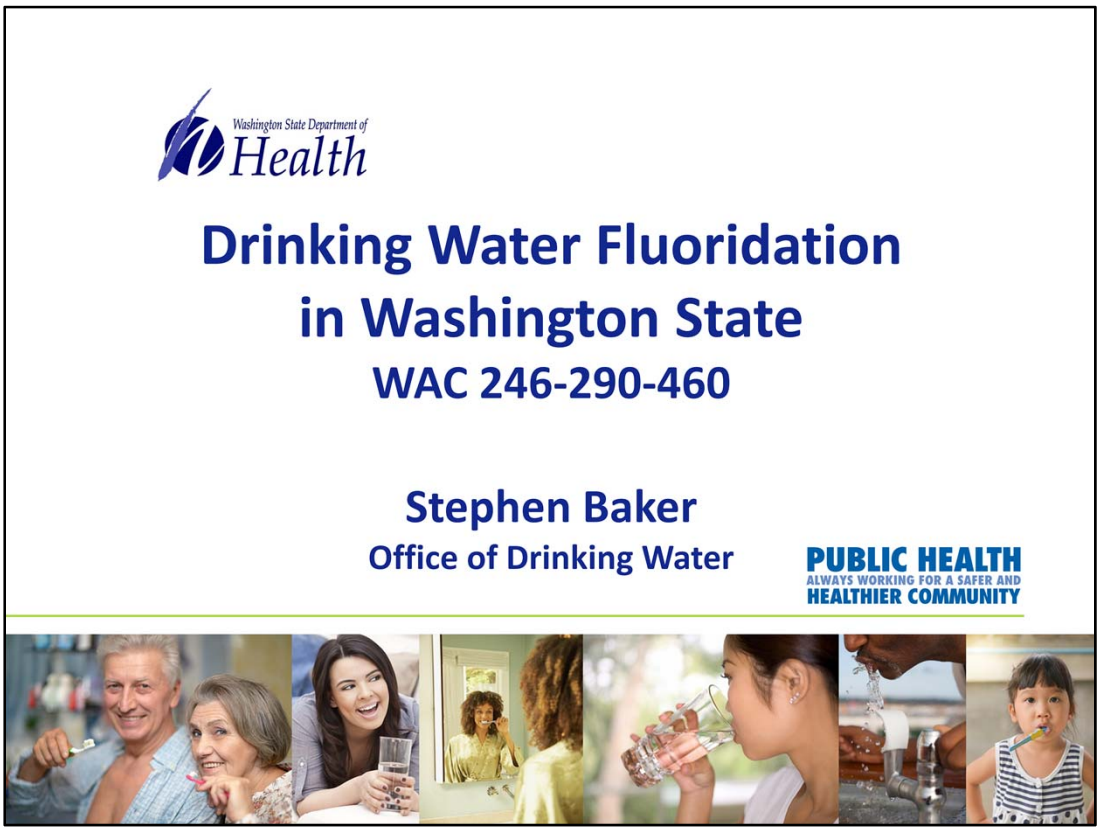

Good morning! My name is Stephen Baker. I'm with the Operator Certification and Training Section of the Office of Drinking Water.

Earlier this year, the U.S. Department of Health and Human Services (HHS) adopted a new recommended optimal fluoride level for drinking water.

Washington Administrative Code 246-290-460 establishes design, operating, monitoring, and reporting requirements for public water systems that *choose* to fluoridate. Our State Board of Health is now in the process of revising the WAC, based on HHS guidance.

Office of Drinking Water's Mission

We work with others to protect the health of the people of Washington State by ensuring safe and reliable drinking water.

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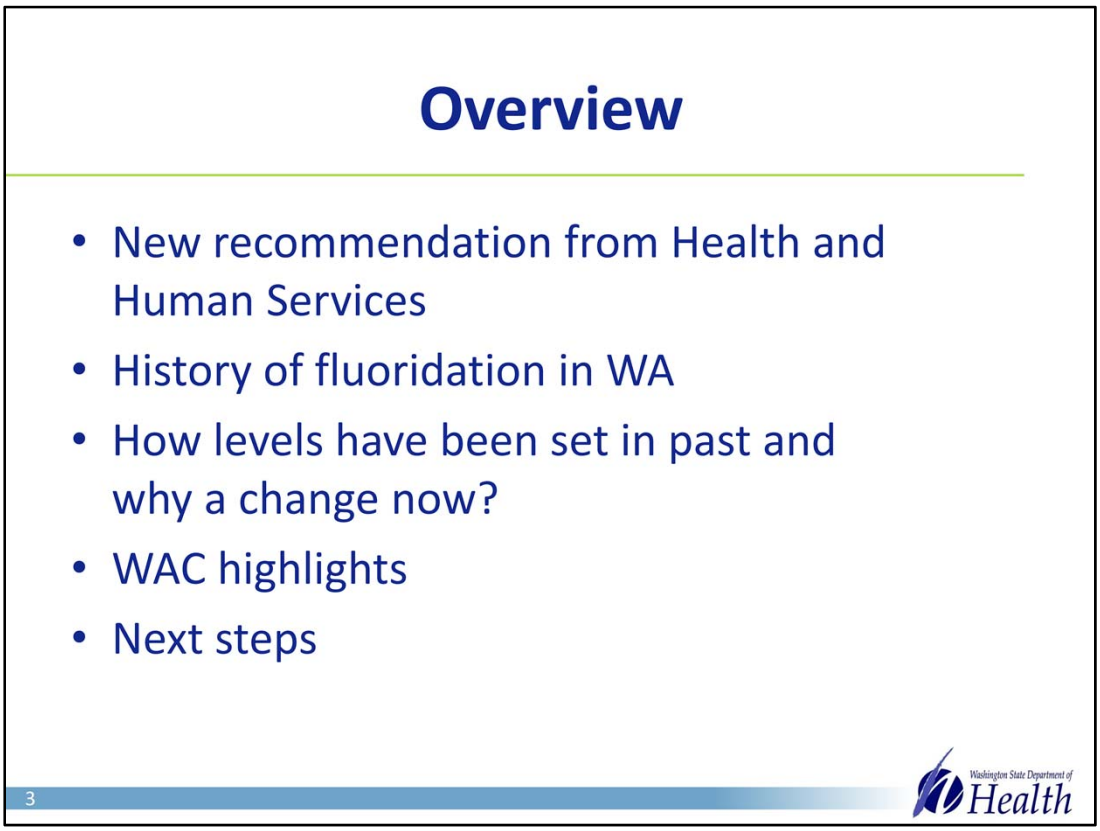
Washington State Department of Health

Our mission: We work with others—with the owners and operators of public water systems, to protect health…



Here's an overview of this presentation.
We'll be covering:

- Natural fluoride and fluoridation
- HHS's new recommendation
- How optimal levels were previously set
  --and reasons for changing now
- A brief history of fluoridation
- Draft rule highlights
- And, next steps in the rule updating process

Fluoridation Definition

"Water fluoridation is the adjustment of the natural fluoride concentration of fluoride-deficient water to the level *recommended for optimal dental health.*"

—*Fluoridation Facts*, ADA, 2005

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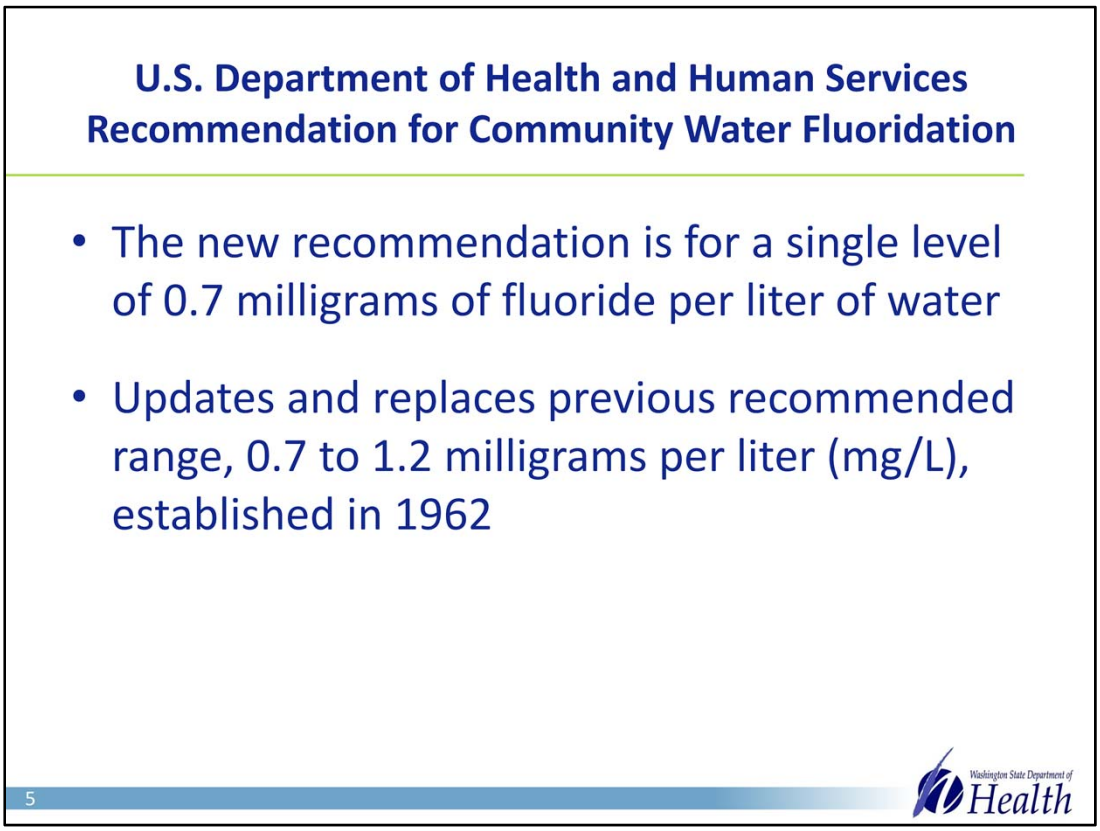
The term "fluoridation" means the ***adjustment*** of fluoride concentrations in drinking water to levels beneficial for dental health.

To achieve the oral health benefits of water fluoridation, the concentration must be at least 0.6 mg/L.

Adjustment is normally upward, but it can also be downward if natural levels are excessively high.

Fluoride is adjusted upward using additives that are primarily produced from the naturally-occurring mineral, apatite.



On April 27 of this year, HHS issued a new recommendation for community water systems that choose to add fluoride for oral health benefit.

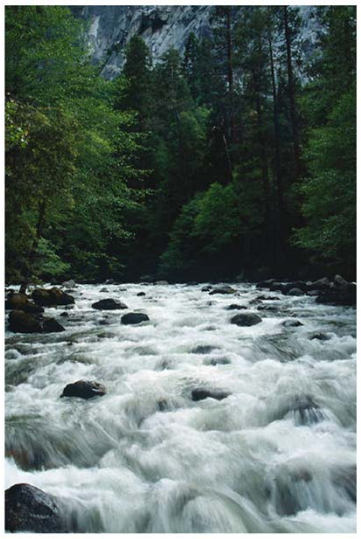
HHS now recommends an optimal fluoride concentration of 0.7 mg/L.

The previous recommendation for optimal fluoride concentration was established by the U.S. Public Health Service in 1962.

Optimal fluoride concentration in drinking water is the level providing the best balance of protection from dental caries while limiting the risk of dental fluorosis.

Fluoride is Naturally Occurring

- Surface water (rivers)—typically low concentrations of 0.2 mg/L or less
- Groundwater (wells)—higher concentrations of 0.1 mg/L to over 5.0 mg/L
- Ocean water is typically 0.8 to 1.4 mg/L



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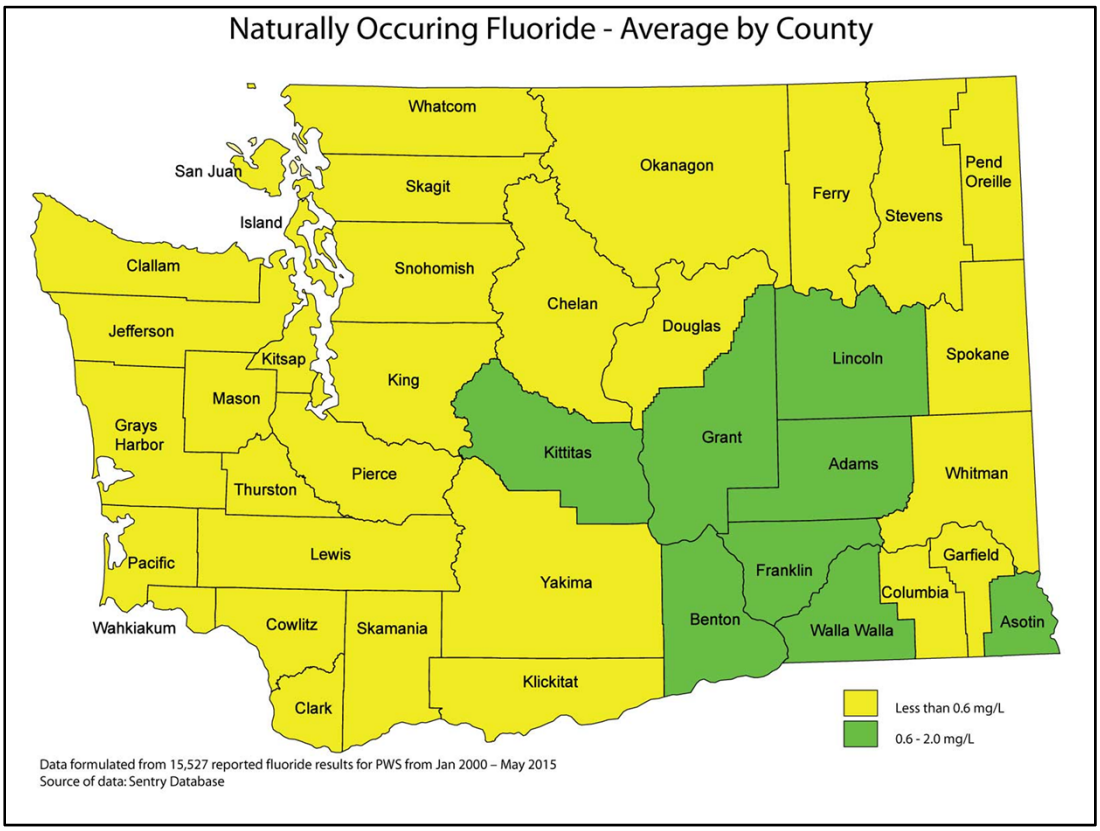
Fluoride is the ionic form of the element fluorine, the 14th most abundant element in the earth's crust. Virtually all water on earth contains some naturally-occurring fluoride,.

In surface freshwater, fluoride concentrations are usually low, typically, 0.01 to 0.3 mg/L.

In groundwater, the natural concentration of fluoride depends on geological, chemical and physical characteristics of the aquifer.

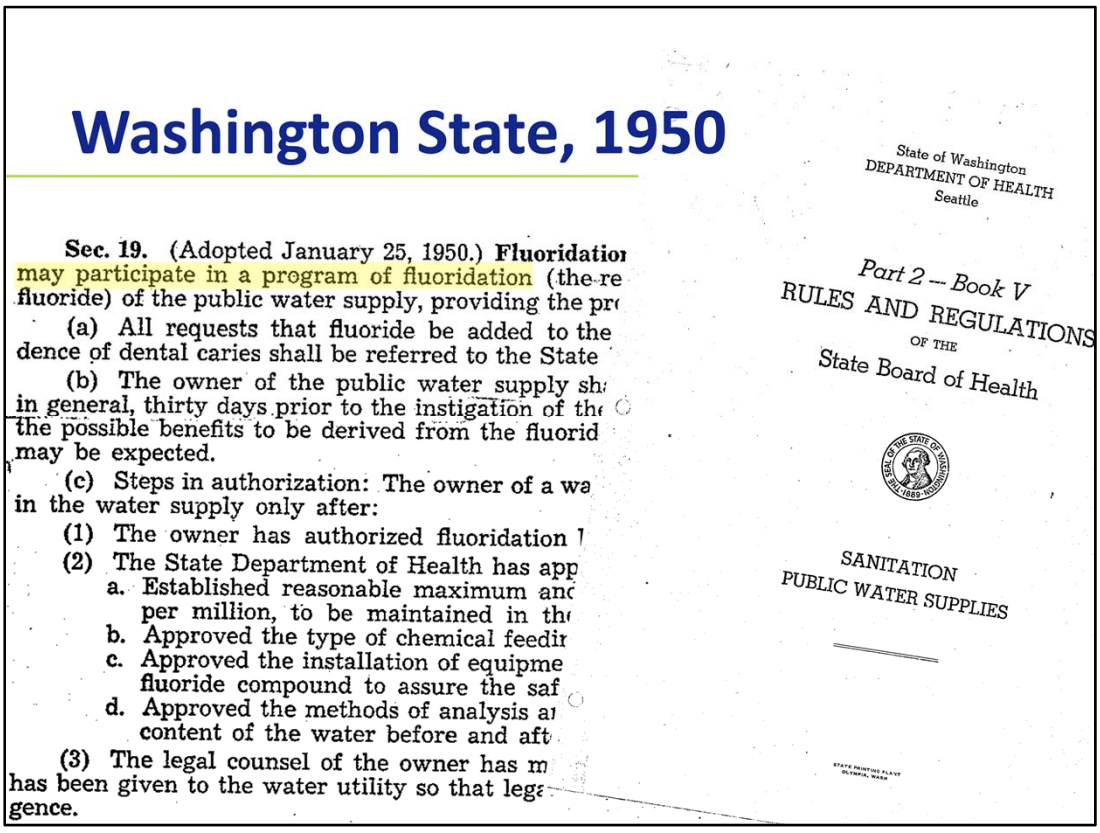
Concentrations in Washington groundwaters range from negligible to more than 5 mg/L. Worldwide, values exceeding 35 mg/L have been reported.



Natural fluoride is found throughout the state: This map reflects over 15,000 monitoring results gathered from PWSs over the past fifteen years.

The green-shaded counties had sources **averaging** between 0.6 and 2.0 mg/L. Yellow counties had average values less than 0.6 mg/L.

Results are not flow or population weighted.



Beginning in January 1945, Grand Rapids, Michigan, became the first city to adjust the public water supply's fluoride concentration.

Five years later, the Washington State Board of Health adopted a rule allowing a purveyor to, "participate in a program of fluoridation…"

The recommended range in Washington, at that time, was 0.7 to 1.5 mg/L --currently it is 0.8 to 1.3 mg/L, and with the new rule, the recommended optimal level will be fine-tuned to 0.7 mg/L.

Risk Factors for Enamel Fluorosis

- Total fluoride intake.
- Fluoride supplements:
  - 26 percent of children in fluoridated areas received inappropriate supplements.*
- Fluoride toothpaste:
  - Excess amount may be applied.
  - Young children swallow.

*Pendrys & Morse. J Public Health Dent 1995;55:160-4.

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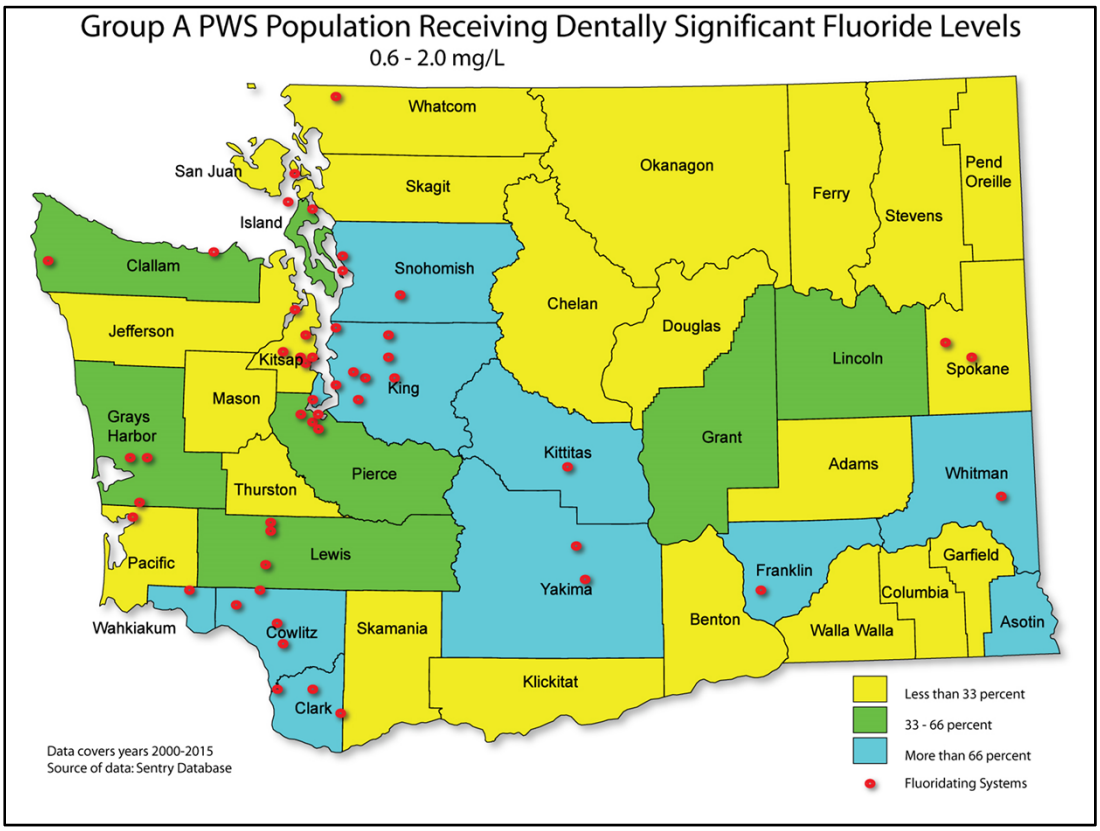
Dental fluorosis is a condition that causes changes in the appearance of tooth enamel.

The oral health community tells us that fluoride protects everyone's teeth from decay, but fluorosis only occurs with developing teeth before they have erupted from the gums.

According to CDC, 87 percent of fluorosis is due to excessive use of topical fluorides, **not** water fluoridation, with ingestion of high-fluoride toothpaste by children being a major factor.

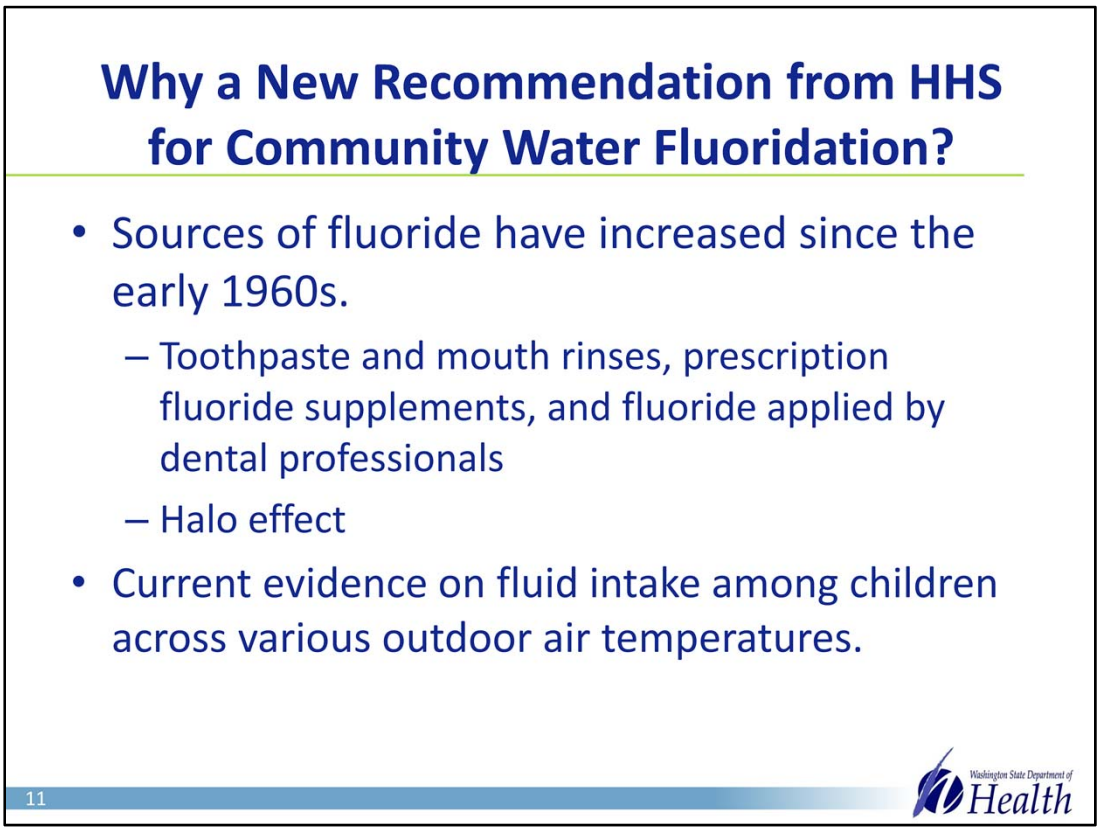


Red circles on this map represent the approximate location of our 51 fluoridating systems.

The map also shows the percent of each county's PWS populace receiving a protective level of fluoride. In the blue counties, more than two-thirds of the population is receiving at least 0.6 mg/L fluoride.

Green counties, less than two-thirds of the population receives the minimum of at least 0.6 mg/L fluoride.

Yellow, less than one-third of the population receives the minimum protective level of fluoride in drinking water.



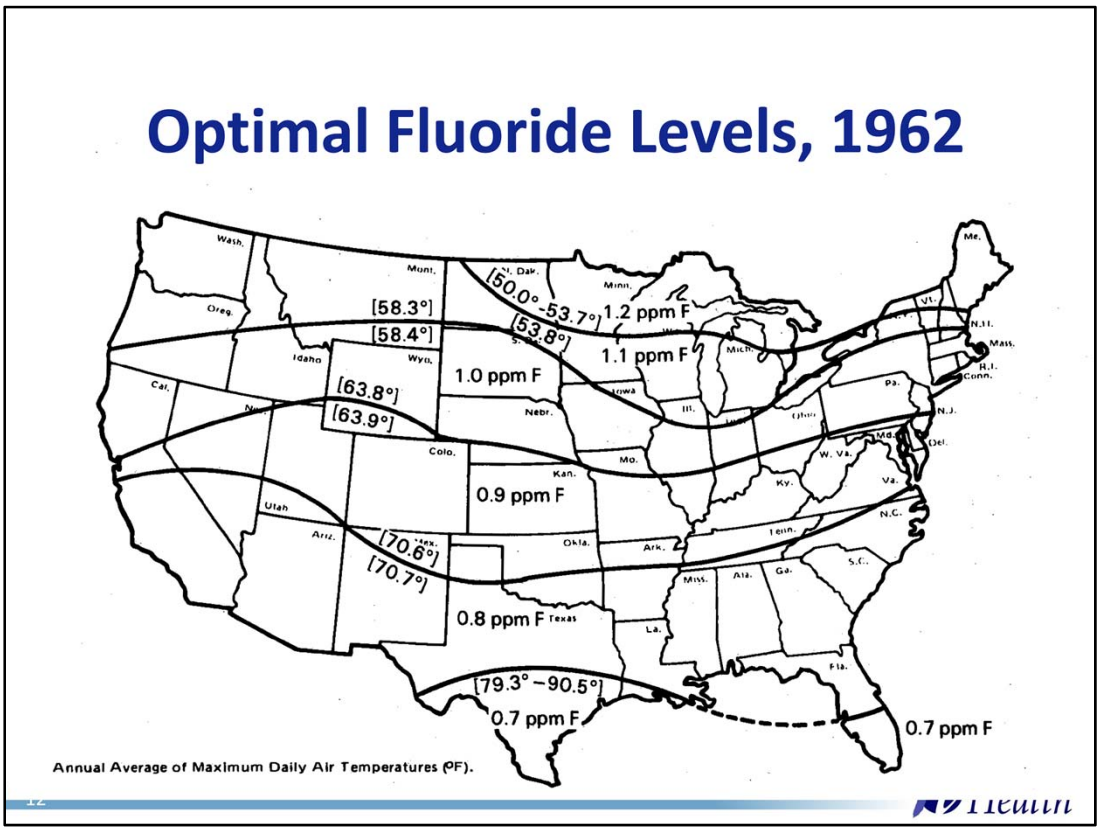
So, why do we have this new recommendation for a reduced level?

It is because of an increase in enamel fluorosis resulting chiefly from the present wide-scale availability of fluoride. There is more fluoride in the human environment now, than there was fifty years ago—primarily from oral care products. But now also from a range of beverages and foodstuffs.

The term, "Halo effect," refers to how food and beverage products originating or processed in fluoridated communities increase fluoride availability in non-fluoridated areas in which they may be consumed.

HHS' recommendation reflects changes in our children's lives which reduce and level-out fluid consumption. These include:

- Air conditioning and central heating
- Modes of transportation
- And trends in play, exercise, and outdoor activities

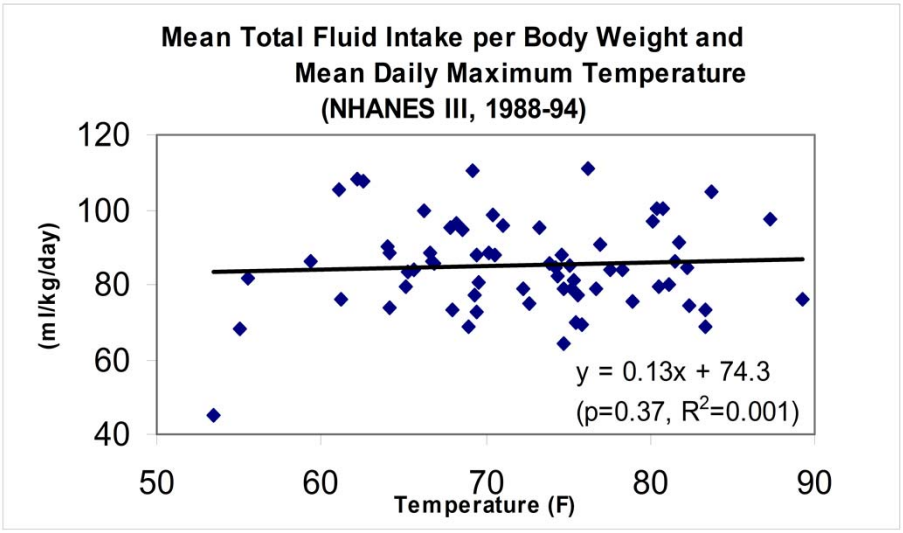


In 1962, the U.S. Public Health Service came out with this map of recommended fluoride target values for the U.S., ranging from 0.7 mg/L in south Texas to 1.2 mg/L in northern Minnesota, based on annual average temperatures.

Using CDC's criteria, optimum values also varied across Washington, from 1.1 for Port Angeles, to 0.9 for Pasco.

HHS now recommends a ***uniform*** national standard —primarily because current studies find water consumption is no longer dramatically different in different temperature zones of the U.S.

Fluid Intake and Climate



Sohn W, Heller KE, Burt BA. Fluid consumption related to climate among children in the United States. J Pub Health Dent 2001; Vol.61;2; .

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Here is a chart from CDC's National Health and Nutrition Examination Survey. It shows fluid intake among U.S. children across various outdoor air temperatures.

Note that the central tendency, represented by the black line, is almost flat-lined between 55 and 90 degrees: Kids in hot places aren't drinking appreciably more fluids than kids in cooler spots.

WAC 246-290-460

Current	Draft (New)
Design must be reviewed & approved prior to start	…and PWS must notify DOH prior to stopping
Optimal values: 0.9 – 1.1 mg/L	Single optimal value: 0.7 mg/L
Control "range" = 0.8 – 1.3 mg/L	"Operating tolerance" = 0.6 – 1.0 mg/L

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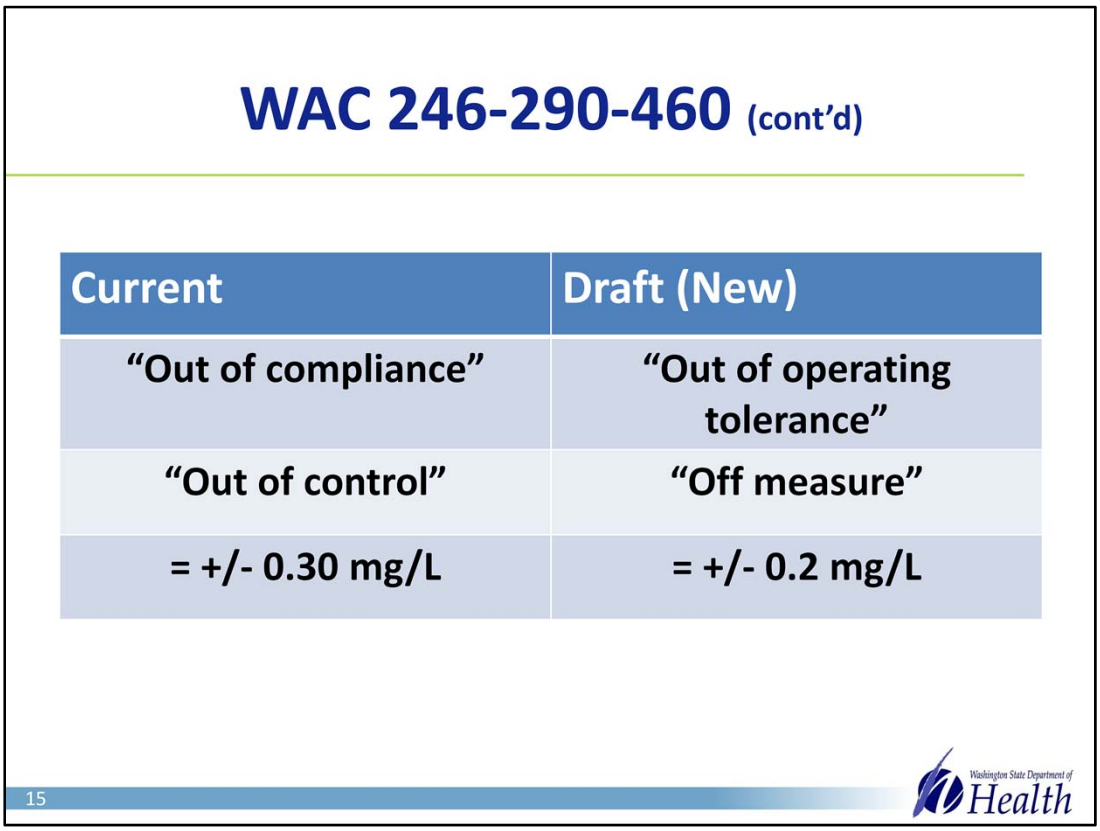
Implementing HHS' recommendations, WAC 246-290-460 will continue to address elements of design, operation, monitoring and reporting.

This and the next slide summarize the changes contained in the new draft rule.

The draft rule includes a new requirement to notify the department when a system permanently stops fluoridating the water supply.

It changes the optimal values of the current rule to the single HHS recommended optimal value of 0.7 mg/L.

And changes from a control "range" of 0.8 – 1.3 mg/L, to an "operating tolerance" of 0.6 – 1.0 mg/L.



The draft rule also makes some minor wording changes:

> *"Out of compliance"* becomes *"Out of operating tolerance"*
>
> *"Out of control"* becomes *"Off measure"*

And, because of improved analytical techniques, the rule reduces the acceptable margin of error in field measurements from +/- 0.30 to +/- 0.2 mg/L

Here is an outline of the anticipated next steps in rulemaking

We have already advised our 51 fluoridating systems to maintain levels as close as possible to 0.8 mg/L, the lowest level allowed in our current regulations. This will remain our position until the new level is formally codified next year.

Last month we completed draft rule language.

We have a couple of other formal rulemaking steps upcoming, including a briefing to the State Board of Health in January 2016, and a public hearing in March 2016.

Thank you for participating in this webinar.

If you would like to provide comments on the draft rule, you may send them electronically to the email address on your screen no later than August 31, 2015.