

ALERT USERS GROUP

Proactive Maintenance



COMPANY CONFIDENTIAL



Proactive Maintenance

- Daily Reports
- Data Analysis
- Depicting Trends
- Over Reporting
- Low Batteries
- Alarming
- GPS Lock (ALERT2)
- Double Mass Plots
- Unknown Logs
- Stage Changes

Data Validation

Validation Result	Code	Reports	Percent
Good data, passed all validation tests	A	21586	98.9
Failing invalid conversion test	IC	67	0.3
Good data, received out of sequence	AS	40	0.2
Maintenance mode	MM	33	0.2
Failing negative delta validation	ND	26	0.1
Failing min value validation	MN	23	0.1
Failing max value validation	MX	21	0.1
Failing positive delta validation	PD	13	0.1
Good data, starting a new sequence	AN	10	0.0

Abnormal Changes

Stage Changes

(Where the change exceeds 0.25)

Reporting Sensors: 8

Site	Site ID	Sensor	Sensor ID	Max	Min	Change
Kelly Dam	410	Stage	413	47.62	44.67	2.95
East Plum Creek @ HW 105	3010	Stage	3013	1.00	0.01	0.99
Broadway	10031	Stage	7	1.27	0.69	0.58
Broadway	10031	Stage 24 hour avg	4583	1.20	0.73	0.47
Goldsmith/Eman	640	Stage	643	0.56	0.10	0.46
Nolte Pond	10025	Stage	7	45.86	45.47	0.39
Sand Creek @ Colfax	10016	Stage	7	0.07	-0.25	0.32
Green Ditch	4590	Stage	4593	1.38	1.08	0.30

Over Reporting Sensors

Sensors Over-Reporting
(Where at least 100 reports were received in a day)
Noisy Sensor-Days: 27

Site	Site ID	Sensor	Sensor ID	Date	# Reports
DIA @ Third Creek	1480	Stage (well)	1483	2017-04-04	377
DIA @ Third Creek	1480	Stage (well)	1483	2017-04-03	330
Magnolia Wx	6601	Wind Direction	5	2017-04-04	156
Magnolia Wx	6601	Wind velocity, maximum	6	2017-04-04	156
Magnolia Wx	6601	Relative Humidity	2	2017-04-04	156

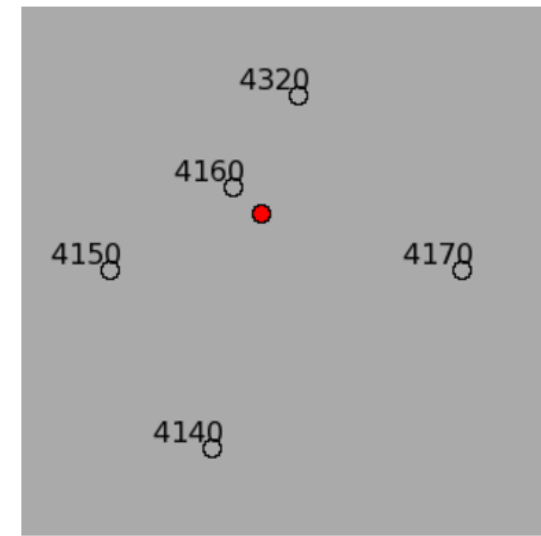
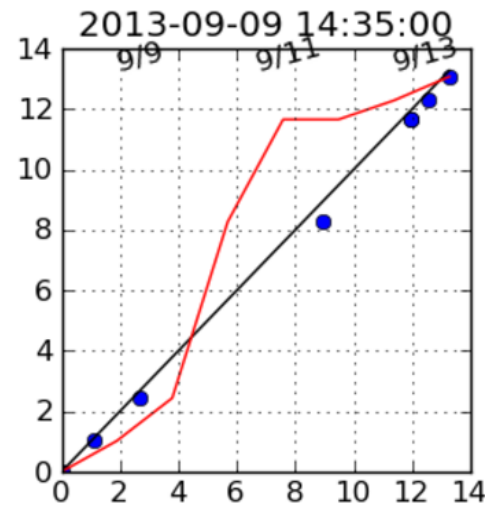
Over Reporting Sensors

Daily Rain			
Reporting Sensors: 139			
Site	Site ID	Sensor ID	Rain Total
Filter Plant	4100	4100	1.18
Pinewood Spring	4510	4510	0.28
Magnolia Wx	6601	4900	0.27
Pump Station #3 ETO	970	970	0.24
Sunshine	4160	4160	0.20
Pinebrook	4170	4170	0.20
Hills Mills	4710	4710	0.20

Double Mass Analysis

- Quickly determine quality of rainfall data
- Compares rainfall of a single site to its 5 closest neighbors
- Find clogged tipping buckets in minutes

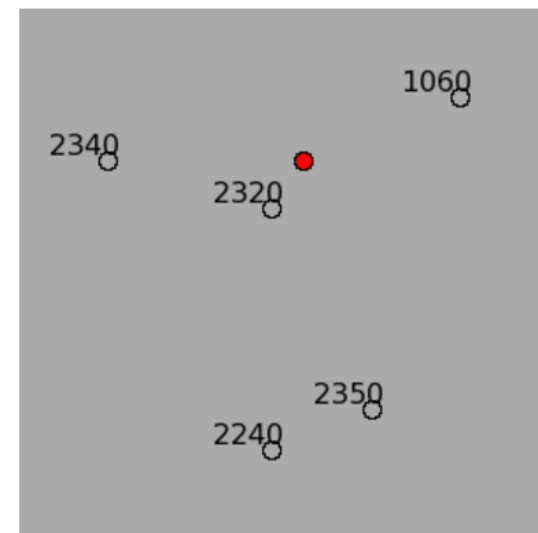
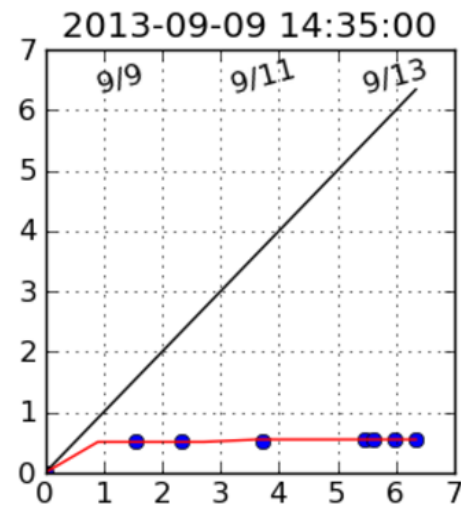
	Dist	Accum	#Rpts	Start	End
4880	0.000	13.072	182	09/10/13	09/16/13
4160	0.405	13.270	238	09/10/13	09/16/13
4320	0.917	15.909	277	09/10/13	09/16/13
4140	1.685	11.616	205	09/10/13	09/16/13
4150	1.964	12.128	207	09/10/13	09/16/13
4170	2.554	13.466	221	09/10/13	09/16/13



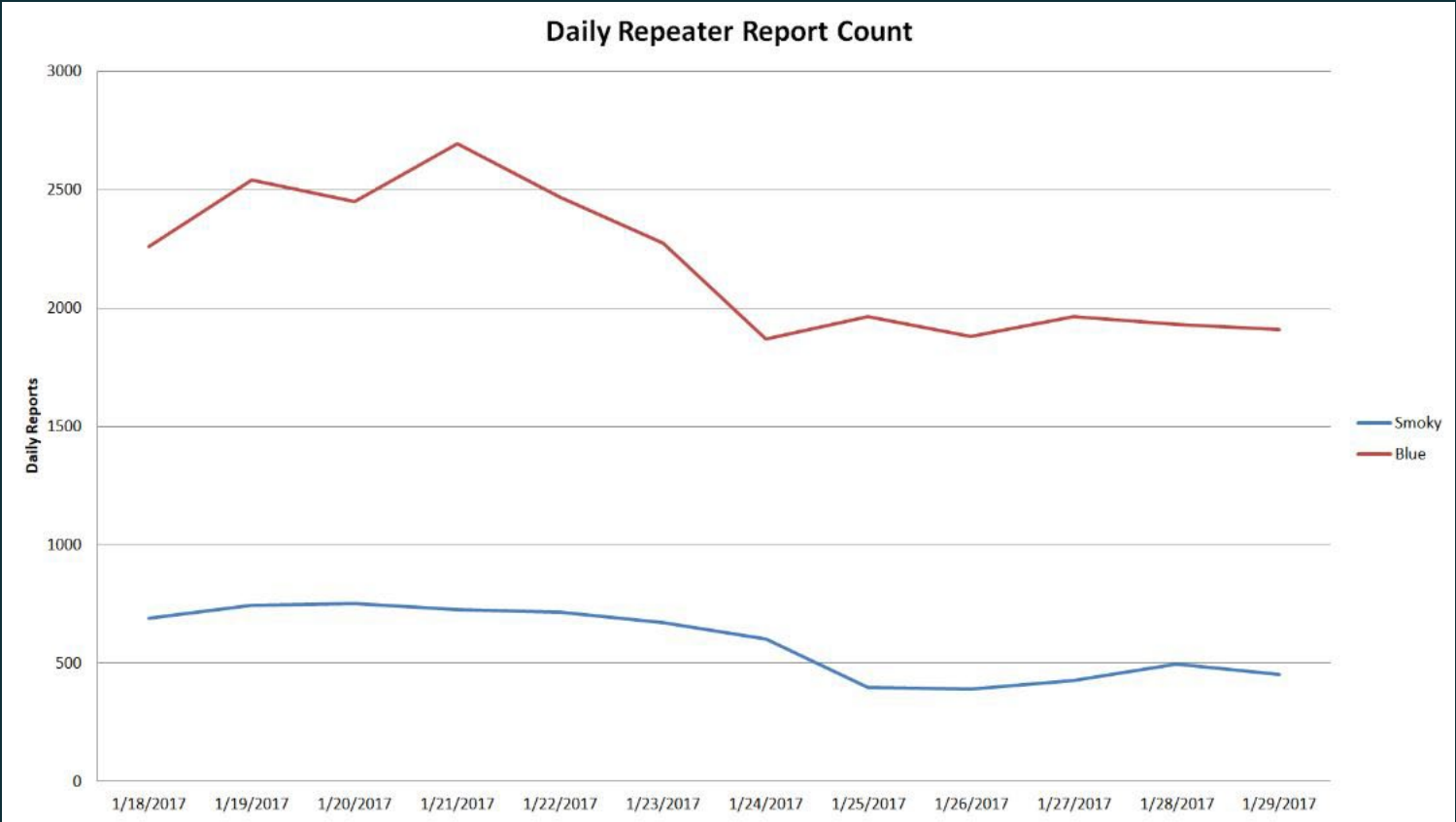
Double Mass Analysis

- Under-reporting gauge

	Dist	Accum	#Rpts	Start	End
2310	0.000	0.551	20	09/10/13	09/16/13
2320	0.639	6.457	96	09/10/13	09/16/13
1060	2.364	9.176	163	09/10/13	09/16/13
2350	2.373	5.906	101	09/09/13	09/16/13
2240	2.537	5.631	99	09/10/13	09/16/13
2340	2.916	4.528	89	09/10/13	09/16/13



System Loading



Historical Average
2500

Historical Average
750

Failure Average
1900

Failure Average
400



Questions?

For more information, let's talk at:
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