



# Poudre River Downtown Project

## Team:

- City of Fort Collins: Stormwater, Natural Areas and Parks Departments
- Anderson Consulting Engineers
- S2o Design and Engineering
- BHA Design
- BioHabitats
- Miller Ecological Consultants
- Walsh Environmental



# The Project

- Zone map of entire reach





# Poudre River



## Recreation

## Habitat

## Flood

### 3 Equally Weighted Objectives

- Opportunities and Constraints
  - Each must allow for the others
  - River channel currently serves over ½ million visitors per year in Ft Collins
  - Confined corridor with limited parking and access
  - Incremental costs very low
    - This changes the discussion with regards to ww park

# Steps City Staff Have Taken So Far on Creating a Whitewater Park

- Formulated a project which includes flood, habitat, and in-stream and streamside recreation.
- Attained title to the riverbed
- Purchased ditch rights, in cooperation with New Belgium, in order to make a whitewater park possible
- Hired S2o to begin the design and analysis process
- Have begun a step-by-step process to identify opportunities, propose designs, and procure funding

Fort Collins' goal is to create a Benchmark project that is the best Whitewater Park that can be created that meets these multiple objectives

## Conclusions (preview)

- A Whitewater Park is feasible, but, the Poudre River flows will sustain a (relatively short) kayaking season
  - ▶ The boating season will likely be shorter in the future due to increased water demands
- We Believe that a Park could be designed that is integrated with the objectives of the project including connectivity of habitat and flood mitigation—but there are major challenges including water rights, potential environmental contamination, native species criteria, Permitting (USACE 404 & 401) etc.
- The Park would likely be one of local significance providing for many different types of in-stream recreation with expert level kayaking only at higher levels.
- A value decision needs to be made regarding costs vs. benefits given the short season... Expectations should also be managed.



# What is a Whitewater Park?

- A focal point for in-stream recreation
- Built from native rock and provides for habitat as well as fish passage.





## Economic Impact

- Enhance Fort Collins adventure brand
- \$300,000-800,000 in potential economic impact cited in a recent study



## A Place That is an Iconic Attraction

- Additional amenity in Fort Collins
- Attraction at a variety of flow levels
- A demonstration of Fort Collins commitment to its people and its environment





# A Place that is a Benefit to the Environment

- Positive environmental impacts
- Native materials that are naturally beautiful
- Creates and restores in-stream and riparian habitats
- Provides for in-stream and riparian connectivity





## A Place that Invites All Kinds of Folks

- Designed for paddlers of all abilities, from tubing to kayaking
- Create spaces for community events
- Design for full and empty spaces
- Provides a place to gather as a family, church group, community





## A Place that is an Experience

- Nine out of ten people never get wet
- Designed for the young, the old, the families and the friends
- A Place to learn about rivers and the environment



# What is a Whitewater Park Not?

- A skateboard park on a river
- An impediment to Fish passage
- A Flood Risk





*Hawea River at 100 year flood flow testing*

# Designed to Minimize Flood Impacts

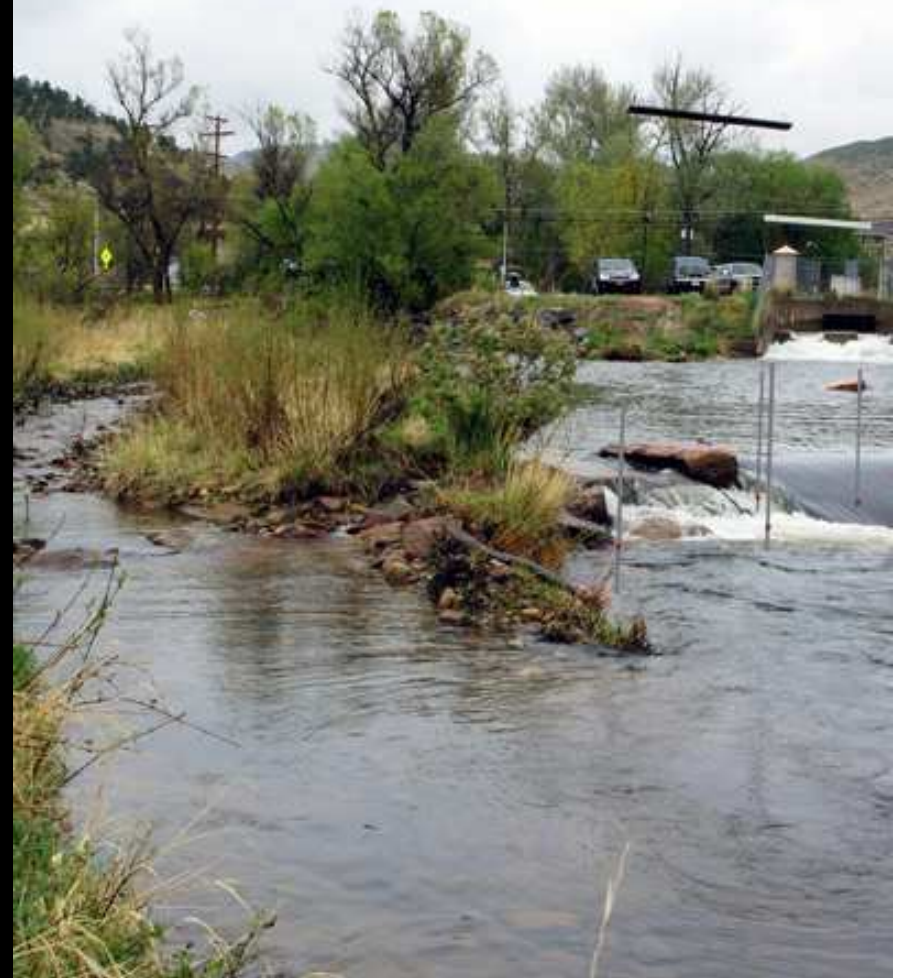
- Designed to have no net effect on 100 year flood level



## Connected Habitat

- Designed to pass fish
- Creates deep pools and overwinter habitat
- Projects can improve existing character of the river or reach.

Fish Bypass &  
Preble's Jumping Mouse  
Habitat  
Lyons Whitewater Park, CO





# Hydrology of the Poudre River Through Downtown Fort Collins

**Anderson Consulting Engineers**

**S2o Design and Engineering**

## The Project

- Zone map of entire reach





# Poudre River

## Whitewater Park Potential Locations



## Flow Definitions

Not so simple...

- Historical Flows
- Baseline Flows
- Post-NISP Flows



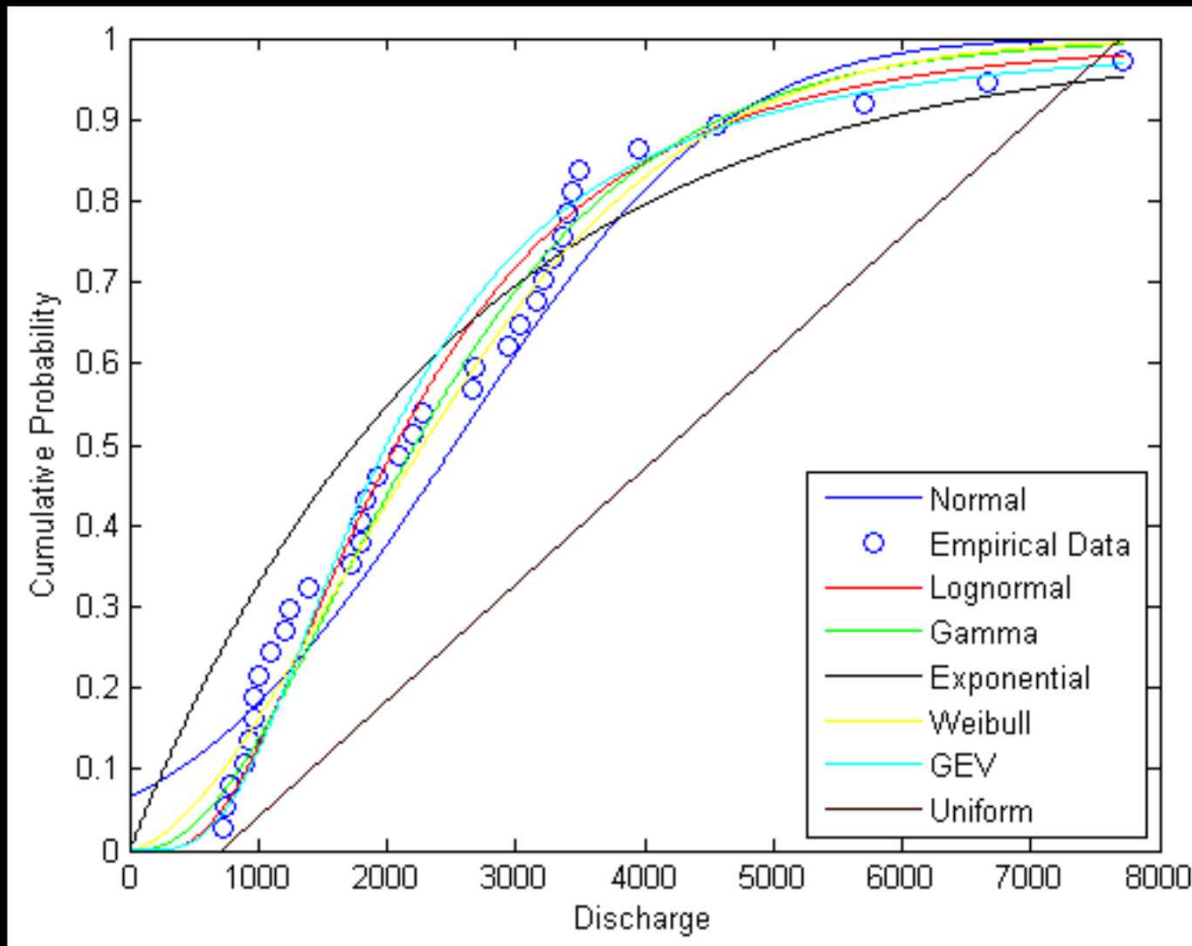
# Number of Days Exceeding 200 cfs on Clear Creek (Golden) and Poudre River (Fort Collins)

Whitewater park paddling season May 1<sup>st</sup> – July 17<sup>th</sup>

– 11 weeks (77 days)

- Clear Creek in Golden
  - Average 9 weeks out of 11 weeks (63 days)
- Poudre River in Fort Collins (Historic Flows)
  - Average 6.4 weeks out of 11 weeks (45 days)
  - Some decrease over period of record

## Poudre River Historic Flows



Flow Rates (cfs)	Return Period (yr)
5,000	10.95
2,000	2.00
900	1.10
600	1.02
200	1.00

\* Front Range Hydraulics. 2012. Poudre River Kayak Park Final Report.

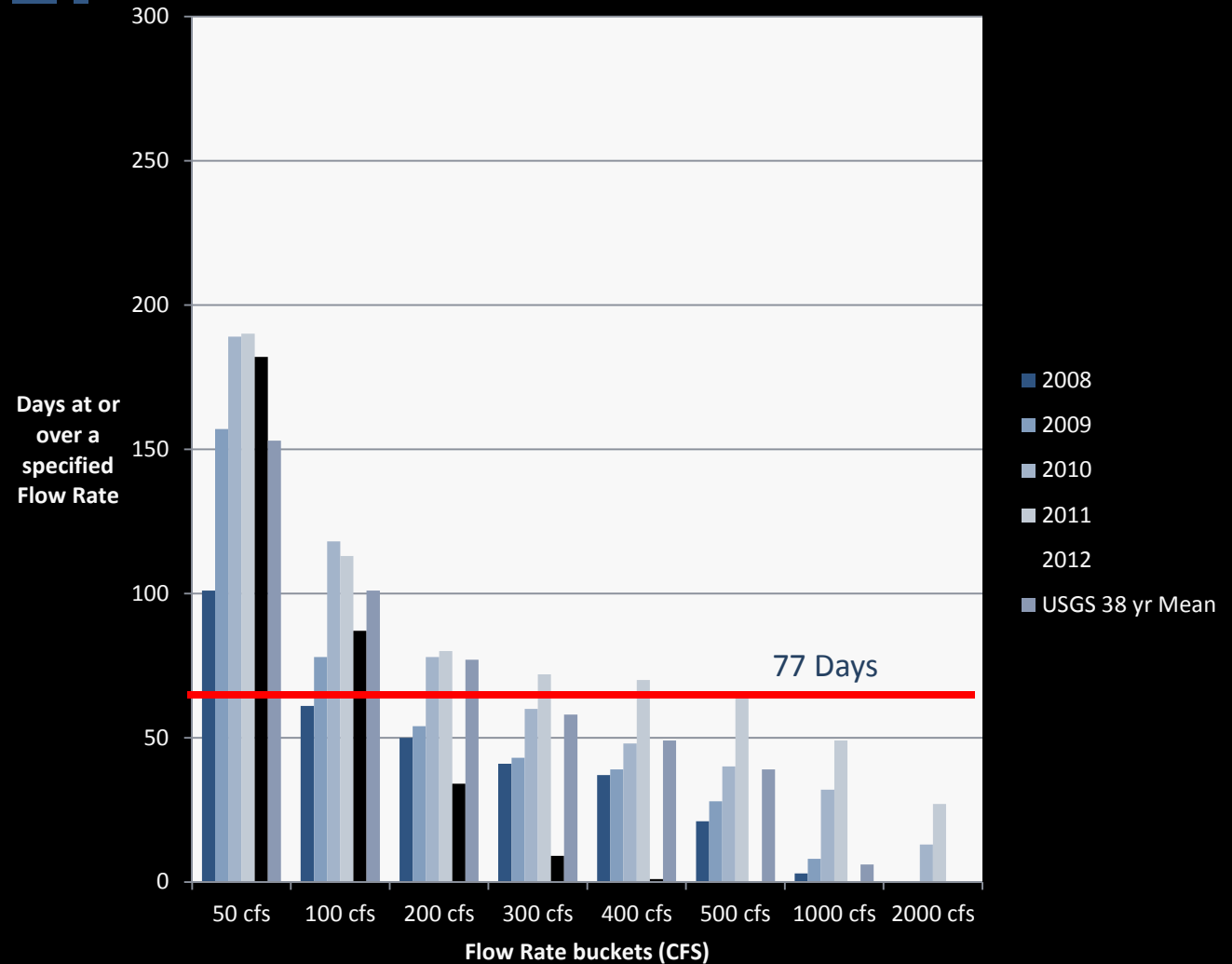


# Poudre River

## What Does This Really Mean?

### Historic Poudre River Flows (existing flows are lower)

- Cache la Poudre River at Fort Collins, CO USGS 06752260
- Upstream of Lincoln St
- Gage Record 1975-2013
- Mean of Daily Mean Flow Rates

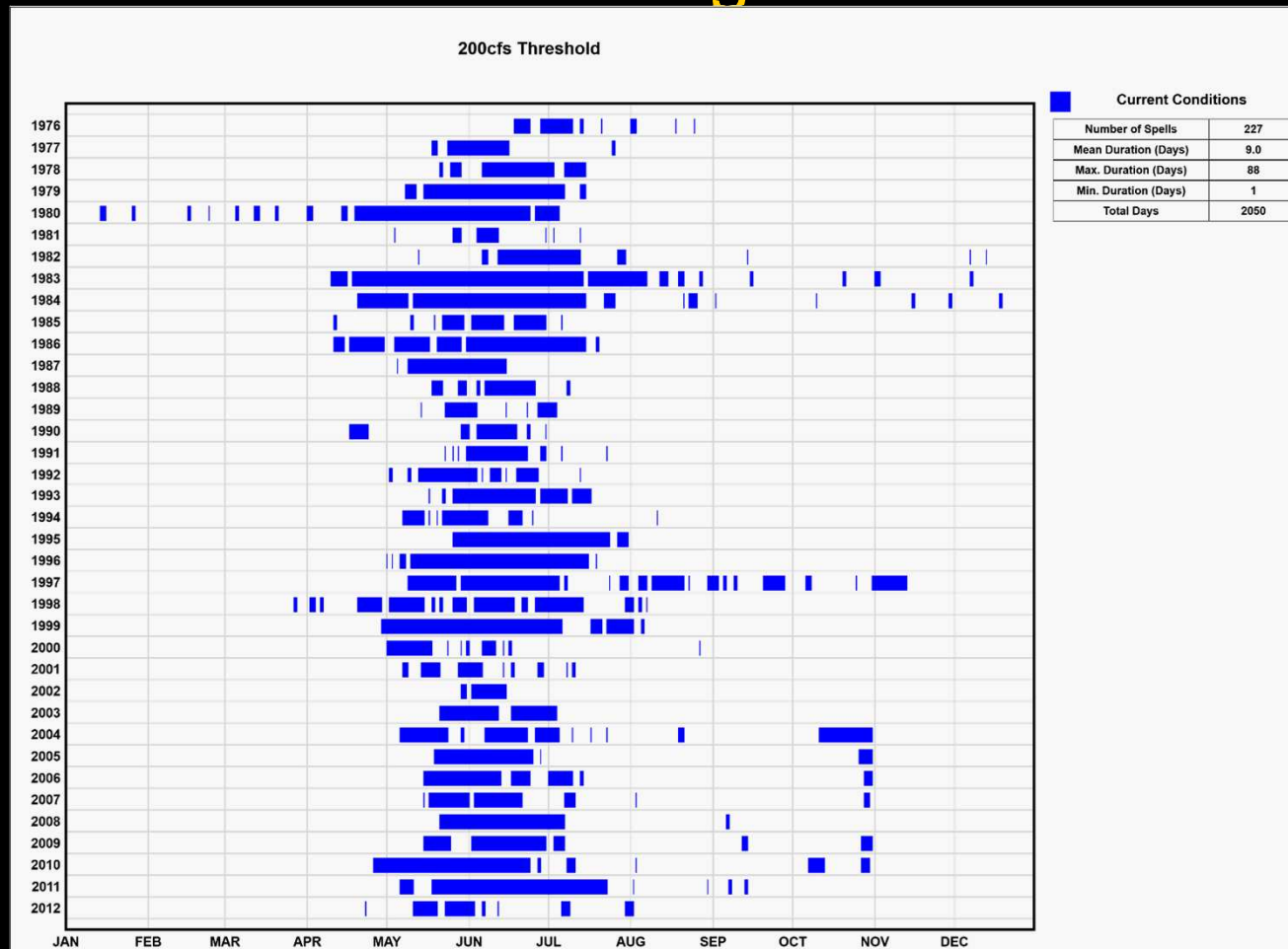


\* Tillema, John. 2013. Fort Collins Whitewater Park Flow Study, July 2, 2013. Presentation.

\* United States Geological Survey (USGS). 2013. USGS 06752260 Cache La Poudre River at Fort Collins, CO. Available from: [http://waterdata.usgs.gov/nwis/inventory?agency\\_code=USGS&site\\_no=06752260](http://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=06752260) [Accessed on 8/5/2013]

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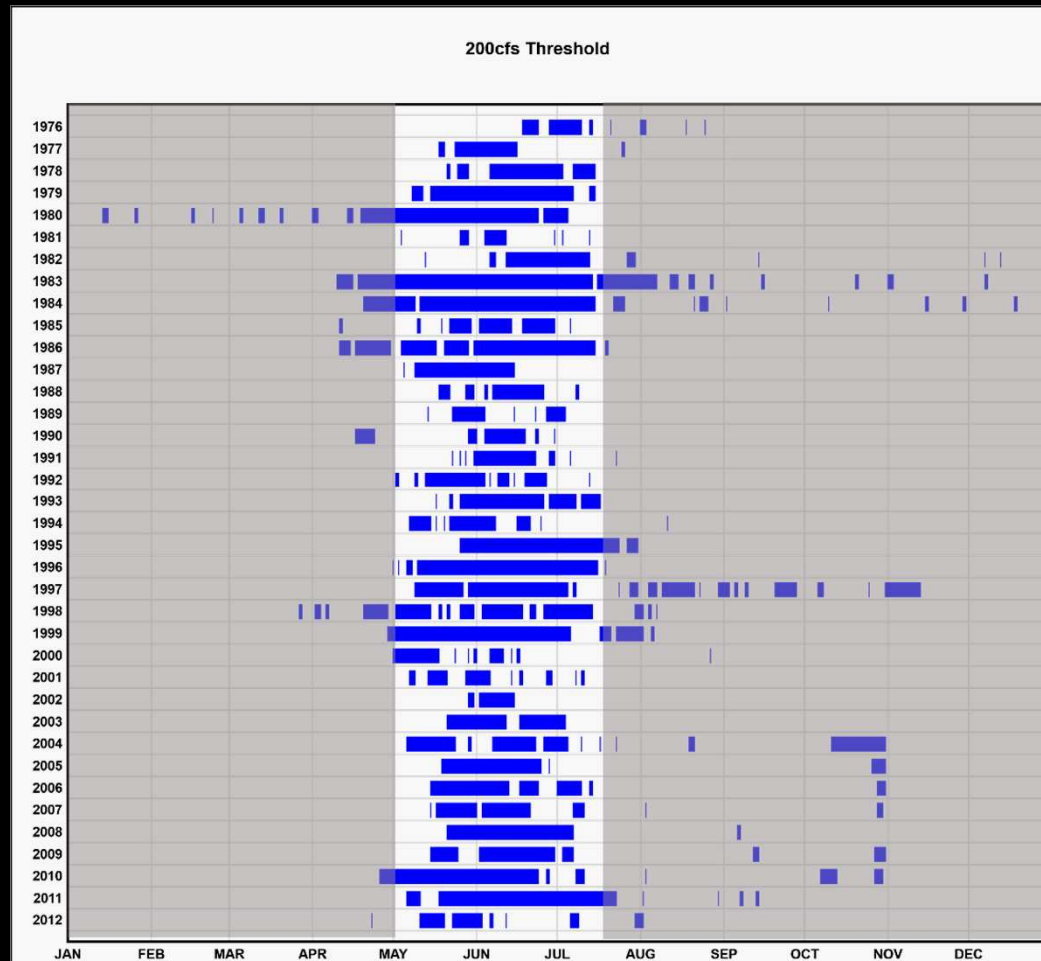
## Dates When Historical Average Daily Flows Exceed 200 cfs at the Lincoln St. Gauge





# Poudre River

## Dates When Historical Average Daily Flows Exceed 200 cfs at the Lincoln St. Gauge



## What does the Future Hold ?

- **Future water demands will continue to deplete river flows**
  - ▶ **Future storage facilities and exercising of current water rights will continue to reduce flows in the river**
- **The Unknowns**
  - ▶ **Climate change:** Will historical precipitation project into the future? Will precipitation increase or decrease?
  - ▶ **Future storage projects:** Various water storage projects will reduce river flows



# What is the Northern Integrated Supply Project (NISP)

- A regional water supply project designed to serve the current and future water needs of 12 towns and water districts in Larimer, Weld, Morgan, and Boulder Counties
- Construction of Glade Reservoir near the canyon mouth
  - Approximate capacity 170,000 acre-feet
- Divert up to 800 – 1,200 cfs depending on reservoir stage
- Reduced stream flow in the Cache la Poudre River below the points of diversion
- There are also a City of Fort Collins and a City of Greeley water storage projects.

\* ERO Resources Corporation. 2008. Northern Irrigated Supply Project, Draft Environmental Impact Statement. Prepared for the Northern Colorado Water Conservancy District

# Poudre River

## Impacts of Current and Future Demands, and NISP on Stream Flow in the Poudre

Monthly Average Stream Flow (cfs) at Lincoln Street Gage												
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Baseline Flows												
Wet year	28.36	27.58	25.51	18.43	24.18	32.48	280.83	908.44	252.65	83.04	17.43	25.89
Avg. Year	31.51	25.34	16.32	15.55	13.21	17.1	188.6	529.4	174.5	15.98	12.89	43.17
Dry Year	27.9	27.3	14.16	15.56	9.6	11.12	131.12	215.44	66.41	31.2	11.24	23.77
Project Flows												
Wet year	27.04	22.65	14.07	14.99	20.16	34.83	163.5	368.9	172.27	45.56	17.44	25.18
Avg. Year	27.58	22.14	13.02	12.87	13.24	14.35	54.13	245.47	93.43	11.19	12.95	43.4
Dry Year	23.76	25.13	12.06	10.93	9.58	11.2	43.79	116.69	23.2	23.25	11.21	21.75
Change in Flow												
Wet year	-1.32	-4.93	-11.43	-10.8	-4.02	2.35	-117.33	-539.54	-80.38	-37.49	0.01	-0.71
Avg. Year	-3.93	-3.2	-3.3	-2.69	0.02	-2.75	-134.47	-283.93	-81.07	-4.79	0.06	0.23
Dry Year	-4.14	-2.17	-2.11	-4.64	-0.02	0.08	-87.33	-98.75	-43.21	-7.95	-0.03	-2.03
Percent Difference												
Wet year	-4.70%	-17.90%	-44.80%	-41.90%	-16.60%	7.20%	-41.80%	-59.40%	-31.80%	-45.10%	0.00%	-2.70%
Avg. Year	-12.50%	-12.60%	-20.20%	-17.30%	0.20%	-16.10%	-71.30%	-53.60%	-46.50%	-30.00%	0.40%	0.50%
Dry Year	-14.80%	-7.90%	-14.90%	-29.80%	-0.20%	0.70%	-66.60%	-45.80%	-65.10%	-25.50%	-0.20%	-8.50%

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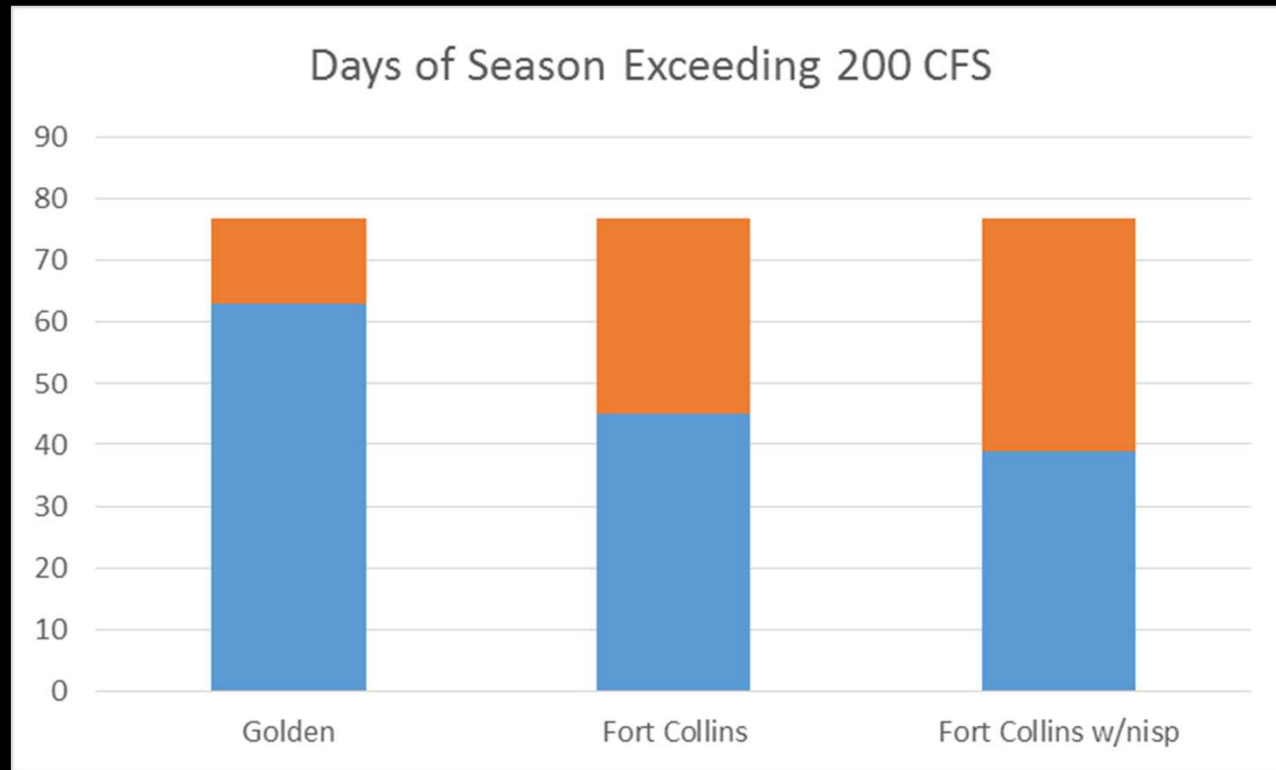
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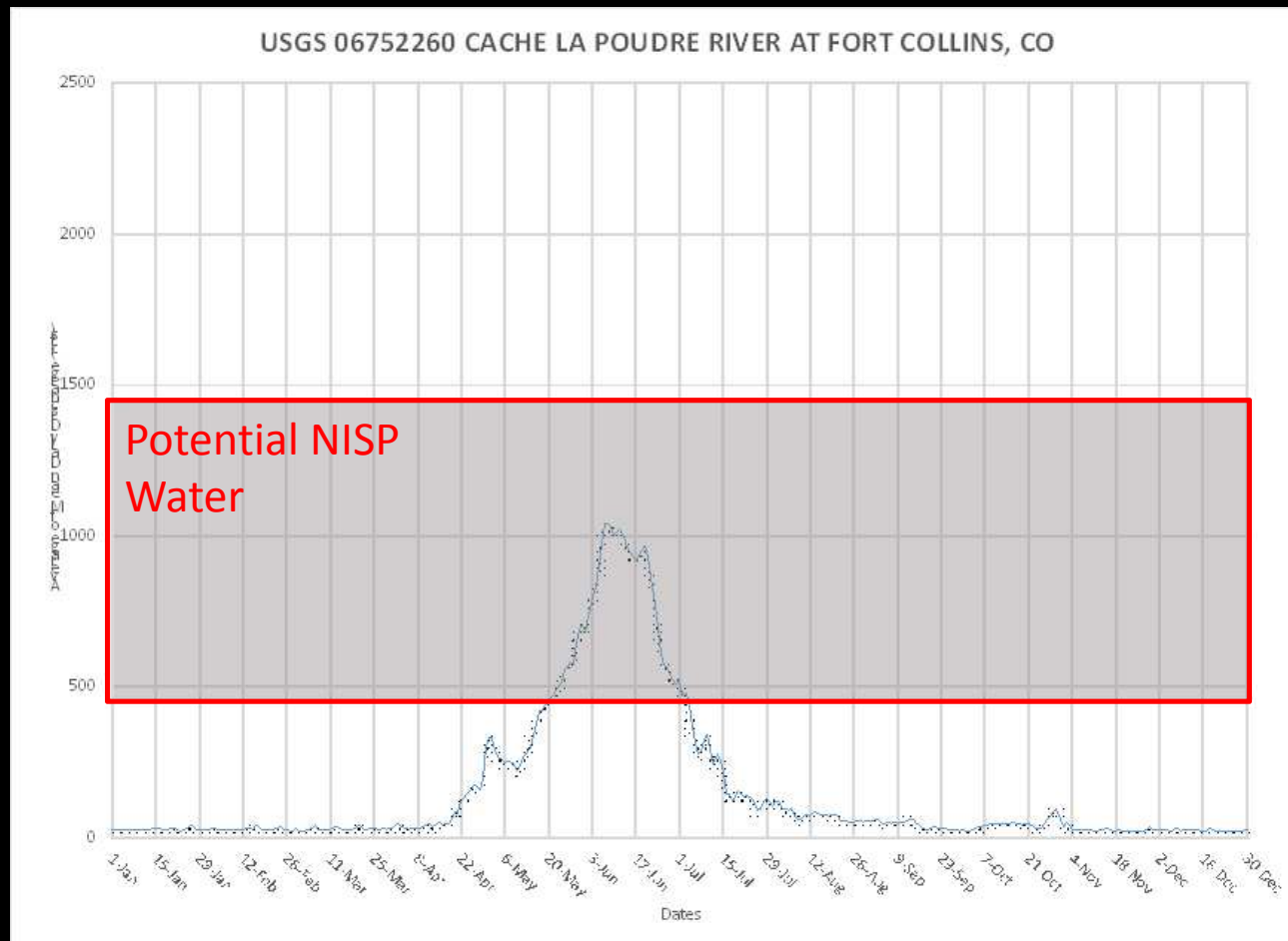
\*There are more days of flow



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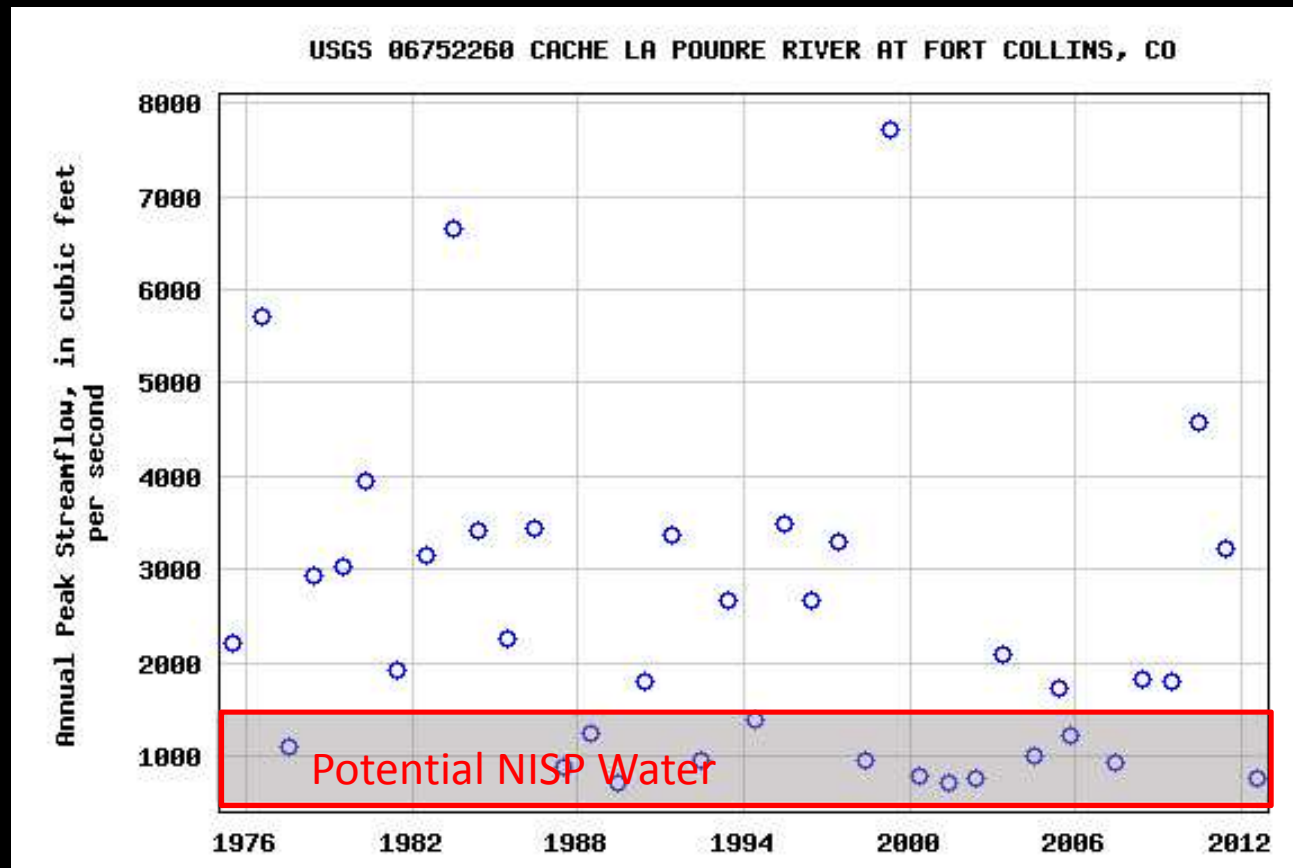
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\*Rough Analogy



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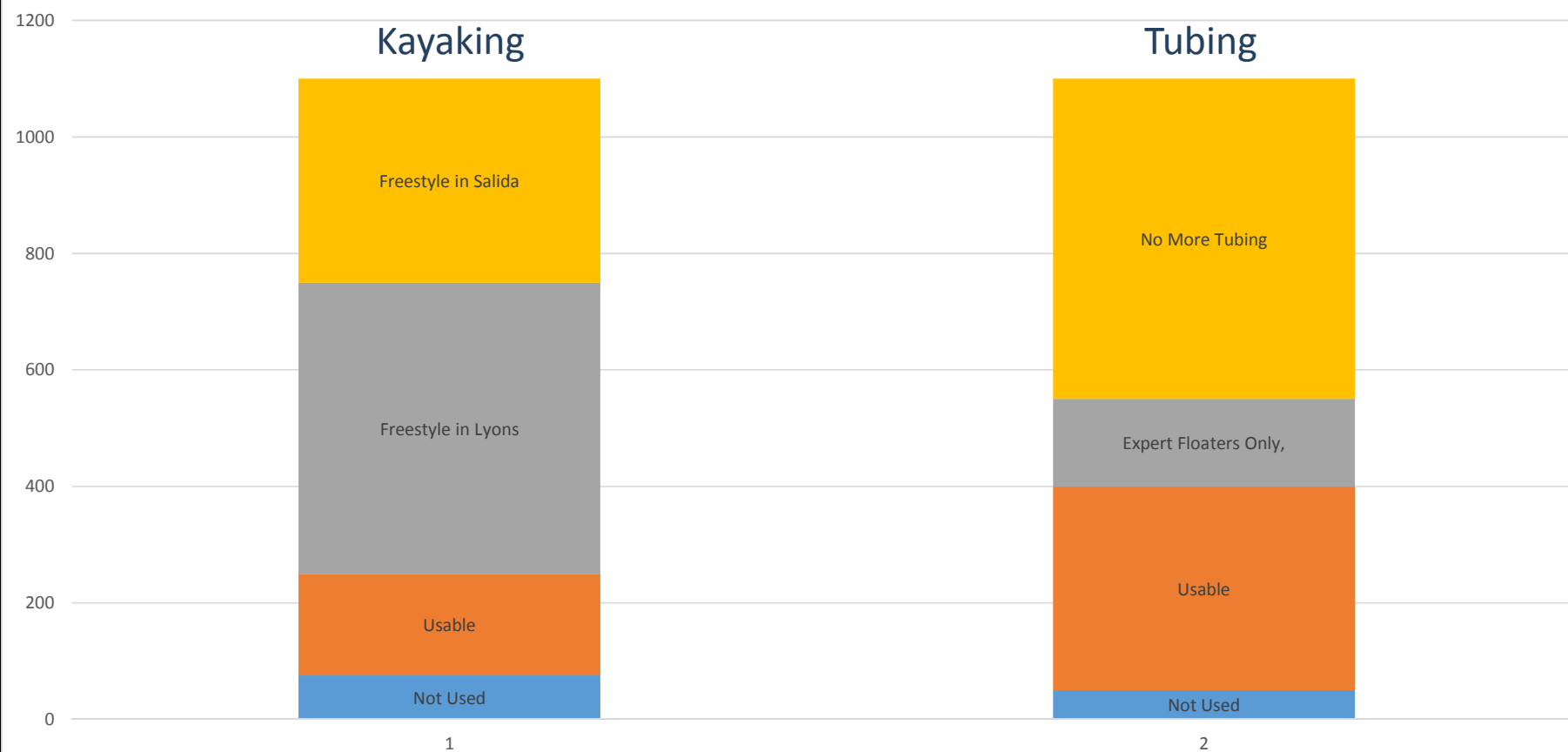
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# Poudre River

Whitewater Park Flows



Is Any of the City's Stored Water Available to  
Supply Flows for Whitewater Play ?

**Short Answer...No**

## Next Steps

- Open house and providing input to the design team
- Continued Design process including work sessions with City Boards and City Council.
- Master Plan Design of the Entire Project
  - This will provide the context in which the park is located and designed
  - Several concepts to be vetted
- Detailed Design, Permitting, and Implementation...
  - Could be an extended process
  - 2015 would be the earliest

**We want you to be a part of this process!**



## Conclusions

- A Whitewater Park is feasible, but, the Poudre River flows will sustain a (relatively short) kayaking season
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