



# DATA ANALYSIS TOOLS

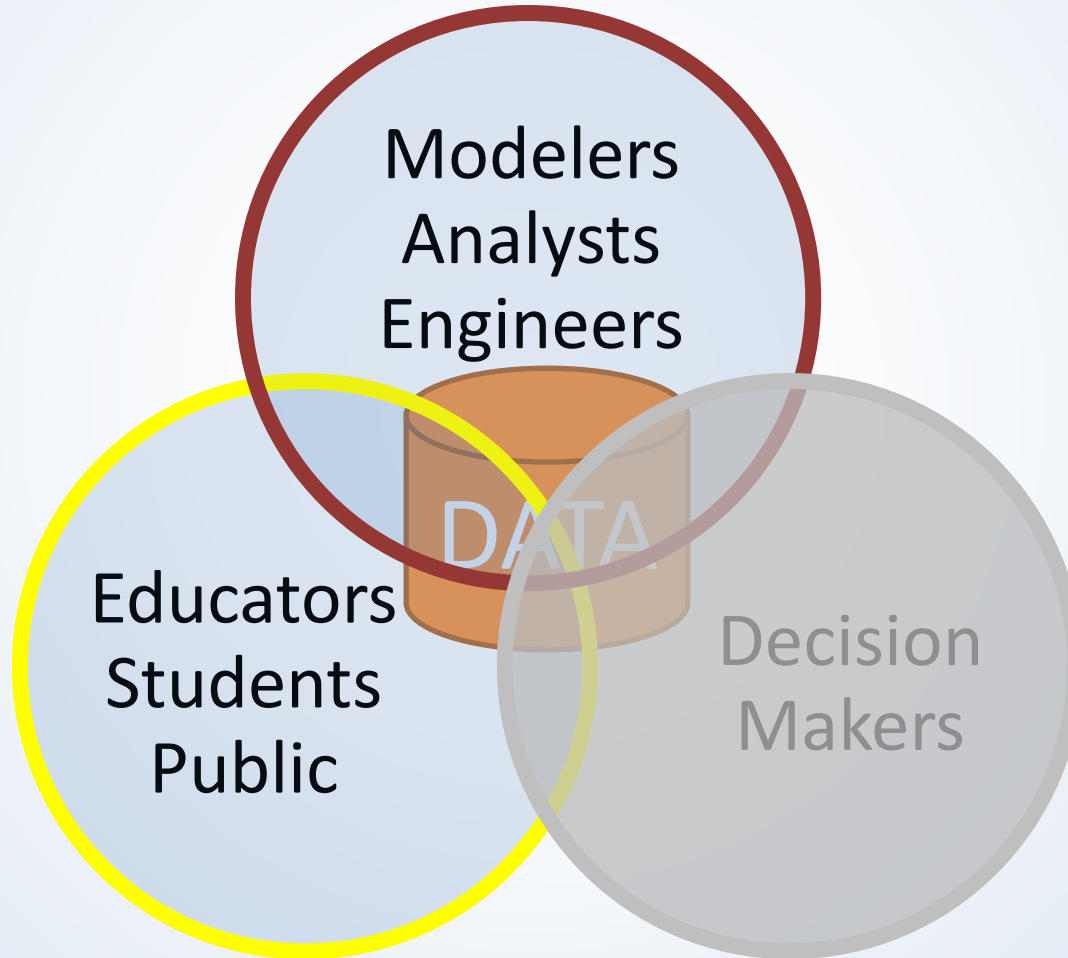
FOR

# DECISION MAKERS

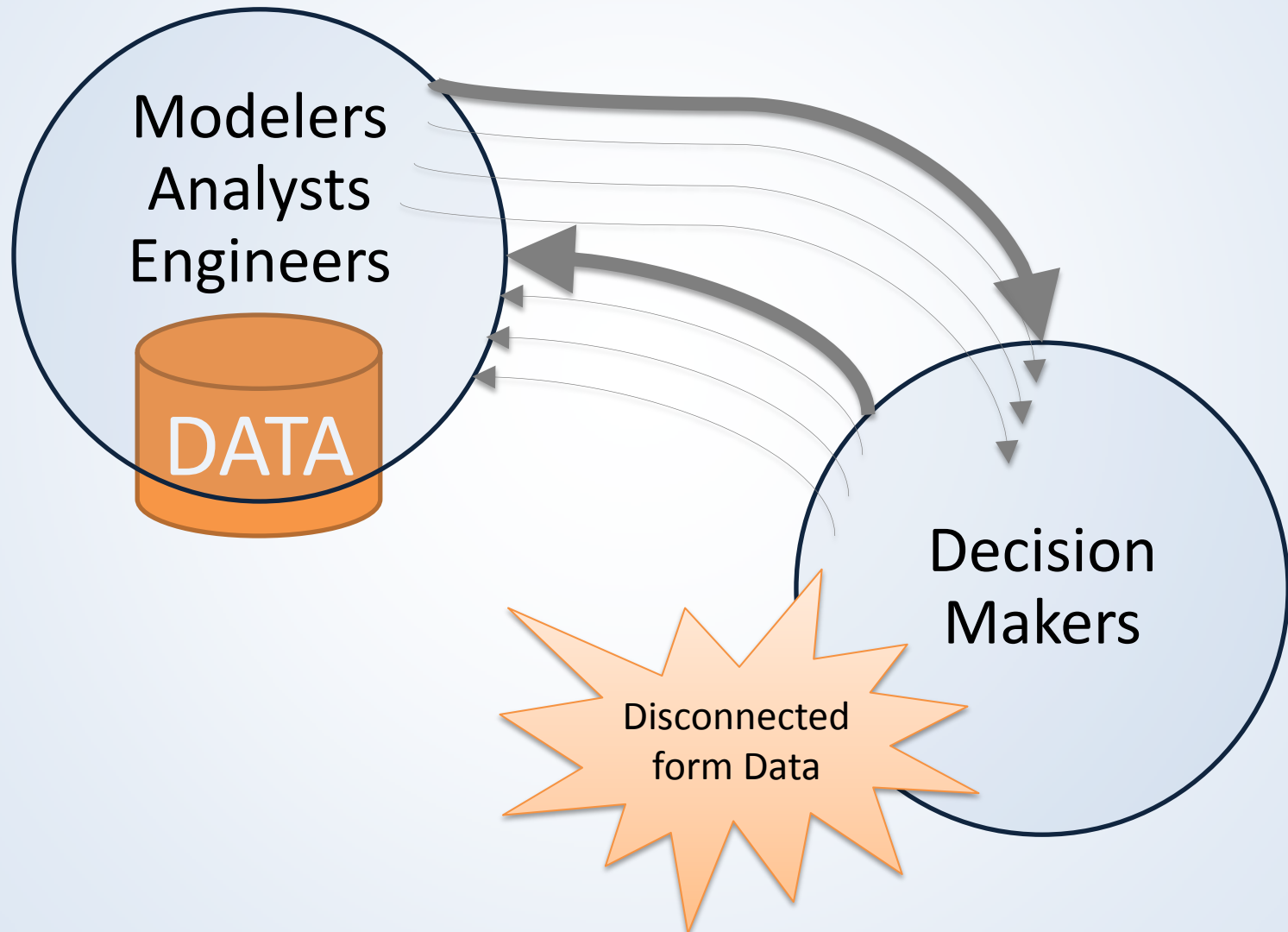
- Program Managers
- Watershed Groups
- Policy Directors
- Planning Boards and TACs
- .....
- .....

TOOLS  
FOR

# Water Quality Data Users



# Traditional Question/Answer Process



# Decision Makers – (my) Definition

- SMART People

with

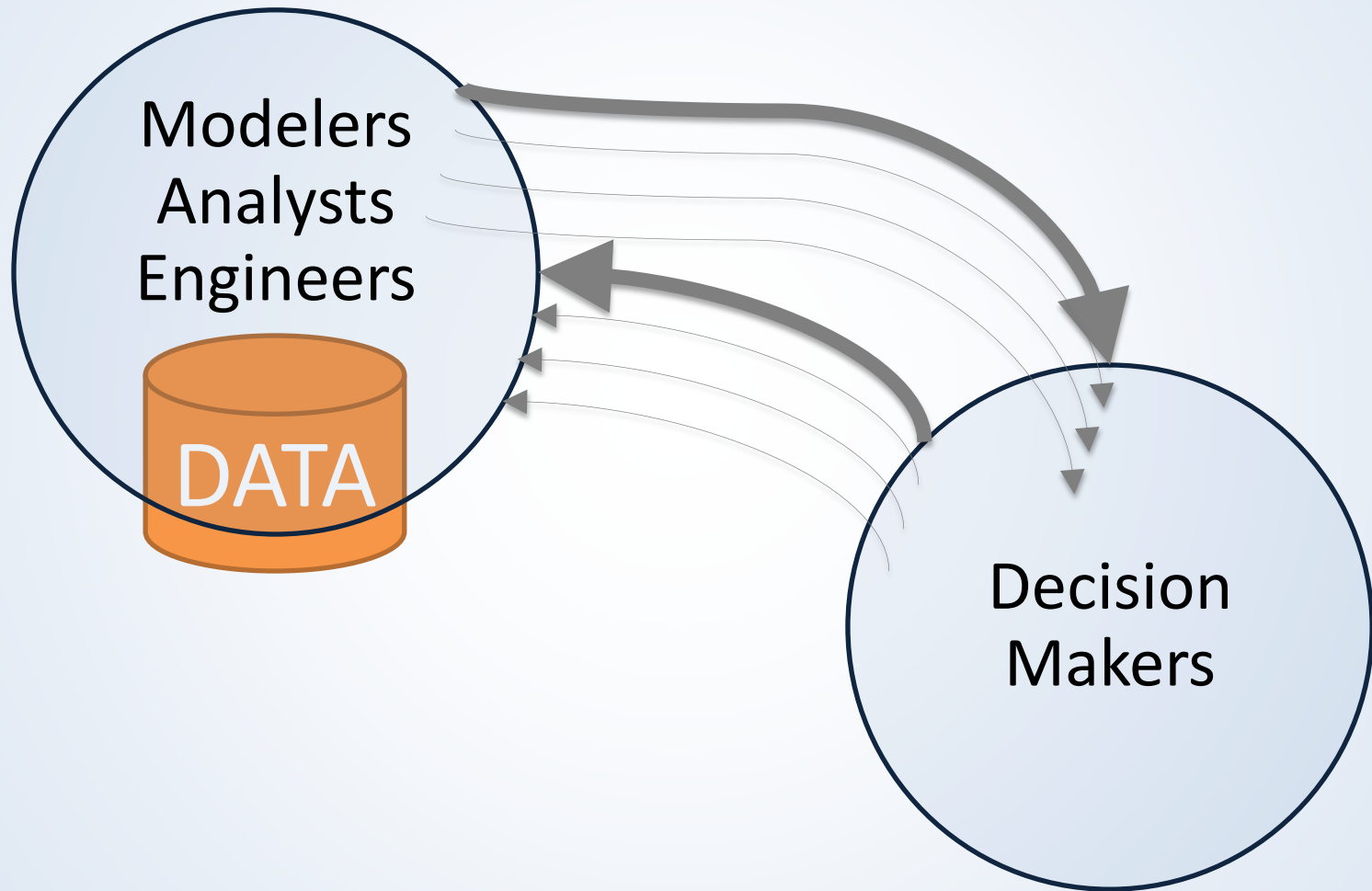
- LOTS of QUESTIONS

and

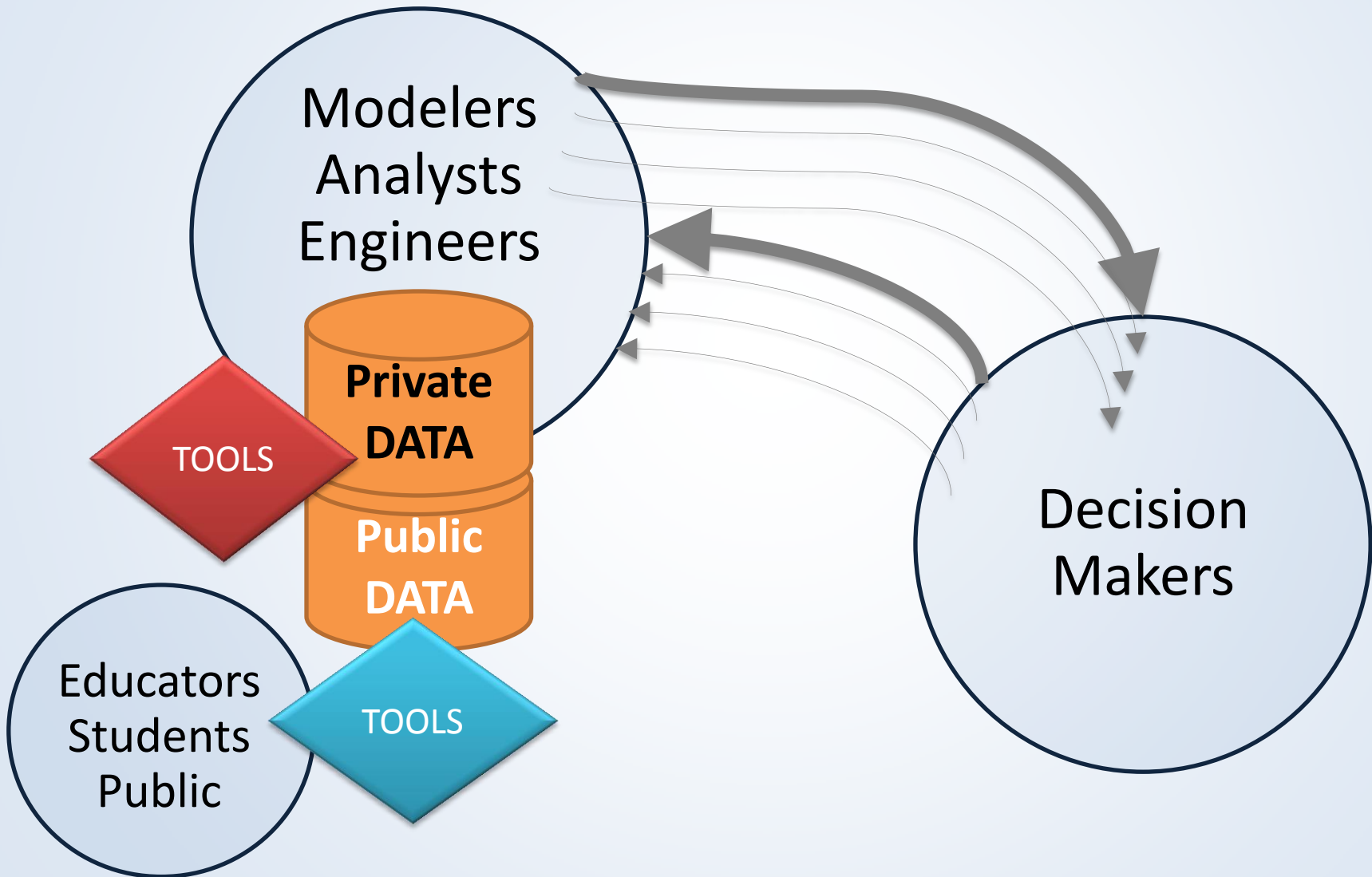
- LITTLE Time



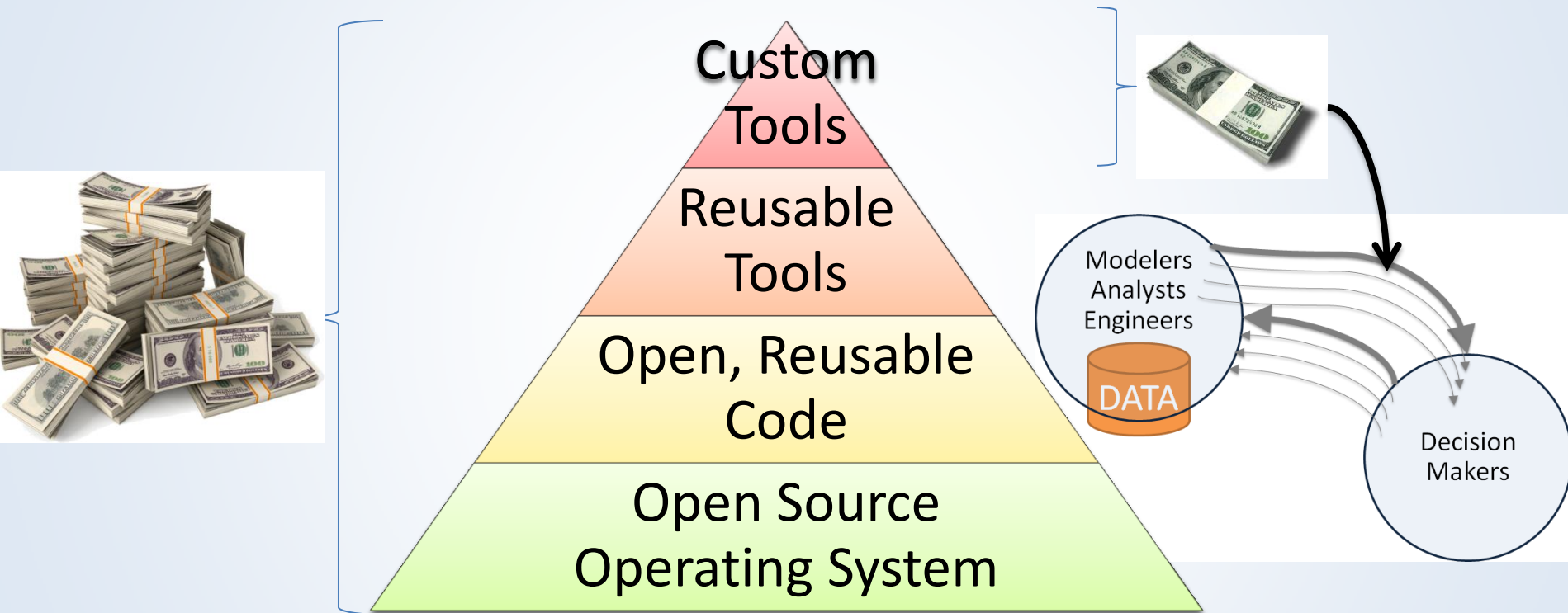
# Traditional Question/Answer Process



# Question/Answer Process – It's Changing...



# Question/Answer Technology – It's Changing...



***“Innovation is how we adapt to change.”***

~ Tim Kastle

# Connecting Decision Makers with Data

- Start with “big data” and public tools like ERAMS, CIM, CDSN, STORET, USGS, etc.
  - To focus in on issues and questions. Then...
- Leverage **reusable “building blocks”** and **Create interactive, custom tools**
  - **AS NEEDED** by project or even person
  - **to explore very specific questions**
  - **using public data repositories AND private data**



# Connecting Decision Makers with Data

## Example 1

N/P Ratios vs. Chlorophyll-a

## Example 2

Up/Down Stream GW→SW Chemistry



## Welcome to the CCBWQA Portal

This site provides access to water quality data collected along Cherry Creek and in Cherry Creek Reservoir. A collection of interactive visualization tools allow a user to explore, filter, and analyze the data in graphs and tables.

*Please review the terms of use of this website before use. To request a user login for this website, please contact the website administrator at [CCBWQPortal@gmail.com](mailto:CCBWQPortal@gmail.com).*



Integrating water quality with

- Community development
- Water supply
- Recreation
- Wildlife habitat
- Open space



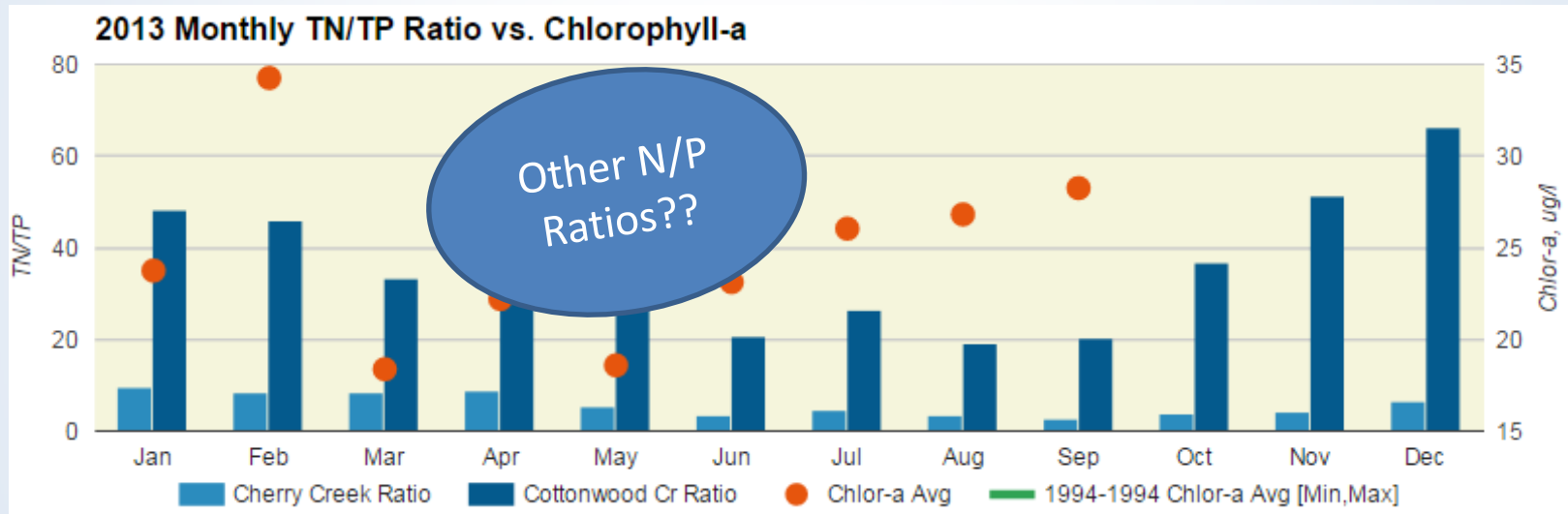
Example 1

# Are Nitrogen/Phosphorus Ratios an Indicator of Seasonal Algae Growth?

- A couple thousand measurements for different N and P species from 1992 → 2014 for two creeks entering reservoir
- 600+ Chlorophyll-a measurements over the same period taken in the reservoir

Example 1

# Are Nitrogen/Phosphorus Ratios an Indicator of Seasonal Algae Growth?



Compare Data Behind the Ratios??

Compare to past averages??

# Explore Water Quality in Cherry Creek Basin: Nitrogen and Phosphorus Influences on Algae

## Customize Analysis

Submit Filters

Numerator (top graph)

TKN

- None -

TN

TIN

TKN

TP

SRP

(bottom graph)

Year to Analyze

2013

Period Start

2009

Period End

2013

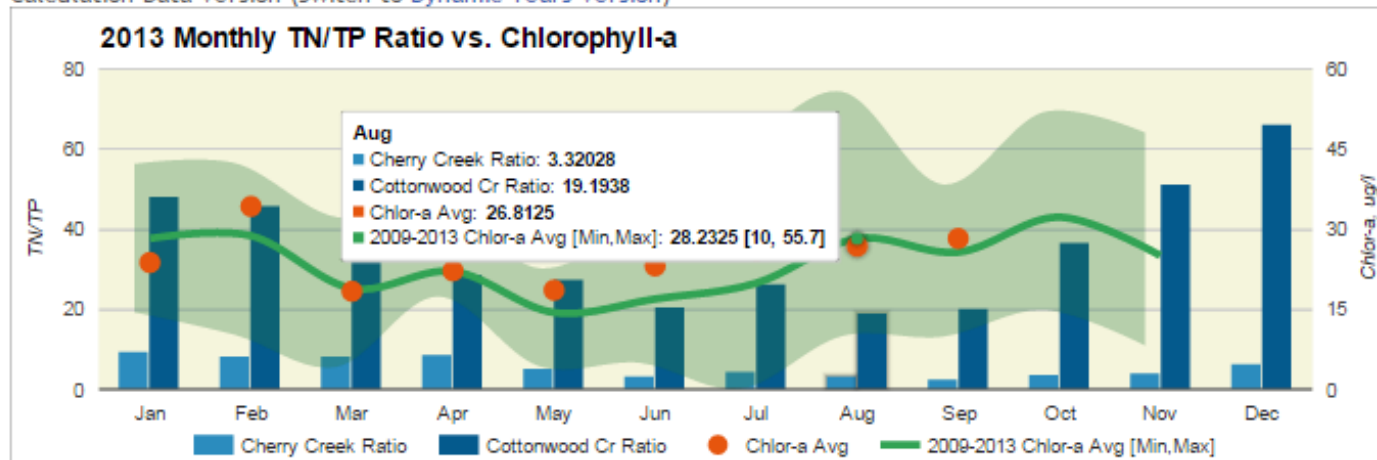
Std Value, Top Graph, ug/L

Std Value, Bottom Graph, ug/L

## Notes

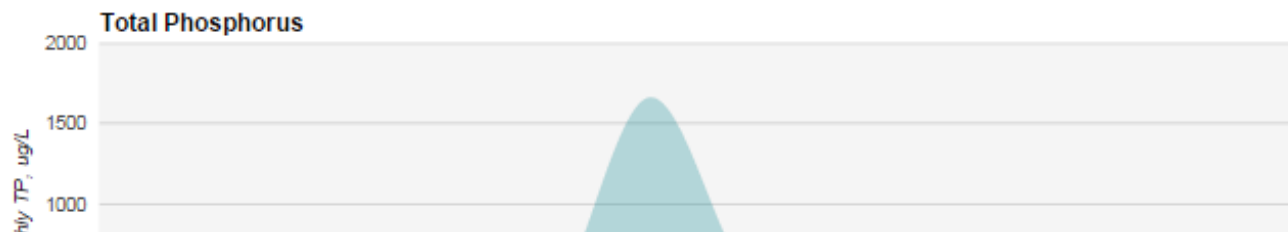
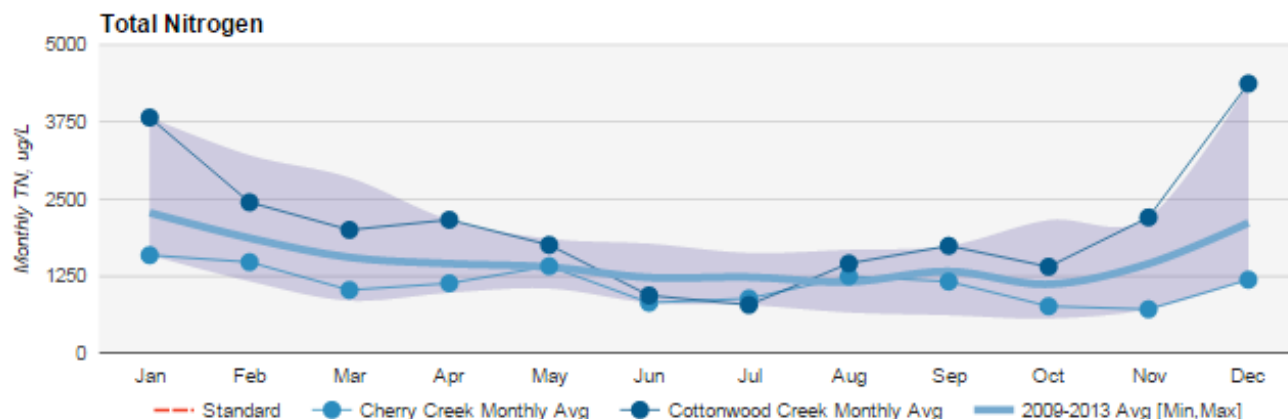
- Cherry Creek Data shown is measured at station CC-10.
- Cottonwood Creek Data shown is measured at station CT-2.
- Chlorophyll-a Reservoir

Calculation Data Version (Switch to [Dynamic Years Version](#))



Shaded areas represent full range of measured values over the selected background years, with the average shown as the darker shaded band.

## Ratio Calculation Data



Example 2

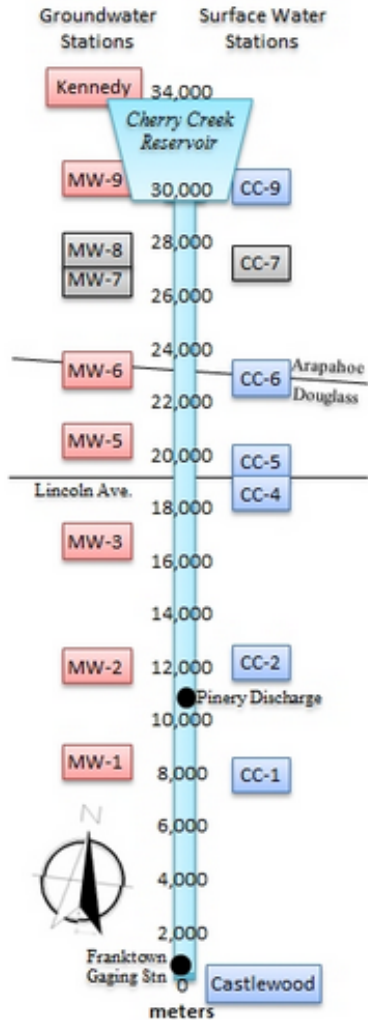
# Does GW chemistry affect SW chemistry in the watershed?

- Have collected SW and GW measurements for characteristics that can be affected by geology since 1992
- At locations on Cherry Creek and Tribs from top to bottom of watershed
- Thousands of possible graphs...  
where to start??



## Explore Water Quality in Cherry Creek Basin: Surface and Groundwater Upstream to Downstream

### Station Locations



Select a year

2014

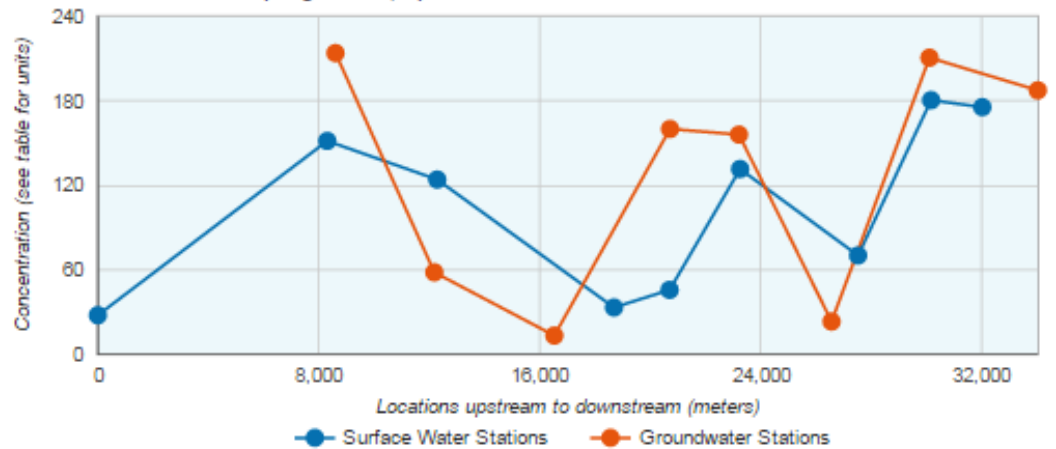
Select a parameter

SRP as P

Select a season

Annual Jan-Dec

SW and GW Sampling Results, Upstream to Downstream



### Tabular Data

Distance	Surface Water	Groundwater	Unit	Year	Season	Parameter
0	27.4697		ug/l	2014	Annual Jan-Dec	SRP as P
8300	151.5		ug/l	2014	Annual Jan-Dec	SRP as P
12280	124		ug/l	2014	Annual Jan-Dec	SRP as P
18675	33		ug/l	2014	Annual Jan-Dec	SRP as P
20687	45.5		ug/l	2014	Annual Jan-Dec	SRP as P
23237	131.5		ug/l	2014	Annual Jan-Dec	SRP as P
27505	70		ug/l	2014	Annual Jan-Dec	SRP as P
30148	180.5		ug/l	2014	Annual Jan-Dec	SRP as P
32000	175.533		ug/l	2014	Annual Jan-Dec	SRP as P
8598		214	ug/l	2014	Annual Jan-Dec	SRP as P
12175		58	ug/l	2014	Annual Jan-Dec	SRP as P
16516		13	ug/l	2014	Annual Jan-Dec	SRP as P
20702		160	ug/l	2014	Annual Jan-Dec	SRP as P

# 2015 Sustaining Colorado Watersheds Conference

## Watershed Spotlight | Big Thompson

- THE WATERSHED
- RIVER WATCH GROUPS
- MAPS
- DATA ▾**
- FIELD
- NUTRIENTS
- METALS
- GALLERY

### DASHBOARD

#### Feedback?

Have some feedback for us? Please use the form below to let us know! (Opens in new window)

Feedback



### Data

Stream Segment

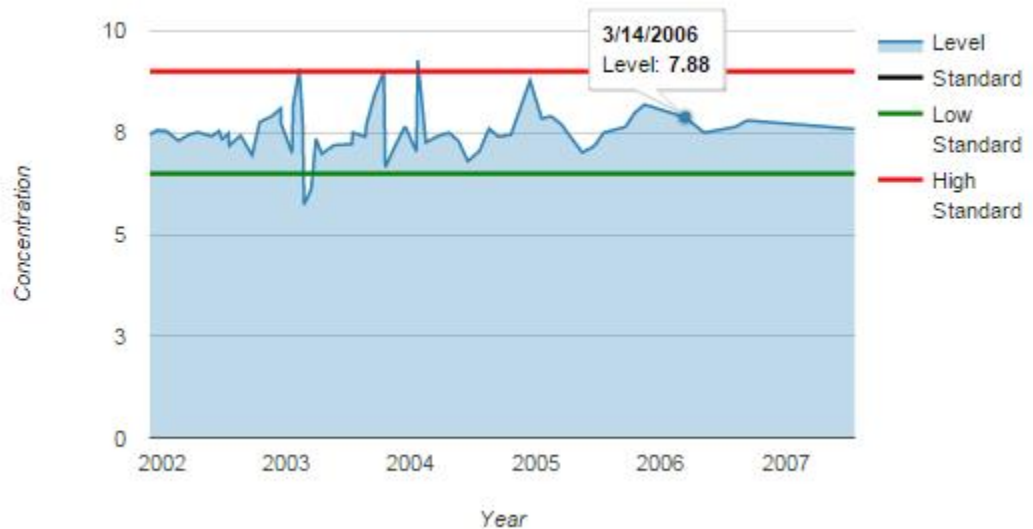
COSPBT01 ▾

Parameter

pH (S.U.) ▾

#### Field Data Description

A total of 1585 sampling events across 9 stations are represented below. Use the dropdowns to filter by WBID stream segment and water quality parameter.



#### Feedback?

Have some feedback for us? Please use the

plains. The watershed intersects Larimer, Weld, and Boulder counties and

waters where ample fishing, pure as it flows towards the

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## Data

### Stream Segment

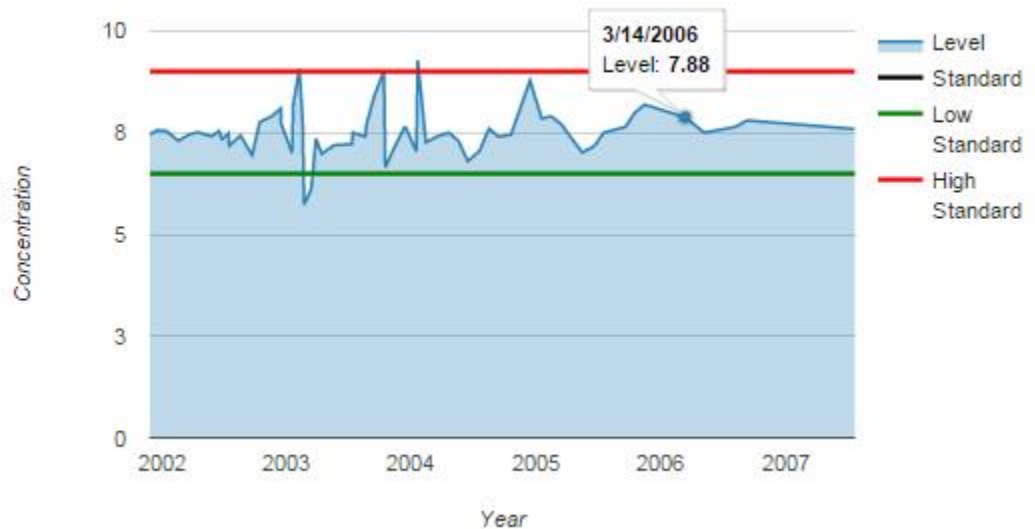
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# Questions?

Contact:

**Kelly Close** [kelly.close@lrewater.com](mailto:kelly.close@lrewater.com)

<http://www.lrewater.com/Technology>