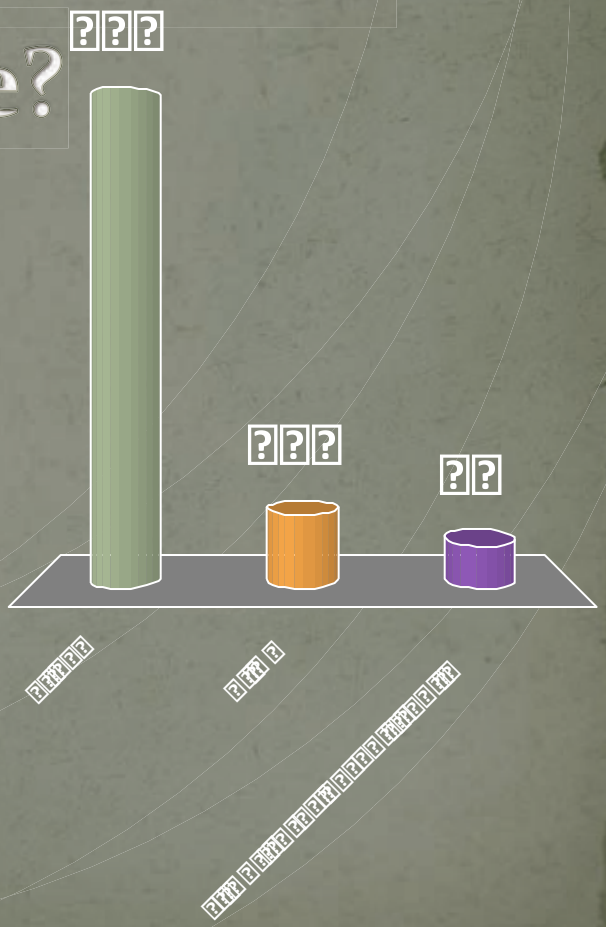


7. As laws currently stand, can ID do anything to help WA deal with low flows?

- [illegible]
- [illegible]
- [illegible]

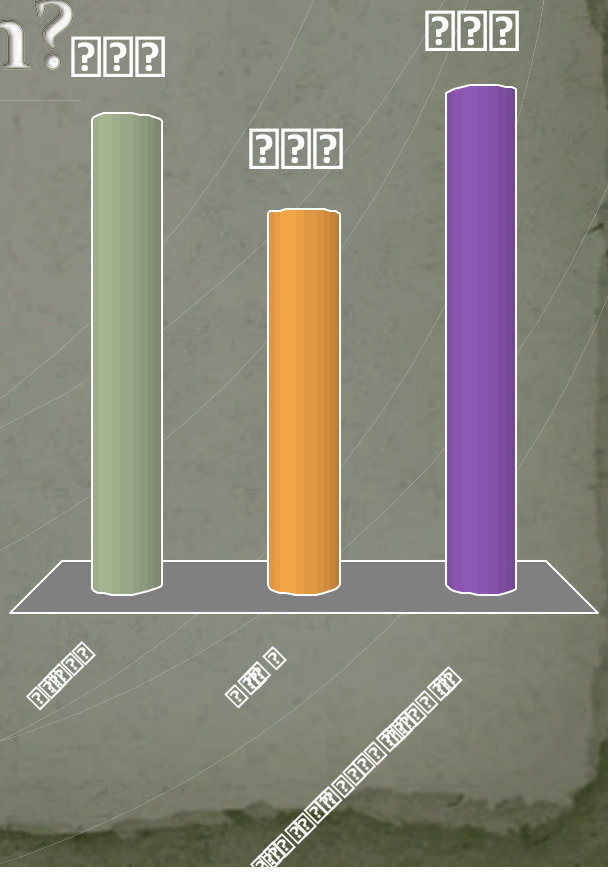
8. Idaho is adjudicating to better define current users and to manage future resources. Should Washington do the same?

- [illegible]
- [illegible]
- [illegible]



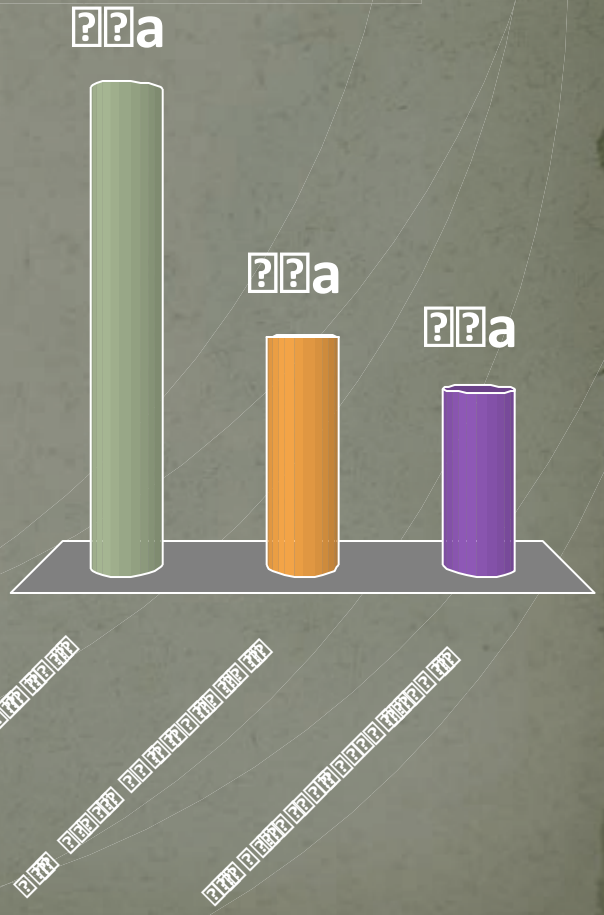
9. Do you think that during the period when leaking irrigation ditches were in heavy use (prior to their removal in the 1960s) Spokane River in-stream flows were artificially high?

- [illegible]
- [illegible]
- [illegible]



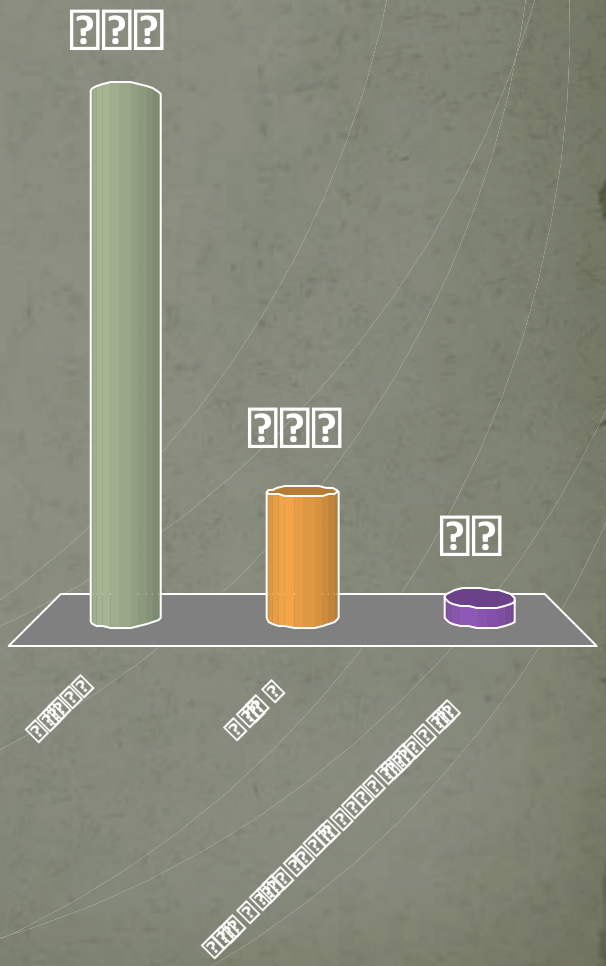
10. If flows at Post Falls Dam were increased during summer low-flow periods, what would the result be?

- [illegible]
- [illegible]
- [illegible]



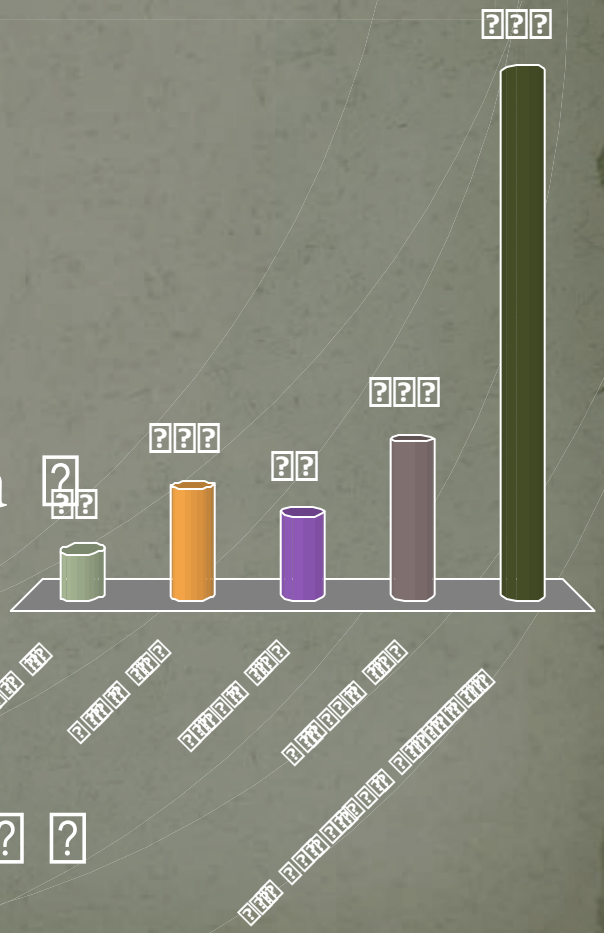
11. Are wells in Spokane contributing to low flow problems in the Spokane River?

- [illegible]
- [illegible]
- [illegible]



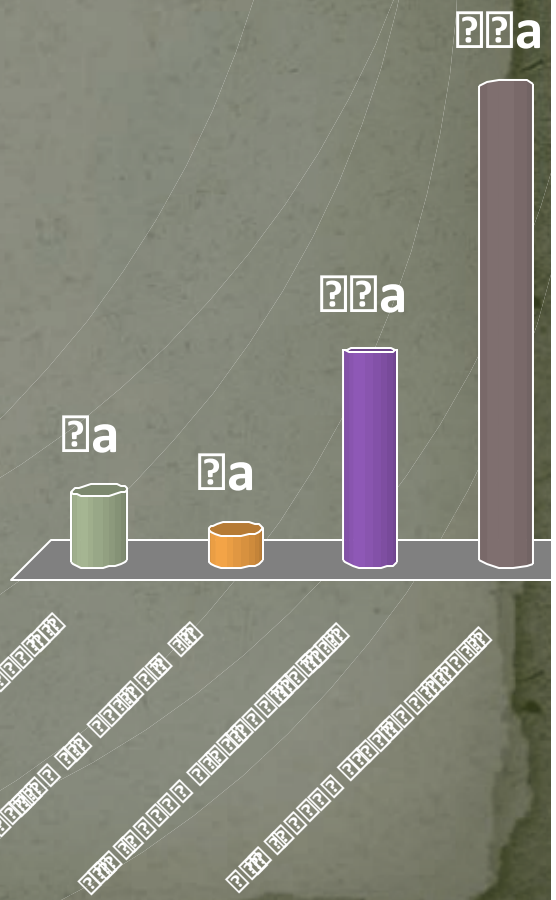
12. How far from the river would wells in Spokane need to be moved to re-time impacts on in-stream flows?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



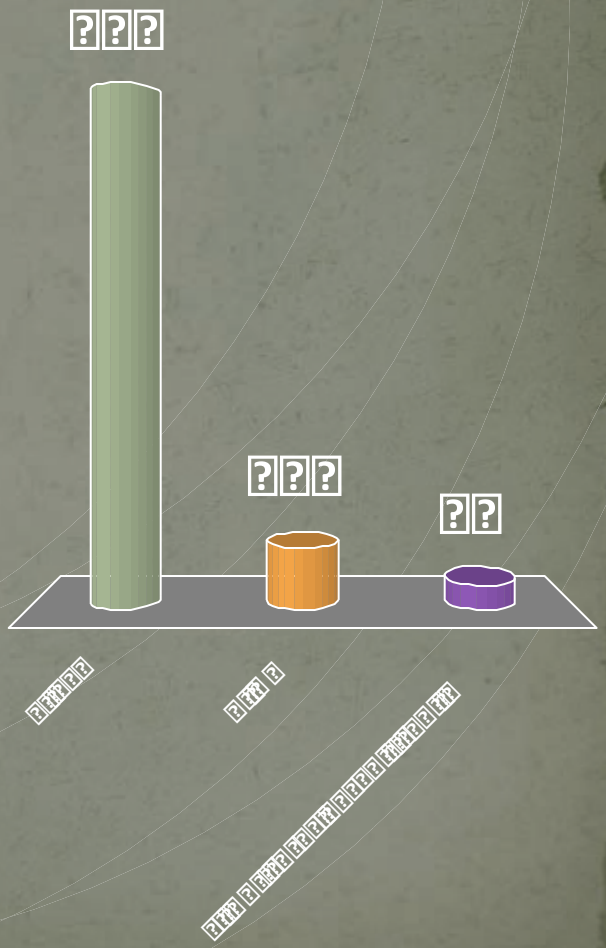
13. Which do you value most?

- [illegible]
- [illegible]
- [illegible]
- [illegible]



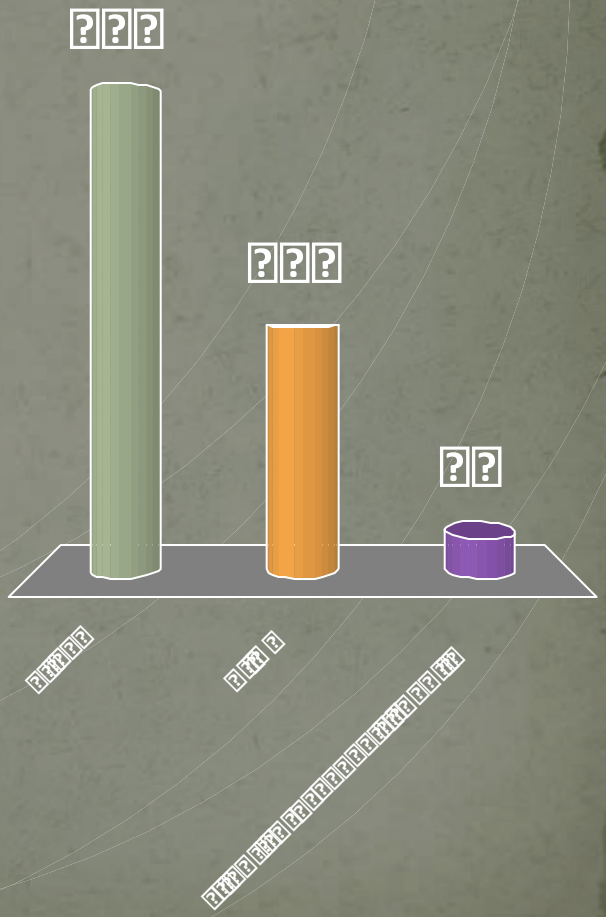
14. Is maintaining flows in the Spokane River a value to the basin at large?

- [illegible]
- [illegible]
- [illegible]



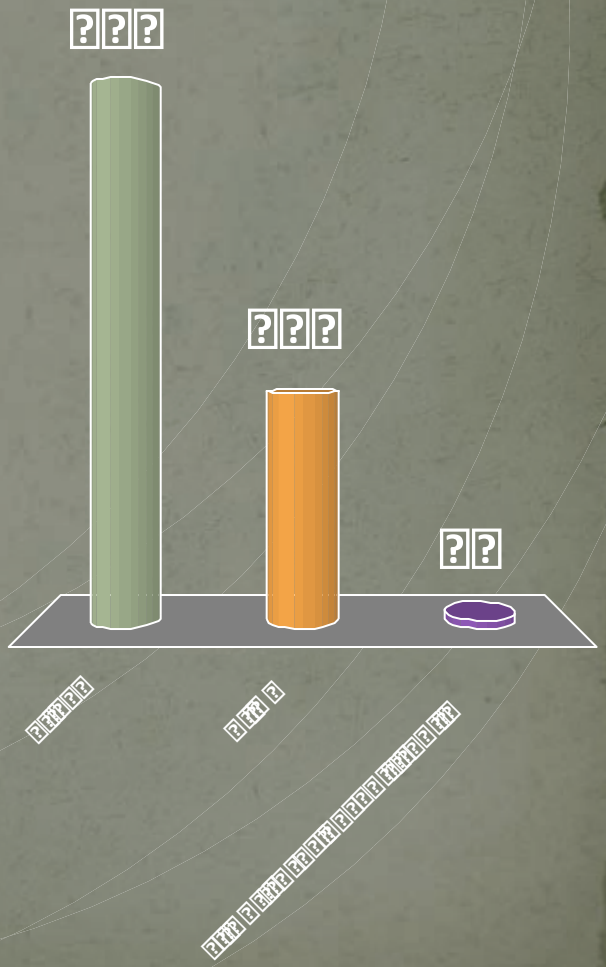
15. Are maintaining lake levels in the region's lakes a value to the basin at large?

- [illegible]
- [illegible]
- [illegible]



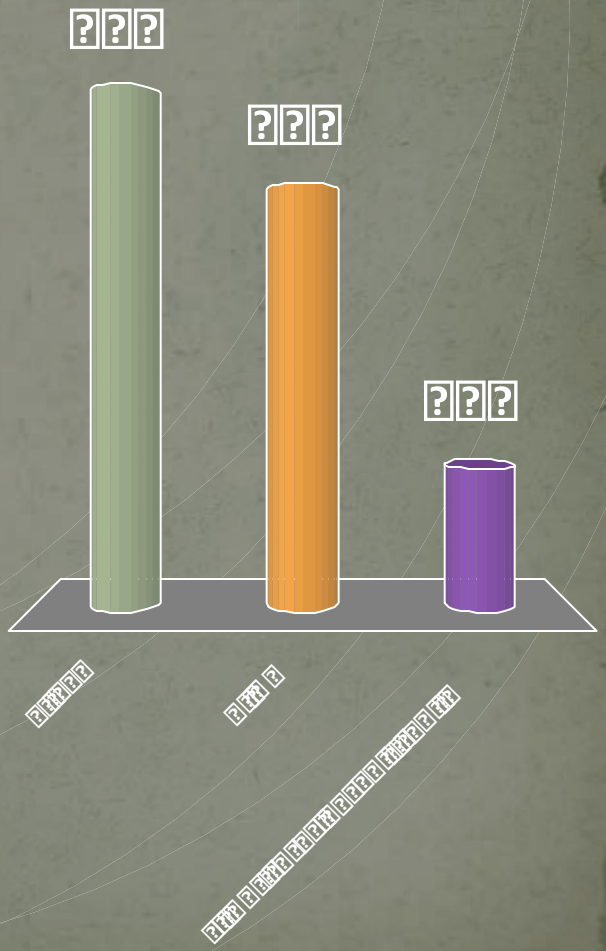
16. Is the possibility of an extended drought of concern?

- [illegible]
- [illegible]
- [illegible]



17. Is there is sufficient information to predict the effect on water supply of an extended drought in the region?

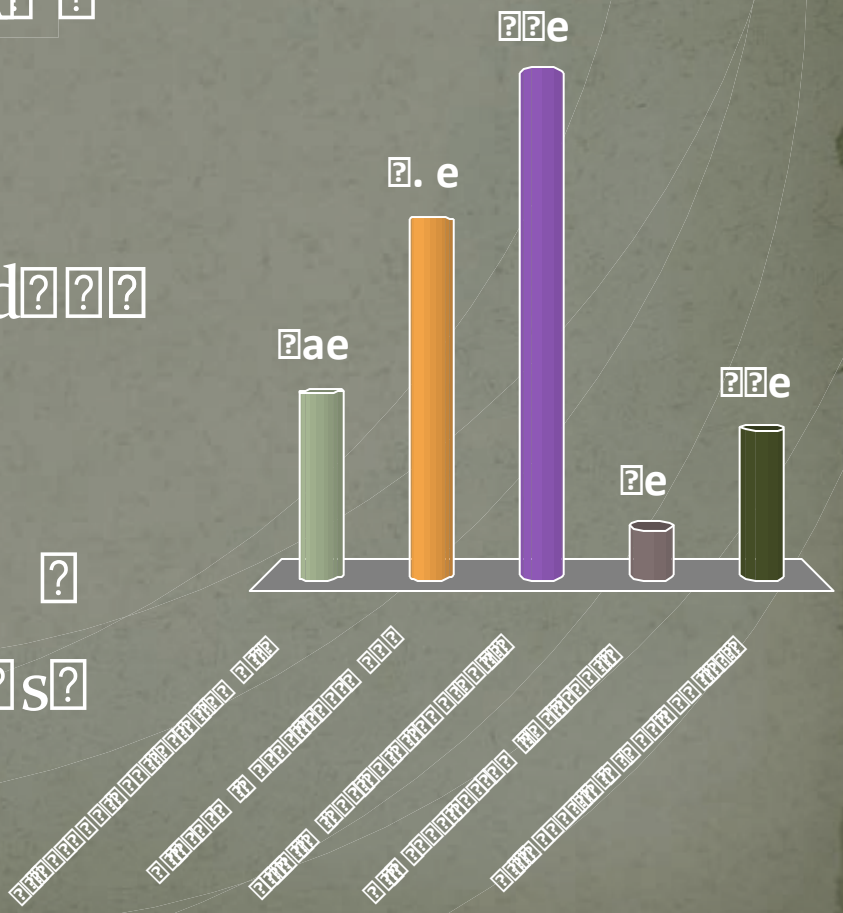
- [illegible]
- [illegible]
- [illegible]



III. Phosphorous and toxics

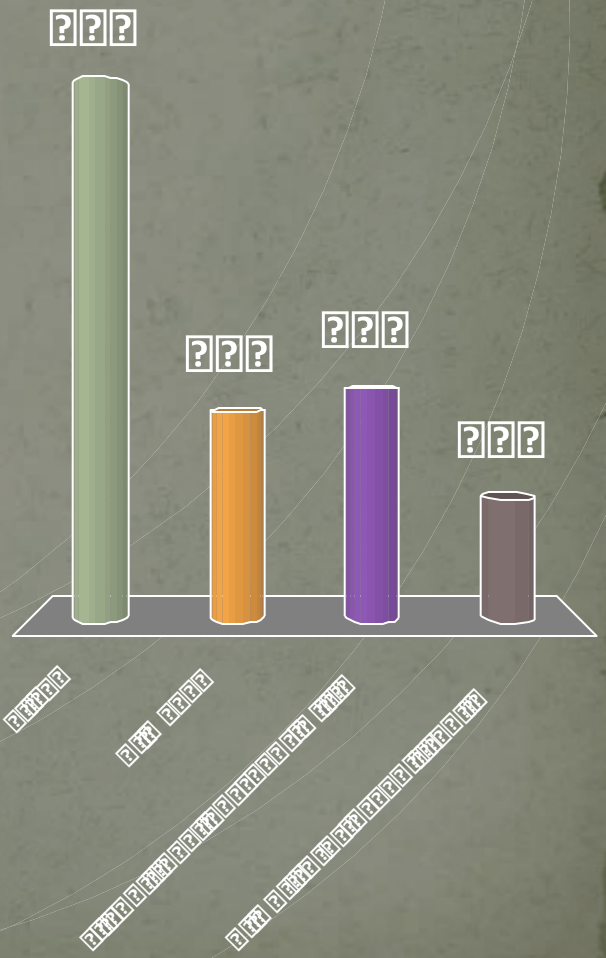
1. Where should funding for water treatment efforts be focused?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]



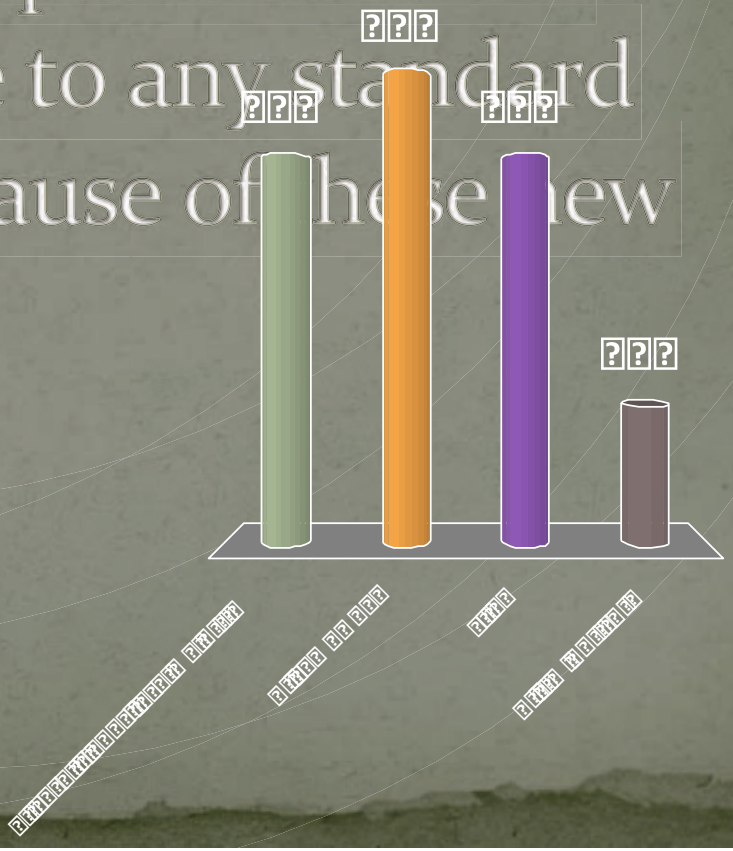
2. Will the upgrades required for P discharge reduction reduce other toxics?

- [illegible]
- [illegible]
- [illegible]
- [illegible]



3. If it is more cost effective for waste water treatment plants to "land apply" waste water for golf courses park and other places than to discharge how concerned are you about keeping toxics and phosphorous in the system that compliance to any standard could never be met because of these new nonpoint sources?

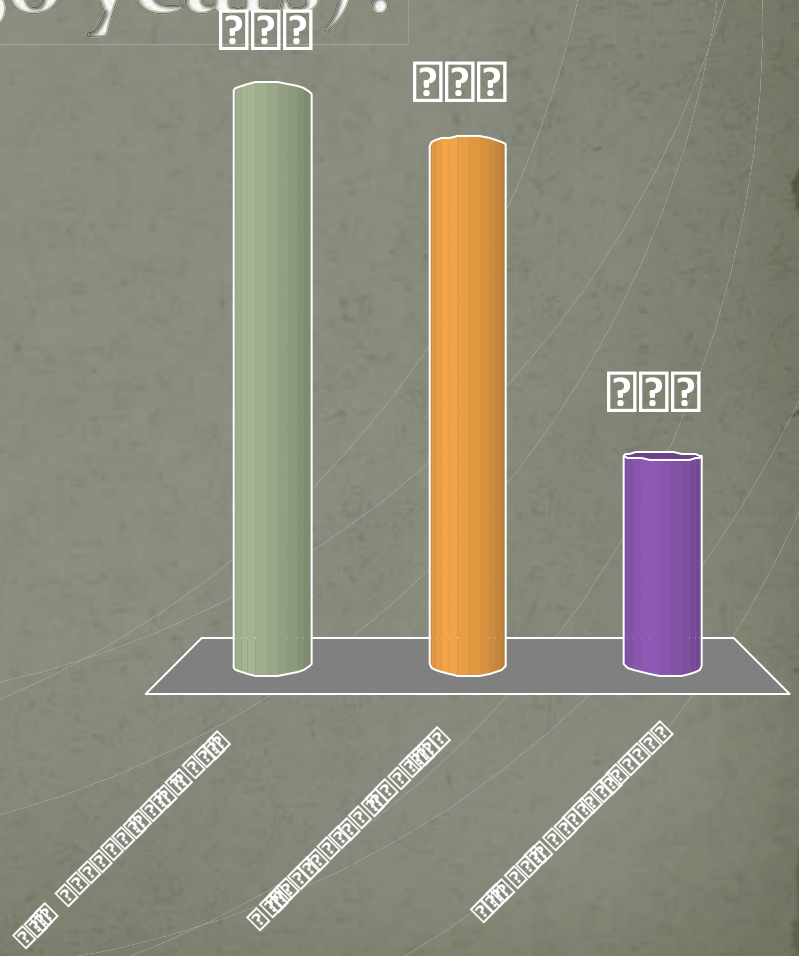
- [illegible]
- [illegible]
- [illegible]
- [illegible]



IV. Collaboration:

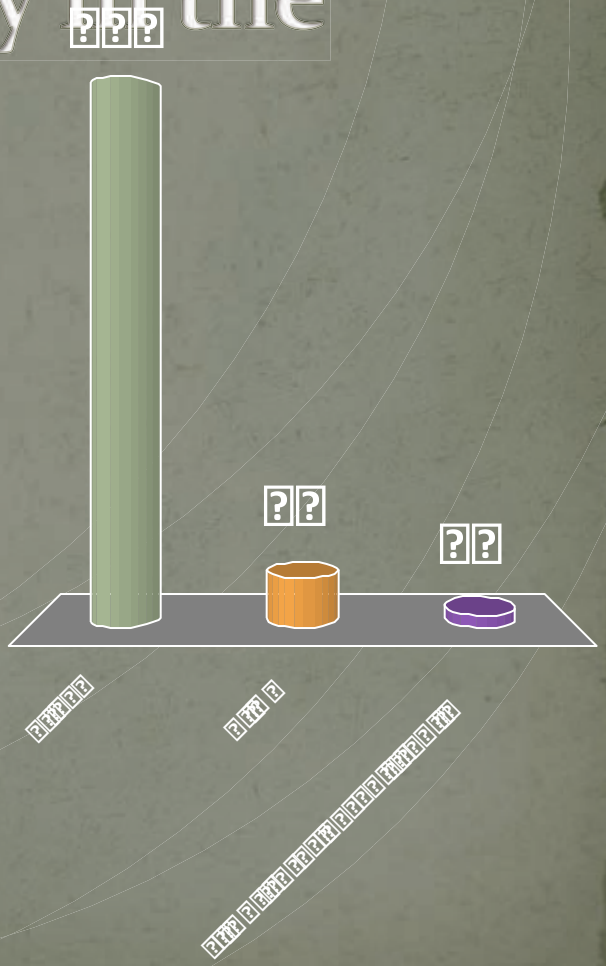
1. Where do you see management of water resources in the Spokane River Basin in 2063 (50 years)?

- [illegible]
- [illegible]
- [illegible]



2. Should establishing a plan for basin-wide water resources management be a priority in the SVRP?

- [illegible]
- [illegible]
- [illegible]



3. If you answered yes to the previous question, indicating that basin-wide management should be a priority, how soon do you think that those management plans could be established?

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Thank you for your input

- [illegible]
  - [illegible]
  - [illegible]

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University of Idaho

Oregon State University OSU

Pacific Northwest National Laboratory

NCAR National Center for Atmospheric Research

Water Research Center State of Washington

NSF

USDA

NIFA

BioEarth

Biosphere-relevant earth system model