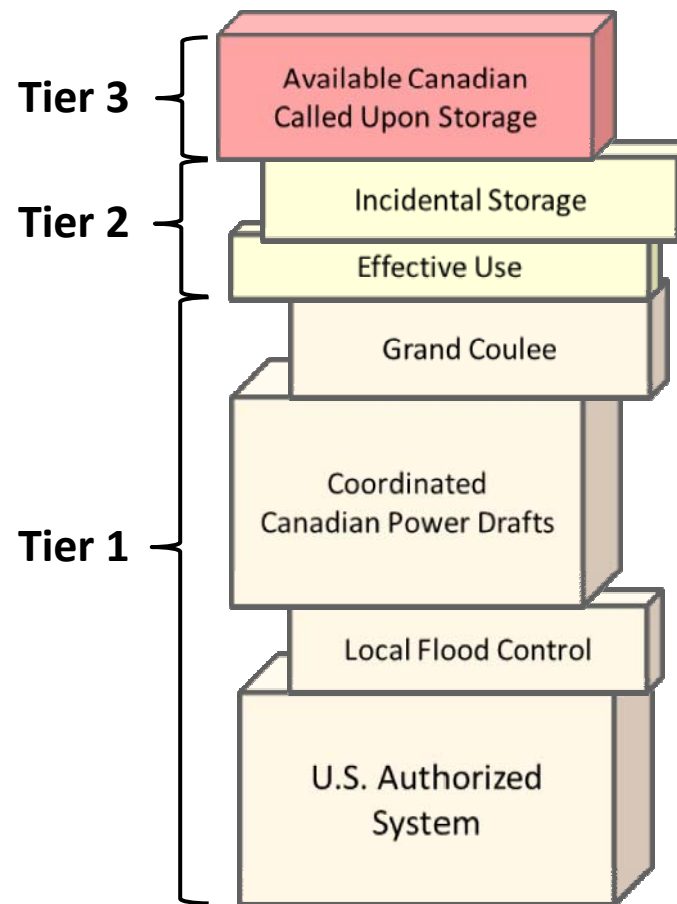


Columbia River Treaty 2014/2024 Review  
**Flood Risk Management**

Iteration 1 Results

# Effective Use and Called Upon

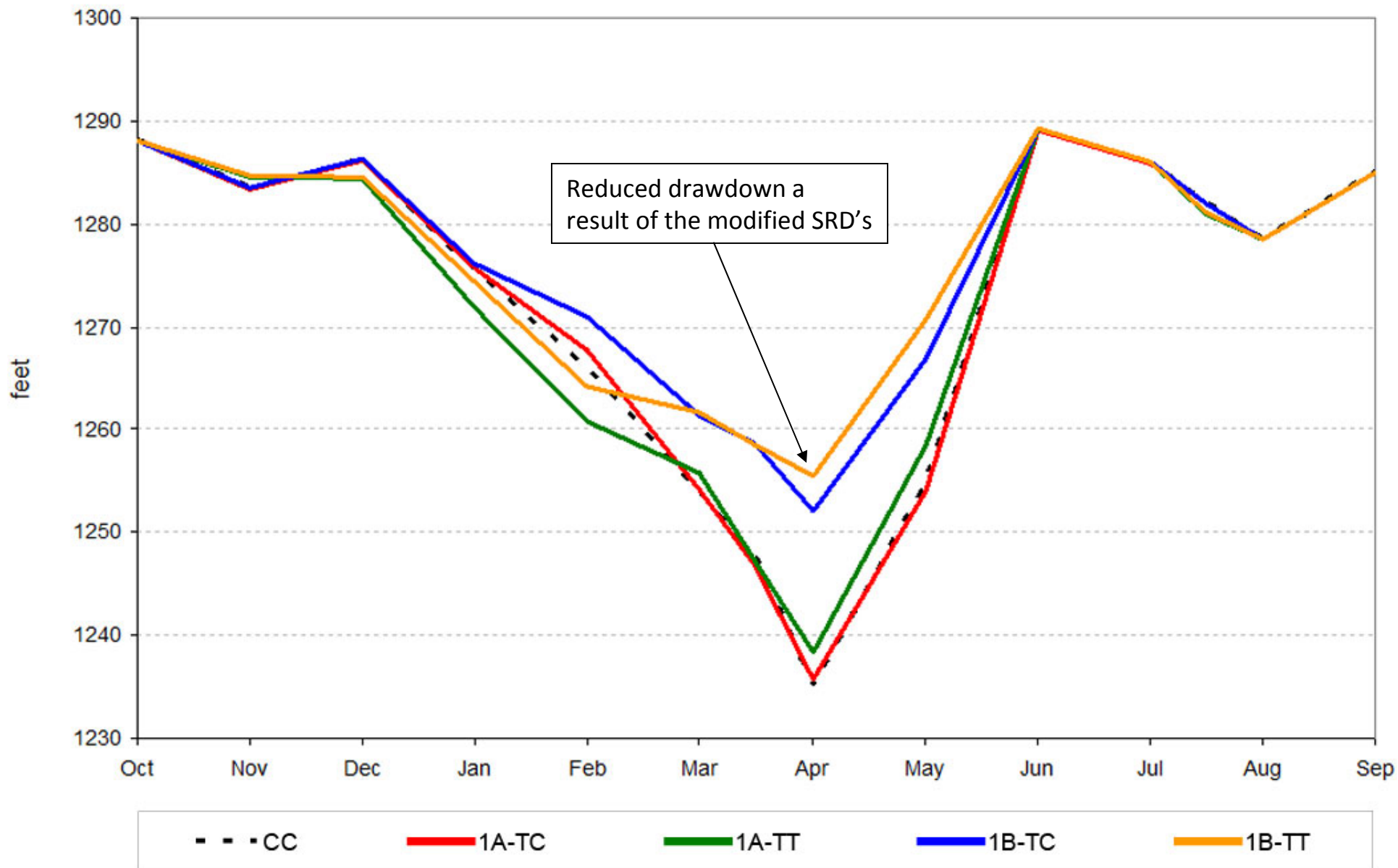
For Post 2024 Called Upon Operations



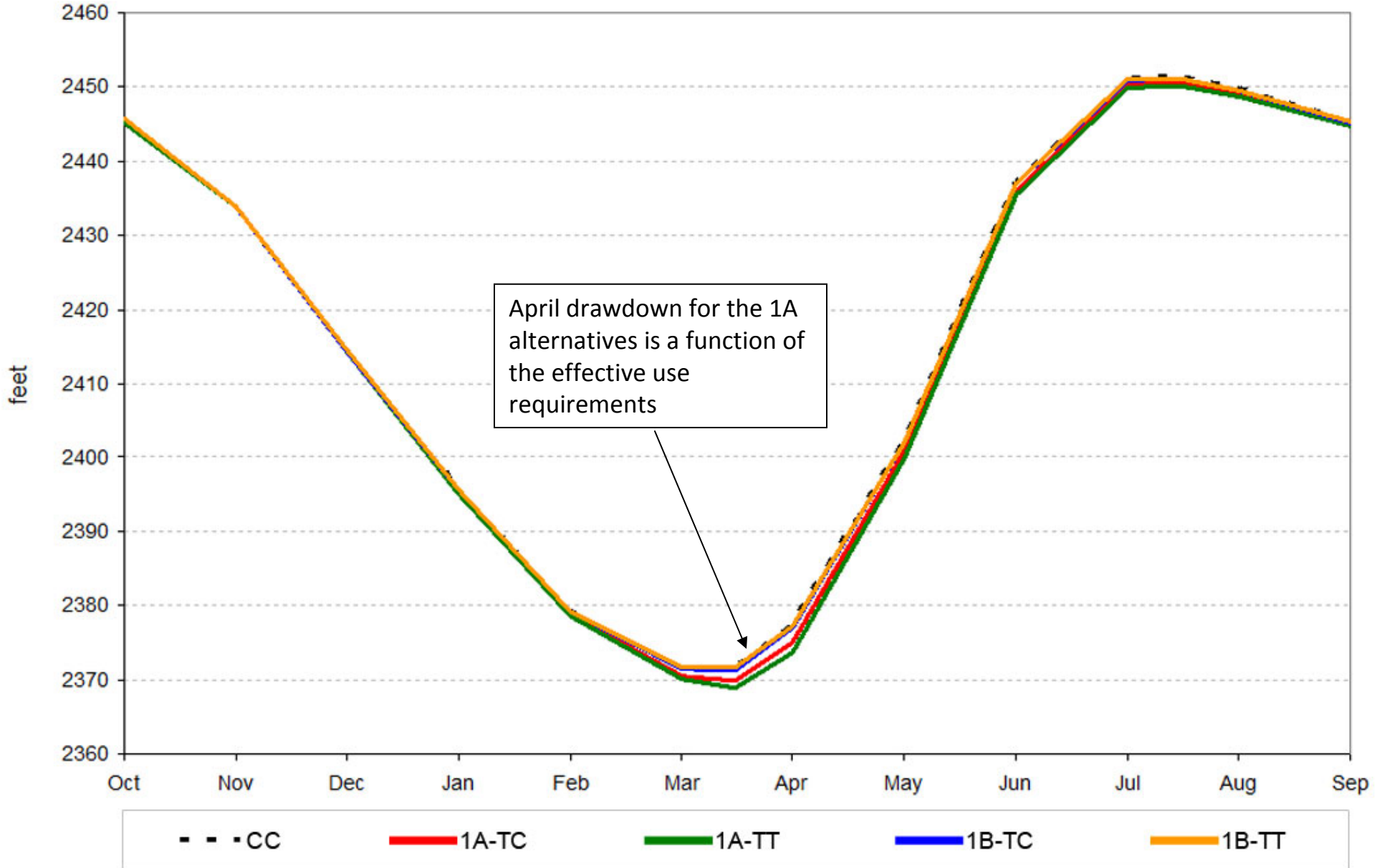
# Iteration 1 Alternatives

Former Alternative Names	Current Naming Convention	Treaty Status	SRDs
RC-CC	1-CC	Continues	US-Current CA-Current/on call
450 TC	1A-TC	Continues	US-Current/EU CA-Called upon
450 TT	1A-TT	Terminates	US-Current/EU CA-Called upon
600 TC	1B-TC	Continues	US-Current (except <b>GCL, DWR, BRN</b> )/EU CA-Called upon
600 TT	1B-TT	Terminates	US-Current (except <b>GCL, DWR, BRN</b> )/EU CA-Called upon

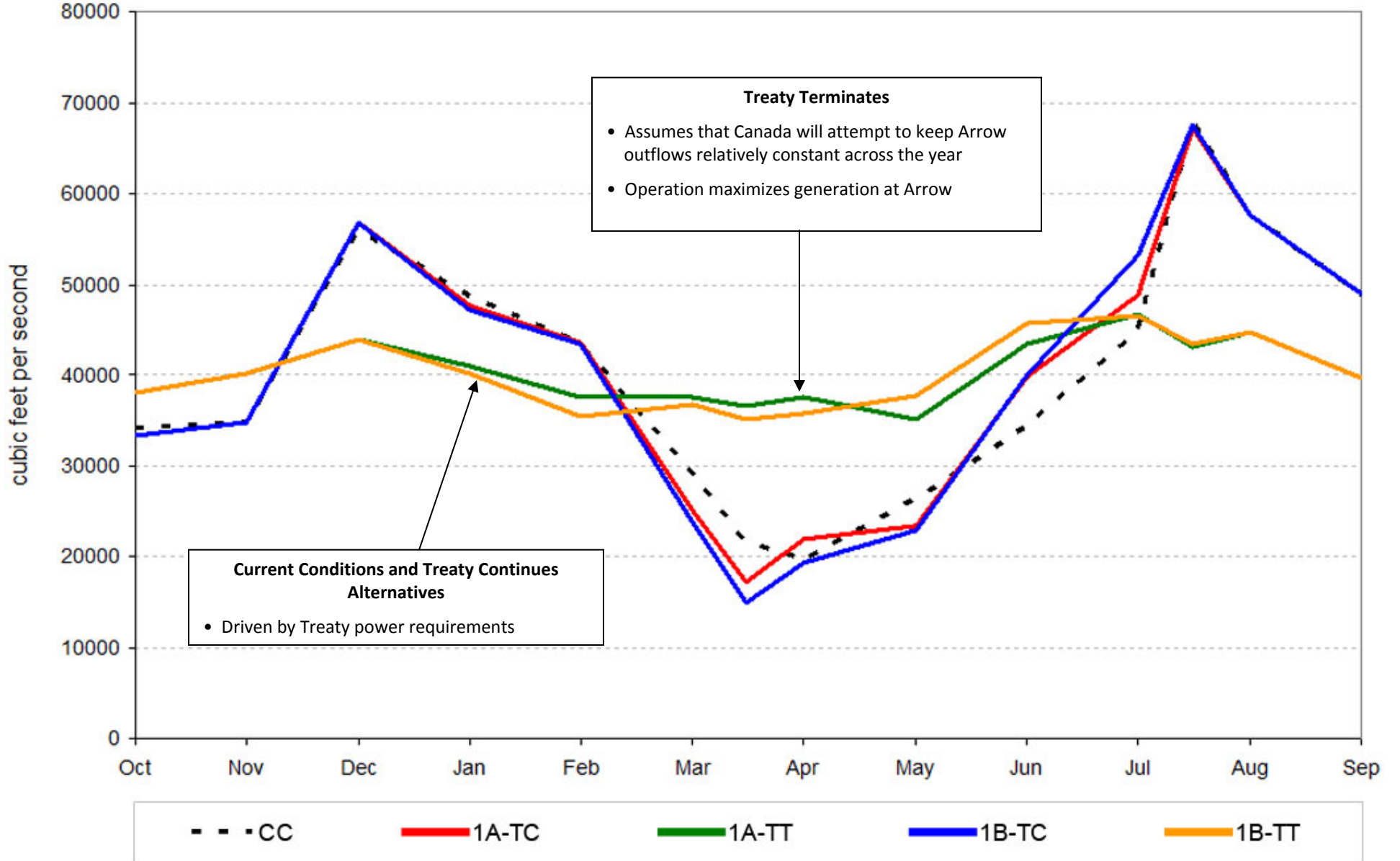
## Grand Coulee - Average Elevation - All Years



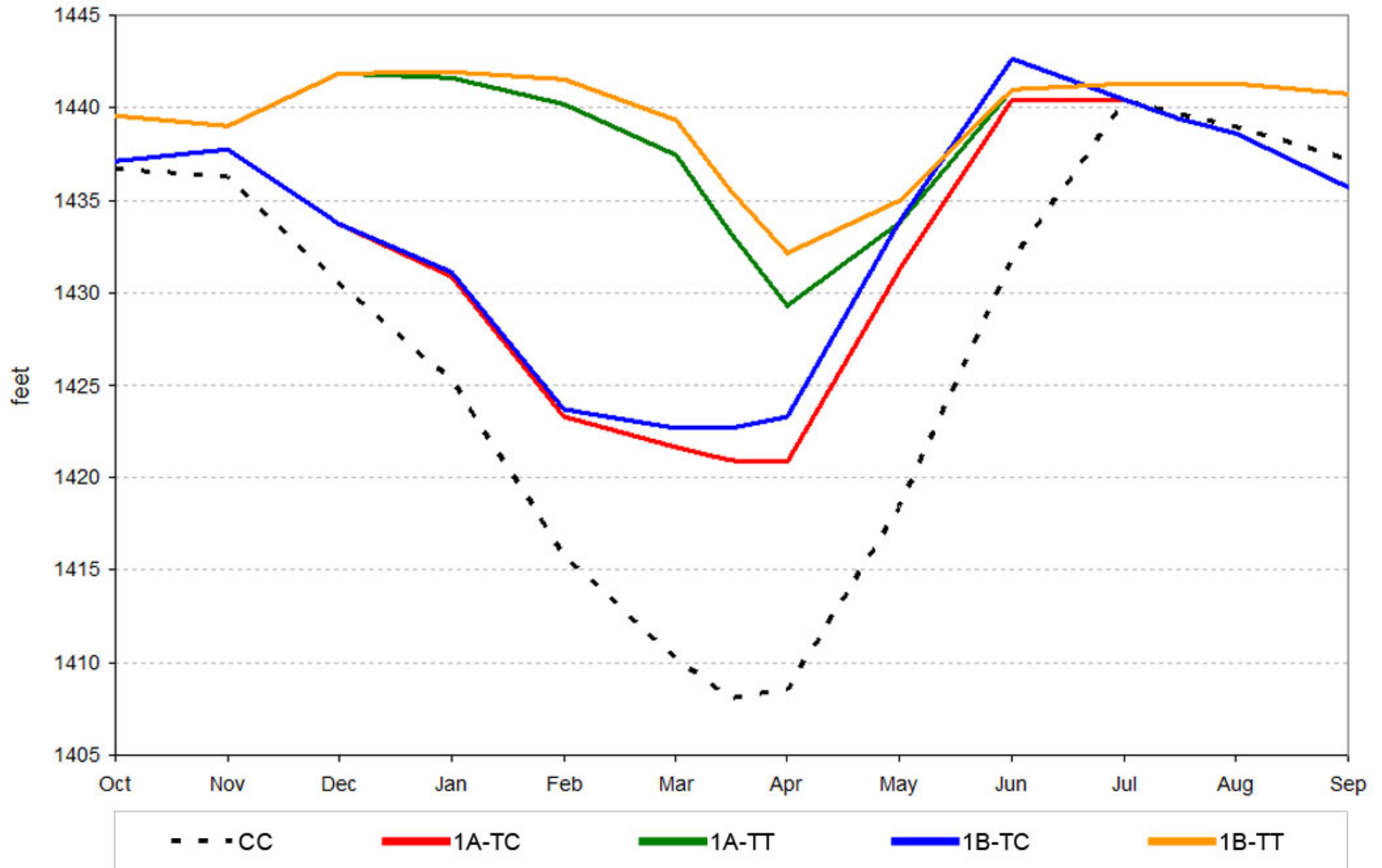
# Libby - Average Elevation - All Years



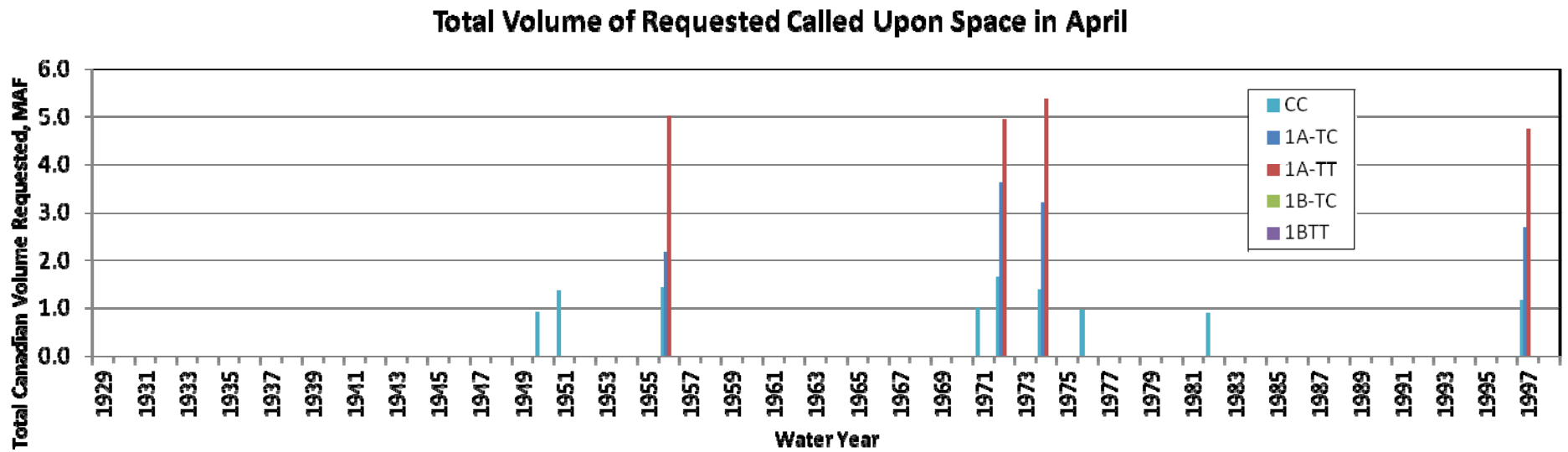
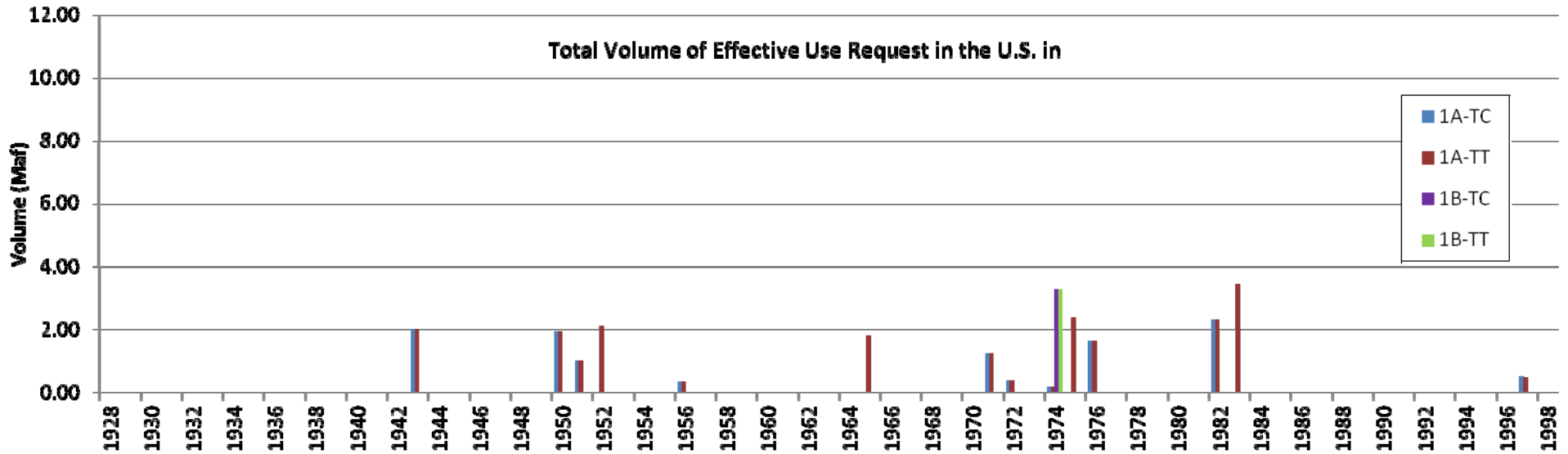
# Columbia River at Arrow Dam - Average Outflow - All Years



## Arrow - Average Elevation - All Years



# Effective Use and Called Upon



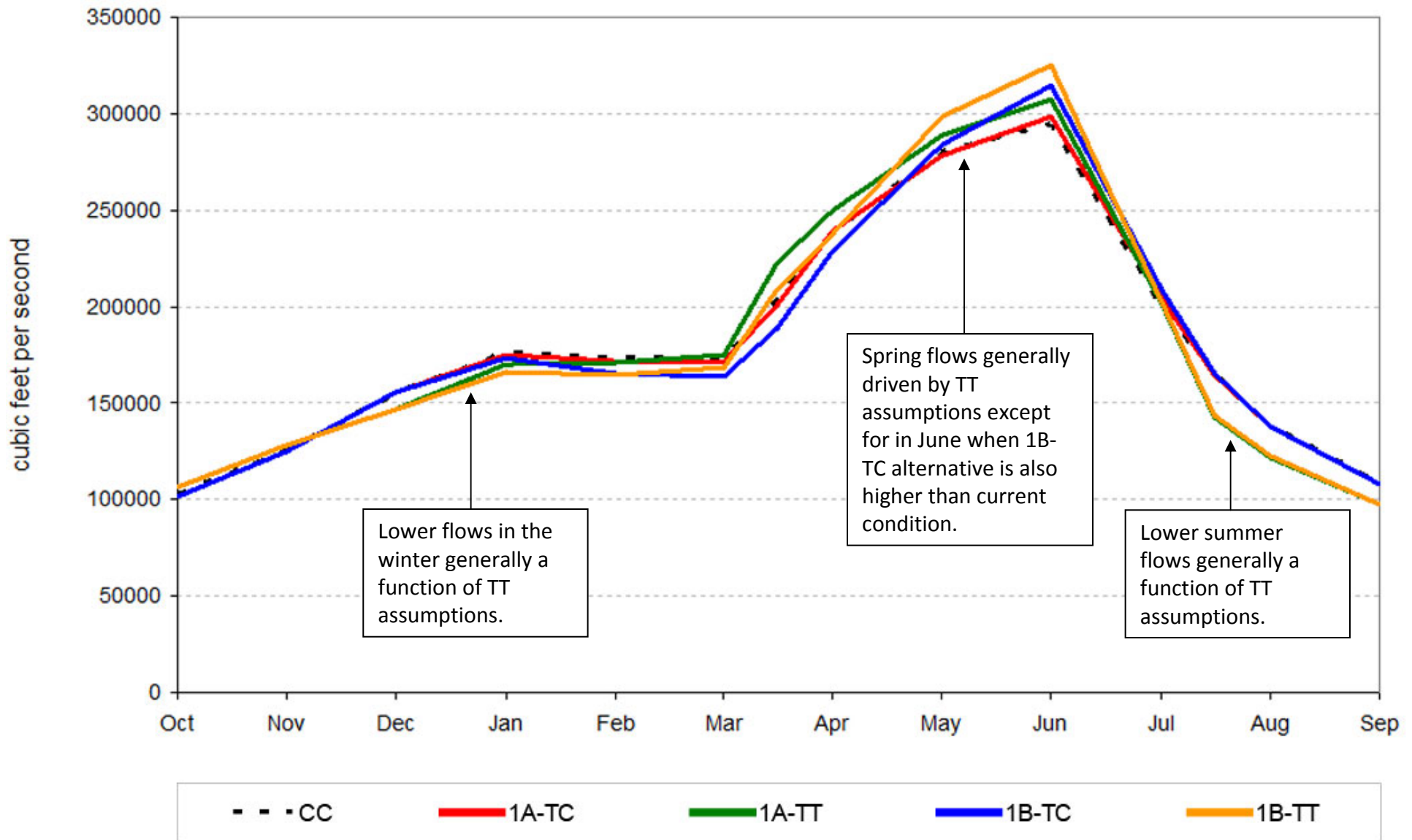


## ***Preliminary of Range of Canadian Hydropower Revenue Losses Due to Called Upon by Year\****

<b>Treaty Scenario</b>	<b>\$ million</b>
1A-TC (4 years)	5 - 25
1A-TT (6 years)	4 - 34

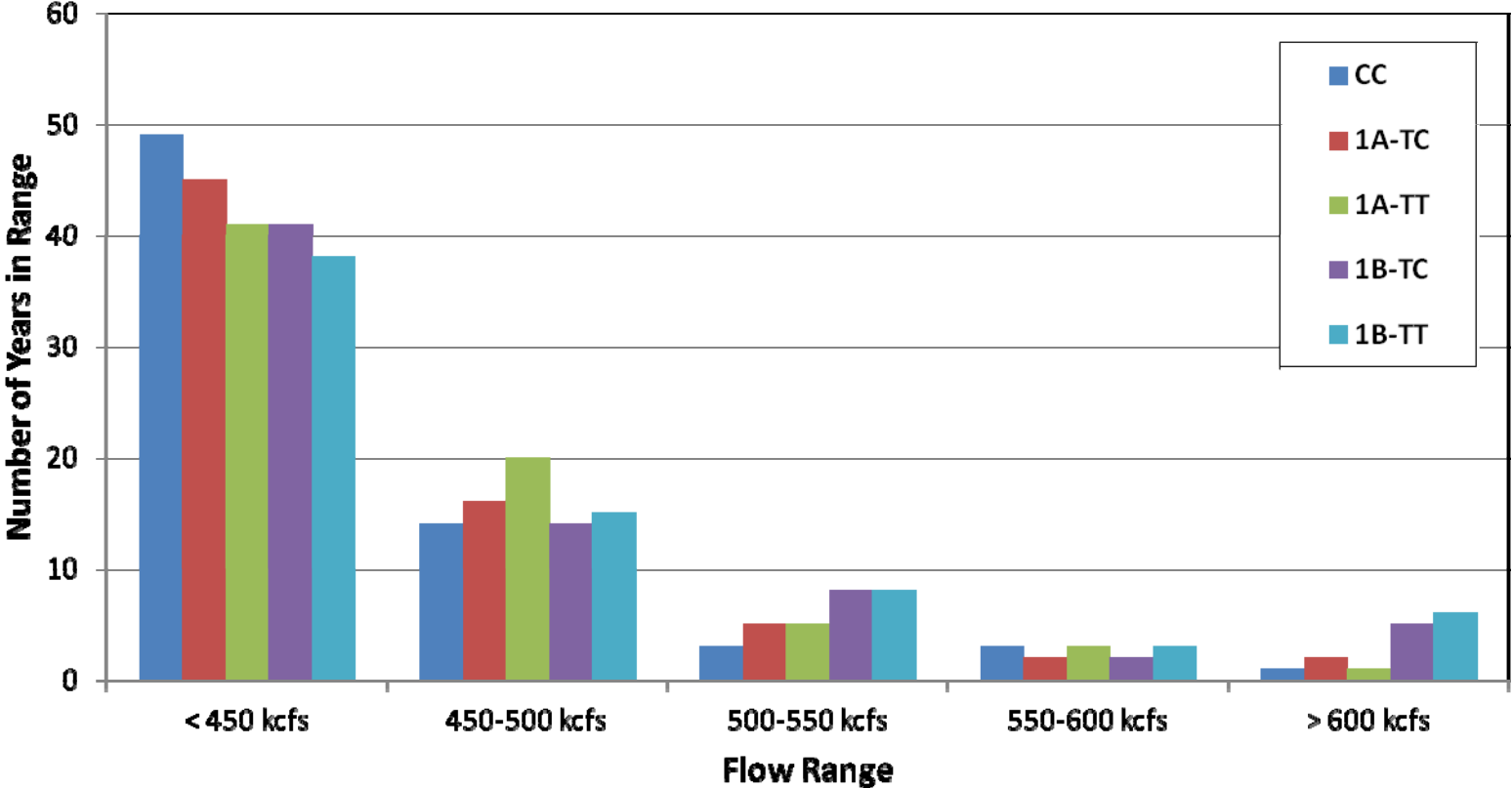
\*Dollar estimates reflect both energy and capacity

# Columbia River at The Dalles Dam - Average Outflows - All Years



# Flood Peak Occurrences at The Dalles

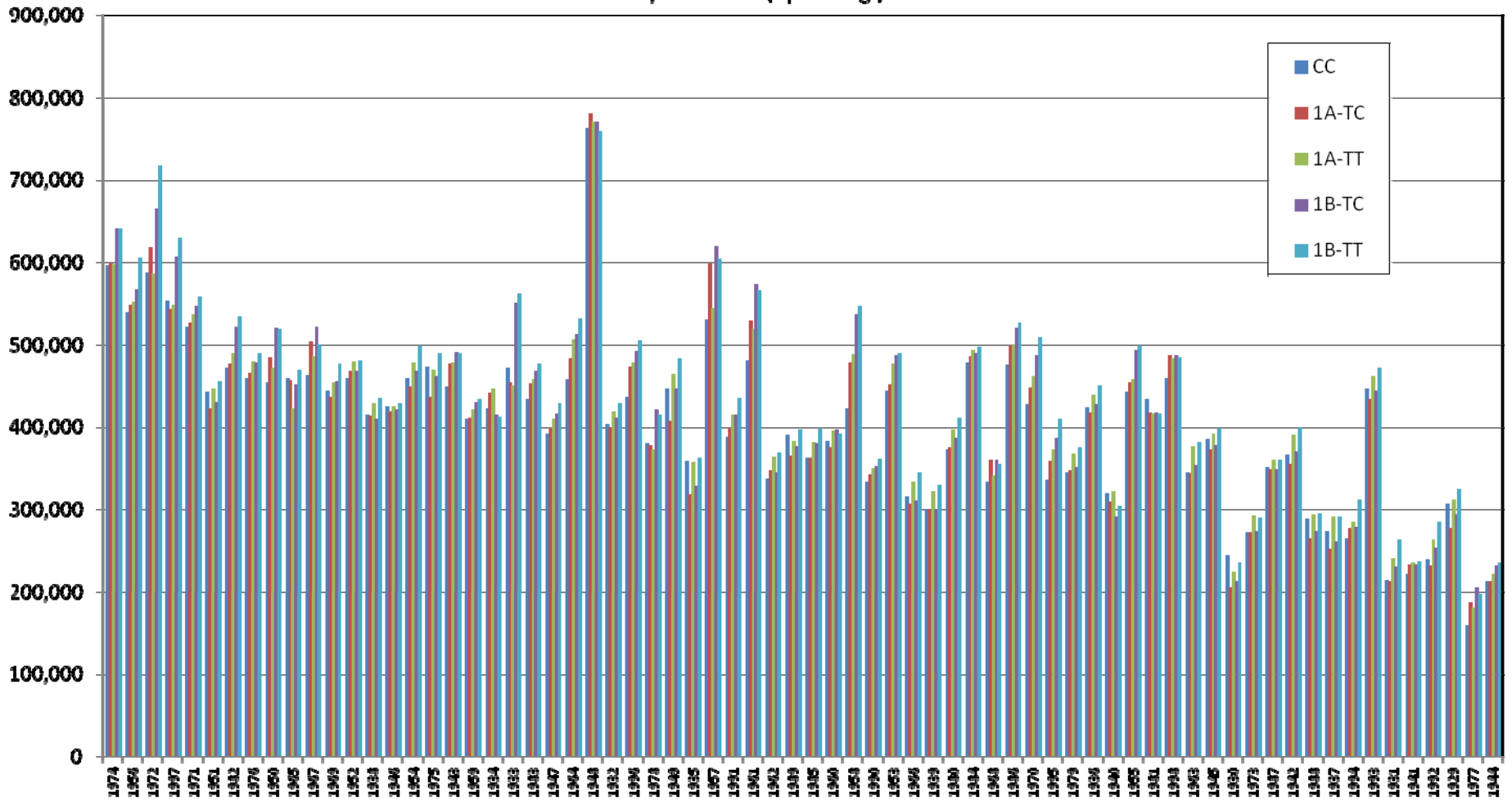
**Number of Years for 3-Day Average Spring Peak Flows,  
Columbia River at The Dalles**



# Columbia River at The Dalles

## Columbia River at The Dalles

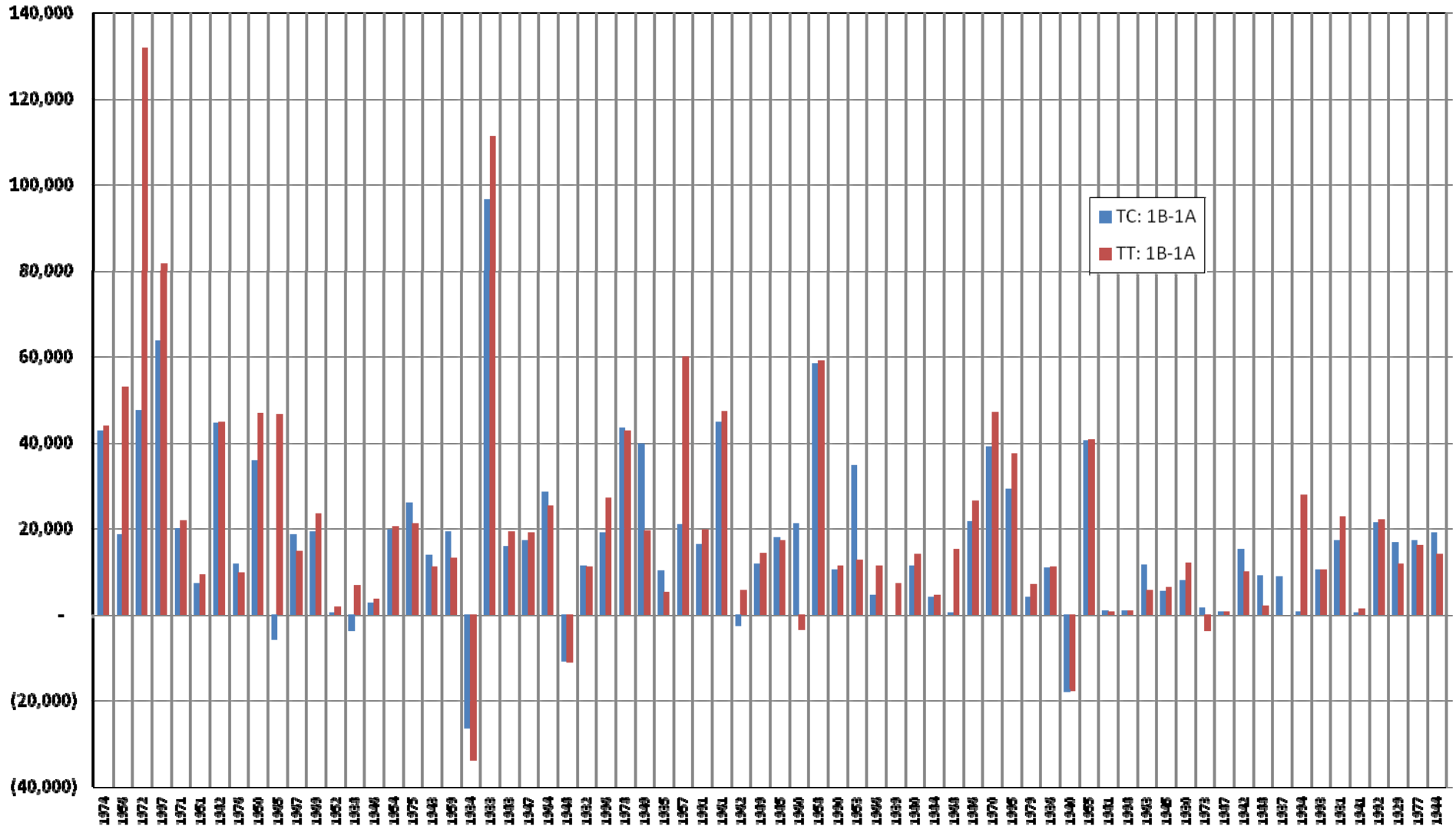
3-Day Peak Flow (Apr. - Aug.) in CFS



Water year sorted by Apr-Aug forecast at The Dalles

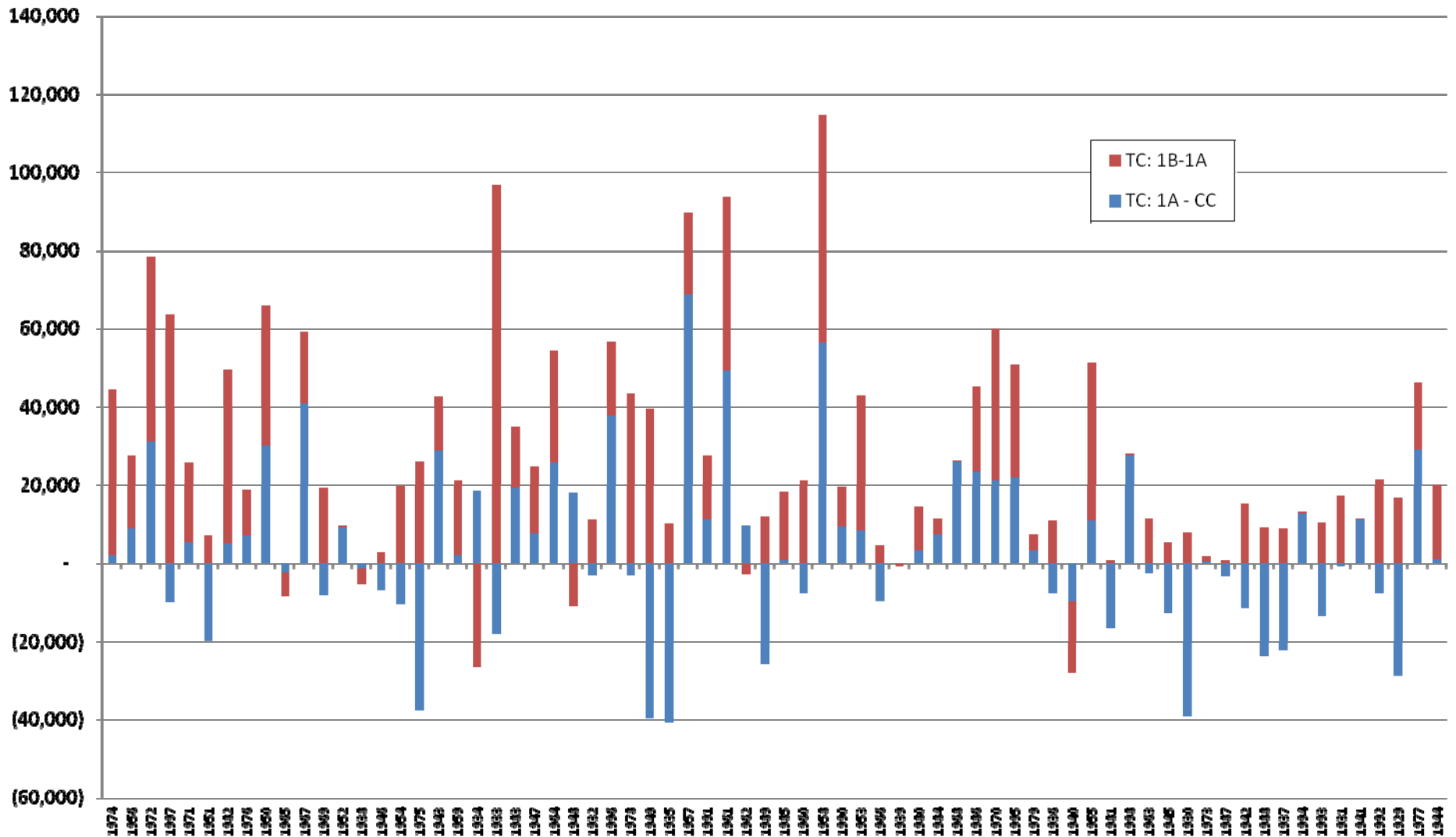
# Columbia River at The Dalles

(3-day Peak Flows)  
1B increase from 1A



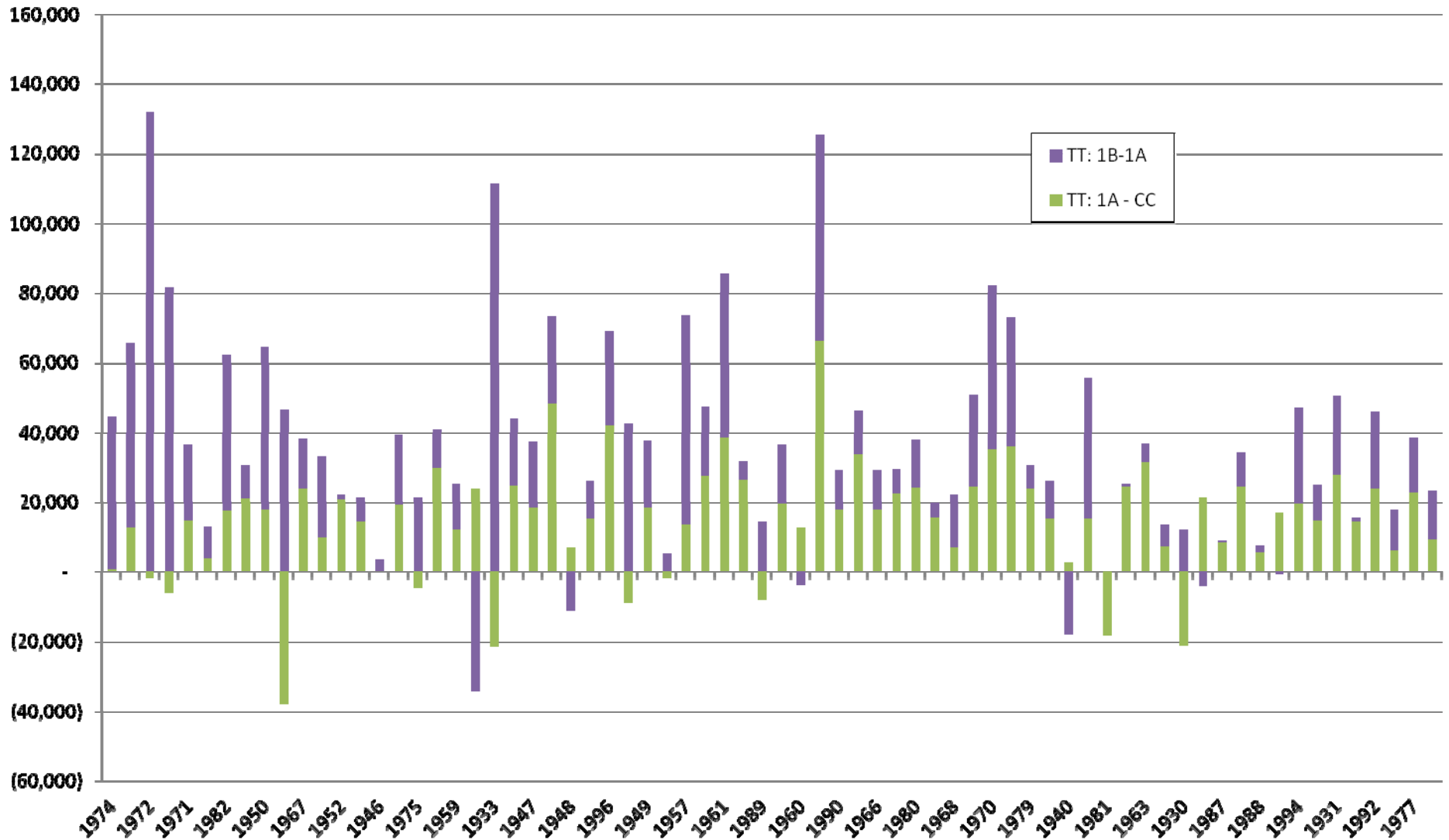
# Columbia River at The Dalles

Change in 3-Day Peak Flow (Apr-Aug)  
Treaty Continues



# Columbia River at The Dalles

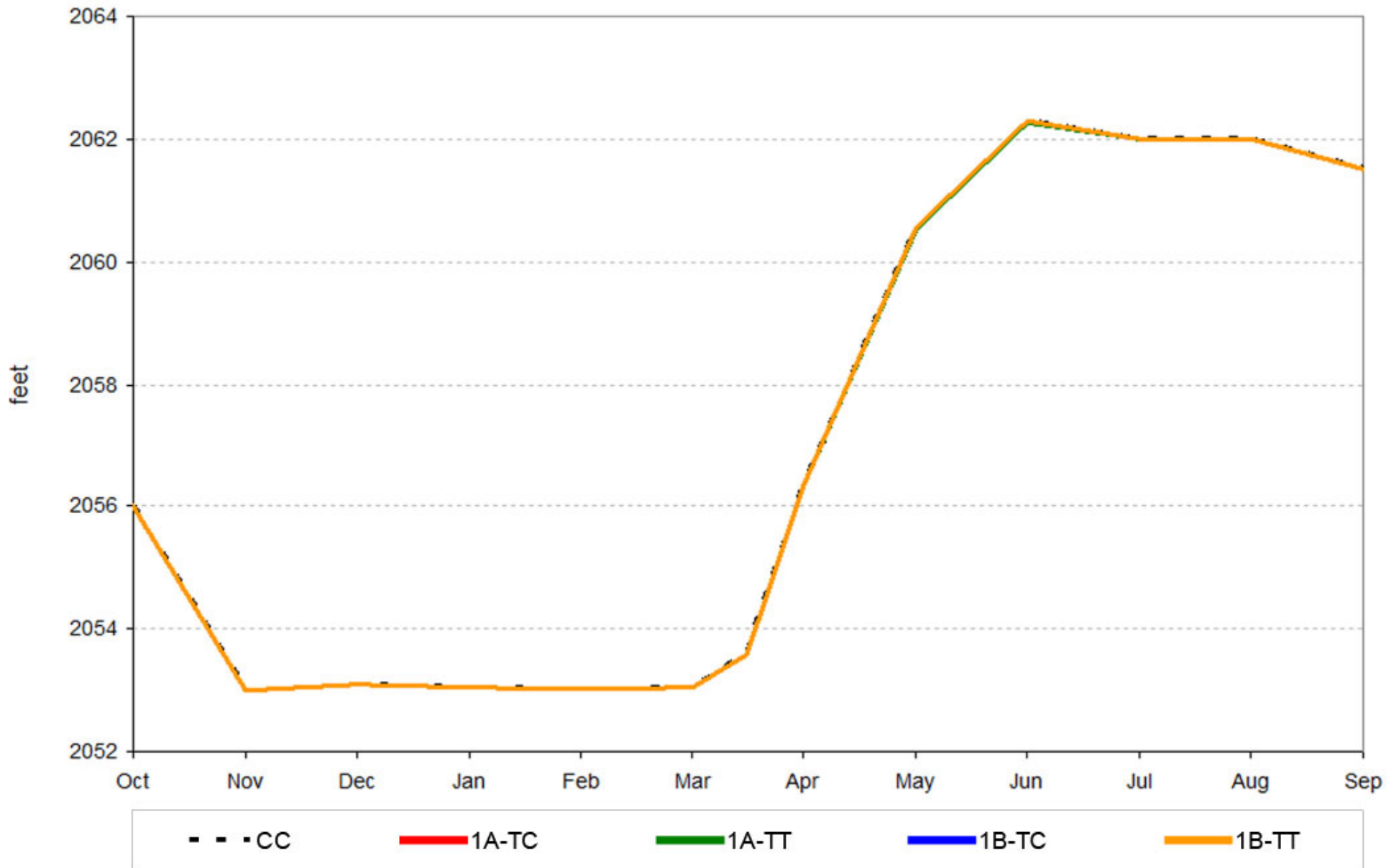
Change in 3-Day Peak Flow (Apr-Aug)  
Treaty Terminates



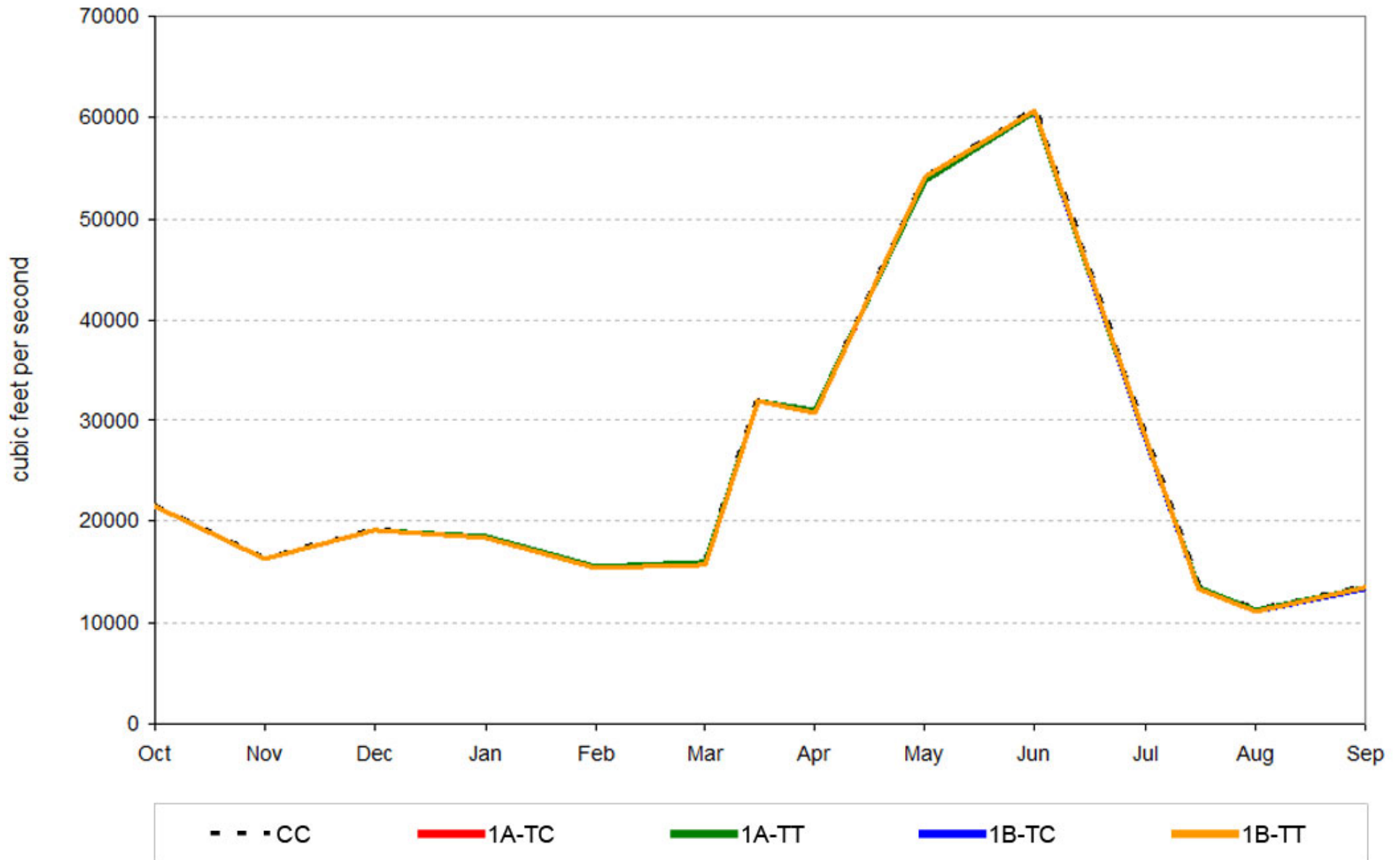
# Discussion



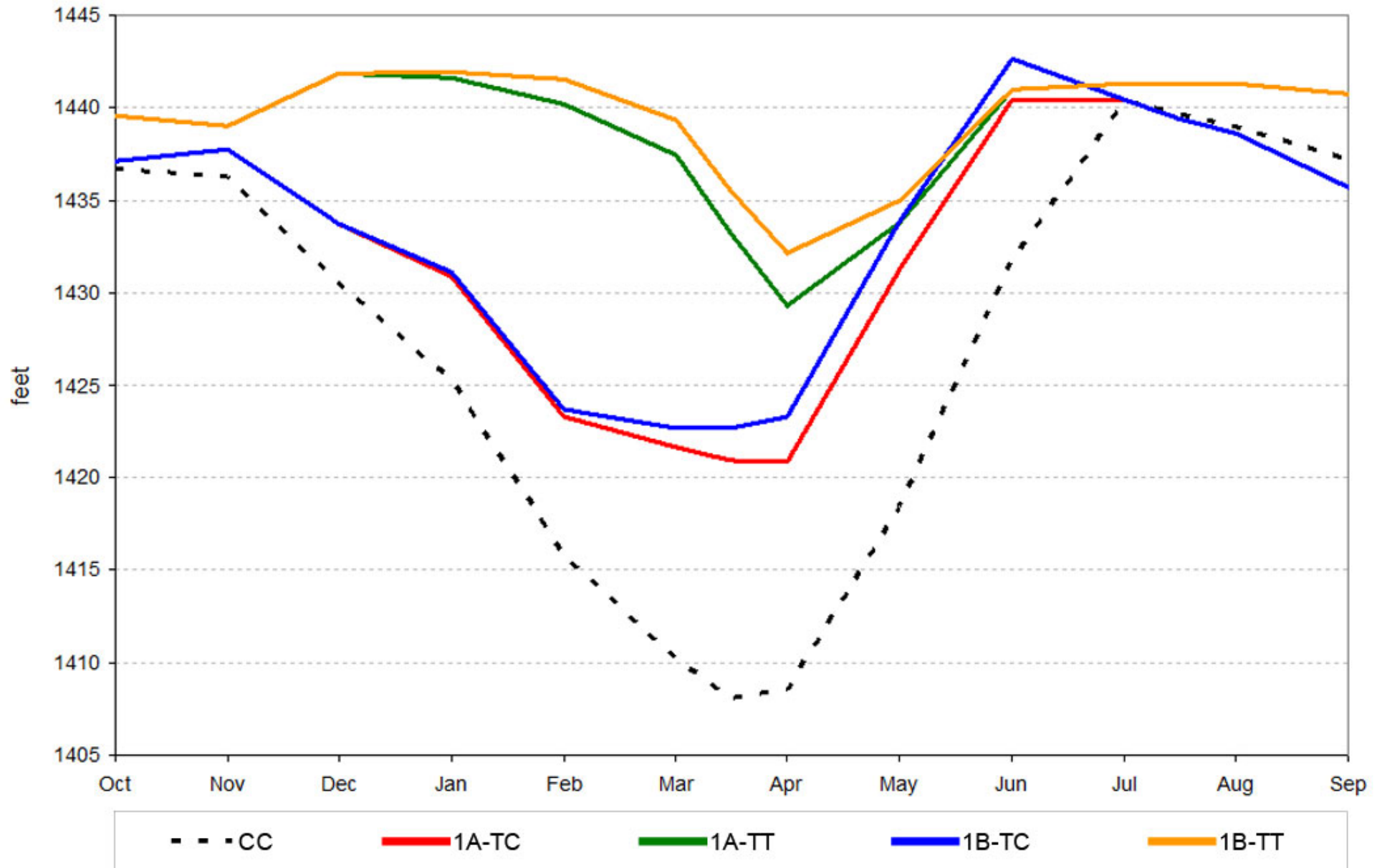
## Albeni Falls - Average Elevation - All Years



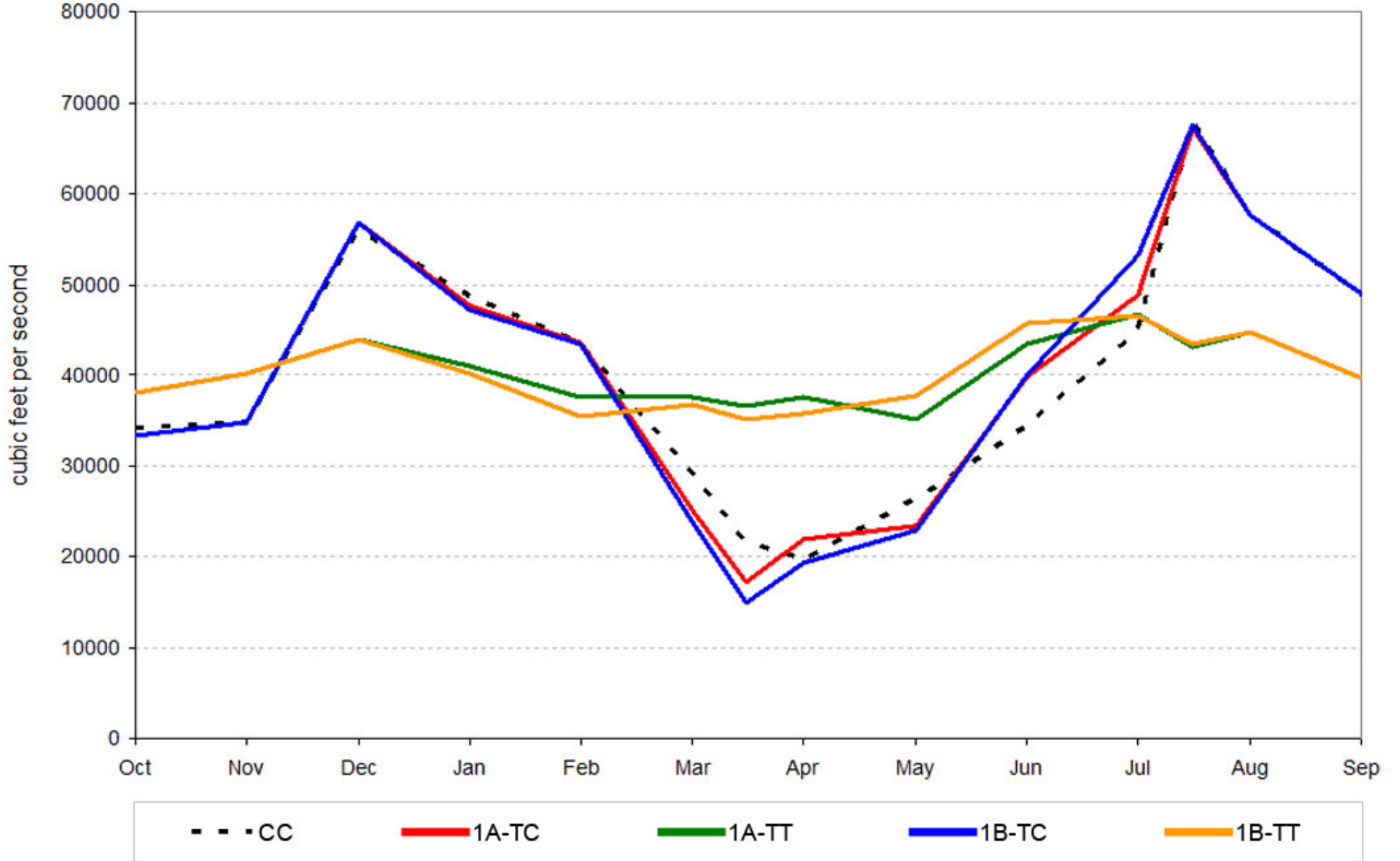
# Pend Orielle River at Albeni Falls Dam - Average Outflows - All Years



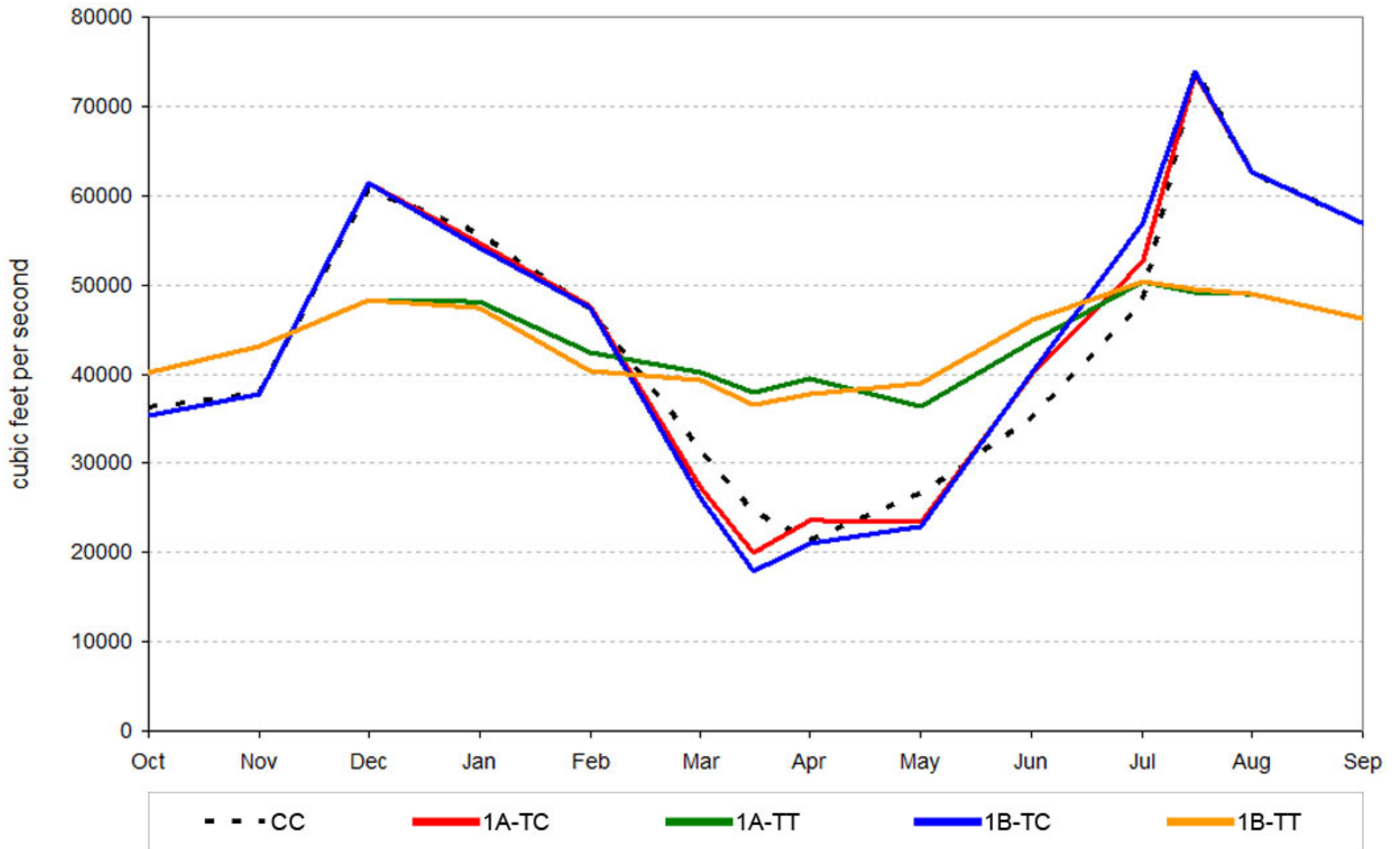
## Arrow - Average Elevation - All Years



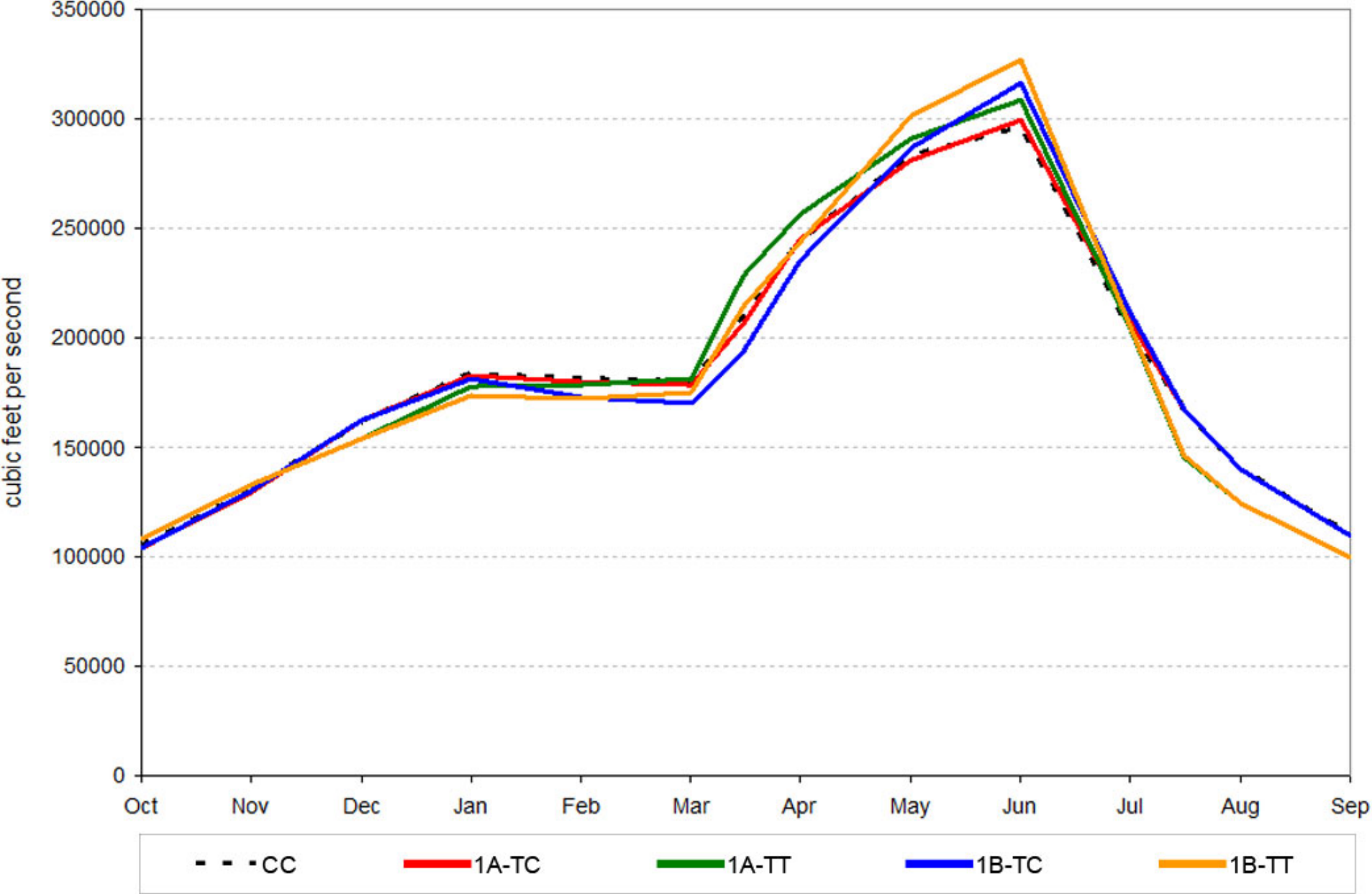
# Columbia River at Arrow Dam - Average Outflow - All Years



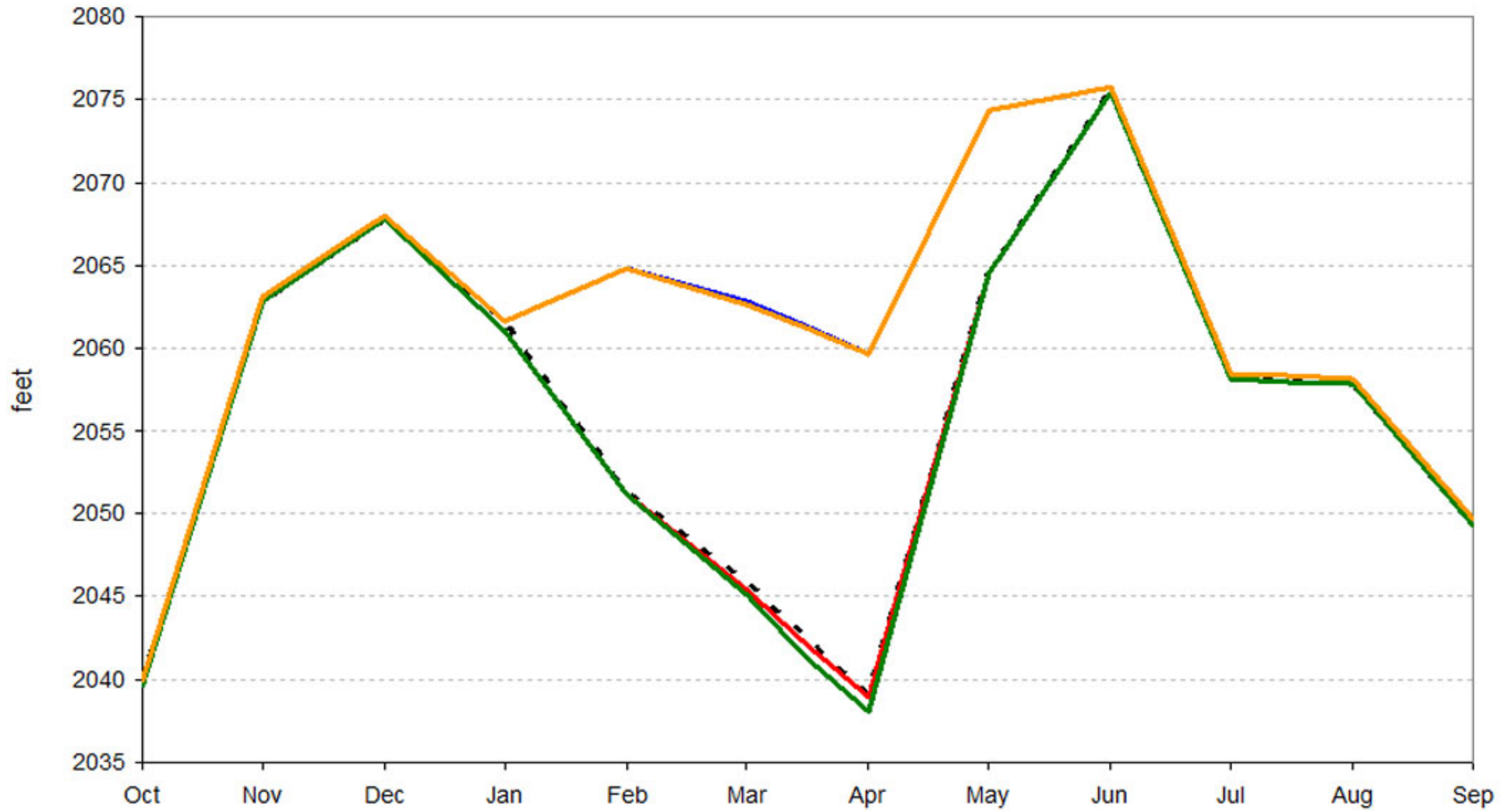
# Columbia River, Arrow plus Duncan - Average Outflows - All Years



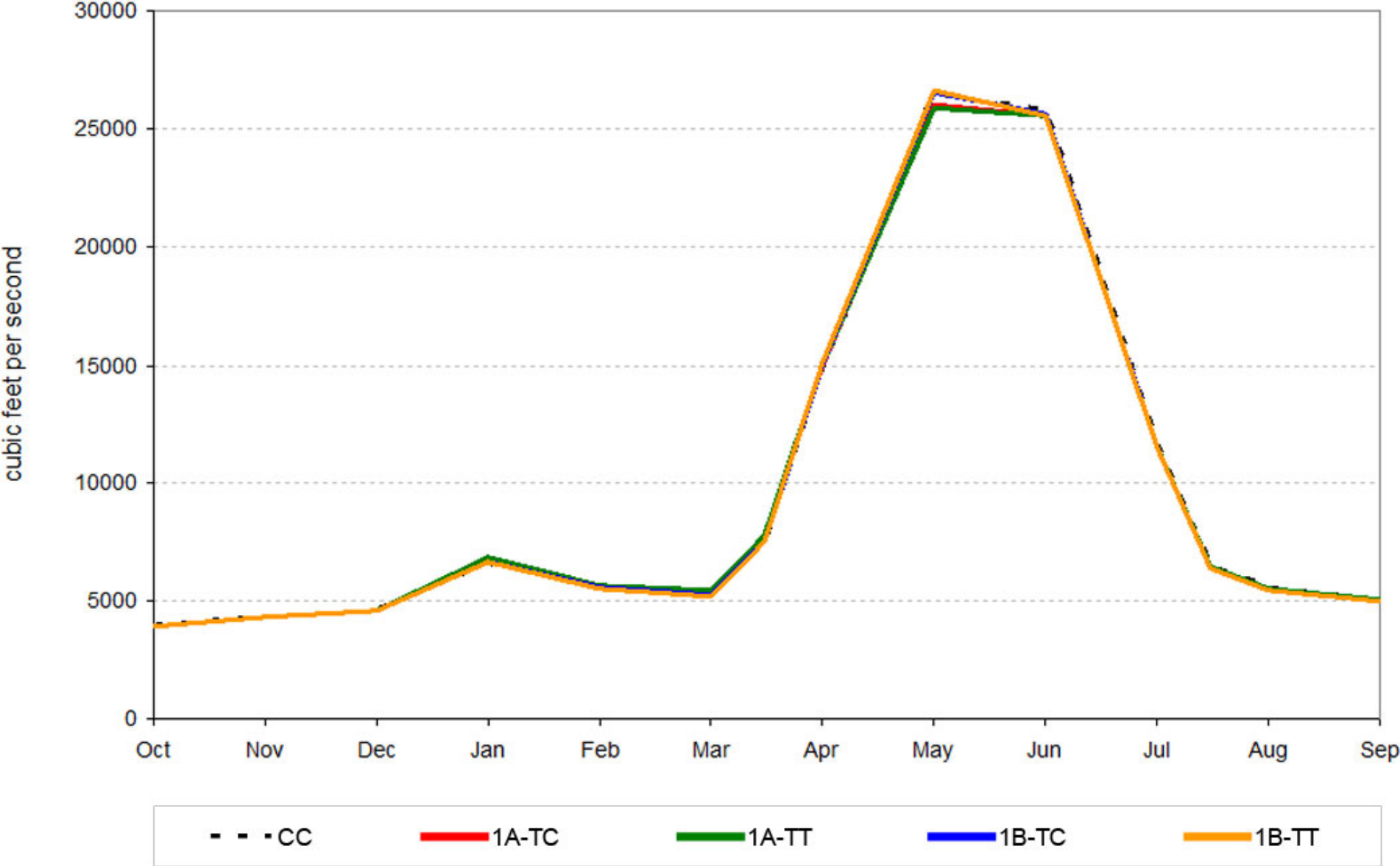
# Columbia River at Bonneville Dam - Average Outflows - All Years



## Brownlee - Average Elevation - All Years

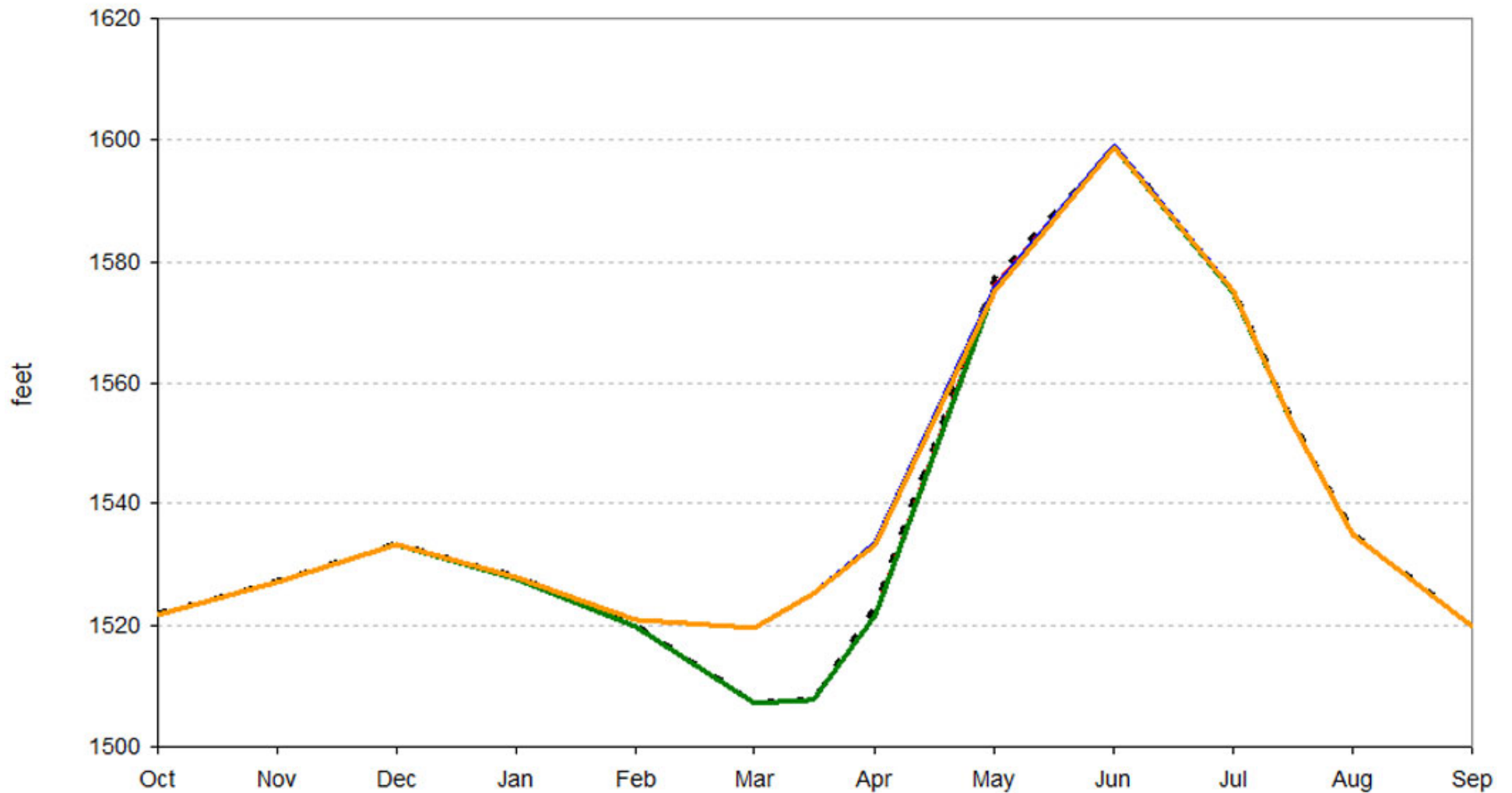


# Flathead River at Columbia Falls - Average Outflows - All Years

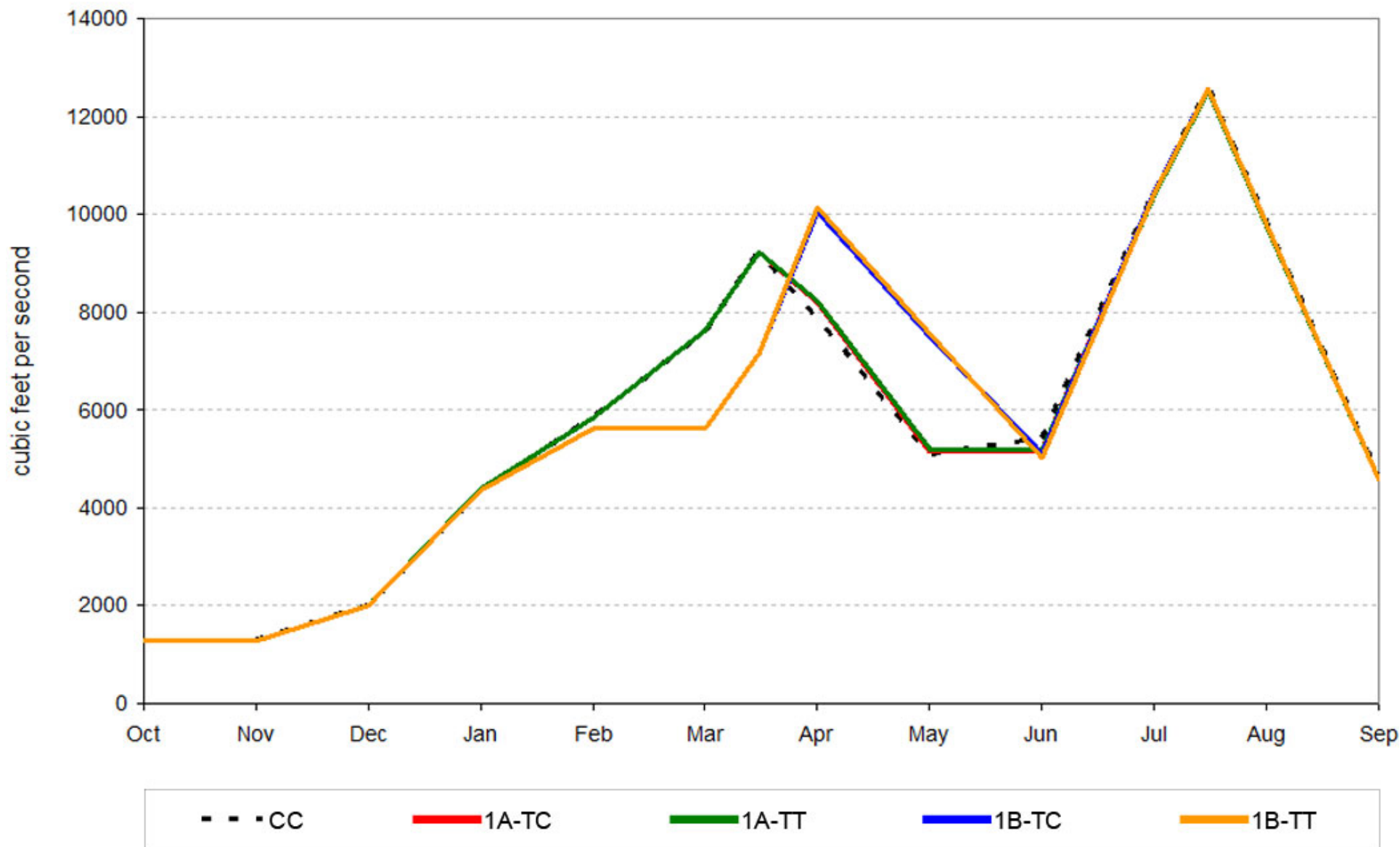




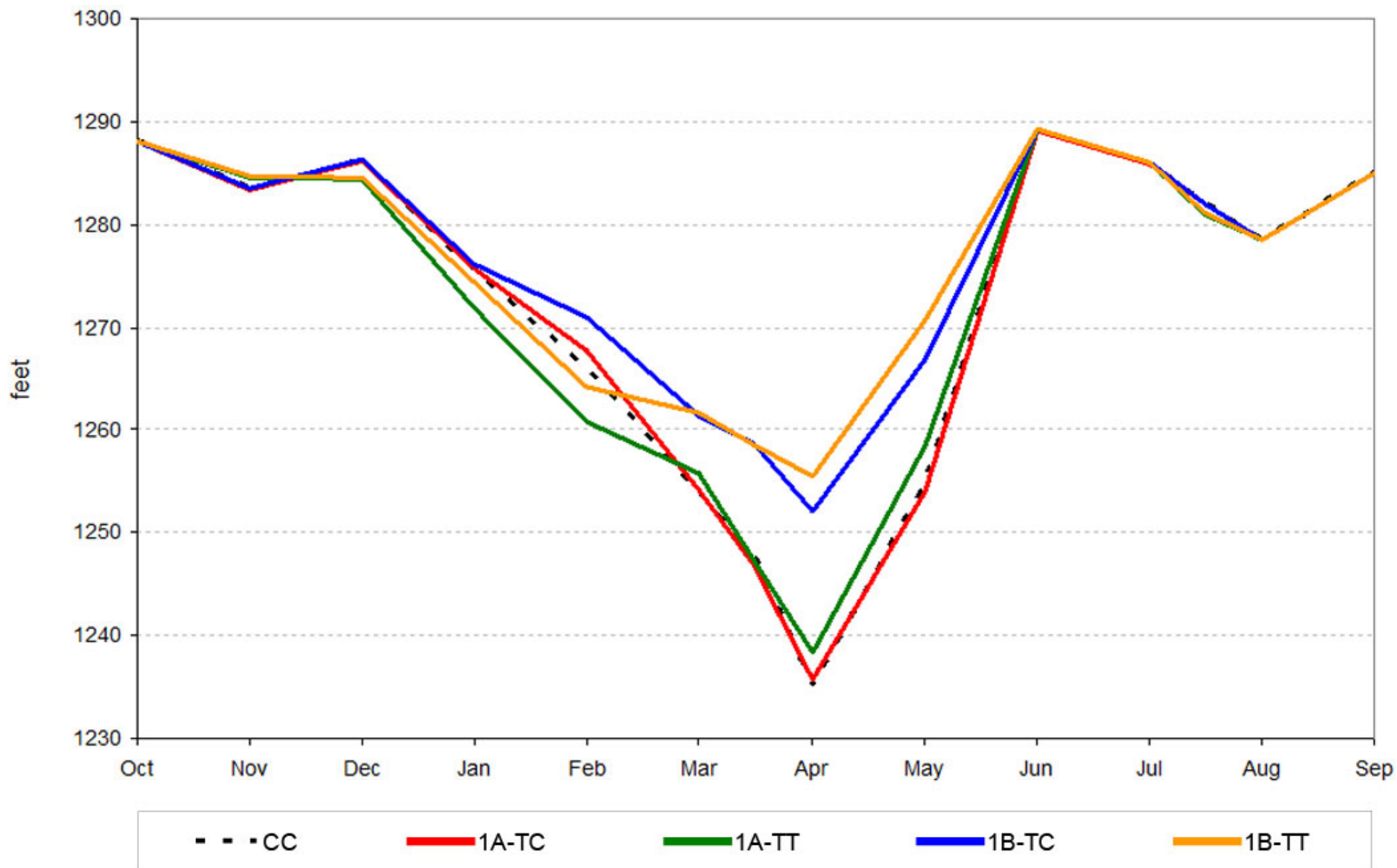
## Dworshak - Average Elevation - All Years



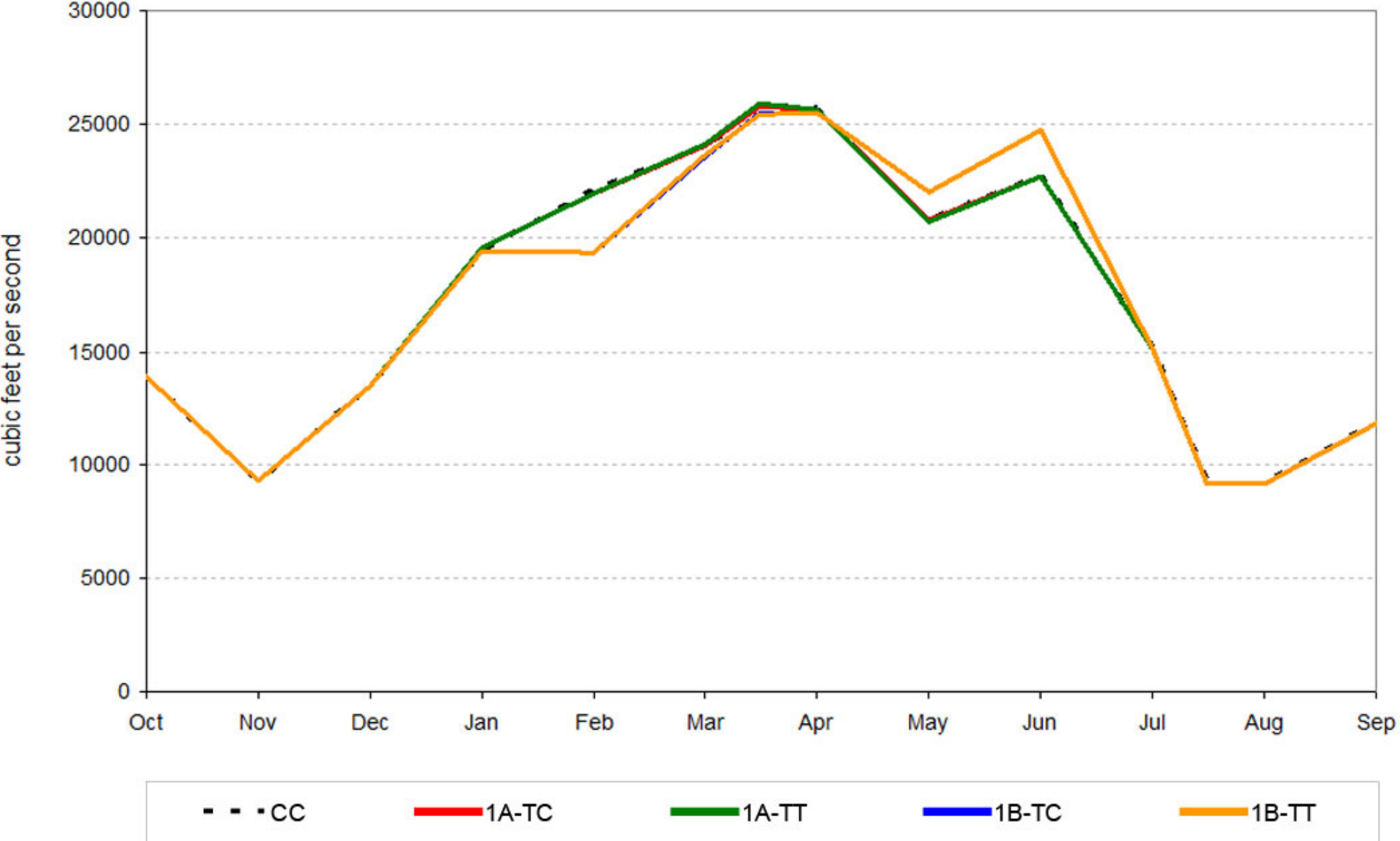
# Clearwater River at Dworshak Dam - Average Outflows - All Years



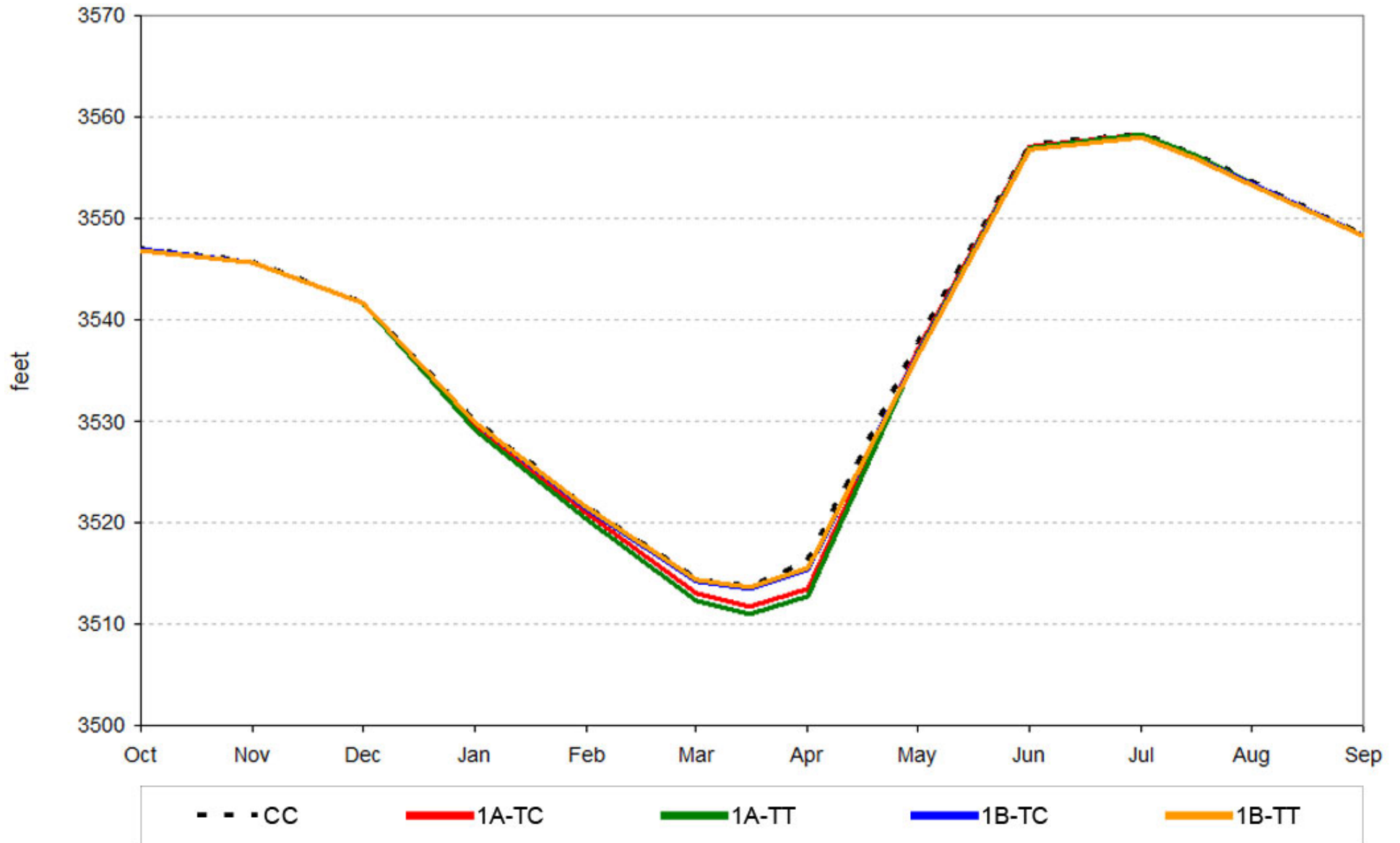
## Grand Coulee - Average Elevation - All Years



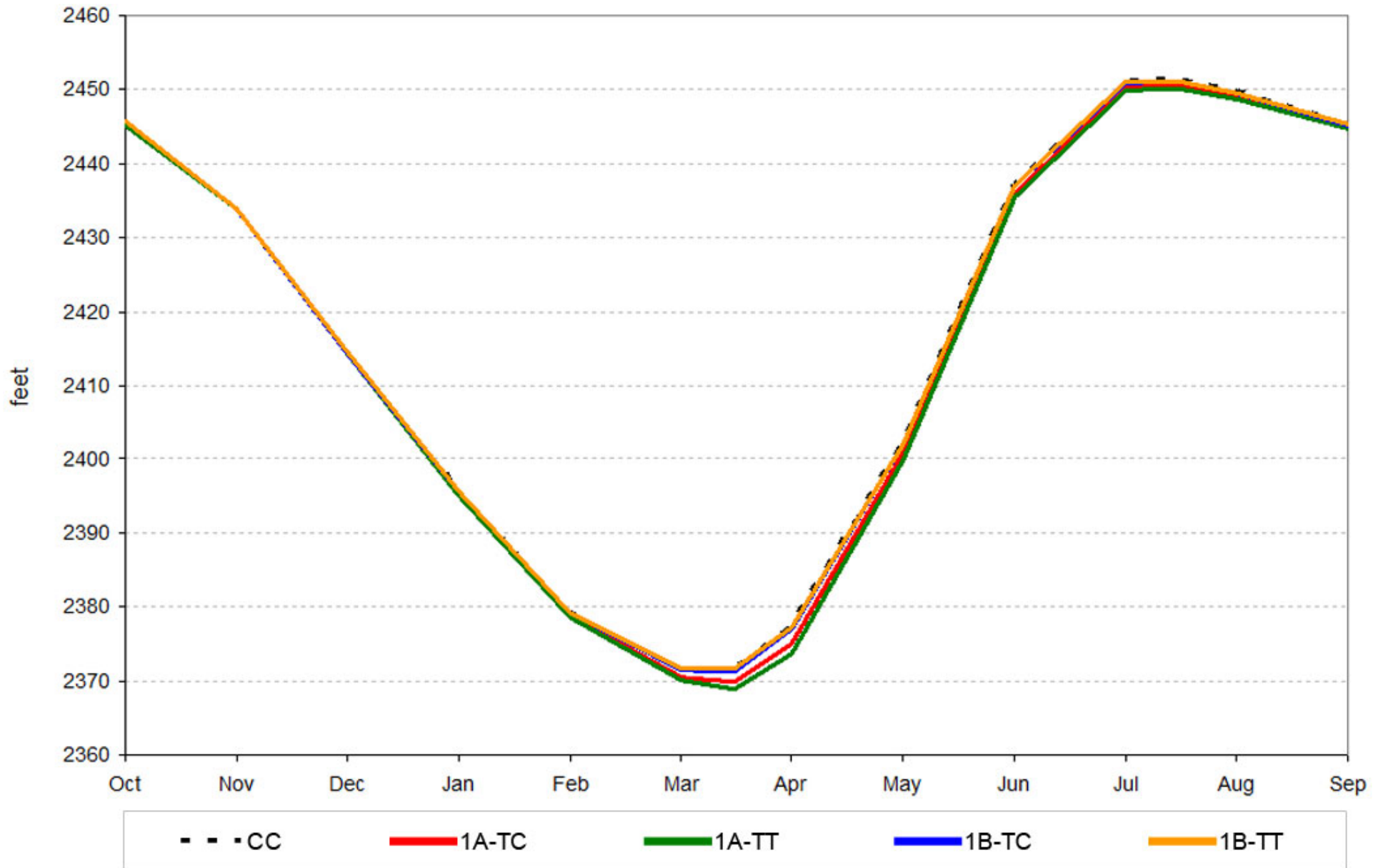
# Snake River at Hells Canyon Dam - Average Outflows - All Years



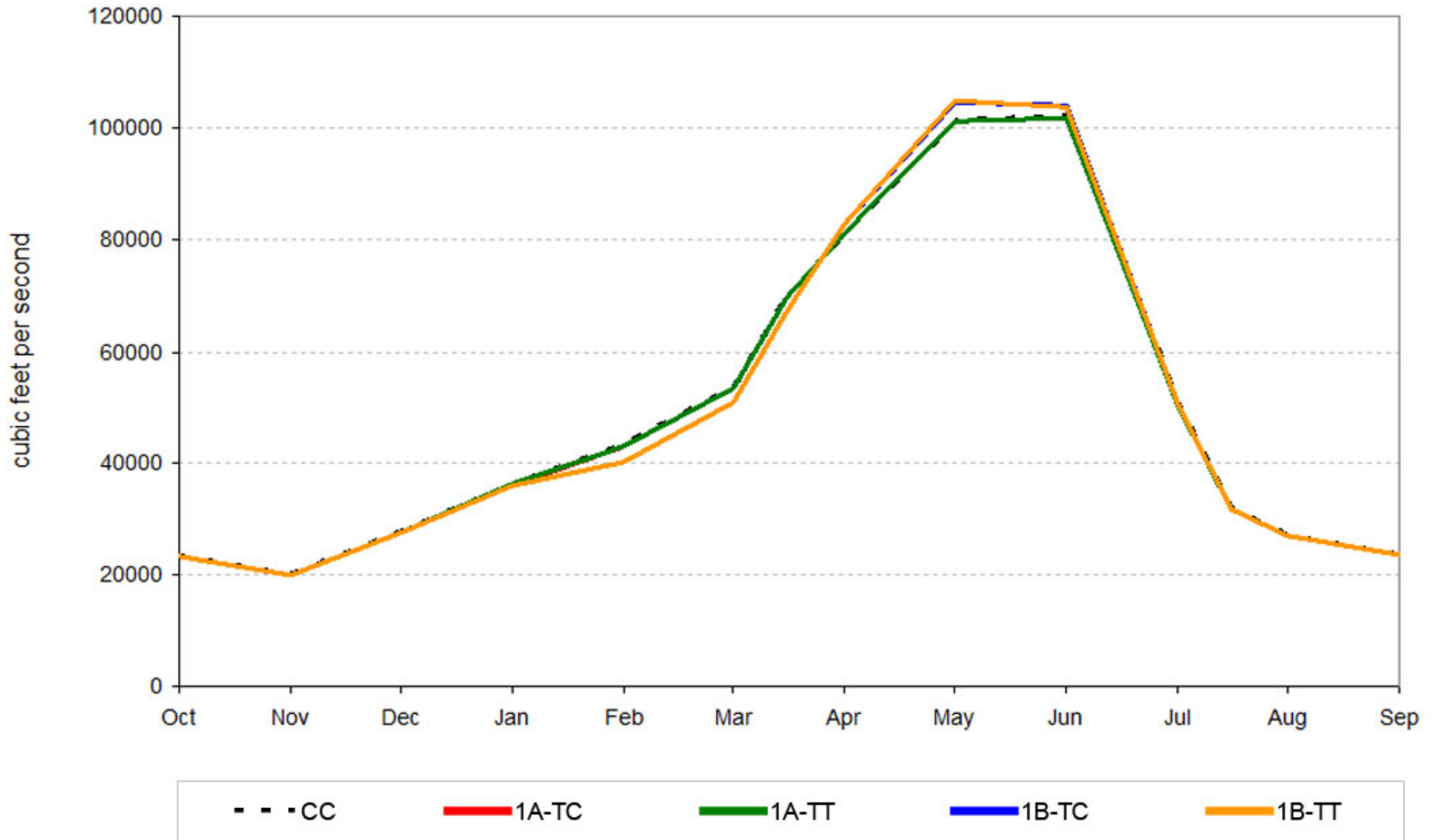
## Hungry Horse - Average Elevation - All Years



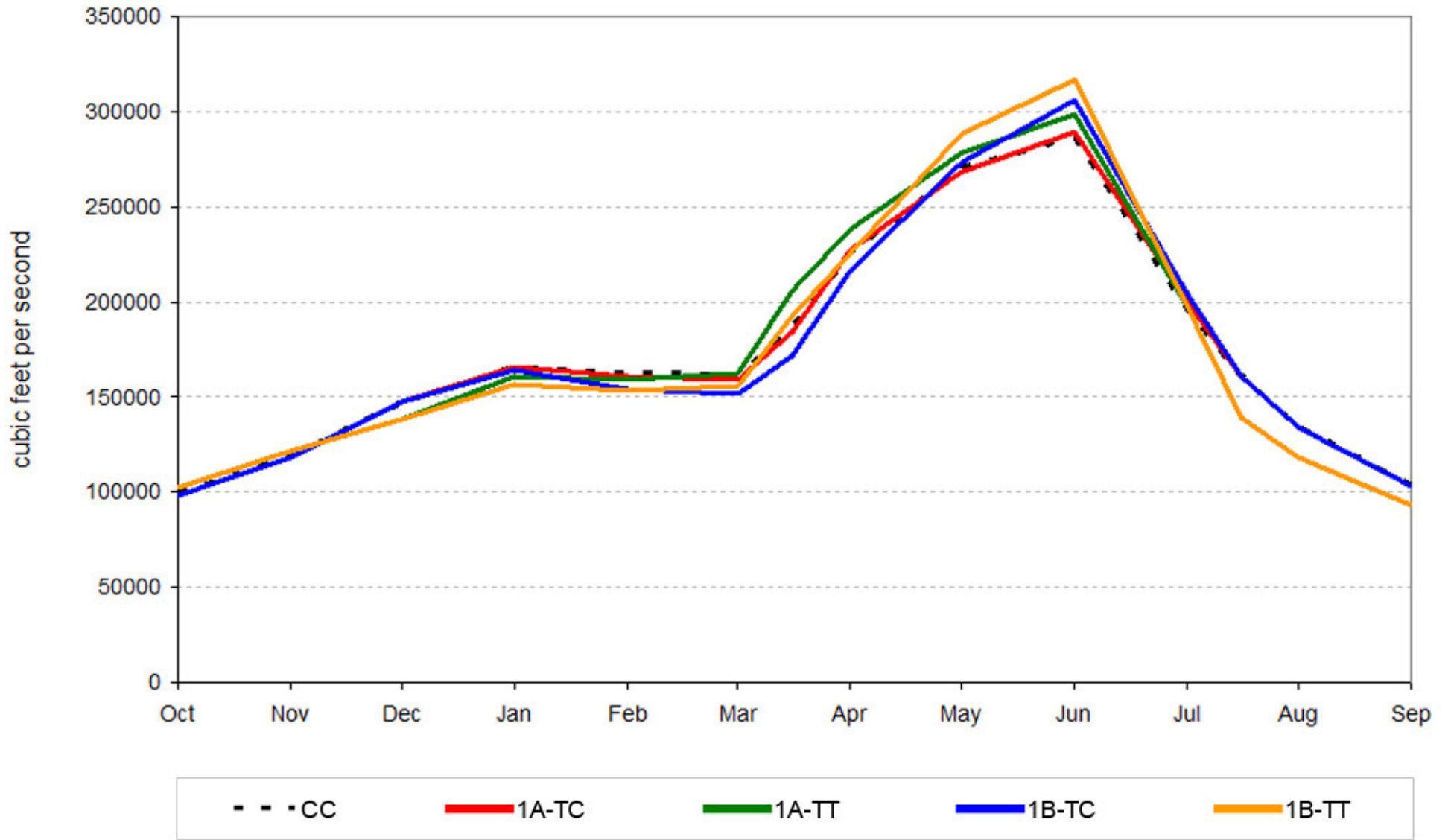
## Libby - Average Elevation - All Years



# Snake River at Lower Granite Dam - Average Outflows - All Years

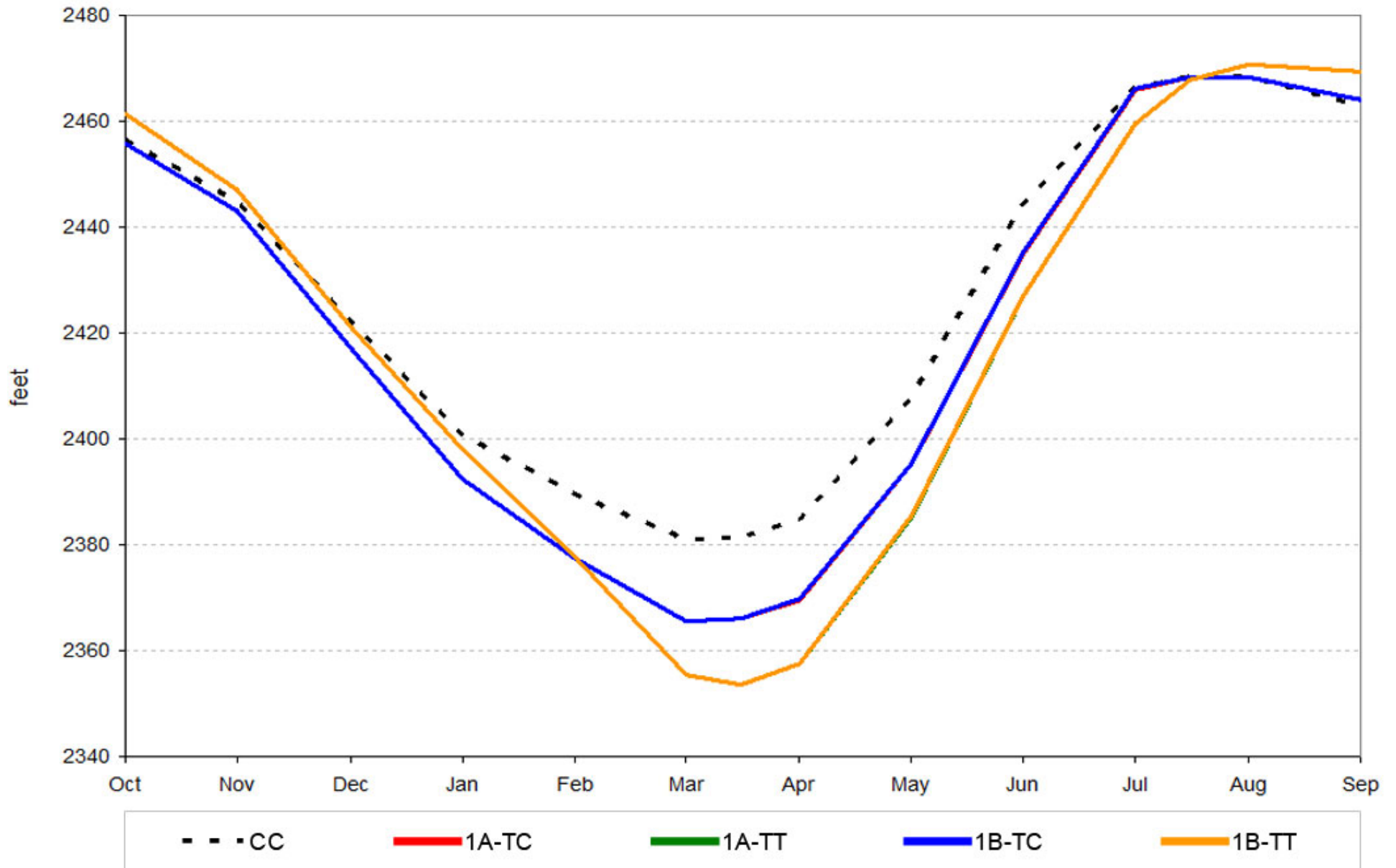


# Columbia River at McNary Dam - Average Outflows - All Years

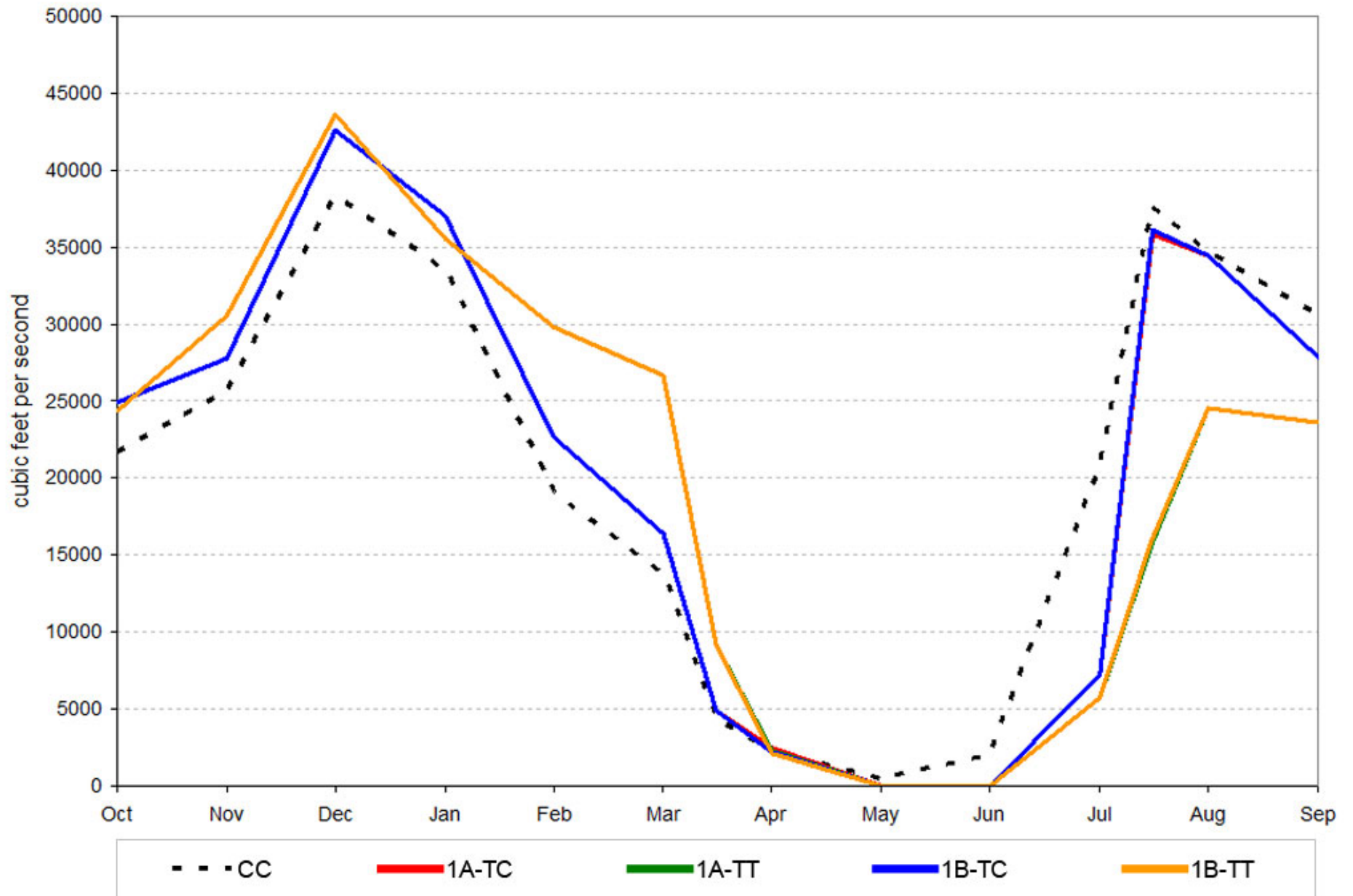




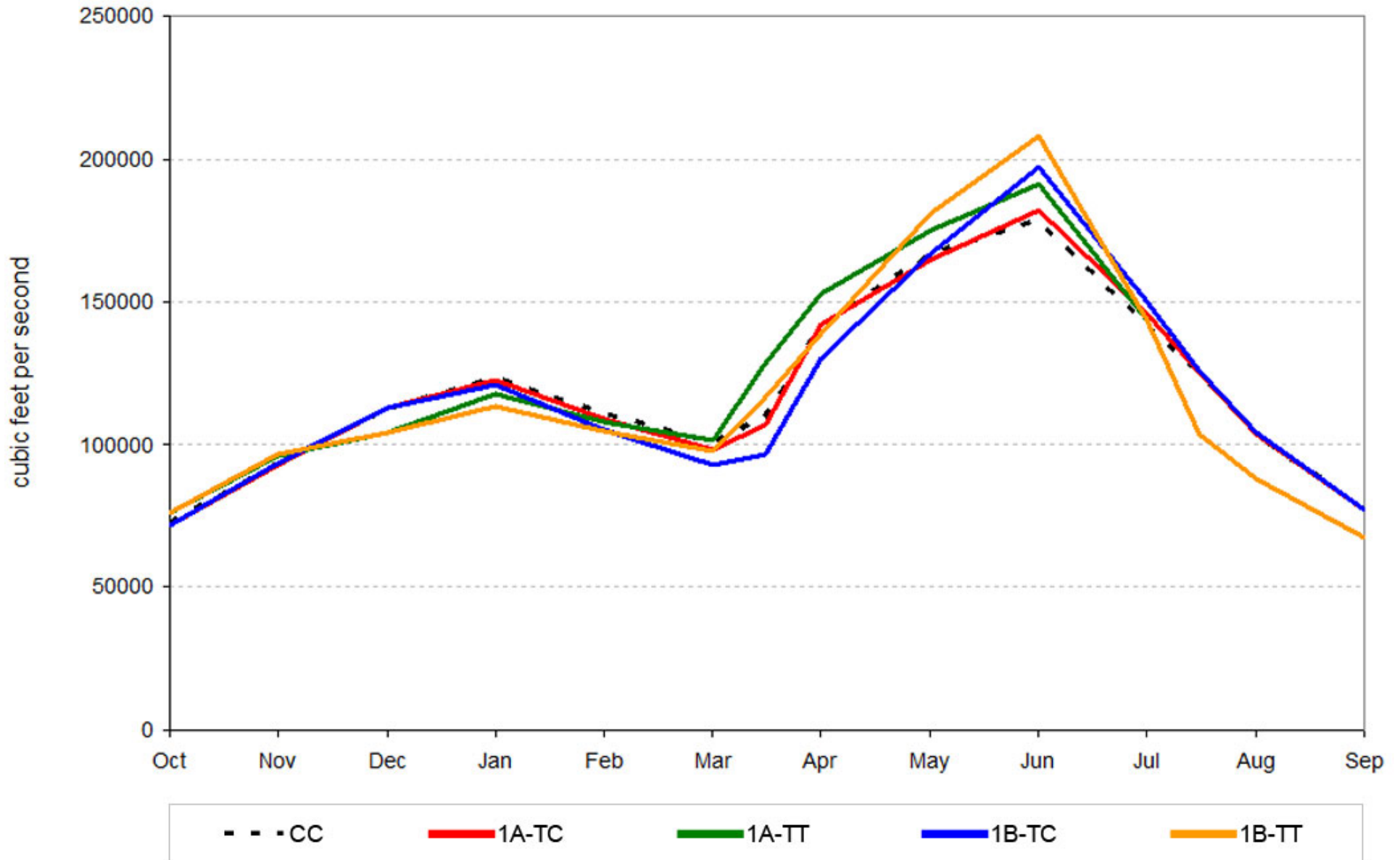
## Mica - Average Elevation - All Years



## Columbia River at Mica Dam - Average Outflow - All Years



# Columbia River at Priest Rapids Dam - Average Outflows - All Years



# Columbia River at The Dalles Dam - Average Outflows - All Years

