Colorado Nutrient Monitoring

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Two part strategy was adopted June, 2012

- Regulation 85 – Applies downstream of dischargers
  - Established a technology based treatment requirement
    - Domestic over 2mgd and some industrial wastewater dischargers
      - 45 facilities – 90% of flow
    - Enhanced nutrient control requirements for storm water discharges – data gap analysis and public education
    - Voluntary provision for nonpoint source sources
    - Monitoring requirements
- Regulation #31
  - Scientifically based numerical values to protect classified uses.
    - Apply to streams and lakes above discharges and to protect municipal water supplies taken directly from lakes and reservoirs.
    - Phase 2 effective May 31, 2022 – applying Reg. 31 numbers below dischargers.

Regulation #85

Table 1 Regulation #85-Nutrient Effluent Limits (for facilities over 2.0 mgd in high priority watersheds)		
Parameter	**Annual Median[1]**	**95th Percentile[2]**
Total Phosphorus	1.0 mg/L	2.5 mg/L
Total Inorganic Nitrogen[3] as N	15 mg/L	20 mg/L

[1]Running annual median of all samples taken in the most recent 12 calendar months.
[2]The 95th percentile of all samples taken in the most recent 12 calendar months.
[3]Determined as the sum of nitrate as N, nitrite as N, and ammonia as N.

- New facilities have lower limits
- Monitoring
  - Requires all domestic wastewater facilities to monitor effluent, upstream and downstream of discharge monthly - about 99 facilities
  - Sampling Analysis Plan required and annual submission of data

Regulation #31

Table 2 Interim Numeric Values for Total Phosphorus, Total Nitrogen, and Chlorophyll *a*					
Parameter	Rivers and Streams		Lakes and Reservoirs		
	Cold	Warm	Cold	Warm	Direct Use Water Supply
Total Phosphorus	110 ug/L[1]	170 ug/L[1]	25 ug/L[2]	83 ug/L[2]	not applicable
Total Nitrogen	1,250 ug/L[1]	2,010 ug/L[1]	426 ug/L[2]	910 ug/L[2]	not applicable
Chlorophyll *a*	150 mg/m^2 [3]	150 mg/m^2 [3]	8 ug/L[4]	20 ug/L[4]	5 ug/L[5]

[1]Annual median, allowable exceedance frequency 1-in-5 years

[2]Summer (July 1 - September 30) average in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years

[3]Summer (July 1 - September 30) maximum attached algae, not to exceed.

[4]Summer (July 1 - September 30) average chlorophyll *a* in the mixed layer of lakes (median of multiple depths), allowable frequency 1-in-5-years.

[5]March 1-November 30 average chlorophyll *a* in the mixed layer of lakes (median of multiple depths), allowable frequency 1-in-5 years.

Above dischargers and to protect direct use water supply:

- Phosphorus standards can be adopted to segments beginning 2012
- Nitrogen standards can be adopted to segments beginning 2017

Progress on Implementation of Regulation #85

- Wastewater and Non-Domestic Wastewater Discharge Permits (primarily food manufacturing)
  - are on a 5 year renewal schedule
  - To date only about 20 of the 45 facilities have new permits that include Regulation #85 limits or compliance schedules to meet the limits
  - Monitoring data is showing existing condition in the rivers but minimal facilities are meeting the Regulation #85 limits – data showing the effect of additional treatment is limited

Progress on Implementation of Regulation #85

- Nonpoint Source
  - BMP Implementation
    - Division is collaborating with agricultural operations to develop incentives and cooperative programs for agriculture
      - Assisting with funding of CLEAN Center for development of a watershed assessment tool to characterize nutrient pollution sources within the watersheds
    - Division is to develop and implement education program
      - Contracted with CSU Extension to develop

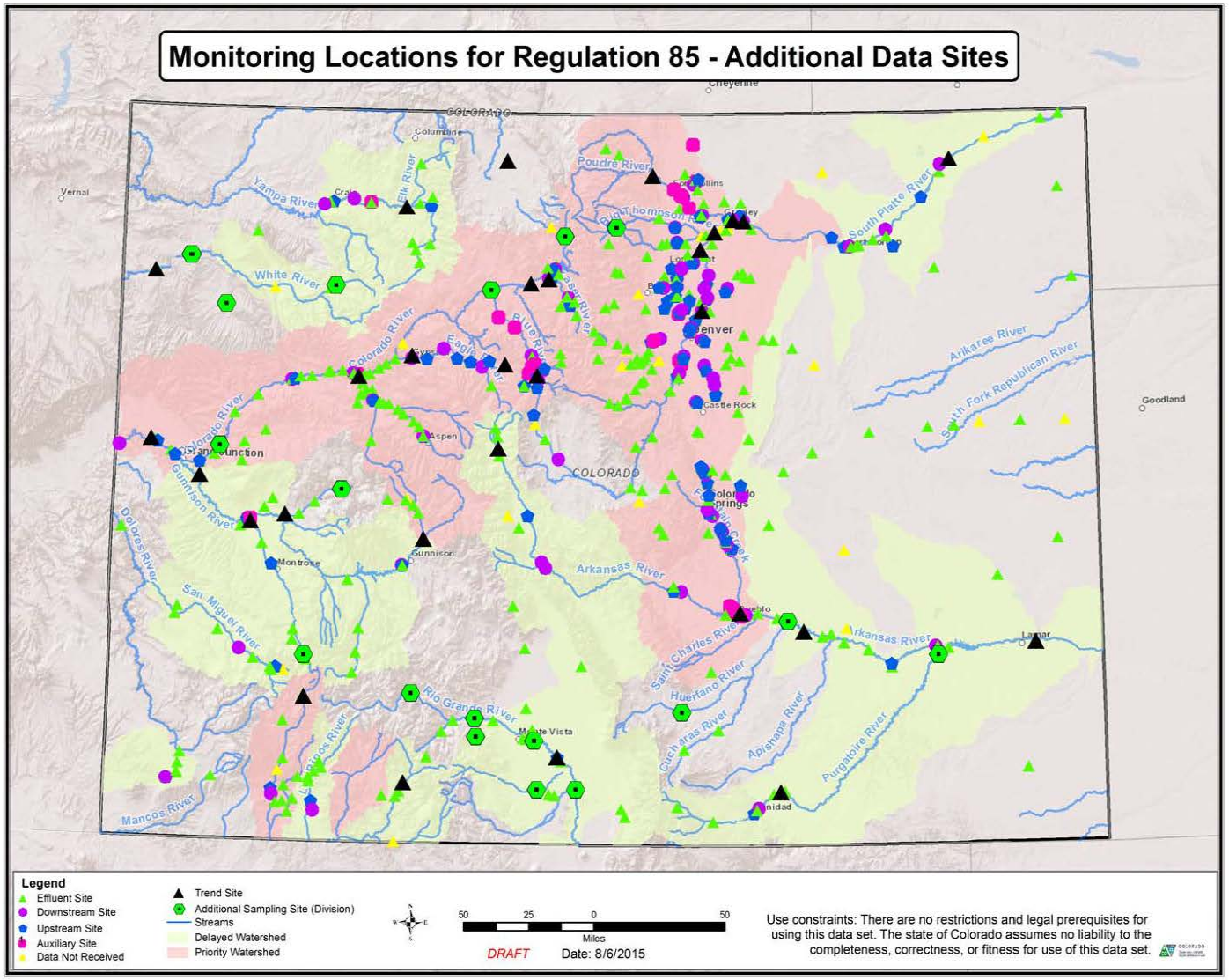
Progress on Implementation of Regulation #85

- Municipal Separate Storm Sewers
- Identified existing data and necessary additional data needed to characterize the contribution of nutrients from theMS4 discharge on a broad basis.
  - Included National Data and non-standard MS4 data
  - Determined Event Mean Concentrations

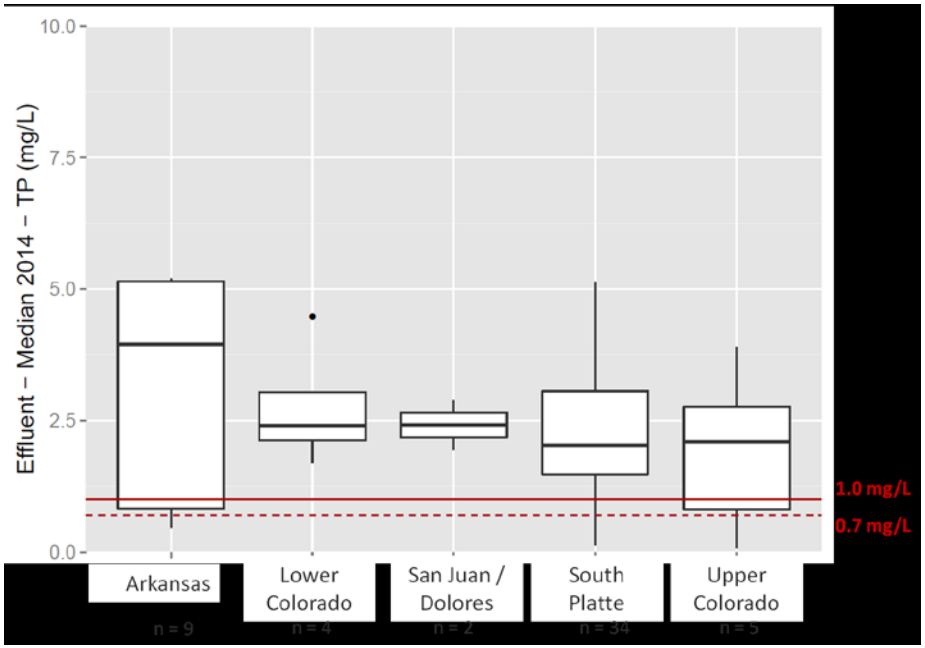
Table 6 Representative EMC Values from Discharge Assessment Data Report		
Parameter	Collaborative Report Event Mean Concentration, mg/L	City of Boulder Event Mean Concentration, mg/L
Total Phosphorus	0.22 to 0.45	0.40 to 0.65
Total Nitrogen	2.79 to 4.19	2.7 to 3.4

Progress on Implementation of Regulation #85

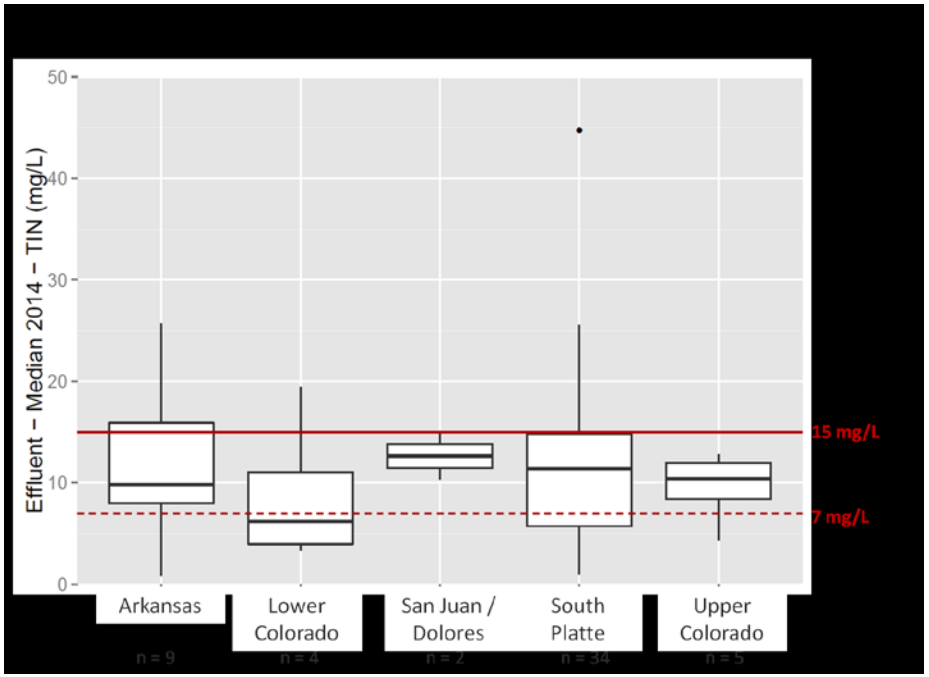
- Monitoring
  - Effluent
  - Upstream
  - Downstream
  - State



Current Discharge Quality vs Regulation #85

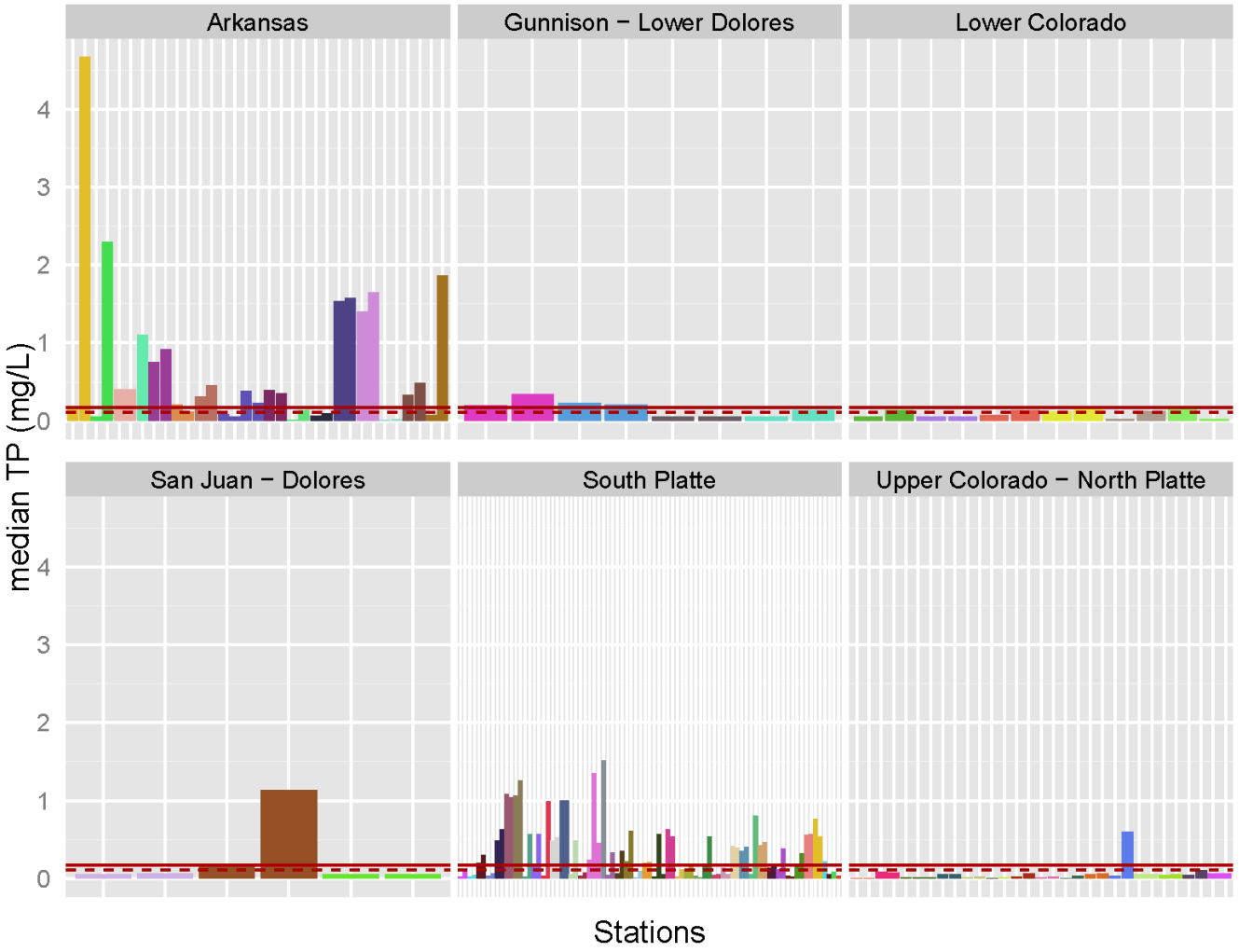


Phosphorus
16.5% meeting limits

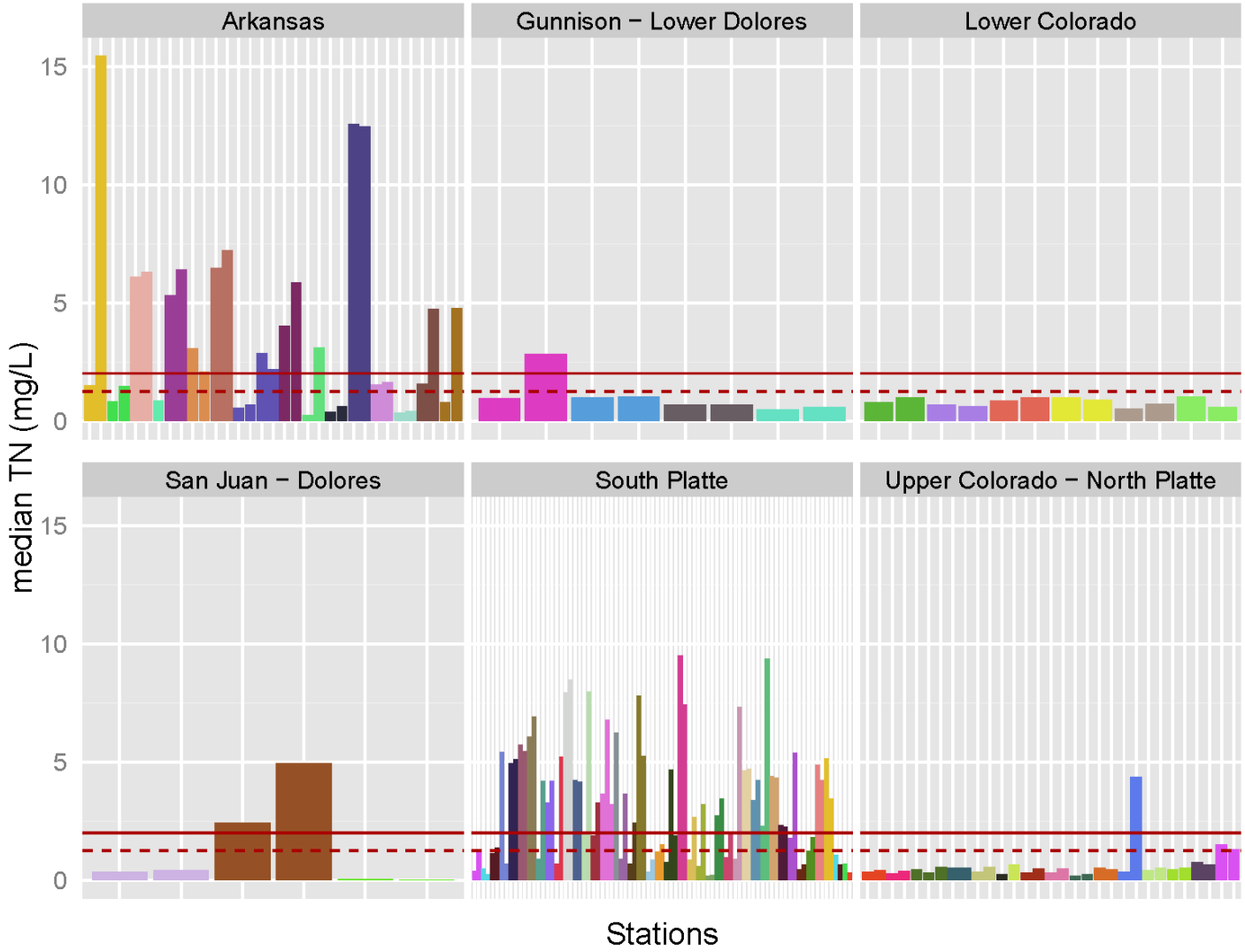


Total Inorganic Nitrogen
57% meeting limits

Instream Concentration – Total Phosphorus



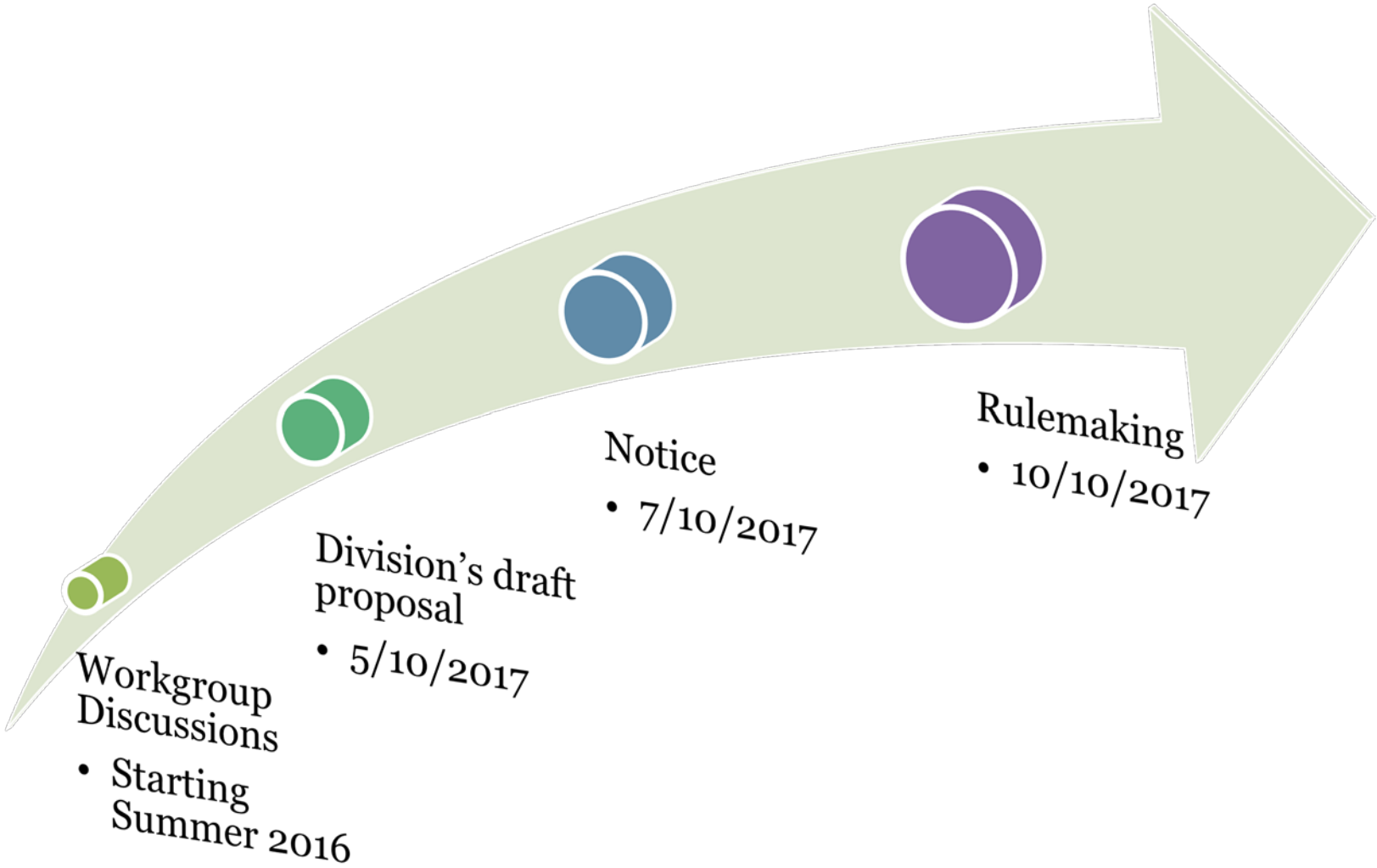
Instream Concentration – Total Nitrogen



Rulemaking to Address Outstanding Issues

- Division continues to support two part strategy adopted but will look modifications.
  - Delayed implementation for Reg.#31 standards is May 31, 2022.
    - Considering changes to this date based on:
      - Technology improvements
      - Need for additional monitoring after completion of Reg.#85 improvements are made, and
      - Effectiveness of modeling projections
  - Determine if Cooling Towers should be required to meeting Reg.#85 limits
  - Include a Trading Provision
  - Determine applicability to federally operated wastewater treatment works.

Timeline


Workgroup Discussions
• Starting Summer 2016
Division's draft proposal
• 5/10/2017
Notice
• 7/10/2017
Rulemaking
• 10/10/2017

Benefits of Phased Process