1. Town Branch (No Gaps): 3/22/2017 to 07/26/2017,: Stream Flow, Broadway Temporary Meter Flow
2. Thompson Rain Flow (No Gaps): 07/01/2015 to 07/26/2017, Stream Flow, Thompson Street Meter Flow, Thompson Street Meter Rainfall
3. Admin Data (No Gaps): 1/1/2014 to 7/26/2017: Stream Flow, Admin Meter Flow
4. Admin Flow Rain (No Gaps): 1/1/2016 to 7/26/2017: Admin Meter Flow, W.U. Rainfall
5. Amboy Data (No Gaps): 7/1/2014 to 7/18/2017, Stream Flow, Amboy Rd Meter Flow
6. Amboy Rain (No Gaps): 1/2/2016 to 7/18/2017, Amboy Rd Meter Flow, W.U. Rainfall
7. Riverside Data (No Gaps): 1/1/2014 to 7/26/2017, Stream Flow, Riverside Meter Flow
8. Riverside Rain Flow (No Gaps): 7/1/2015 to 7/26/2017, Stream Flow, Riverside Meter Flow, Riverside Meter Rainfall
9. Weaverville Data (No Gaps): 1/1/2014 to 7/26/2017, Stream Flow, Weaverville 1 Meter Flow
10. Weaverville Rain (No Gaps): 7/1/2015 to 7/26/2017, Weaverville Meter Flow, Riverside Meter Rainfall
11. Roundhouse Rain (No Gaps): 7/1/2015 to 7/26/2017, Roundhouse Meter Flow, Thompson Meter Rainfall
12. Roundhouse Data (No Gaps): 2/20/2014 to 7/26/2017, Stream Flow, Roundhouse Meter Flow.

After initial probing, the data sets are summarized into 6 sets:

1. Thompson: 7/1/2015/2:00 to 7/26/2017/11:00 (2.0 years hourly)
2. Admin: 1/2/2016/2:00 to 7/26/2017/11:00 (1.5 years hourly)
3. Amboy: 1/2/2016/0:00 to 7/18/2017/6:00 (1.5 years hourly)
4. Riverside: 7/1/2015/2:00 to 7/26/2017/11:00 (1.0 years hourly)
5. Weaverville: 7/1/2015/2:00 to 7/26/2017/11:00 (1.0 years hourly)
6. Roundhouse: 1/2/2016/2:00 to 7/26/2017/11:00 (1.5 years hourly)

Each contains 3 series: (hourly time), River Flow, Basin Flow, Rainfall. The time series are with some gaps – a hour to a couple of month, but mostly are intact.

**Modeling challenges:**

1. **Seasonality for flow (daily for basin flow, unknown seasonality for river flow.**
2. **Pretty strong correlated error structure, but with some data gaps.**
3. **Rainfall effect has a lingering effect: after a rain event, the flow in basin (unknown for river flow) is impacted (with a decreasing magnitude) for a few days.**

**Questions to be answered:**

1. **Do wastewater flows correlate to river flows?**
2. **Do wastewater flows correlate to rainfall?**
3. **Which of these parameters has the biggest impact on wastewater flows (especially during high river flows or wet weather periods)?**
4. **Are these relationships significantly different at any locations in the MSD system?**
5. **Is there evidence that river flows at a certain level begin to influence wastewater flows more significantly (perhaps indicating manholes are being flooded)?**