Total Dissolved Gas Adaptive Management Team

Columbia and Snake Rivers

September 9, 2008
Portland, Oregon

DEQ
State of Oregon Department of Environmental Quality

WASHINGTON STATE DEPARTMENT OF ECOLOGY

www.ecy.wa.gov/programs/wq/tmdl/ColumbiaRvr/ColumbiaTDG.html

Today's Agenda

- Highlights of the technical *Evaluation of the 115% Total Dissolved Gas Forebay Requirement*
- Comments, questions, etc
- Next steps

(comments due October 6)

http://www.ecy.wa.gov/programs/wq/tmdl/ColumbiaRvr/ColumbiaTDG.html

AMT Issue #1

- The need for the 115% forebay TDG requirement.

If the 115% requirement was removed, how would it affect fish (and other aquatic life)?

Decision

Gas Bubble Trauma Impacts

Fish Passage & Survival Impacts

Adaptive Management Team Total Dissolved Gas in the Columbia and Snake Rivers

Evaluation of the 115% Total Dissolved Gas Forebay Requirement

- Available on the AMT Website. Background excel files also available.
- Comments due **October 6** to ODEQ & Ecology

Purpose

- Technical document for ODEQ and Ecology to make a decision on the need for the 115% forebay TDG requirement
- Overview of the regulatory history and requirements
- Summarizes and evaluates the technical information presented at the TDG AMT meetings

Purpose, continued

- Does not include the details of each analysis – relies on materials submitted to AMT for details
- States did some additional summarizing

Purpose, continued

- Does not address management issues (transport, BiOp spill operations, how much *should* we spill, etc.)
- Focused on Lower Columbia and Lower Snake Rivers
- Ecology and ODEQ will reach a decision after we receive your technical comments on the paper

Contents

1. Background
2. Spill Volume with and without the 115%
3. Fish Passage and Survival Impacts
4. Gas Bubble Trauma Impacts

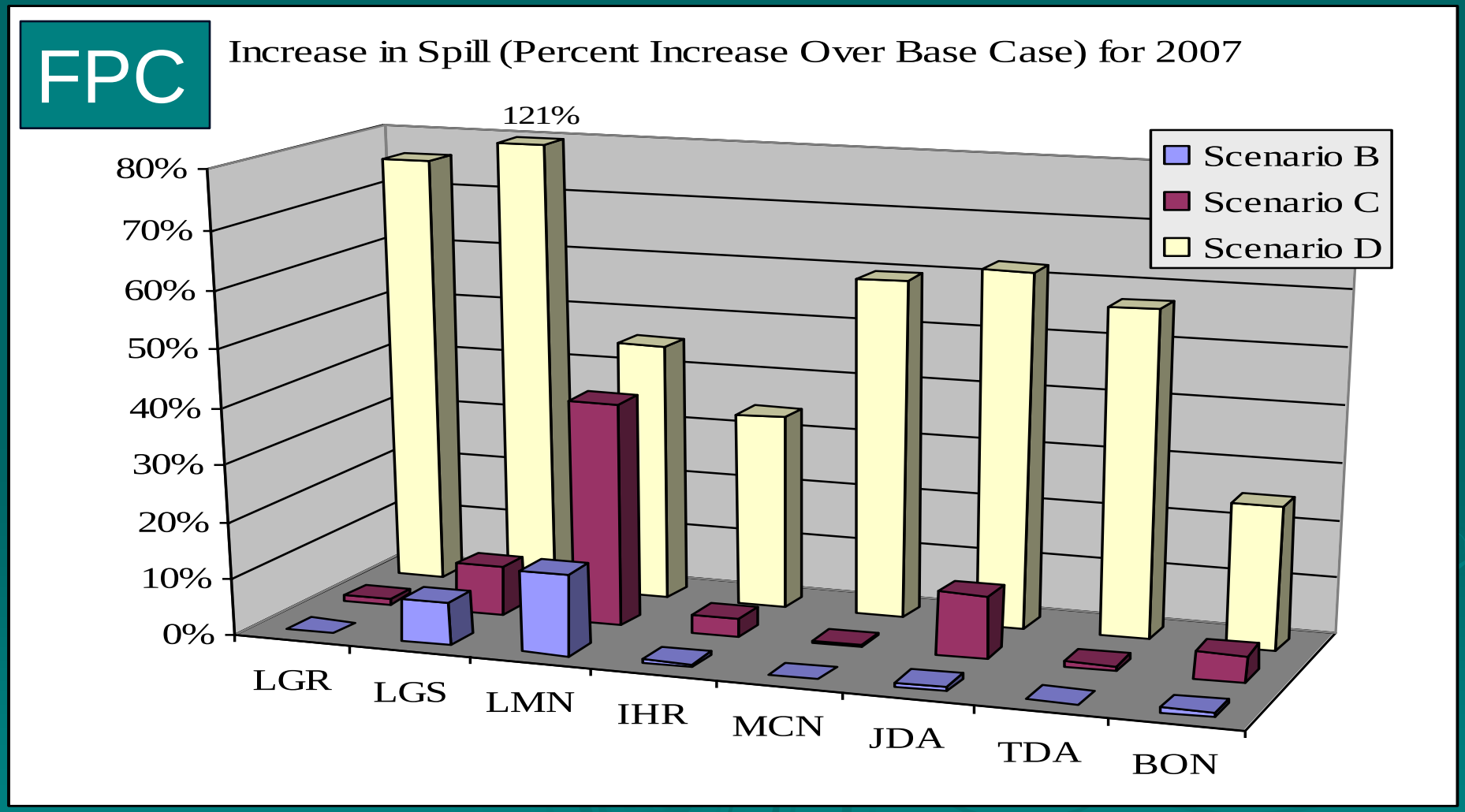
1. Background

- TMDLs cover all Columbia and Snake River Dams
- Oregon waivers and Washington water quality standards for fish passage:
  - 120% in tailrace and
  - 115% in the forebay

1. Background

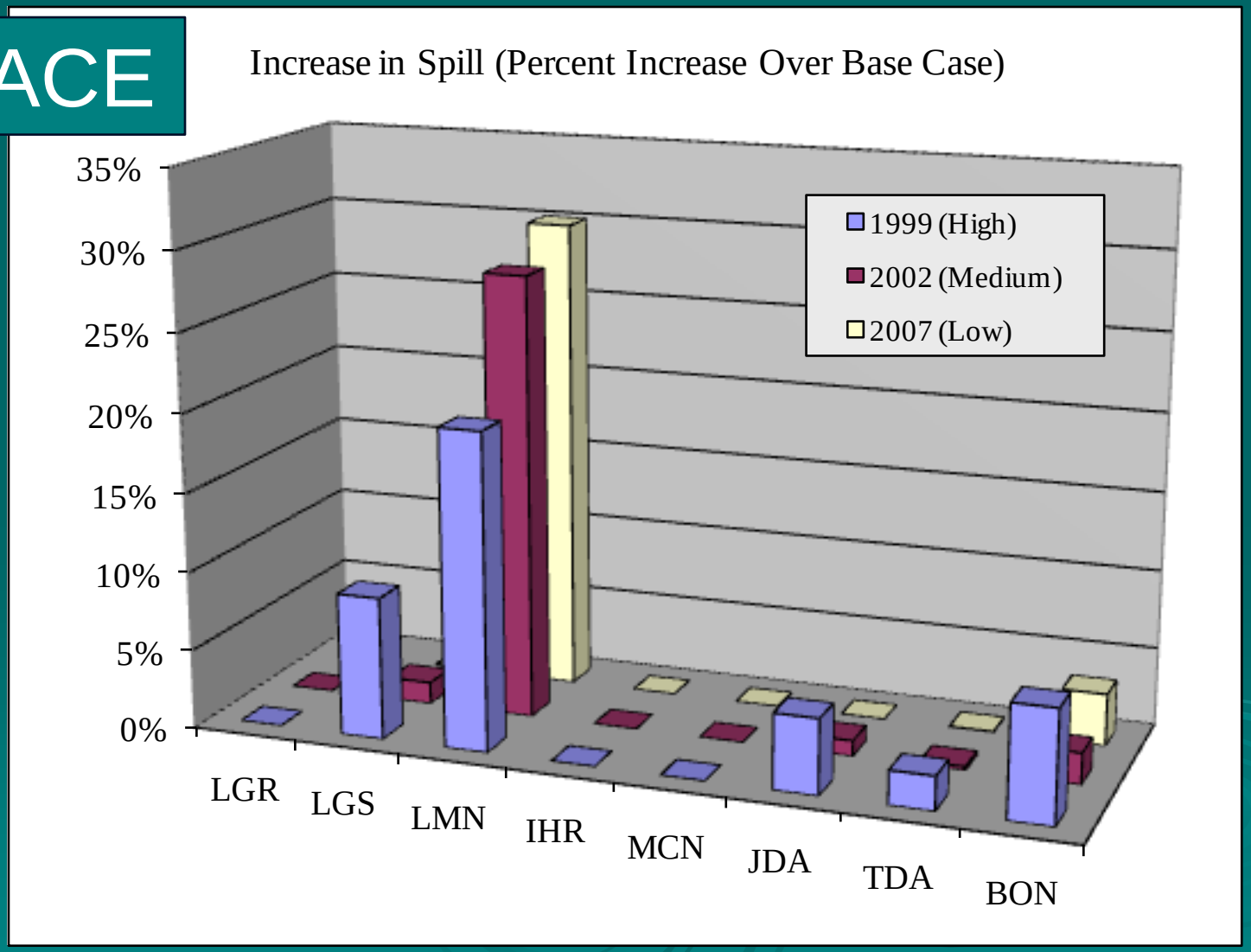
- BiOp
- TMDLs
- AMT process
- Information AMT considered
- Spill volume considerations

2. Spill Volume with & without the 115%



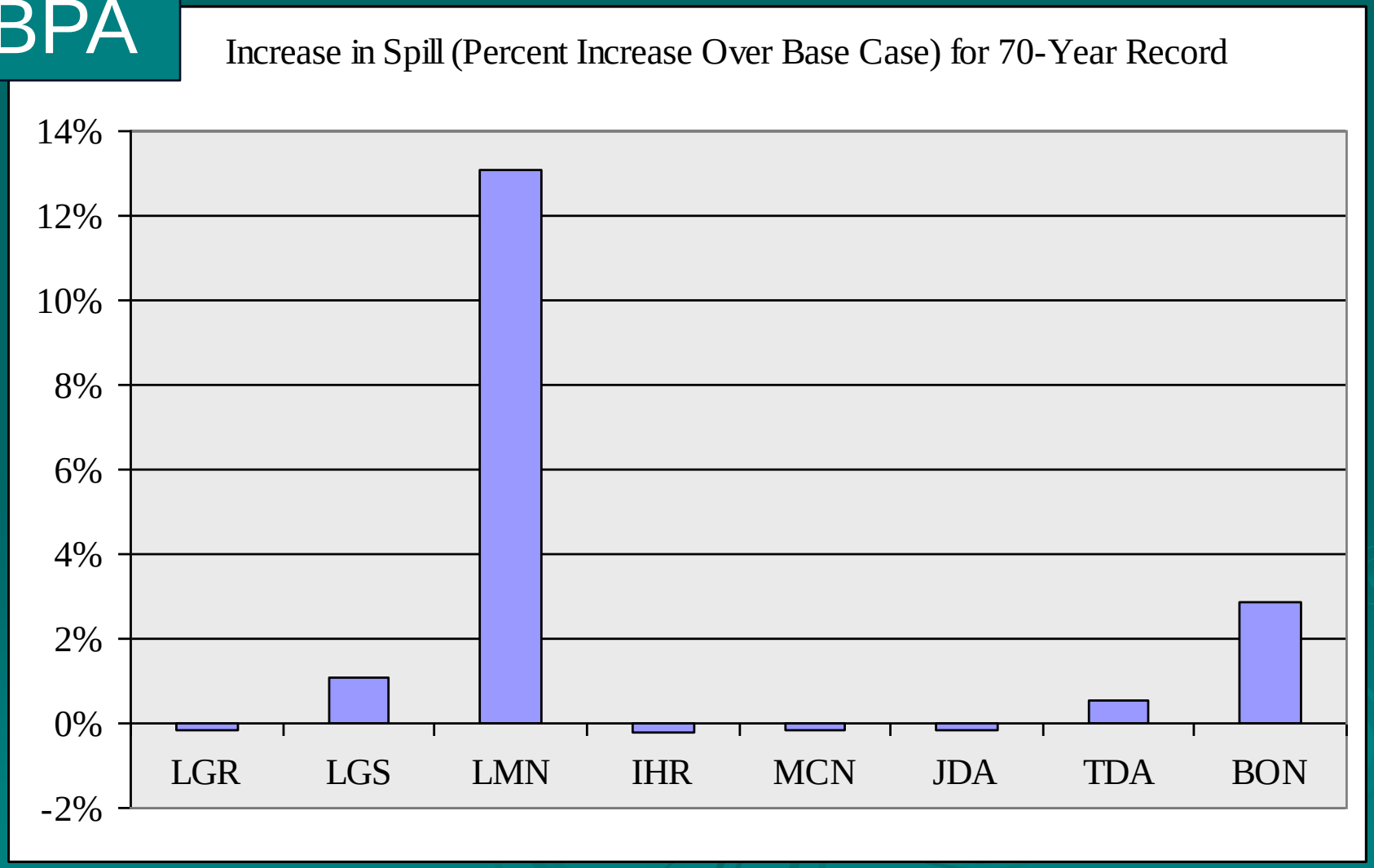
2. Spill Volume with & without the 115%

USACE



2. Spill Volume with & without the 115%

BPA



2. Spill Volume with & without the 115%

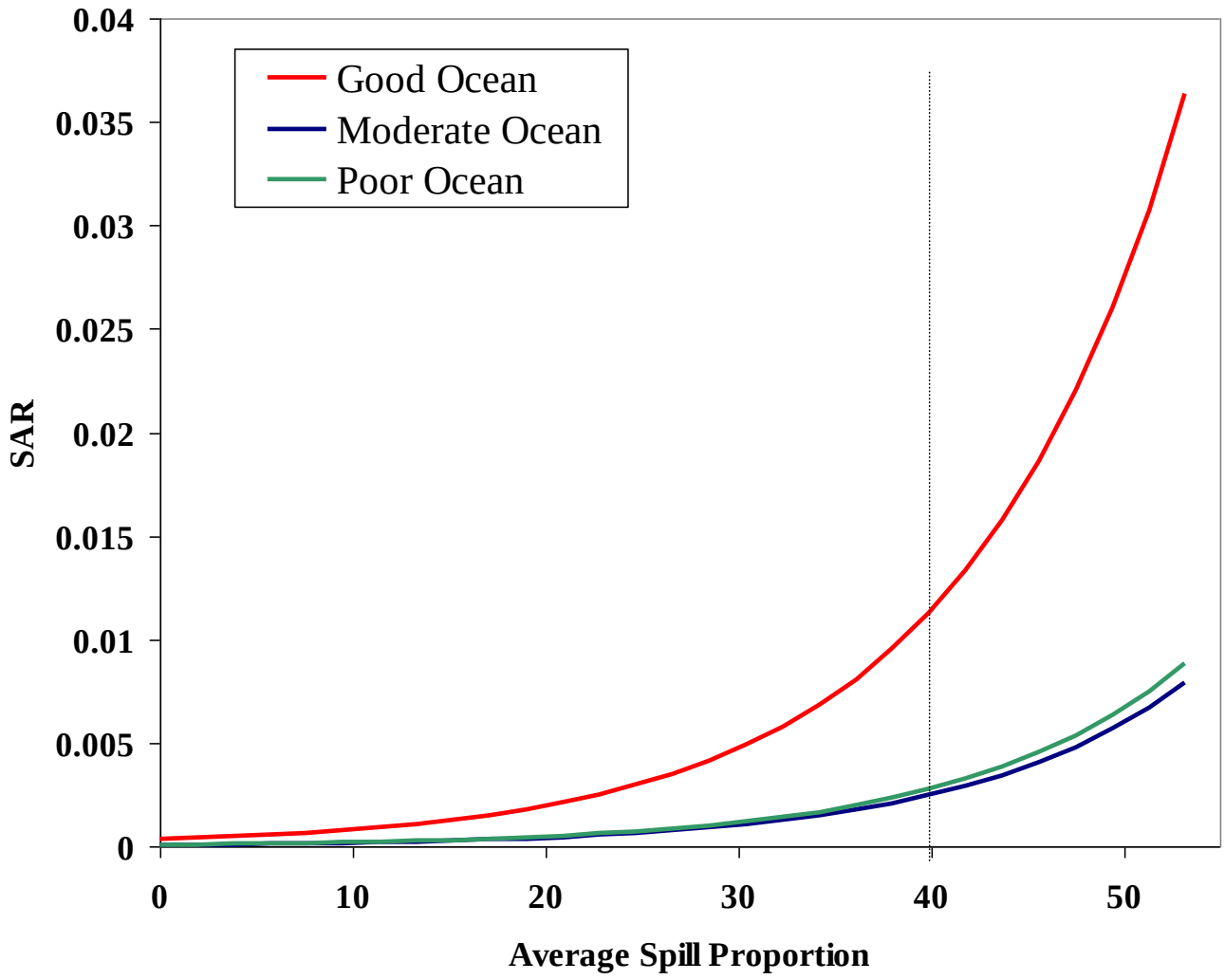
Analysis	**Additional Spill Amount without the 115% Forebay TDG Limit** (per year, an average for all eight dams combined)
FPC	1% - 60% depending on the year and scenario
USACE	1.8% - 4.0% depending on the year
BPA	1.3% average over 70 water years

3. Fish Passage & Survival Impacts

- There is no way to know the exact impacts on fish survival.
- Each of the analyses has uncertainty and controversy:
  - FPC “Importance of Spill”
  - CSS (Comparable Survivability Study)
  - COMPASS
  - Adult Passage and Survival (CRITFC)

3. Fish Passage & Survival Impacts

FPC



3. Fish Passage & Survival Impacts

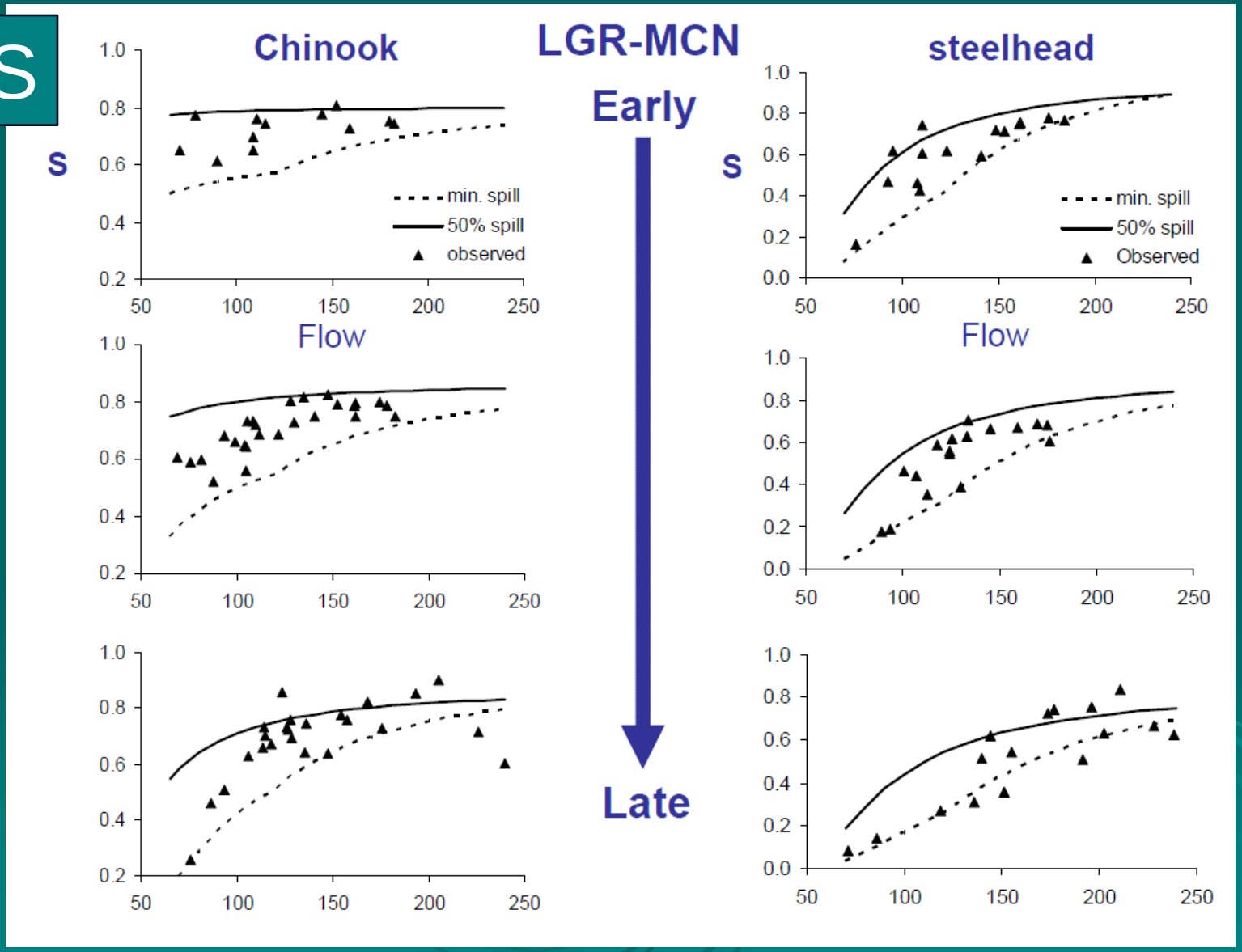
FPC

- The FPC analysis found relationships between survival and spill proportion
- For example, for Snake River Spring / Summer Chinook:

$$\text{Survival} = 0.22e^{(0.024*\text{Ave. Spill Proportion})}$$

3. Fish Passage & Survival Impacts

CSS



3. Fish Passage & Survival Impacts

COMPASS

Species	Measurement	Relative Change
Snake River Spring / Summer Chinook	Whole pop. LGR-LGR SAR	0.8%
Snake River Steelhead	Whole pop. LGR-LGR SAR	-1.1%
Upper Columbia River Chinook	Whole pop. LGR-LGR SAR (surrogate)	0.0%
Upper Columbia River Steelhead	Whole pop. LGR-LGR SAR (surrogate)	0.0%
Mid-Columbia Steelhead	In River Survival	0.0-0.2%

3. Fish Passage & Survival Impacts

CRITFC

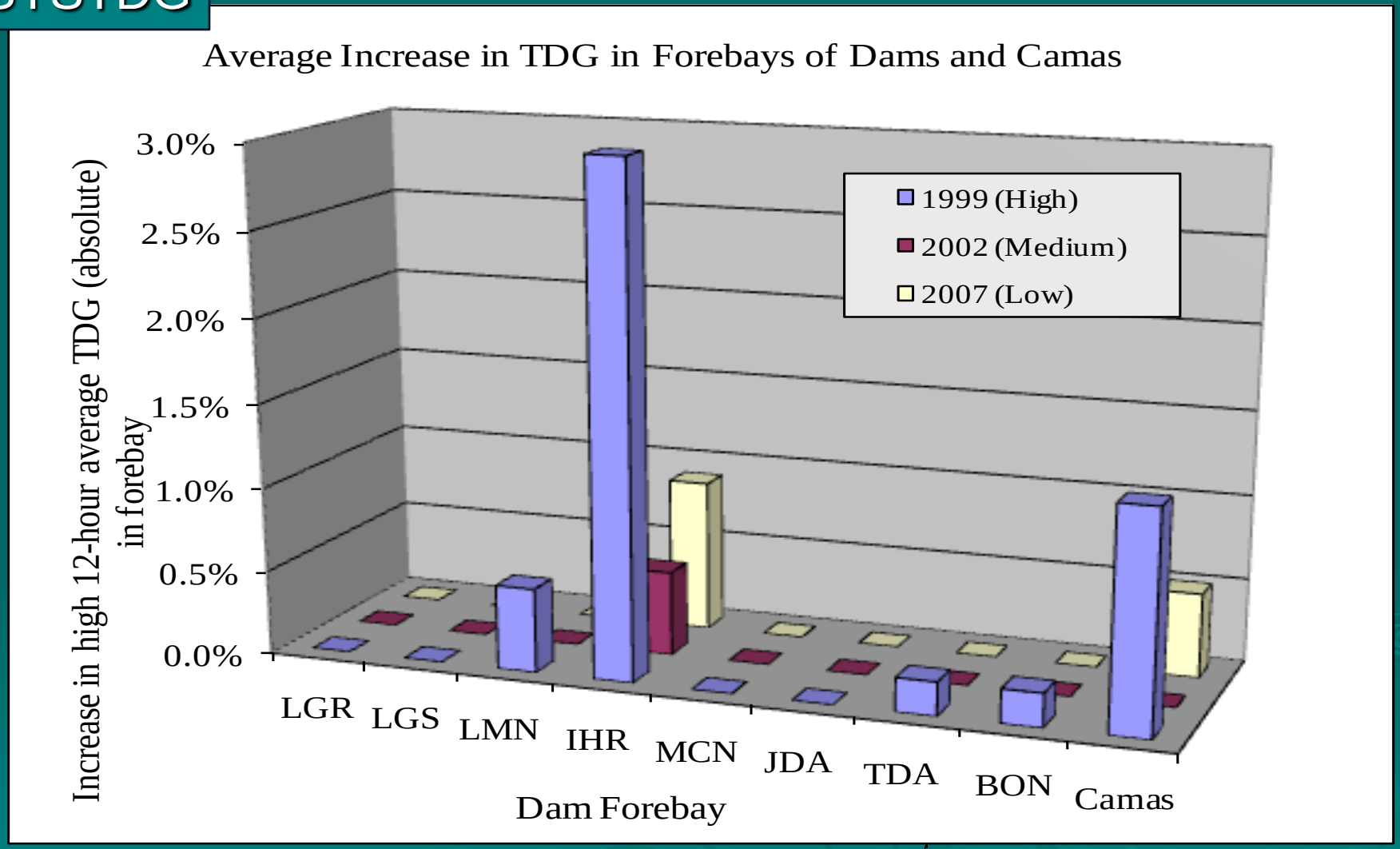
- Spill and surface bypass (and probably a combination), provide the safest downstream passage route for adult migrants

4. Gas Bubble Trauma Impacts

- There is no way to know the exact impacts on aquatic life from increases in TDG due to the increase in spill.
- Information from:
  - USACE SYSTDG TDG Simulations
  - Ecology Literature Review
  - Resident Fish Review (NOAA)
  - Parametrix Literature Review (Weitkamp)
  - GBT Monitoring Program

4. Gas Bubble Trauma Impacts

SYSTDG



Average: 0.3% TDG increase in forebays and 0.1% in tailraces

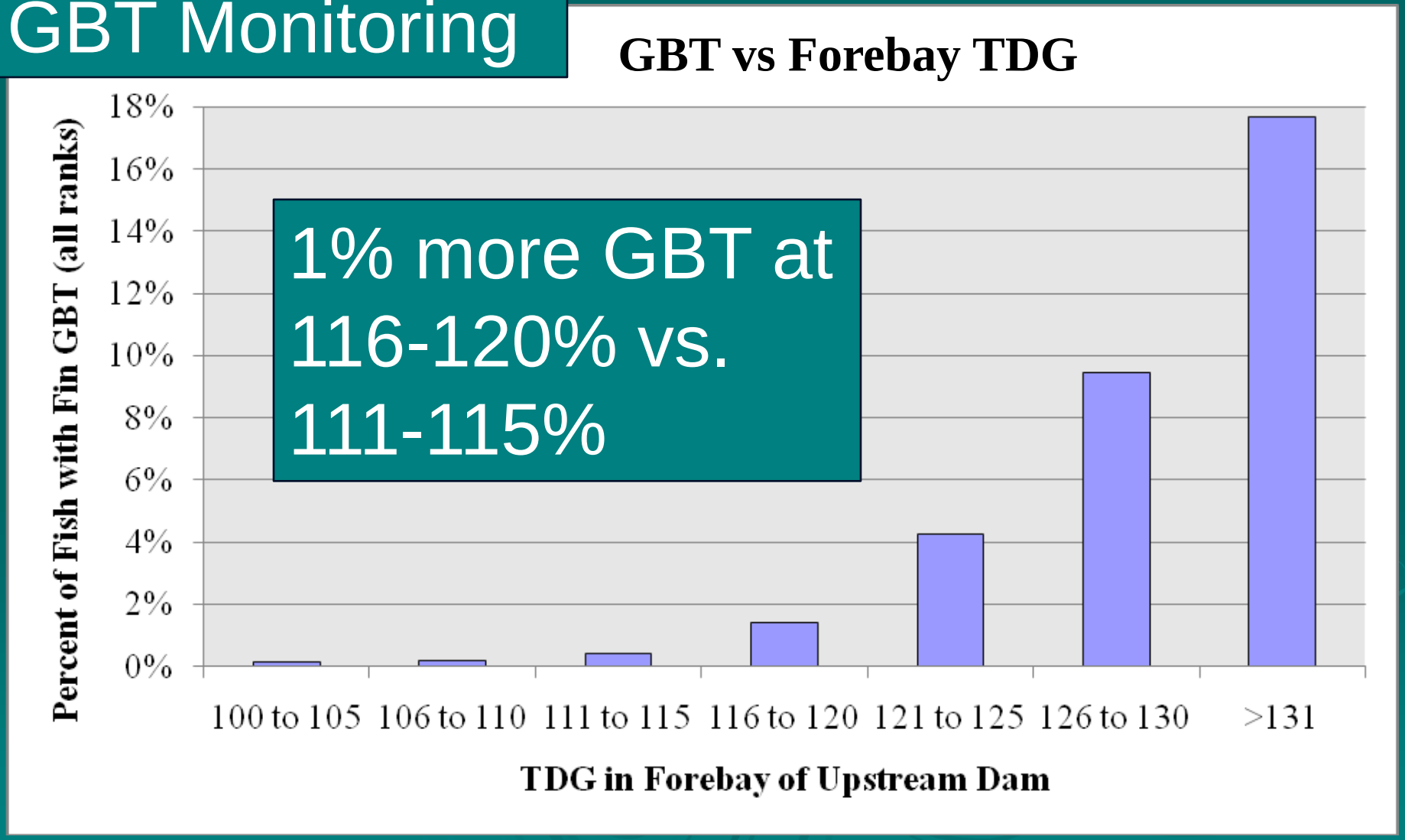
4. Gas Bubble Trauma Impacts

Resident Fish Review & Parametrix Literature Review

- Negligible adverse effects from 120% TDG
- Further, with 10% depth compensation per meter, all aquatic life below 1m protected

4. Gas Bubble Trauma Impacts

GBT Monitoring



1% more GBT at 116-120% vs. 111-115%

4. Gas Bubble Trauma Impacts

Ecology Literature Review

- Detrimental effects on aquatic life at shallow depths (<1m), at >=120% TDG
- Time spent at <1m was usually, but not always, less than the amount of time where significant detrimental effects were found

4. Gas Bubble Trauma Impacts

Eliminating the 115% forebay limit:

- increase TDG 0.3% (forebays) & 0.1% (tailraces)
- *NOAA Fisheries and Parametrix reviews:* any negative effect would be negligible.
- *GBT monitoring program:* <1% increase in GBT signs if TDG increases by 5%
- *Ecology review:* impact to aquatic life in shallow waters <1m that should not be considered negligible

5. Agencies' Decisions

Gas Bubble Trauma Impacts

Fish Passage & Survival Impacts

5. Agencies' Decisions

- Waiting until after we receive your comments to make a decision
- Oregon DEQ and Washington Dept. of Ecology will decide based on the technical information in the paper using weight of evidence approach
- Actual spill volumes and management issues are determined elsewhere

Your comments

- Inaccuracies in the summary of materials presented at AMT
- Any inaccurate conclusions

Comments Due **October 6**!

- **Please send comments in writing to Ecology & ODEQ**

Process

- Review materials submitted at AMT
- ODEQ/Ecology write Synthesis paper
- Presentation of paper to TDG AMT for 30 day review (September)
- Final paper with staff decision (~November)

Washington Process

- **If** Washington decides to remove the 115% requirement, Ecology would need to change water quality standards:
- Rule change, APA requirements, public hearings, EPA/ESA approval, etc.

Oregon Process

- **If** Oregon decides to remove the 115% requirement, ODEQ would issue a Modification Order for the current TDG Waiver signed by ODEQ Director
- Modification Order would undergo official 30-day Public Comment period, to start in ~November
- Final Order would be issued in ~December

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http://www.ecy.wa.gov/programs/wq/tmdl/ColumbiaRvr/ColumbiaTDG.html