Ensuring Reliable Water Supplies for Central Arizona

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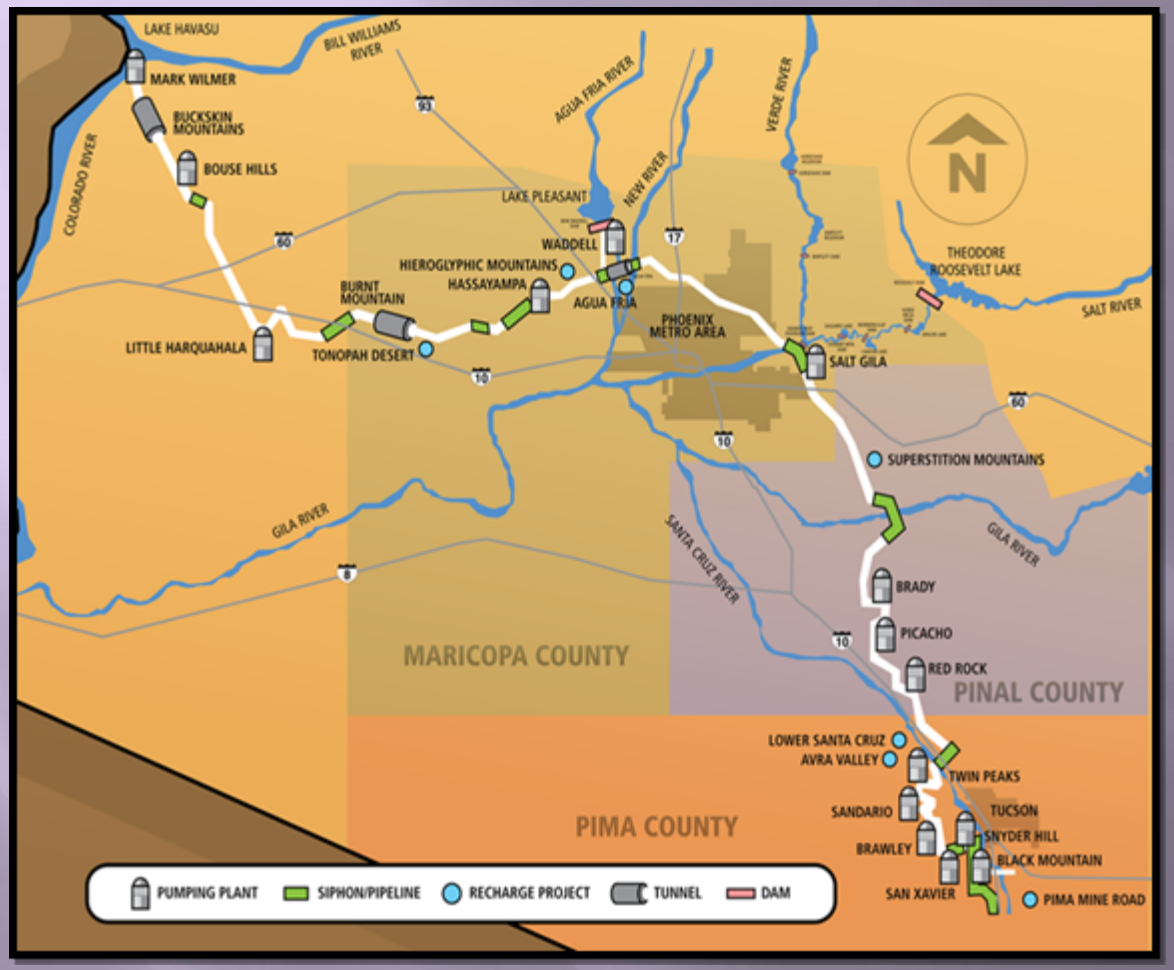
Three Challenges

A Drying West

A Question of Power

A Cost to Consider

A Word About Central Arizona Project



336-mile aqueduct stretches from Lake Havasu to Tucson

14 pumping plants lift water nearly 3000 feet

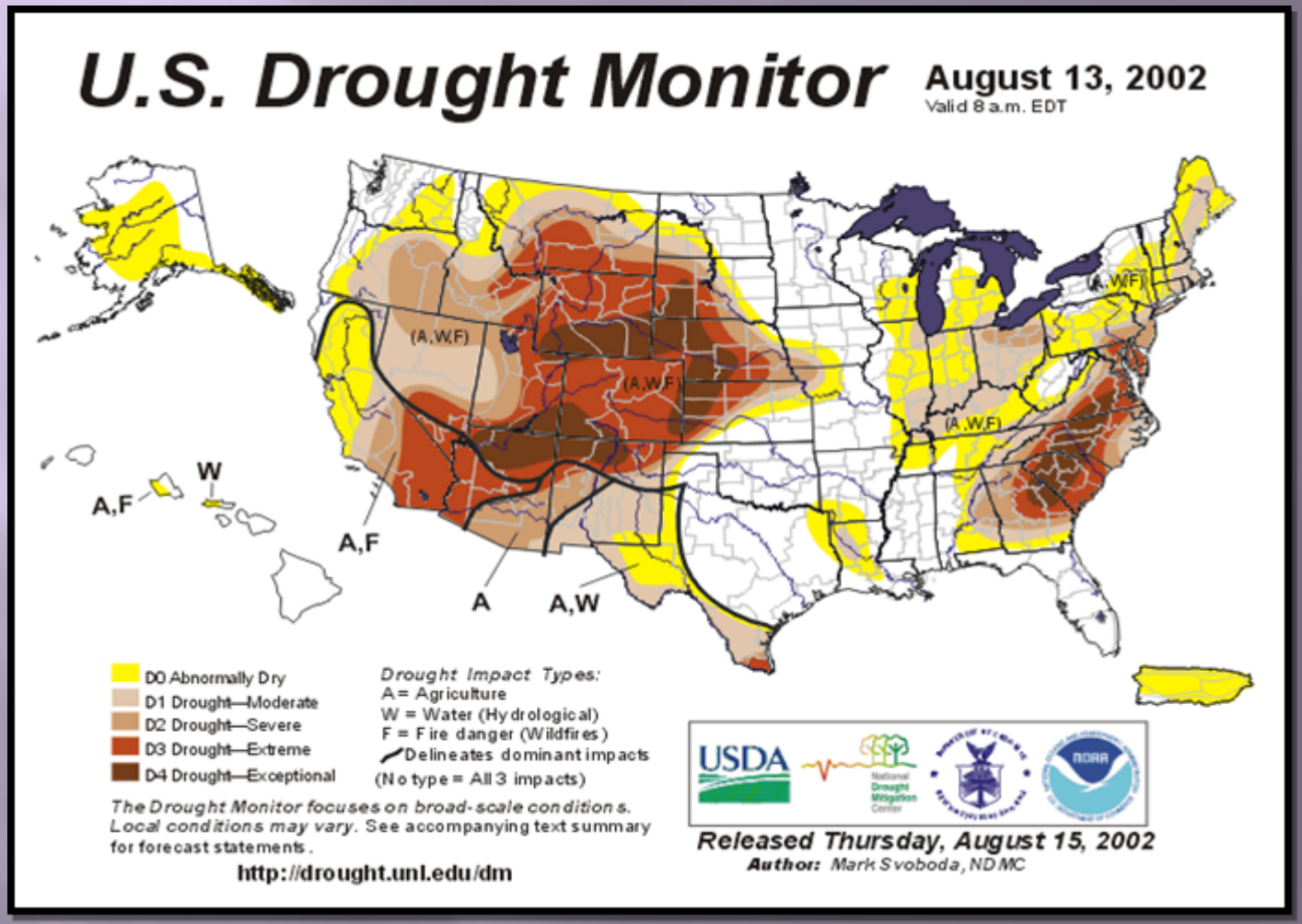
8 siphons, 3 tunnels

Lake Pleasant/New Waddell Dam

Delivers 1.5 million acre-feet of Colorado River water annually

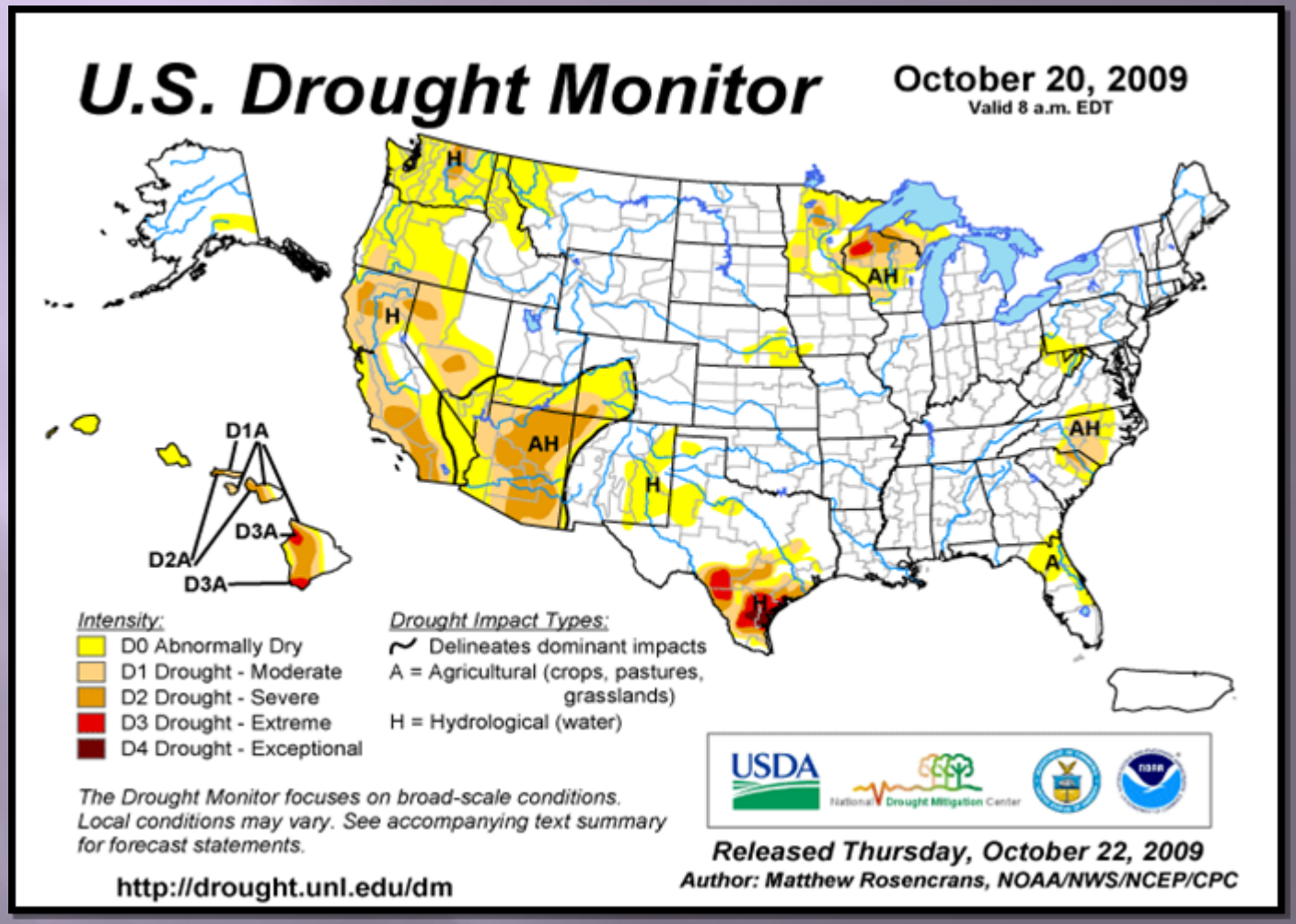
A Drying West

After 10 years of severe to extreme drought…



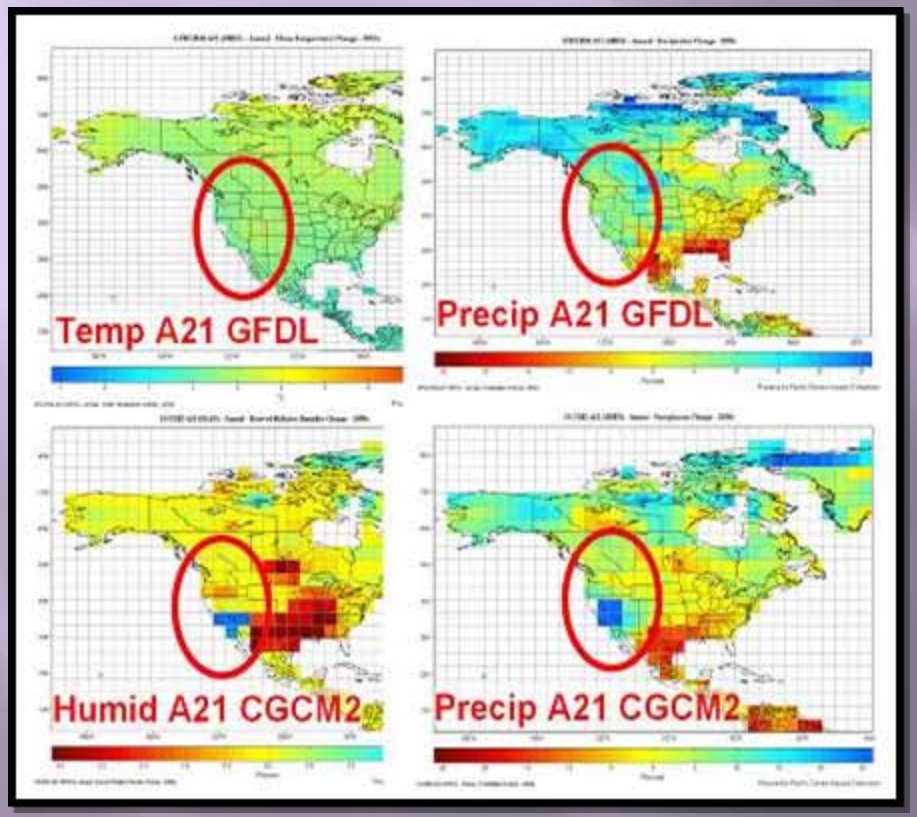
A Drying West

... the situation has improved



A Drying West

We Must Improve Climate Change Models



Current Global Circulation Models are too broad to accurately predict impacts on individual watersheds

The Colorado River watershed is particularly challenging because of the extreme variability in elevation along the river

A Drying West

But For Now… How Do We Respond?

A Multi-Pronged Approach…

Manage the Colorado River

Conserve and reduce "lost" water

Augment the Colorado River

Store Excess Water in Arizona

Plan for Future Water Supplies

A Drying West

New Guidelines for Managing the Colorado River

2006

The 7 Basin States agree on conjunctive management of Lakes Powell and Mead and shortage sharing in the Lower Basin

Lake Mead - 42% as of 10-09

Lake Powell – 63% as of 10-09

2007

The Secretary of the Interior adopts the new Colorado River guidelines and shortage sharing agreement

A Drying West

Conservation and Reducing "Lost" Water

Yuma Desalting Plant

Would remove salts so that drainage water flowing to Mexico can be counted towards U.S. treaty obligations

Drop 2 Reservoir

Allows water that is ordered from Lake Mead but subsequently not used to be delivered later

Vegetation Management

Reduces non-native plants that consume river water and allows reestablishment of native lower water use native vegetation

A Drying West

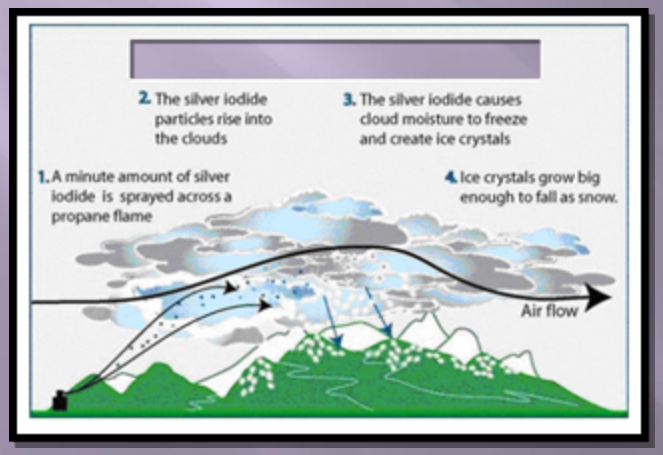
Augmenting the Colorado River

Desalinate Seawater

Treatment plants in Mexico and/or California

Import Additional Water

As Colorado River Basin water becomes more scarce and expensive, importation may become feasible



Modify Weather

Cloud seeding uses silver iodide particles to increase ice crystal growth and may delay anticipated drop in snow-pack

A Drying West

Store Excess Colorado River Water in Arizona

More than 3.5 million acre-feet have been recharged in Underground Storage and Groundwater Savings Facilities since 1992

Groundwater Savings Facilities in Pinal County account for about 2 million acre-feet

The stored water can mitigate the impacts of shortages

A Drying West

Identify Additional Water Supplies

Project ADD (Acquisition, Development and Delivery) Water

A collaborative process to determine when new supplies need to be acquired, who has access , and how to fairly apportion the costs

The ADD Water Project Team includes three CAP Board members, representatives from a variety of external stakeholders and CAP staff to refine, finalize, adopt and implement the Stakeholder Participation Plan.

Currently reviewing alternatives and hammering out differences

The Stakeholder Process is expected to conclude at the end of 2009

A Question of Power

CAP uses about 2.8 million megawatt hours of electrical energy each year

To deliver about 1.6 million acre-feet of water for municipal, agricultural and industrial uses

CAP is the single largest end user of power in Arizona

A Question of Power

95% of the energy used by CAP is produced at the Navajo Generating Station near Page, AZ

A Question of Power

Navajo Generating Station Participants

SRP (21.7%)

US/CAP (24.3%)

LADWP (21.2%)

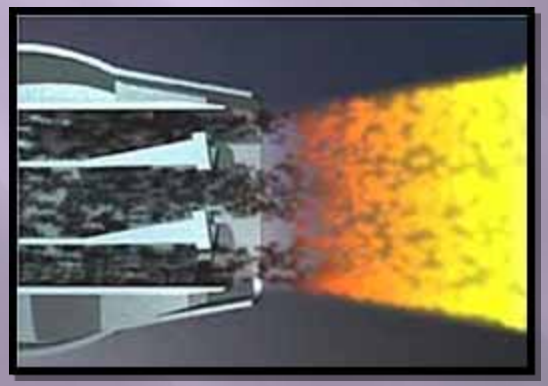
APS (14.0%)

Nevada Power (11.3%)

TEP (7.5%)

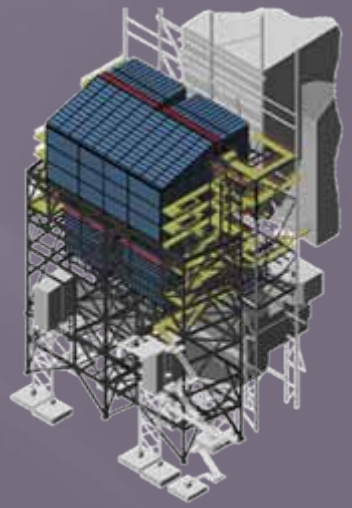
A Question of Power

EPA is currently evaluating additional nitrogen oxide (NOx) controls for NGS under its Regional Haze rules to further improve visibility in the area



Low NOx Burners with Separated Overfire Air

Two types of controls are under consideration to reduce NOx emissions at NGS



Selective Catalytic Reduction (SCR)

A Question of Power

Preferred NOx Control Alternative

The NGS participants are voluntarily installing the low NOx burners, at a cost of over $40 million

This technology will reduce NOx emissions significantly and should produce an improvement in visibility at a fraction of the cost of selective catalytic reduction

CAP is asking EPA to determine that this meets the requirement for the Best Available Retrofit Technology for Navajo Generating Station

A Cost to Consider

Selective Catalytic Reduction would:

- **Cost approximately $660 million in capital costs – more than 15 times the cost of the low NOx combustion technology**
- **Require the importation of 31 tons of anhydrous ammonia (about two tanker trucks) a day to support the control equipment**

If downstream particulate controls are required in addition to SCR, total capital costs could reach $1 billion

To require SCR would raise concerns about the very future of NGS

A Cost to Consider

Surplus Power Sales Fund CAP Repayments

CAP's annual share of the NGS output is approximately 4.3 million megawatt hours of energy

CAP sells about 1.5 million megawatt hours of excess energy each year

NGS power not used for CAP pumping is sold to help repay Arizona's share of the costs of constructing the CAP

A Cost to Consider

The Financial Impact of Cap and Trade

Congress is seeking to pass greenhouse gas legislation

Regulation could take the form of cap and trade tariffs or requirements to install carbon capture technology

Either would impose significant new costs on NGS participants

Preliminary calculations suggest replacing the power and revenues from NGS would require that CAP double or triple water rates to customers

Adding it All Up

Uncertainty About Our Water Supplies

The flow in the Colorado River is expected to decrease

New supplies will likely be needed

The competition for water in the West is expected to increase

Adding it All Up

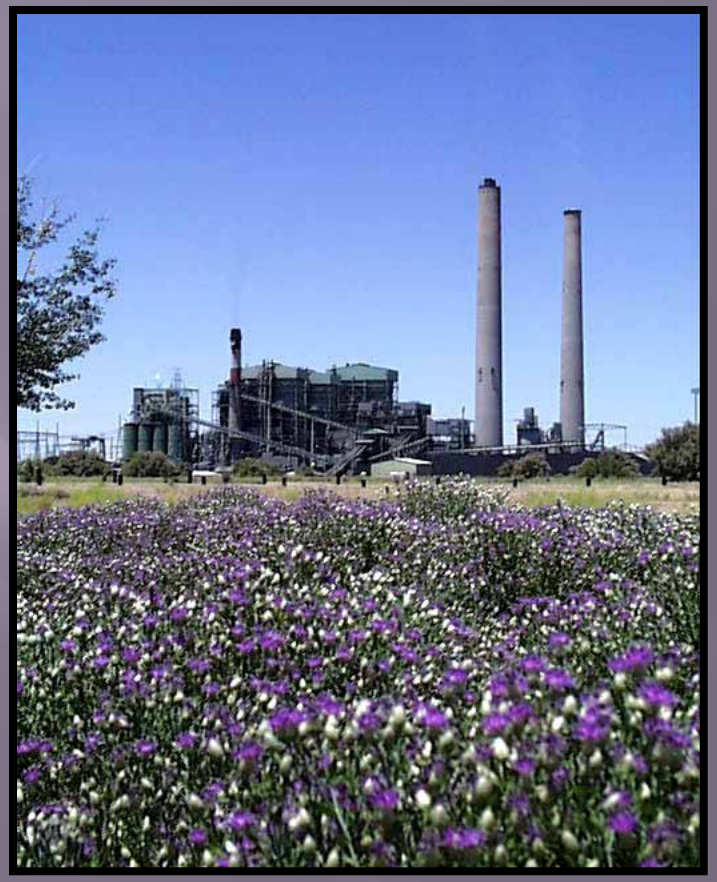
Vulnerable Energy Supplies and Higher Costs

The Navajo Generating Station near Page provides 95% of the energy used by CAP

NGS is a coal-fired plant targeted by EPA

Retrofitting the plant to reduce emissions could approach $1 billion

Potential “Cap and Trade” legislation is on the horizon and could lead to significant increases in CAP water costs



Confronting Climate Change

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Questions?

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