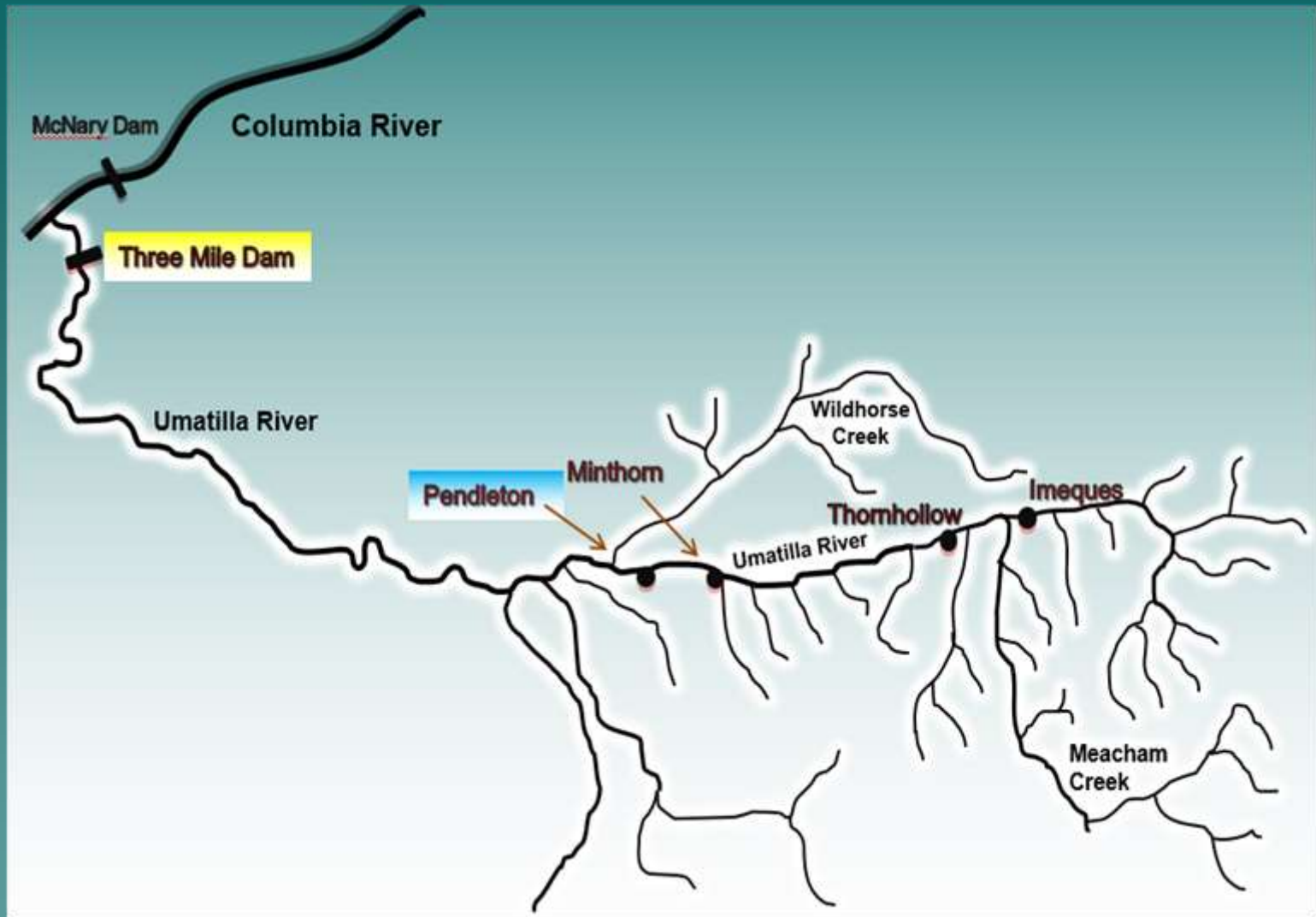


Umatilla River Coho Program: A Study on Adaptive Management




**Confederated Tribes of the
Umatilla Indian Reservation**





Umatilla River Basin

Production History

- 1987-1994 releases - 1.0M smolts produced at Cascade Hatchery. All fish direct released into Umatilla River.
 - 1995-2009 releases – 1.0M smolts from Cascade Hatchery and 500K smolts from Lower Herman Creek Hatchery. All fish direct released into Umatilla River.
 - 2010-2014 releases - 1.0M smolts produced at Cascade Hatchery. All fish acclimated at Pendleton Acclimation Facility.
- 
- A stylized teal silhouette of a mountain range is located in the bottom right corner of the slide.

- 2015-present – 500K smolts produced at Cascade Hatchery. All fish acclimated at Pendleton Acclimation Facility.
- 2015 (BY13) was first release year of 100% progeny of locally adapted broodstock.



Broodstock History

- From the onset of the existing program (1987-through 2009) all smolts were Tanner Ck stock collected and spawned at Bonneville Hatchery.
- Two years during this period brood were also collected from the Umatilla River (93 & 95 BYs).
- Beginning with BY10 – brood for the program collected and spawned at 3MD with eggs incubated to the eyed stage at Irrigon Hatchery then transferred to Cascade Hatchery for hatching and initial rearing.

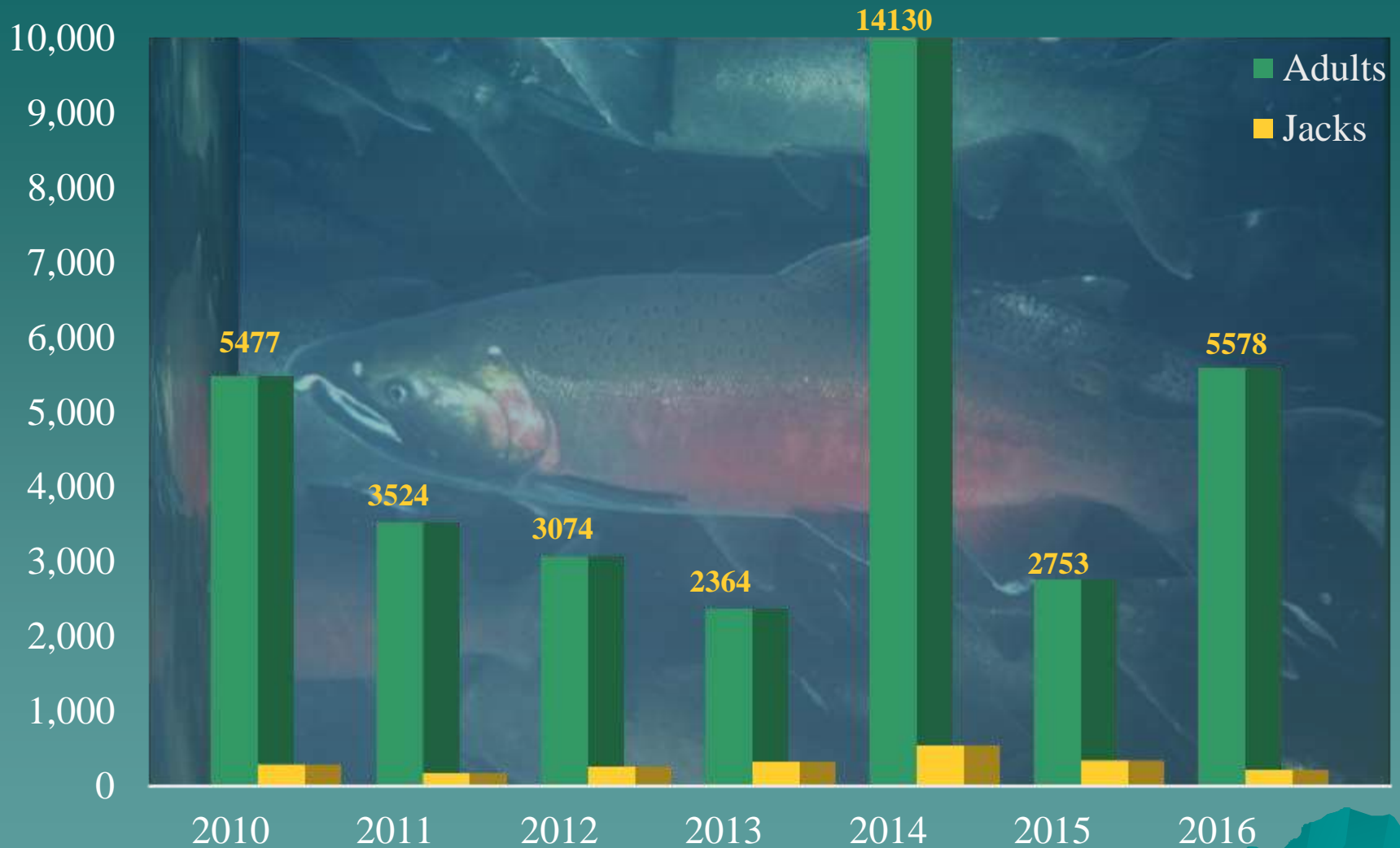
- 2014-present - 100% of broodstock Umatilla origin.



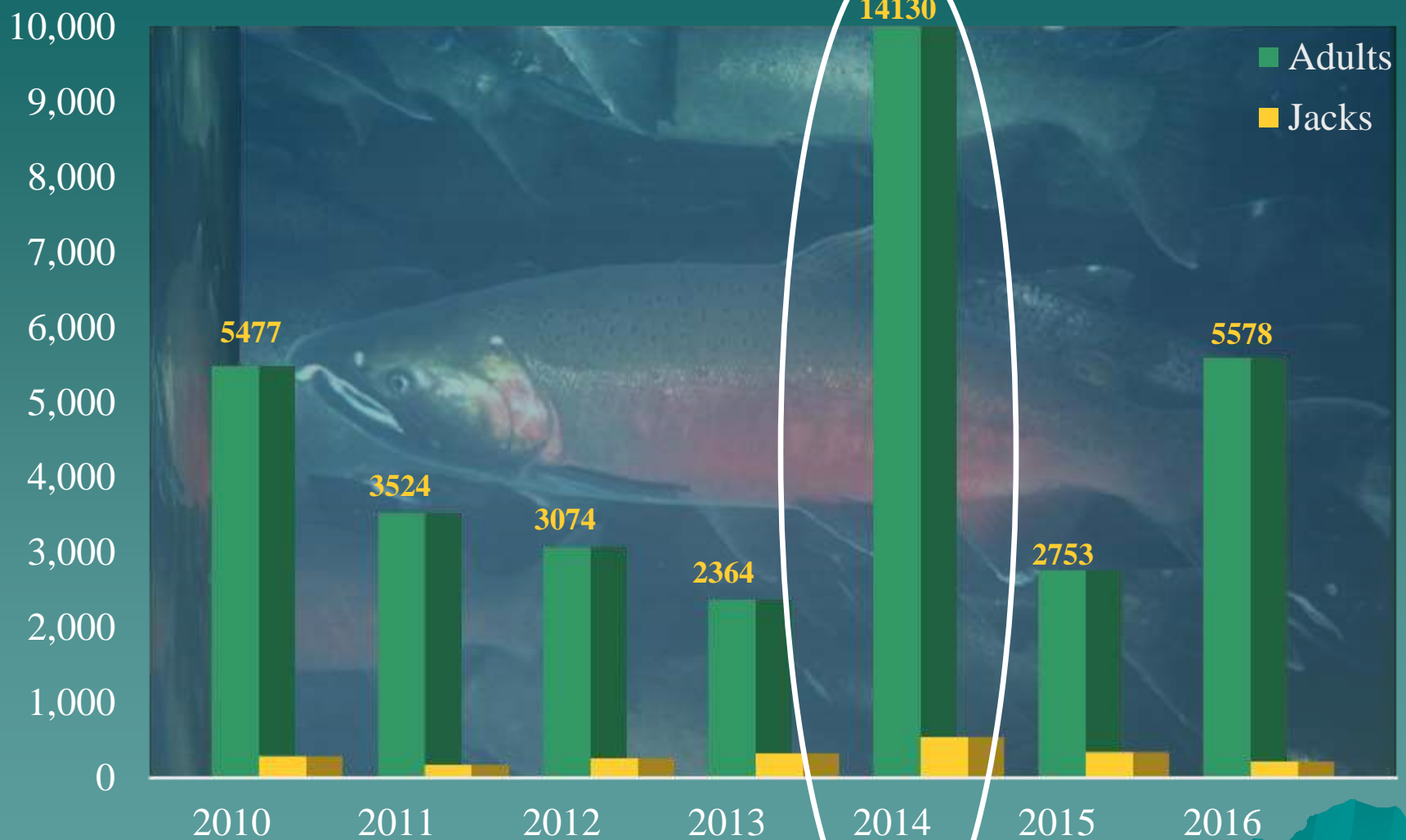
Three Mile Dam Adult Trap, Holding & Spawning Facility



Annual Coho Returns to 3MD



Annual Coho Returns to 3MD

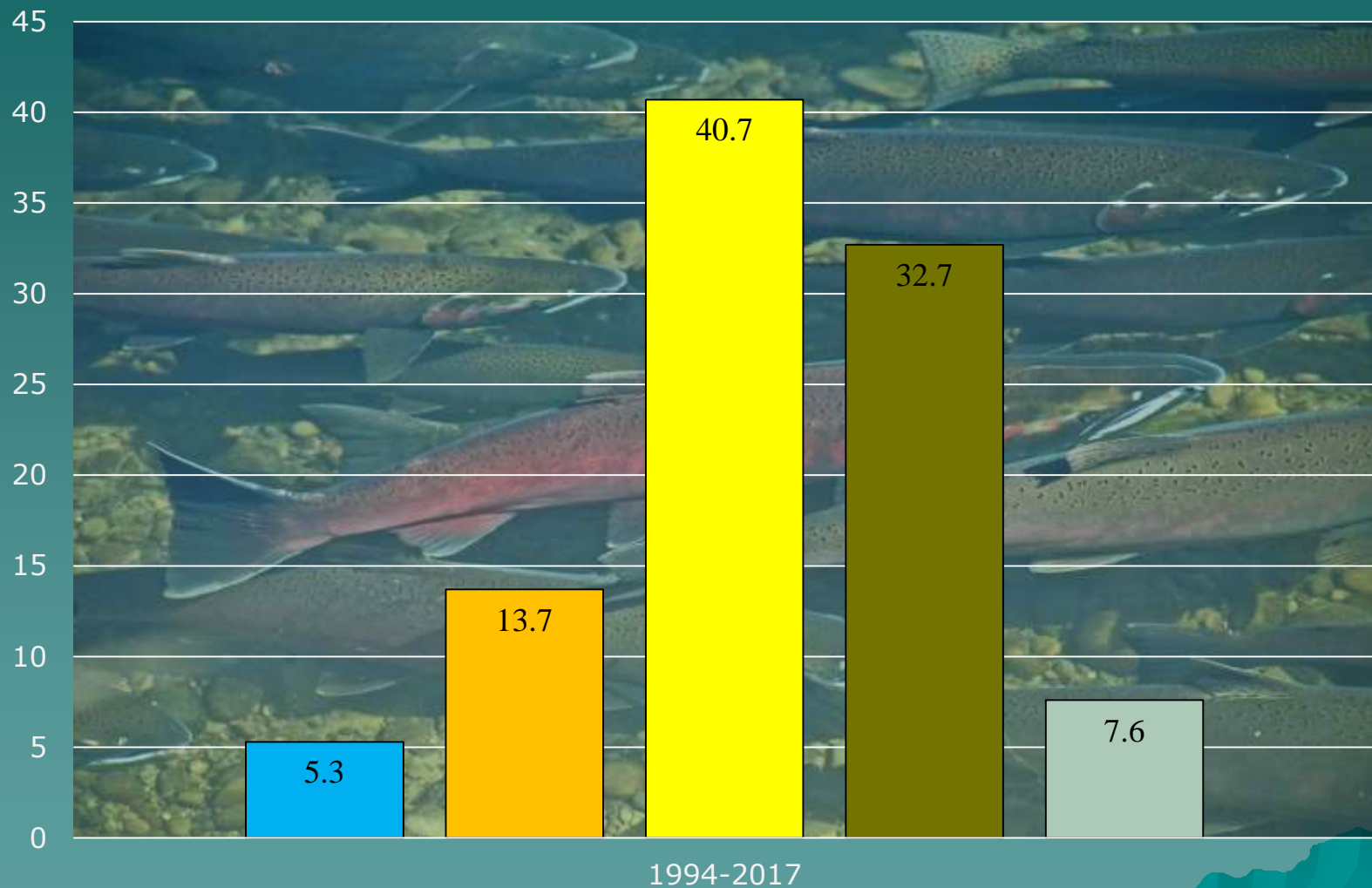


What Problems & Why?

- Initial intent was to collect broodstock proportionally over the entire run.....



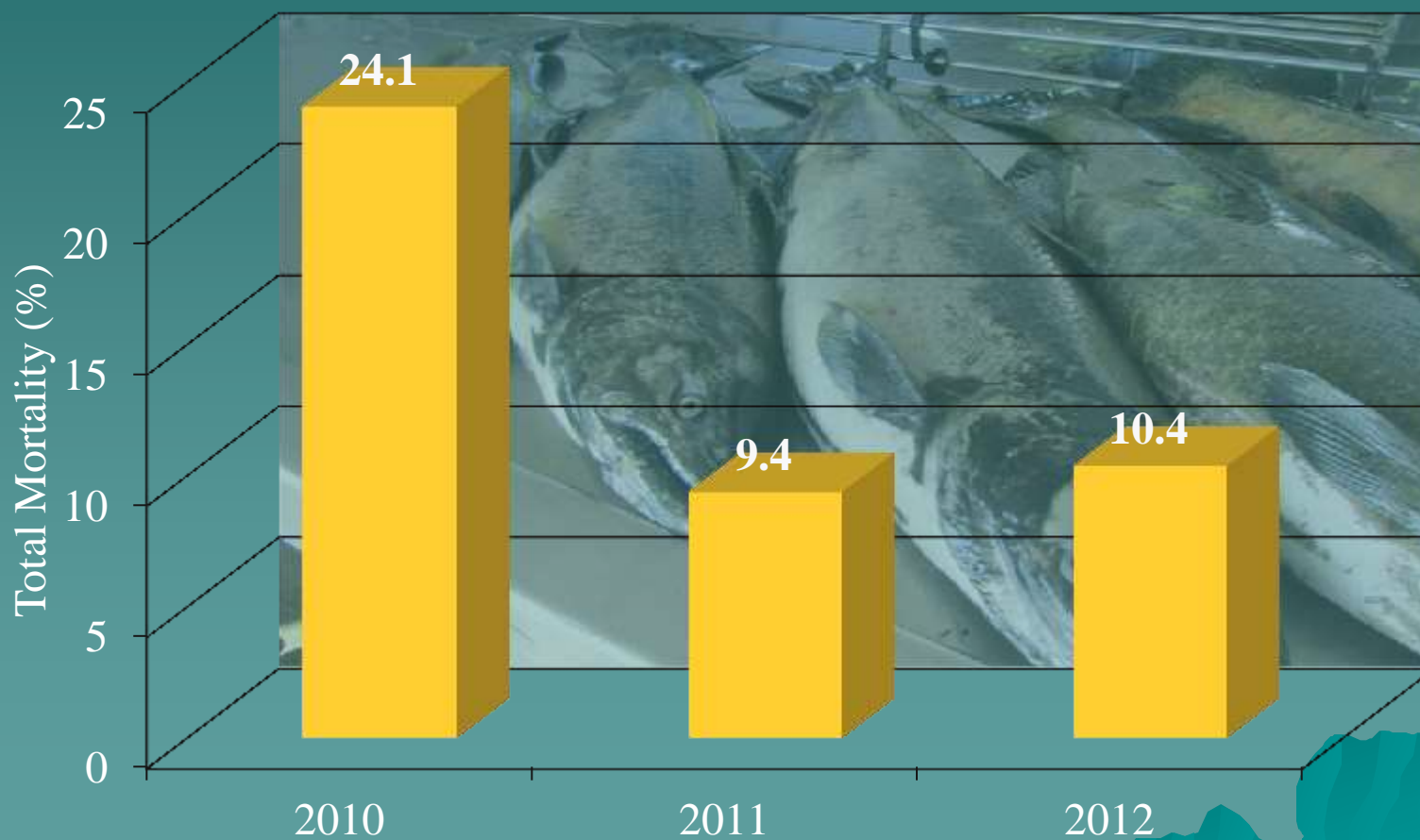
Coho Brood % Run Timing at 3MD



< Sept. 30 Oct. 1-15 Oct. 16-31 Nov. 1-15 > Nov. 15

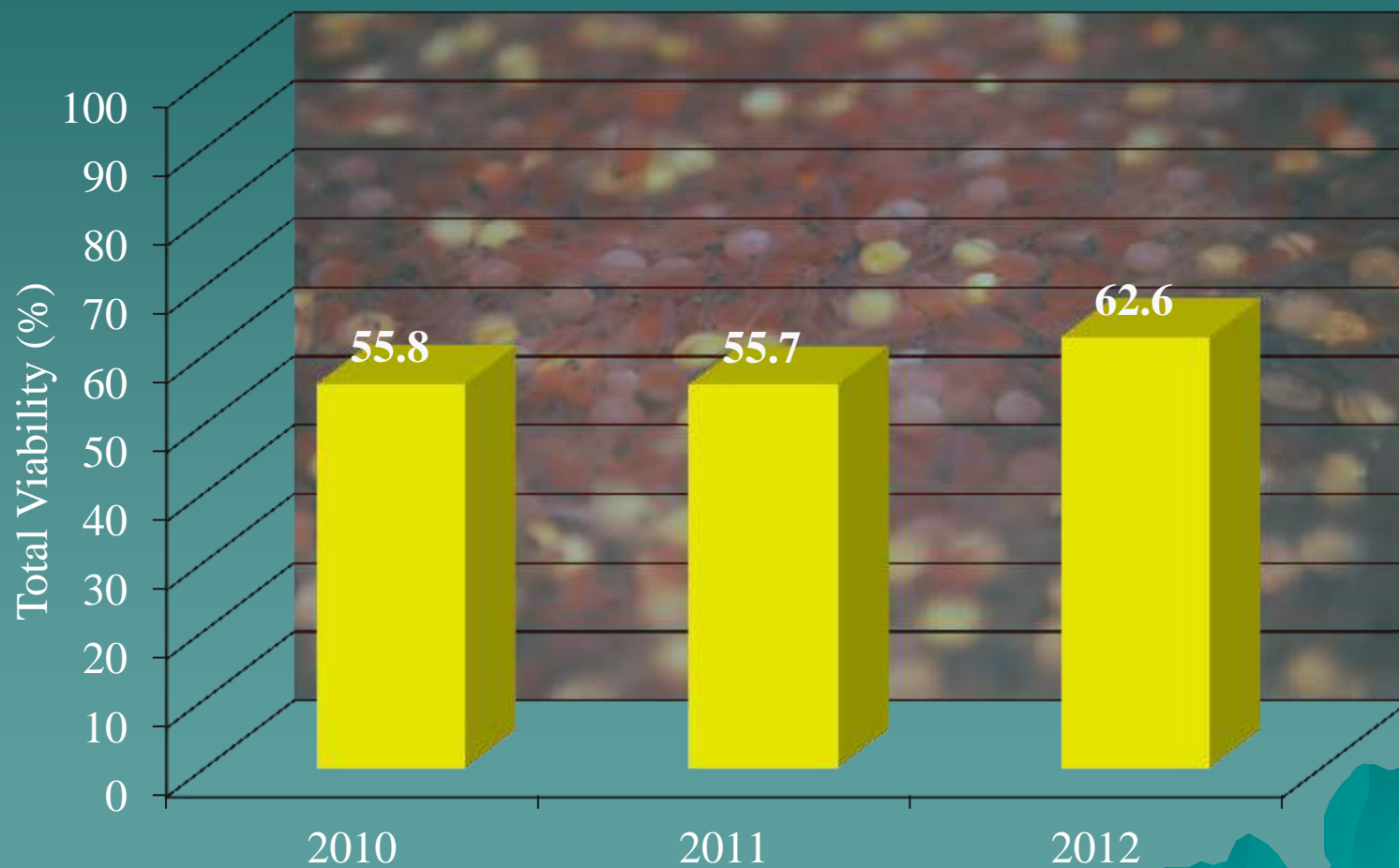
Local Broodstock Development Issues

Pre-spawn Mortality – first 3 years



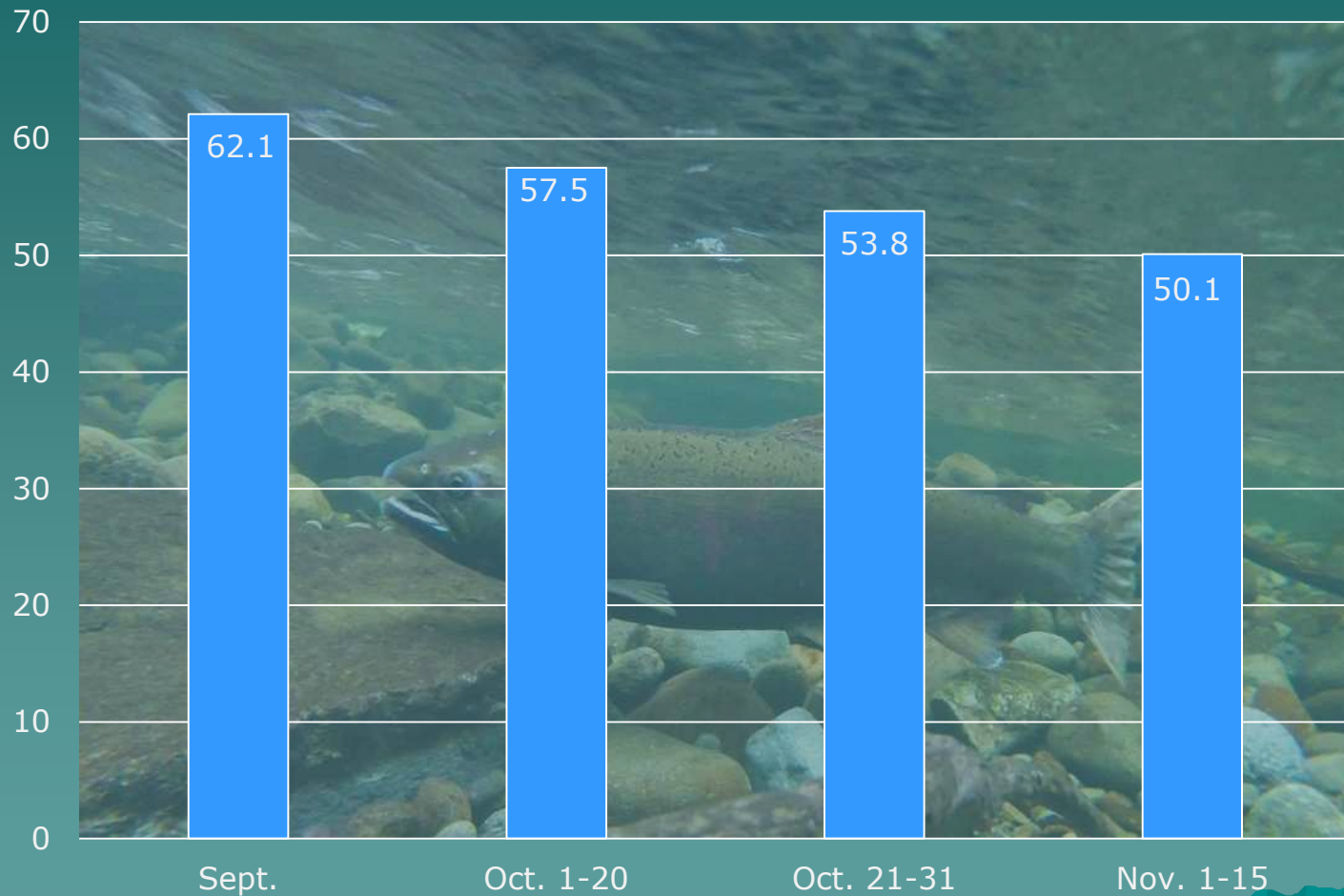
Local Broodstock Development Issues

Egg Viabilities – first 3 years




Water Temperature Averages at 3MD

Brood Collection & Holding Periods

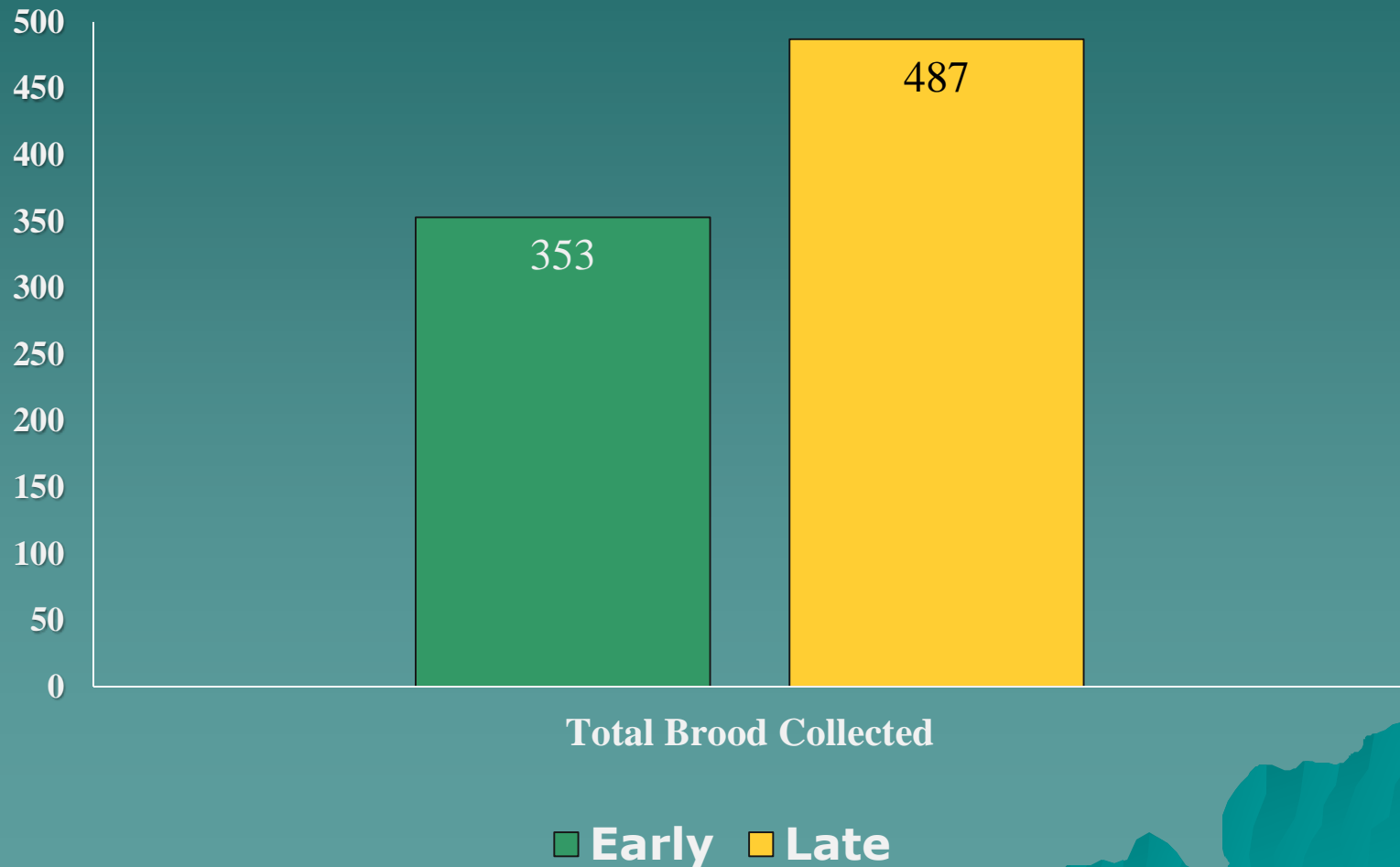


Brood Year 2014

- Due to the projected high return numbers, we performed a comparison of two collection groups...
 - Early group (late Sept-mid Oct).
 - Late group (late Oct-early Nov).
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, extending from the right edge towards the center.

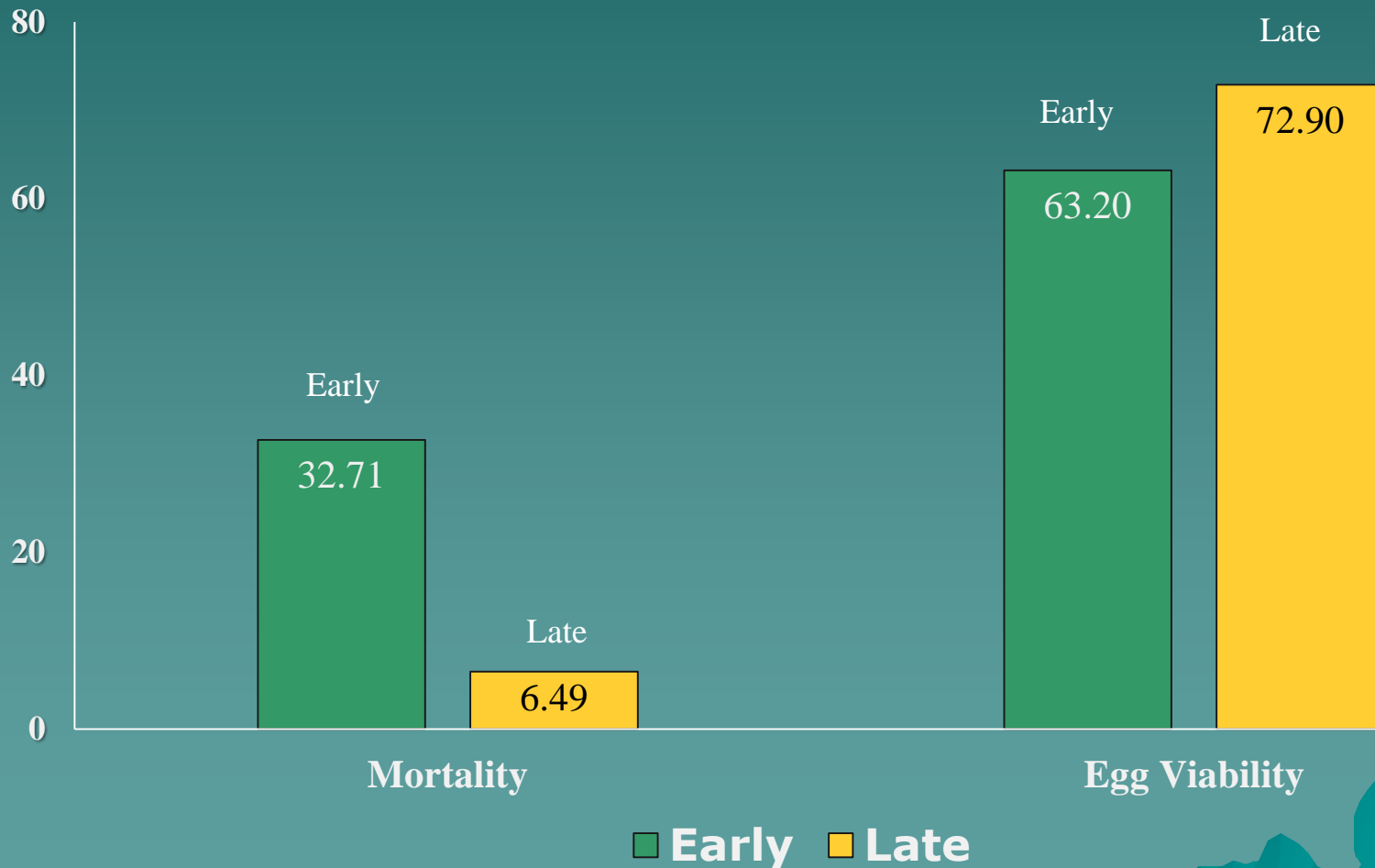
Brood Year 2014

Number of Broodstock Collected



Brood Year 2014

% Pre-spawn Mortality & Egg Viability



2014 Coho Brood Collection Comparison

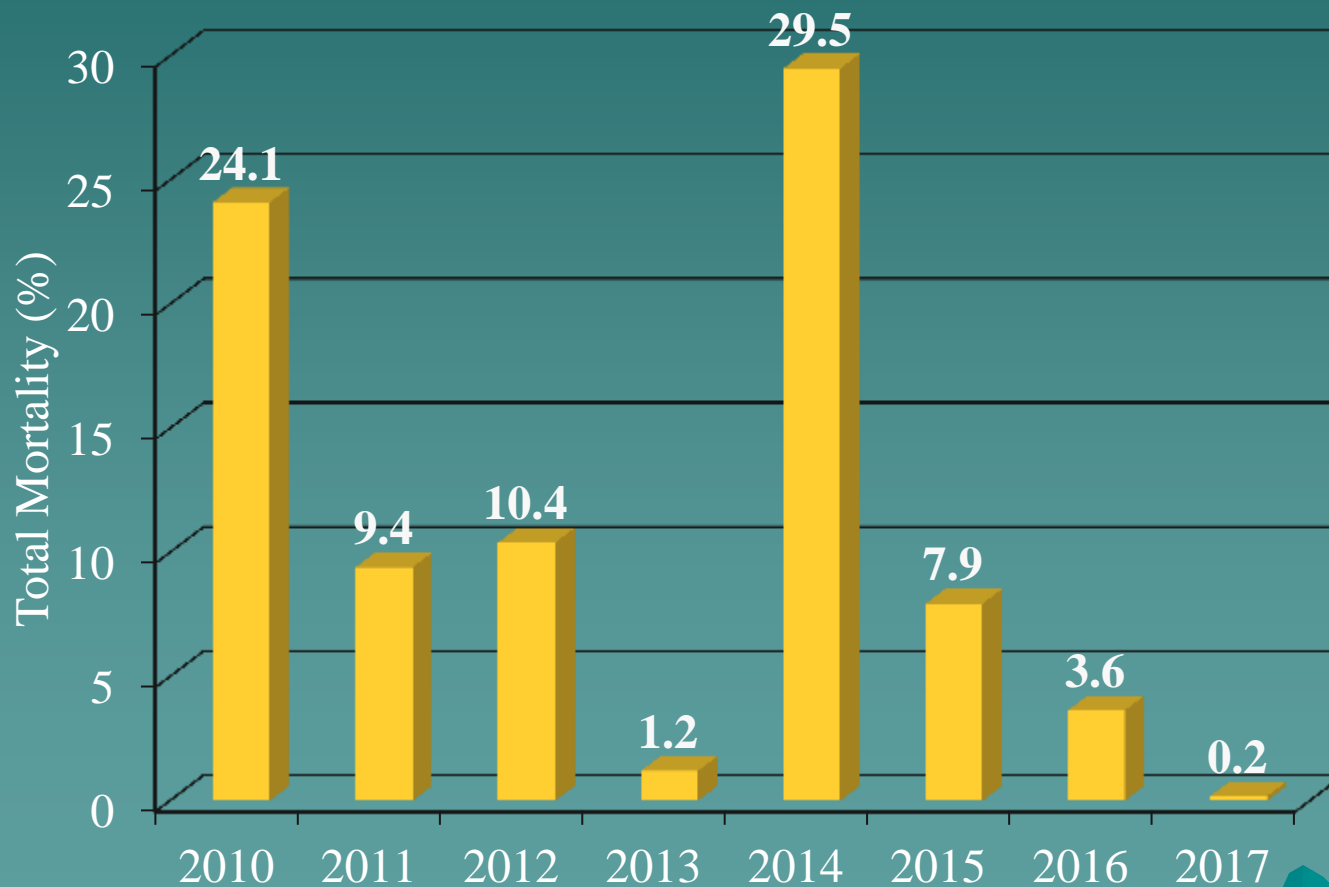
<u>Totals</u>	<u>Collection</u> <u>Dates</u>	<u># Broodstock</u> <u>in Group</u>	<u>Prespawn</u> <u>Loss</u>	<u>% Viability</u>	<u>Ponding</u> <u>Loss</u>	<u>Water Temp</u> <u>Avg.</u>
<u>Early Group</u>	9/18-10/20	353	32.7%	63.2%	6.32%	61.8 (57.2-65.9)
<u>Late Group</u>	10/21-10/31	487	6.5%	72.9%	4.52%	56.0 (53.1-58.2)

Annual Coho Brood Collection Timing at 3MD (all years)



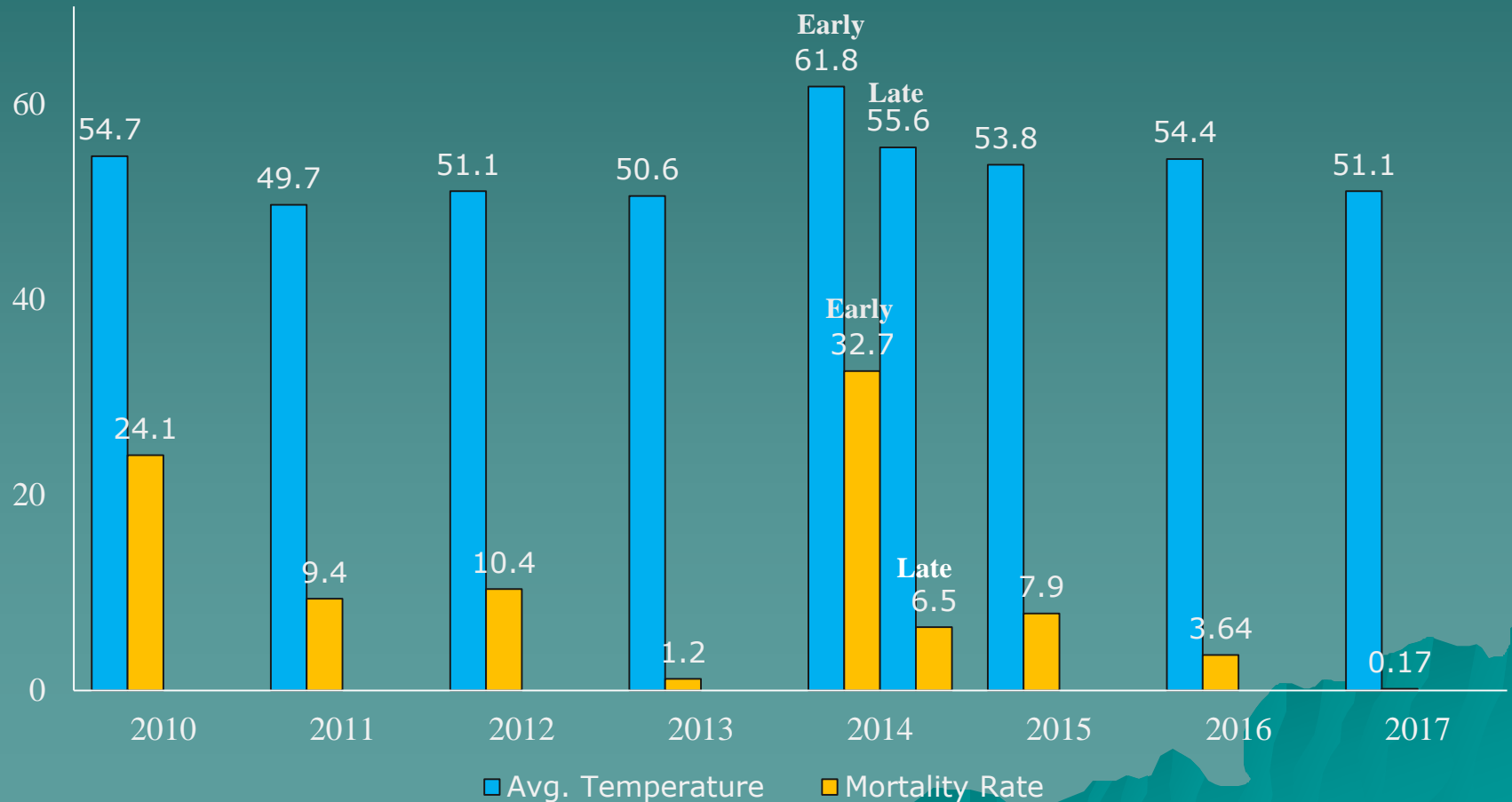
Broodstock Issues & Improvements

Pre-spawn Mortality from last 8 years



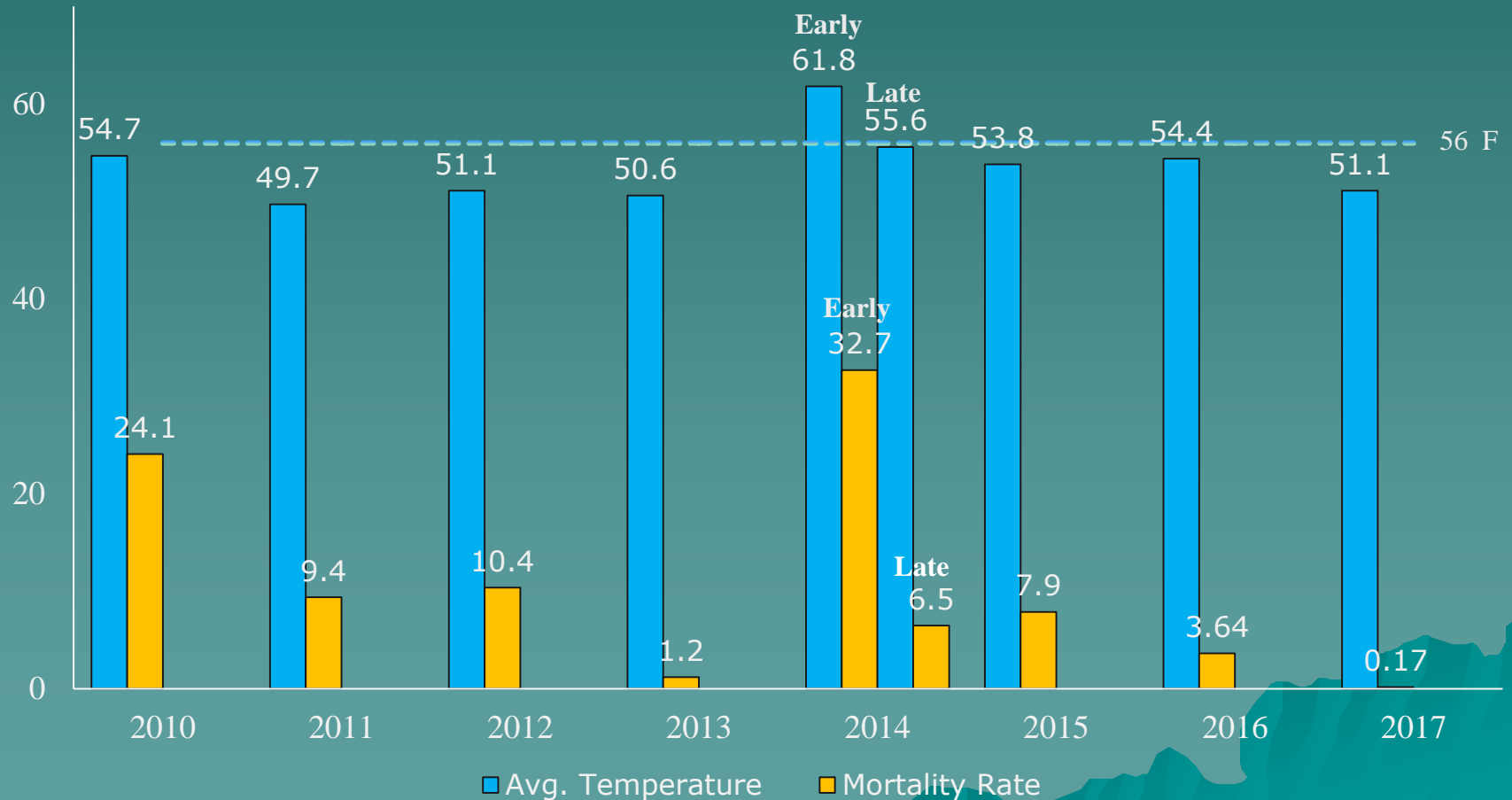
Broodstock Issues & Improvements

Average Water Temps v. Pre-Spawn Mortality Rates
(all brood years – collection & holding periods)



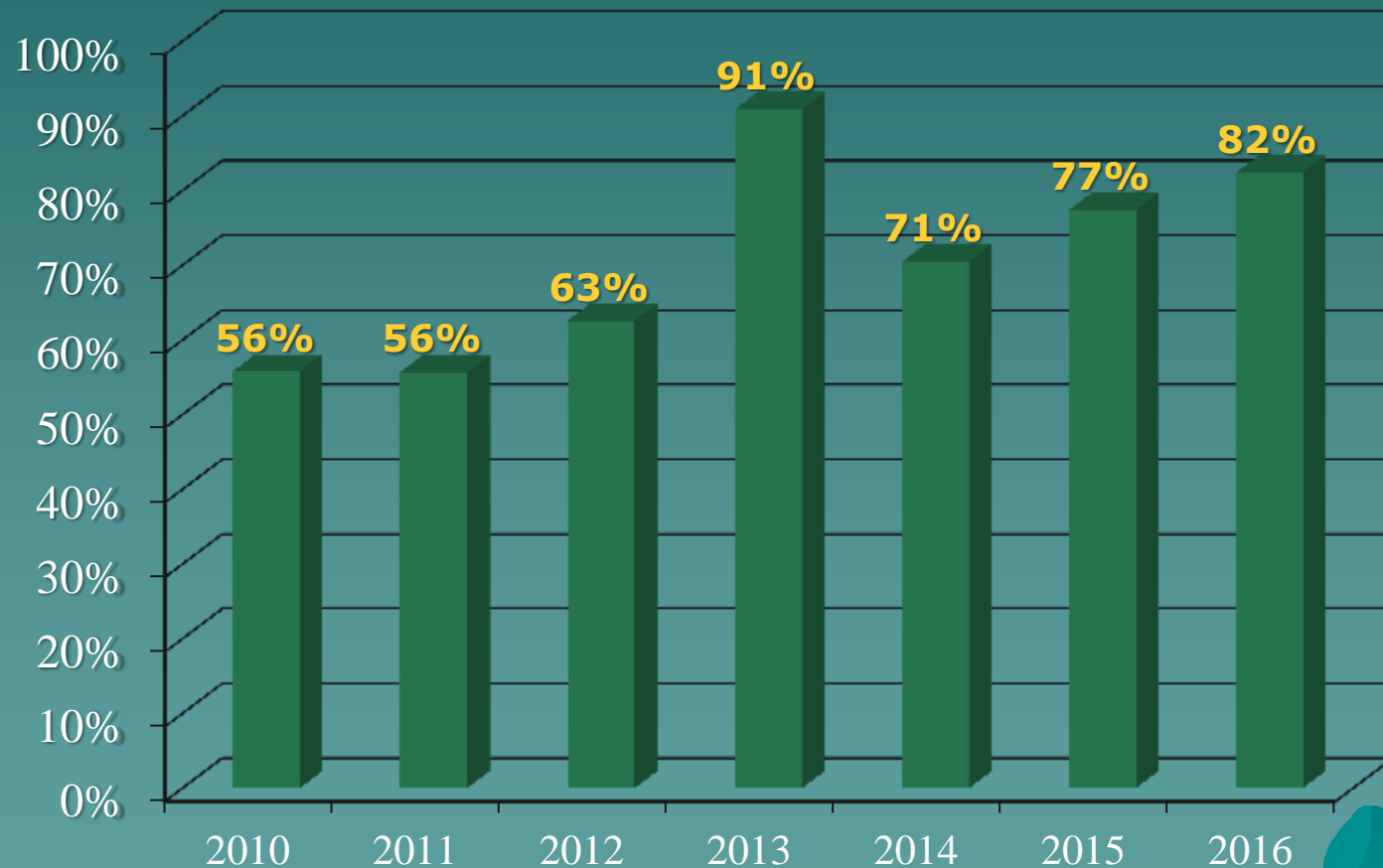
Broodstock Issues & Improvements

Average Water Temps v. Pre-Spawn Mortality Rates
(all brood years – collection & holding periods)



Broodstock Issues & Improvements

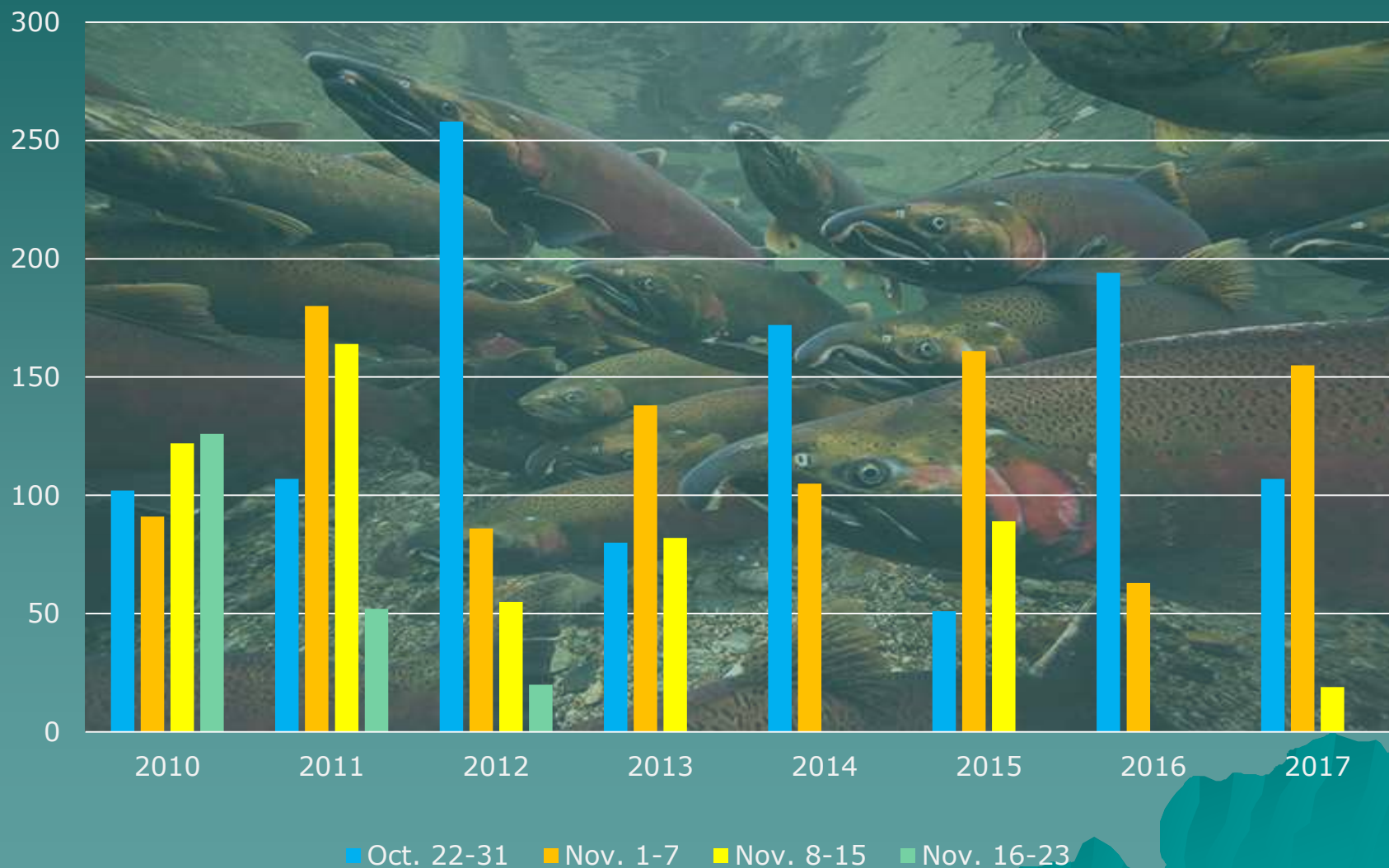
Total % Egg Viability



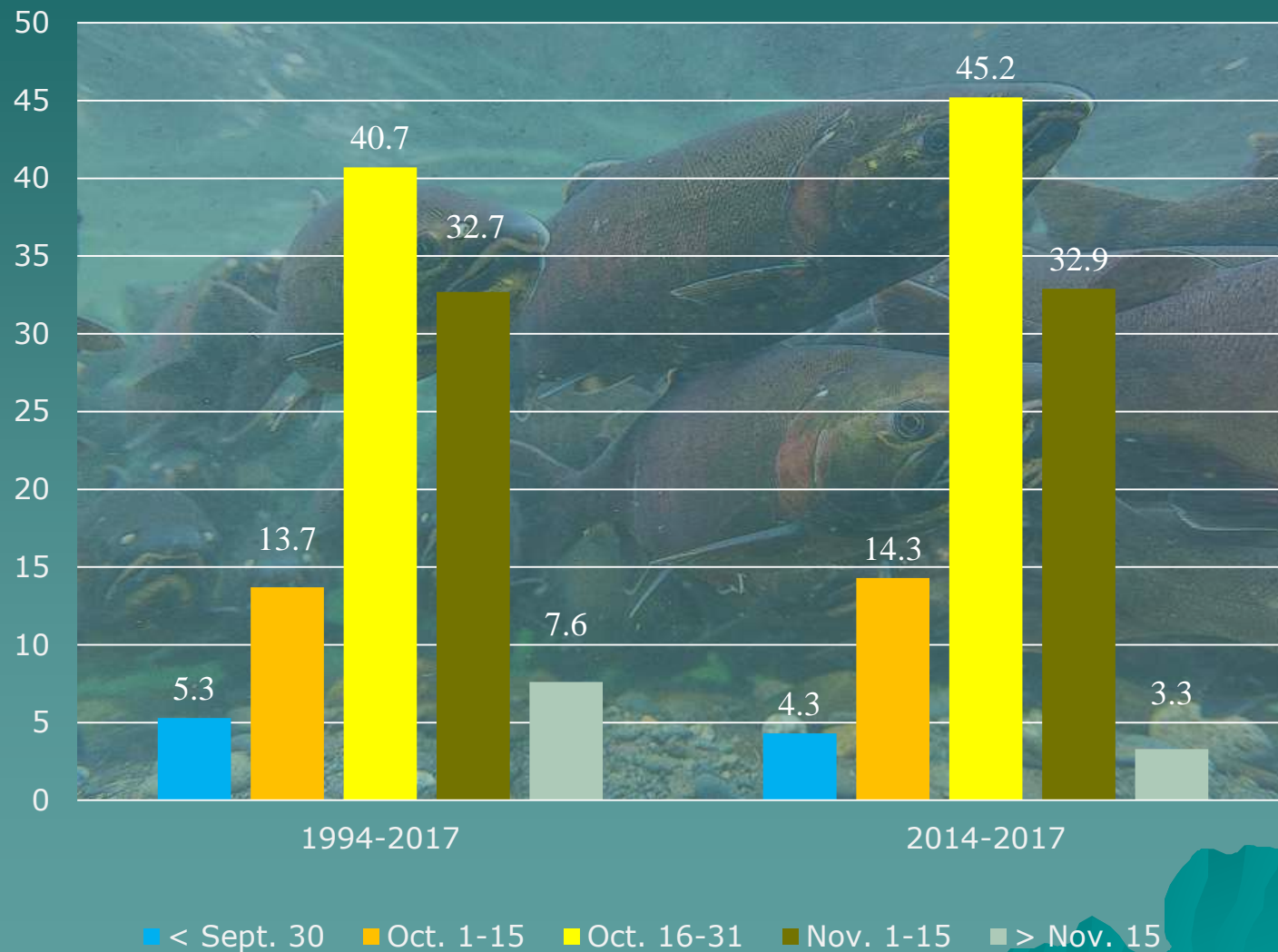
Corrective Measures - Broodstock

- Delayed broodstock collections from late September (2010) to late October (2012) due to high early fall temps.
- 56⁰ F is our magic target for collection timing.
- Changed Male:Female ratio due to potential motility concerns from 1:3 (2010) to 2:4 (2011-12) to 1:1 (2013-present).
- Targeting as many CWT adults as possible – known Umatilla origin (began with BY14).

Coho Spawn Timing at 3MD (all years)




Coho Brood % Run Timing at 3MD



Corrective Measures – Incubation

- Changed water hardening process prior to transfer in 2012 (one-hour to half-hour at 100 ppm ovadine).
- Changed incubation operations in 2012.
 - MAIs to Heath trays
 - 3x/wk formalin treatments to 7x/wk
- Aggressive culling of poor gametes (since BY15).
- BY16 initiated delayed fertilization at Irrigon Hatchery.

The Future

- Use water temperature as management tool for broodstock collection & hold timing.
 - Collecting proportionally over the run is not a good idea.....and it hasn't altered run timing.
 - Continue to adjust and adapt for improved success.....
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, extending from the right edge towards the center.

Questions?



THE BASEBALL SEASON STARTS

©MLBMEME



IN EXACTLY 10 WEEKS

Can't wait for spring training!