

Appendix D: Relationships Between Parameters

Appendix D

- Table D-1. Relationships Between Parameters - Correlation Analysis Results
- Figure D-1. Precipitation and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links
- Figure D-2. Precipitation and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek
- Figure D-3. TSS and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links
- Figure D-4. TSS and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek
- Figure D-5. Dissolved Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River - Flaming Geyser, (b) Green River - Foster Links
- Figure D-6. Dissolved Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek
- Figure D-7. Particulate Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links
- Figure D-8. Particulate Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek
- Figure D-9. Total PCB Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links
- Figure D-10. Total PCB Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek

Table D-1. Relationships Between Parameters - Correlation Analysis Results

Site	Count	Flow Condition	Parameter	Analyte	Correlation	R _s	p value	Significant?
Mainstem Combined	6	Storm	DOC	Anthracene	Spearman	0.058	0.919	No
Mainstem Combined	6	Storm	Mean Flow	Anthracene	Spearman	0.812	0.0583	No
Mainstem Combined	6	Storm	Precipitation	Anthracene	Spearman	-0.145	0.714	No
Mainstem Combined	6	Storm	TOC	Anthracene	Spearman	0.696	0.136	No
Mainstem Combined	6	Storm	TSS	Anthracene	Spearman	0.638	0.175	No
Soos,Newaukum&Mill Creek	15	Storm	DOC	Anthracene	Spearman	0.738	0.00116	Yes
Soos,Newaukum&Mill Creek	15	Storm	Mean Flow	Anthracene	Spearman	-0.523	0.0429	Yes
Soos,Newaukum&Mill Creek	15	Storm	Precipitation	Anthracene	Spearman	0.0162	0.944	No
Soos,Newaukum&Mill Creek	15	Storm	TOC	Anthracene	Spearman	0.767	0.000308	Yes
Soos,Newaukum&Mill Creek	15	Storm	TSS	Anthracene	Spearman	0.63	0.0116	Yes
Mainstem Combined	12	Storm	DOC	Arsenic, Dissolved	Spearman	0.107	0.733	No
Mainstem Combined	12	Storm	Mean Flow	Arsenic, Dissolved	Spearman	-0.282	0.364	No
Mainstem Combined	12	Storm	Precipitation	Arsenic, Dissolved	Pearson	0.185	0.566	No
Mainstem Combined	12	Storm	TOC	Arsenic, Dissolved	Pearson	0.0262	0.936	No
Mainstem Combined	12	Storm	TSS	Arsenic, Dissolved	Spearman	-0.285	0.352	No
Soos,Newaukum&Mill Creek	18	Storm	DOC	Arsenic, Dissolved	Pearson	0.299	0.229	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	Arsenic, Dissolved	Pearson	-0.306	0.217	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	Arsenic, Dissolved	Spearman	-0.0848	0.729	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	Arsenic, Dissolved	Pearson	0.313	0.206	No
Soos,Newaukum&Mill Creek	18	Storm	TSS	Arsenic, Dissolved	Spearman	0.548	0.0184	Yes
Mainstem Combined	12	Storm	DOC	Arsenic, Particulate Estimate	Spearman	0.559	0.547	No
Mainstem Combined	12	Storm	Mean Flow	Arsenic, Particulate Estimate	Spearman	0.804	0.00036	Yes
Mainstem Combined	12	Storm	Precipitation	Arsenic, Particulate Estimate	Spearman	-0.308	0.0317	No
Mainstem Combined	12	Storm	TOC	Arsenic, Particulate Estimate	Spearman	0.727	0.0062	Yes
Mainstem Combined	12	Storm	TSS	Arsenic, Particulate Estimate	Spearman	0.909	0.0000002	Yes
Soos,Newaukum&Mill Creek	18	Storm	DOC	Arsenic, Particulate Estimate	Spearman	0.364	0.134	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	Arsenic, Particulate Estimate	Spearman	-0.412	0.0873	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	Arsenic, Particulate Estimate	Spearman	0.279	0.255	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	Arsenic, Particulate Estimate	Pearson	-0.0667	0.793	No
Soos,Newaukum&Mill Creek	18	Storm	TSS	Arsenic, Particulate Estimate	Spearman	0.625	0.00556	Yes

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Site	Count	Flow Condition	Parameter	Analyte	Correlation	R _s	p value	Significant?
Mainstem Combined	12	Storm	DOC	Arsenic, Total	Spearman	0.559	0.0547	No
Mainstem Combined	12	Storm	Mean Flow	Arsenic, Total	Spearman	0.79	0.001	Yes
Mainstem Combined	12	Storm	Precipitation	Arsenic, Total	Spearman	-0.308	0.0317	No
Mainstem Combined	12	Storm	TOC	Arsenic, Total	Spearman	0.727	0.0062	Yes
Mainstem Combined	12	Storm	TSS	Arsenic, Total	Spearman	0.909	0.0000002	Yes
Soos,Newaukum&Mill Creek	18	Storm	DOC	Arsenic, Total	Spearman	0.5	0.0338	Yes
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	Arsenic, Total	Spearman	-0.464	0.0516	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	Arsenic, Total	Spearman	0.132	0.592	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	Arsenic, Total	Spearman	0.586	0.0103	Yes
Soos,Newaukum&Mill Creek	18	Storm	TSS	Arsenic, Total	Spearman	0.75	0.0000999	Yes
Mainstem Combined	7	Storm	DOC	Benzo(g,h,i)perylene	Spearman	-0.018	0.905	No
Mainstem Combined	7	Storm	Mean Flow	Benzo(g,h,i)perylene	Spearman	0.0721	0.843	No
Mainstem Combined	7	Storm	Precipitation	Benzo(g,h,i)perylene	Pearson	0.22	0.635	No
Mainstem Combined	7	Storm	TOC	Benzo(g,h,i)perylene	Pearson	0.783	0.0371	Yes
Mainstem Combined	7	Storm	TSS	Benzo(g,h,i)perylene	Spearman	0.306	0.438	No
Soos,Newaukum&Mill Creek	9	Storm	DOC	Benzo(g,h,i)perylene	Spearman	0.567	0.0988	No
Soos,Newaukum&Mill Creek	9	Storm	Mean Flow	Benzo(g,h,i)perylene	Spearman	-0.75	0.0158	Yes
Soos,Newaukum&Mill Creek	9	Storm	Precipitation	Benzo(g,h,i)perylene	Spearman	-0.183	0.612	No
Soos,Newaukum&Mill Creek	9	Storm	TOC	Benzo(g,h,i)perylene	Spearman	0.45	0.204	No
Soos,Newaukum&Mill Creek	9	Storm	TSS	Benzo(g,h,i)perylene	Spearman	0.55	0.111	No
Mainstem Combined	8	Storm	DOC	Chrysene	Spearman	0.18	0.619	No
Mainstem Combined	8	Storm	Mean Flow	Chrysene	Spearman	-0.335	0.387	No
Mainstem Combined	8	Storm	Precipitation	Chrysene	Pearson	0.165	0.697	No
Mainstem Combined	8	Storm	TOC	Chrysene	Pearson	0.659	0.0755	No
Mainstem Combined	8	Storm	TSS	Chrysene	Spearman	0.0479	0.885	No
Soos,Newaukum&Mill Creek	16	Storm	DOC	Chrysene	Spearman	0.732	0.000895	Yes
Soos,Newaukum&Mill Creek	16	Storm	Mean Flow	Chrysene	Spearman	-0.525	0.0364	Yes
Soos,Newaukum&Mill Creek	16	Storm	Precipitation	Chrysene	Spearman	0.167	0.526	No
Soos,Newaukum&Mill Creek	16	Storm	TOC	Chrysene	Spearman	0.763	0.000159	Yes
Soos,Newaukum&Mill Creek	16	Storm	TSS	Chrysene	Spearman	0.742	0.000644	Yes
Mainstem Combined	12	Storm	Mean Flow	DOC	Spearman	0.615	0.0308	Yes
Mainstem Combined	12	Storm	Precipitation	DOC	Spearman	-0.2	0.513	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	DOC	Pearson	-0.257	0.303	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	DOC	Spearman	0.185	0.456	No

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Site	Count	Flow Condition	Parameter	Analyte	Correlation	R _s	p value	Significant?
Mainstem Combined	12	Storm	DOC	HPAH, Total	Spearman	0.399	0.189	No
Mainstem Combined	12	Storm	Mean Flow	HPAH, Total	Spearman	0.146	0.635	No
Mainstem Combined	12	Storm	Precipitation	HPAH, Total	Spearman	-0.153	0.619	No
Mainstem Combined	12	Storm	TOC	HPAH, Total	Spearman	0.363	0.233	No
Mainstem Combined	12	Storm	TSS	HPAH, Total	Spearman	0.356	0.243	No
Soos,Newaukum&Mill Creek	18	Storm	DOC	HPAH, Total	Spearman	0.591	0.00969	Yes
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	HPAH, Total	Spearman	-0.581	0.0114	Yes
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	HPAH, Total	Spearman	0.0269	0.908	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	HPAH, Total	Spearman	0.624	0.00556	Yes
Soos,Newaukum&Mill Creek	18	Storm	TSS	HPAH, Total	Spearman	0.591	0.00969	Yes
Mainstem Combined	12	Storm	DOC	LPAH, Total	Spearman	0.0839	0.783	No
Mainstem Combined	12	Storm	Mean Flow	LPAH, Total	Spearman	-0.245	0.429	No
Mainstem Combined	12	Storm	Precipitation	LPAH, Total	Pearson	0.193	0.548	No
Mainstem Combined	12	Storm	TOC	LPAH, Total	Pearson	0.275	0.386	No
Mainstem Combined	12	Storm	TSS	LPAH, Total	Spearman	-0.259	0.402	No
Soos,Newaukum&Mill Creek	18	Storm	DOC	LPAH, Total	Spearman	0.352	0.148	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	LPAH, Total	Spearman	-0.519	0.0269	Yes
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	LPAH, Total	Spearman	-0.429	0.0743	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	LPAH, Total	Spearman	0.387	0.11	No
Soos,Newaukum&Mill Creek	18	Storm	TSS	LPAH, Total	Spearman	0.173	0.482	No
Mainstem Combined	12	Storm	Precipitation	Mean Flow	Spearman	-0.443	0.143	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	Mean Flow	Spearman	0.0889	0.717	No
Mainstem Combined	9	Storm	DOC	Naphthalene	Spearman	0.383	0.285	No
Mainstem Combined	9	Storm	Mean Flow	Naphthalene	Spearman	0.383	0.285	No
Mainstem Combined	9	Storm	Precipitation	Naphthalene	Pearson	-0.0354	0.928	No
Mainstem Combined	9	Storm	TOC	Naphthalene	Pearson	0.477	0.194	No
Mainstem Combined	9	Storm	TSS	Naphthalene	Spearman	0.133	0.709	No
Soos,Newaukum&Mill Creek	11	Storm	DOC	Naphthalene	Spearman	0.418	0.188	No
Soos,Newaukum&Mill Creek	11	Storm	Mean Flow	Naphthalene	Spearman	-0.464	0.141	No
Soos,Newaukum&Mill Creek	11	Storm	Precipitation	Naphthalene	Spearman	0.0729	0.818	No
Soos,Newaukum&Mill Creek	11	Storm	TOC	Naphthalene	Spearman	0.436	0.168	No
Soos,Newaukum&Mill Creek	11	Storm	TSS	Naphthalene	Spearman	0.373	0.245	No

Table D-1. Relationships Between Parameters - Correlation Analysis Results

Site	Count	Flow Condition	Parameter	Analyte	Correlation	R _s	p value	Significant?
Mainstem Combined	12	Storm	DOC	PCB, Total	Spearman	0.161	0.603	No
Mainstem Combined	12	Storm	Mean Flow	PCB, Total	Spearman	-0.021	0.215	No
Mainstem Combined	12	Storm	Precipitation	PCB, Total	Pearson	-0.438	0.154	No
Mainstem Combined	12	Storm	TOC	PCB, Total	Pearson	0.530	0.076	No
Mainstem Combined	12	Storm	TSS	PCB, Total	Spearman	0.161	0.603	No
Soos,Newaukum&Mill Creek	18	Storm	DOC	PCB, Total	Spearman	0.649	0.00347	Yes
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	PCB, Total	Spearman	-0.373	0.125	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	PCB, Total	Spearman	0.239	0.346	No
Soos,Newaukum&Mill Creek	18	Storm	TOC	PCB, Total	Spearman	0.74	0.000217	Yes
Soos,Newaukum&Mill Creek	18	Storm	TSS	PCB, Total	Spearman	0.731	0.000334	Yes
Mainstem Combined	1	Storm	DOC	Pyrene	Spearman	n/a	n/a	No
Mainstem Combined	1	Storm	Mean Flow	Pyrene	Spearman	n/a	n/a	No
Mainstem Combined	1	Storm	Precipitation	Pyrene	Spearman	n/a	n/a	No
Mainstem Combined	1	Storm	TOC	Pyrene	Spearman	n/a	n/a	No
Mainstem Combined	1	Storm	TSS	Pyrene	Spearman	n/a	n/a	No
Soos,Newaukum&Mill Creek	3	Storm	DOC	Pyrene	Spearman	n/a	n/a	No
Soos,Newaukum&Mill Creek	3	Storm	Mean Flow	Pyrene	Spearman	n/a	n/a	No
Soos,Newaukum&Mill Creek	3	Storm	Precipitation	Pyrene	Spearman	n/a	n/a	No
Soos,Newaukum&Mill Creek	3	Storm	TOC	Pyrene	Spearman	n/a	n/a	No
Soos,Newaukum&Mill Creek	3	Storm	TSS	Pyrene	Spearman	n/a	n/a	No
Mainstem Combined	12	Storm	12HrBefore_Precipitation	TOC	Pearson	-0.45	0.142	No
Mainstem Combined	12	Storm	Mean Flow	TOC	Spearman	0.797	0.000664	Yes
Mainstem Combined	12	Storm	Precipitation	TOC	Pearson	-0.275	0.388	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	TOC	Pearson	-0.192	0.446	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	TOC	Spearman	0.251	0.309	No
Mainstem Combined	12	Storm	Mean Flow	TSS	Spearman	0.944	0.0000002	Yes
Mainstem Combined	12	Storm	Precipitation	TSS	Spearman	-0.466	0.117	No
Soos,Newaukum&Mill Creek	18	Storm	Mean Flow	TSS	Spearman	-0.262	0.285	No
Soos,Newaukum&Mill Creek	18	Storm	Precipitation	TSS	Spearman	0.49	0.0382	Yes

*Non-detects for individual PAH compounds not included in correlation analysis.

*Bolded lines indicate statistically significant relationships (p<0.05)

Appendix D. Relationships Between Parameters – Flow Charts

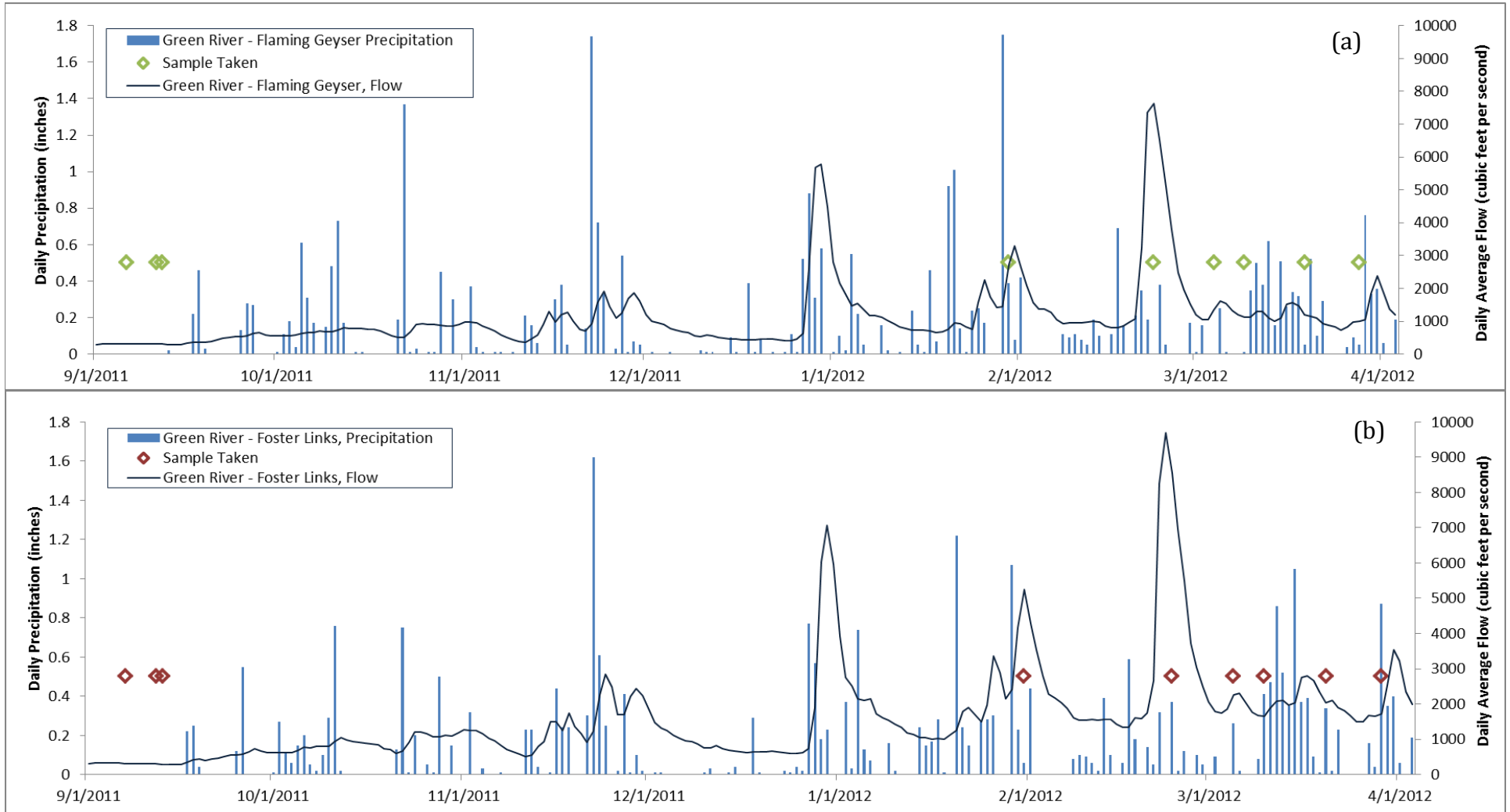


Figure D-1. Precipitation and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links.

Appendix D. Relationships Between Parameters – Flow Charts

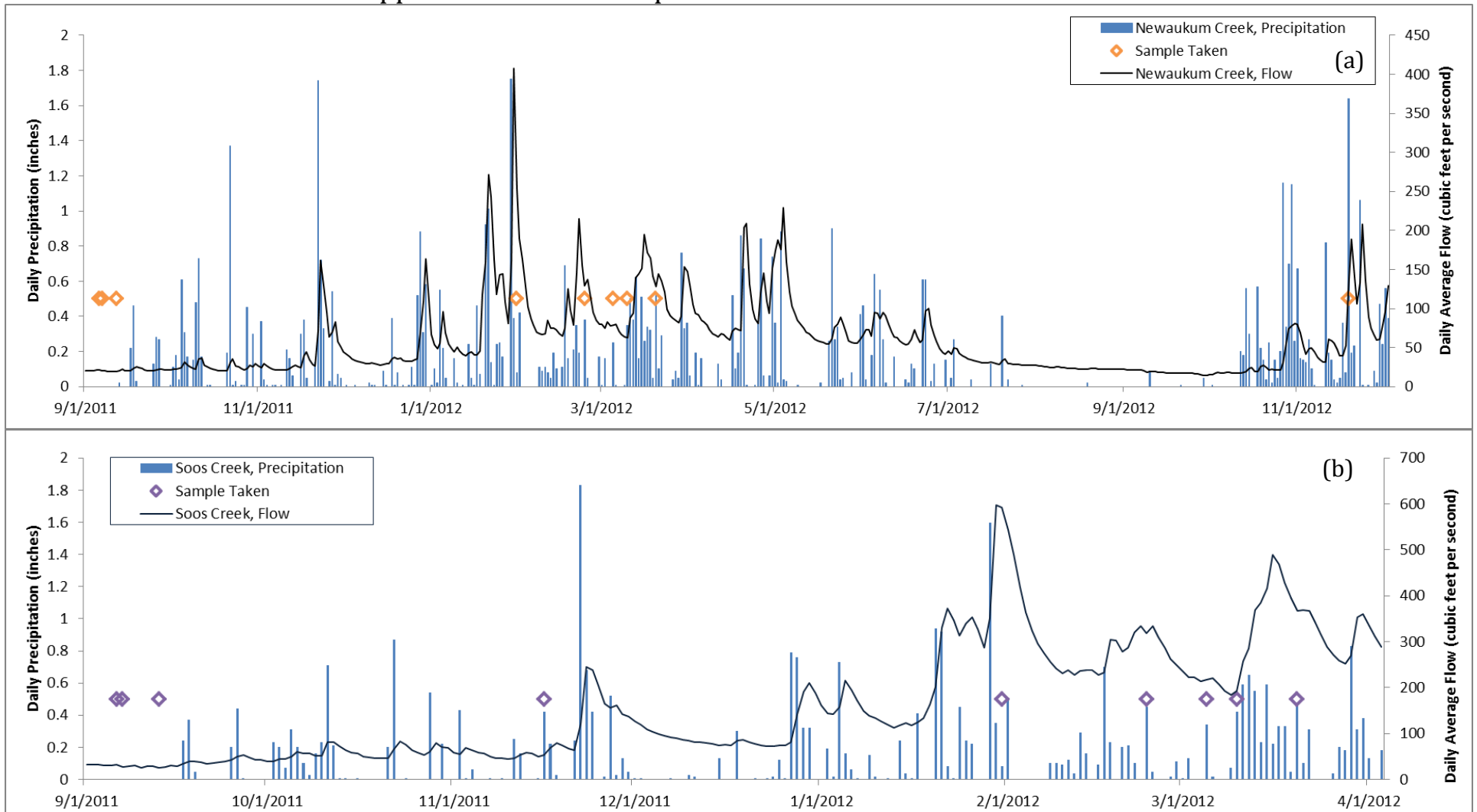


Figure D-2. Precipitation and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek.

Appendix D. Relationships Between Parameters – Flow Charts

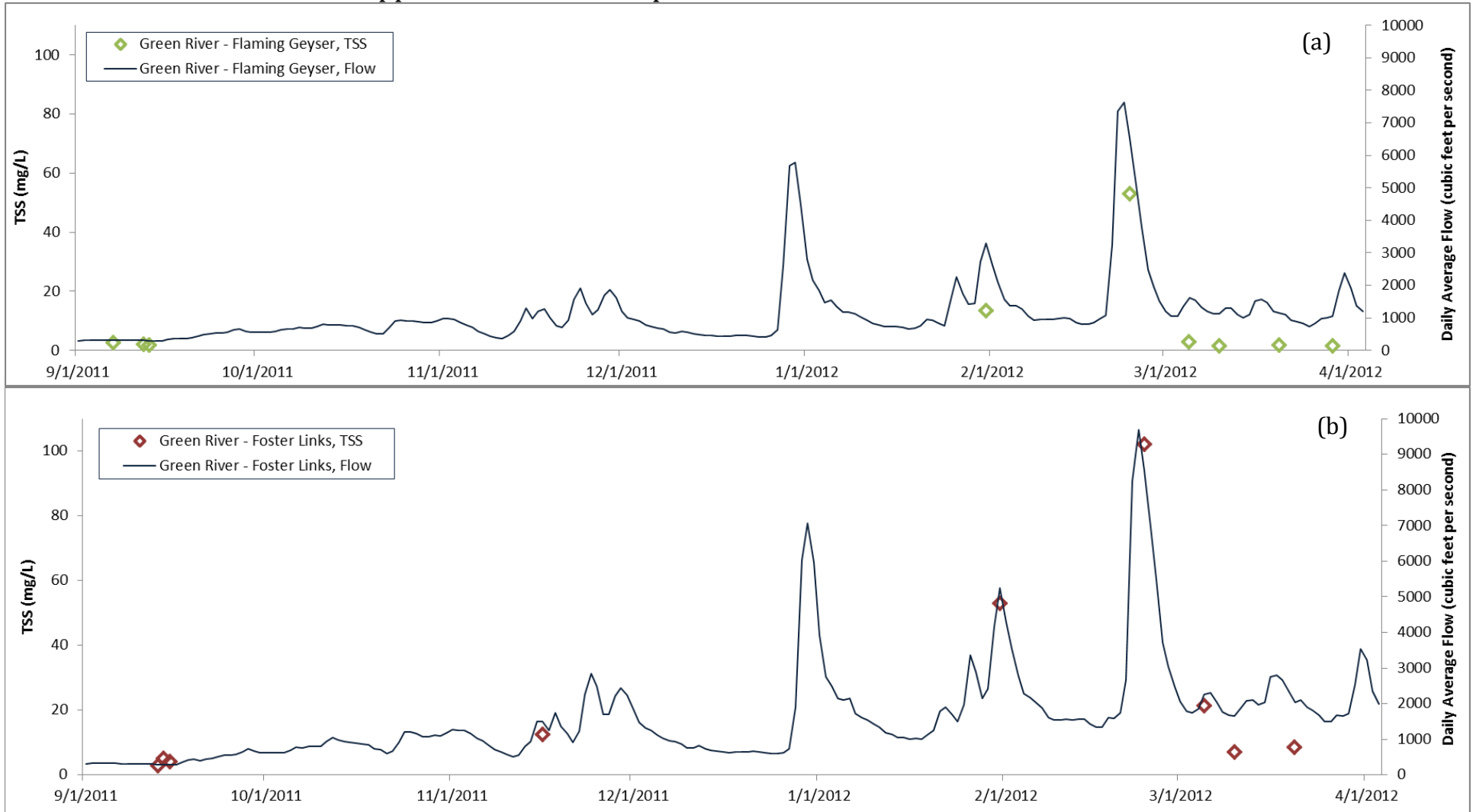


Figure D-3. TSS and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links.

Appendix D. Relationships Between Parameters – Flow Charts

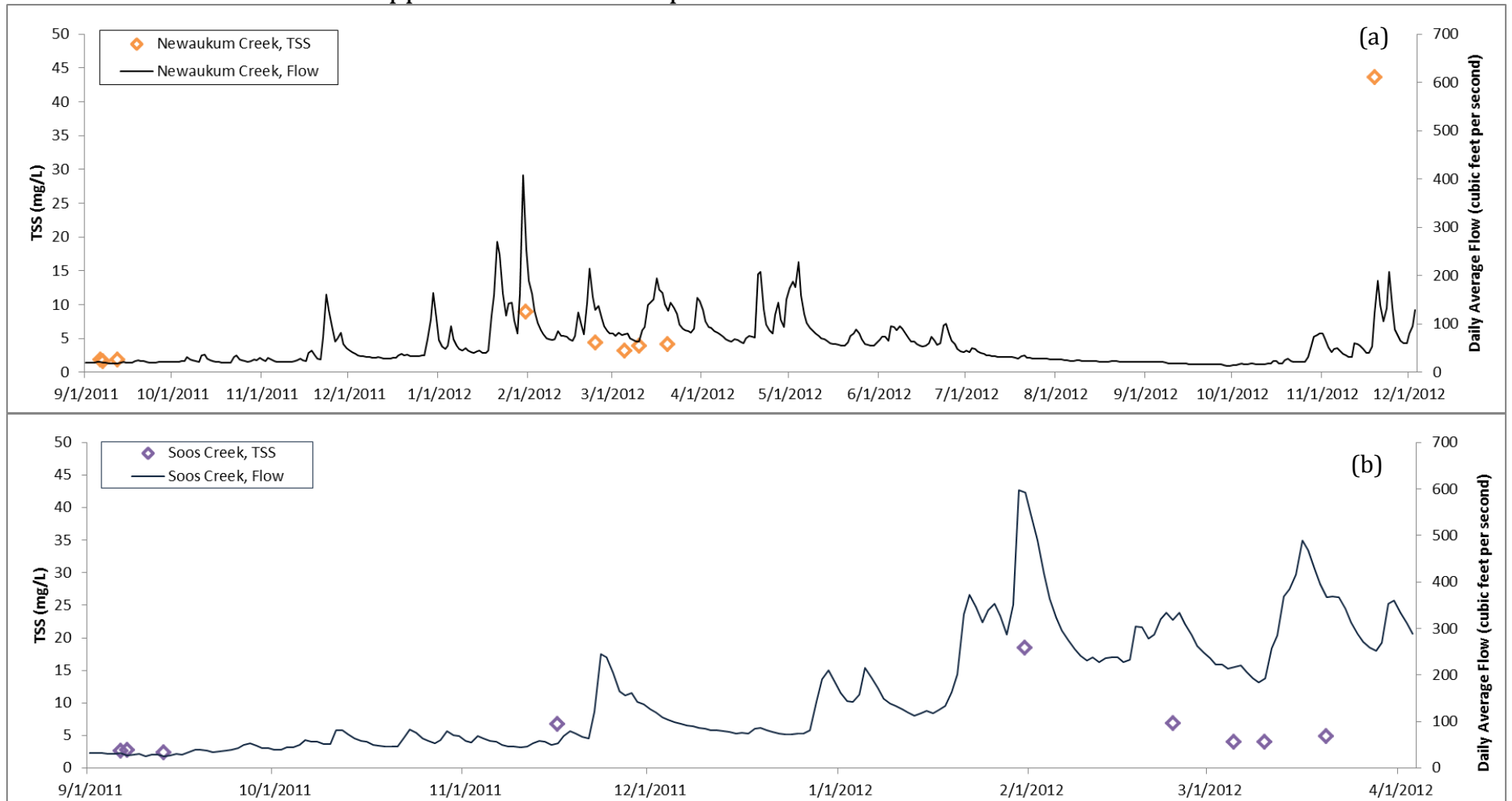


Figure D-4. TSS and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek.

Appendix D. Relationships Between Parameters – Flow Charts

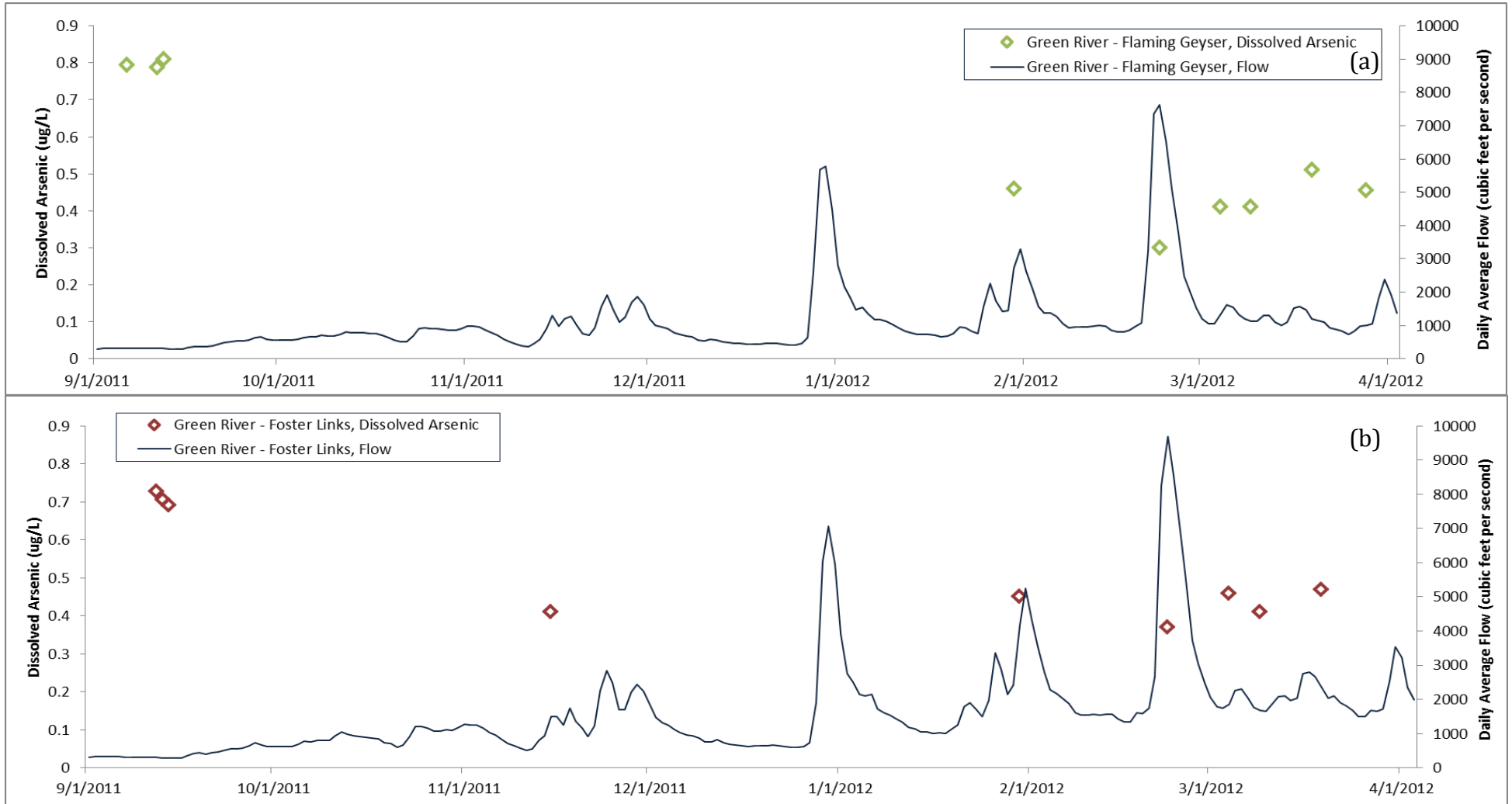


Figure D-5. Dissolved Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links.

Appendix D. Relationships Between Parameters – Flow Charts

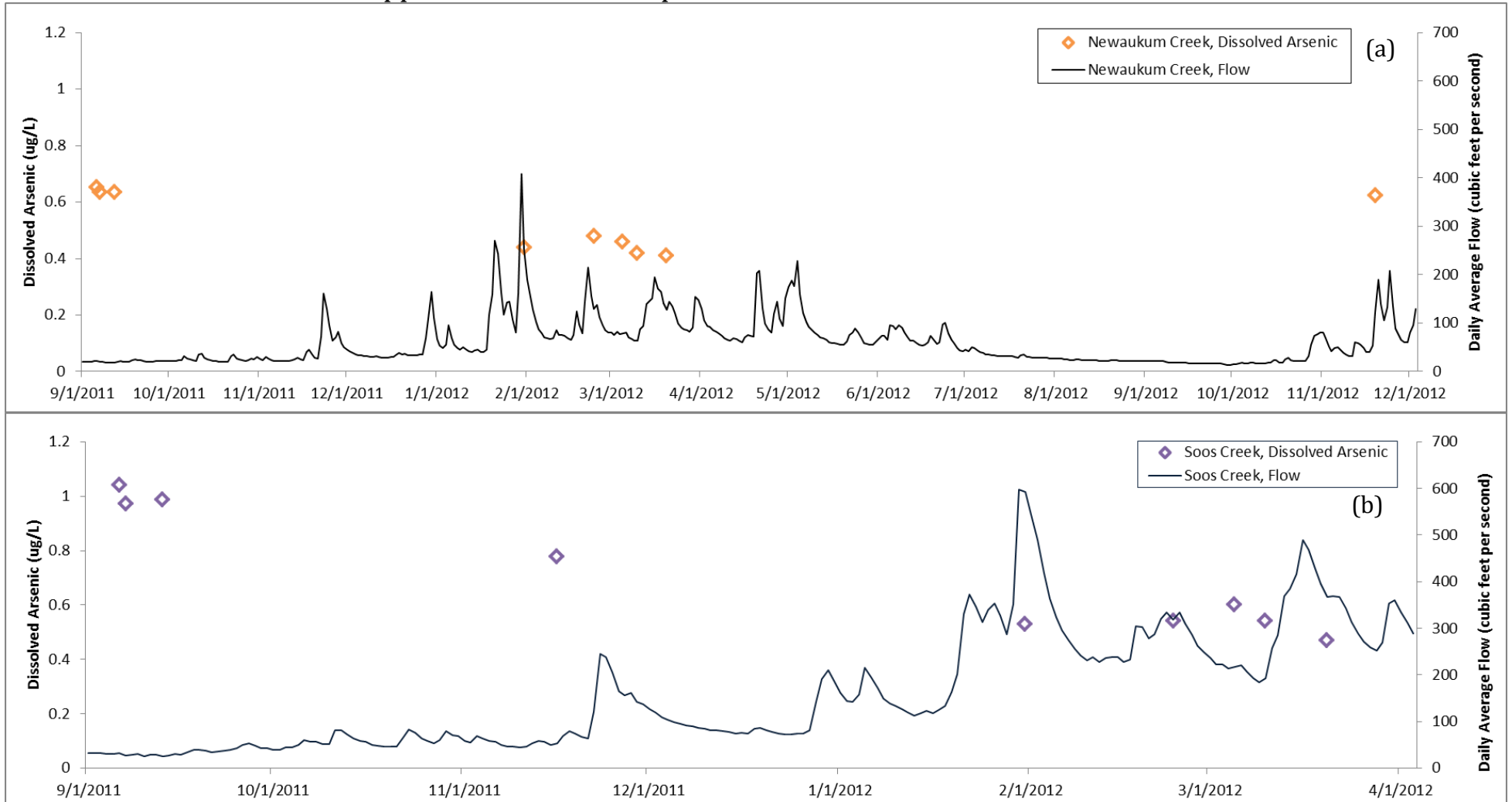


Figure D-6. Dissolved Arsenic Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek.

Appendix D. Relationships Between Parameters – Flow Charts

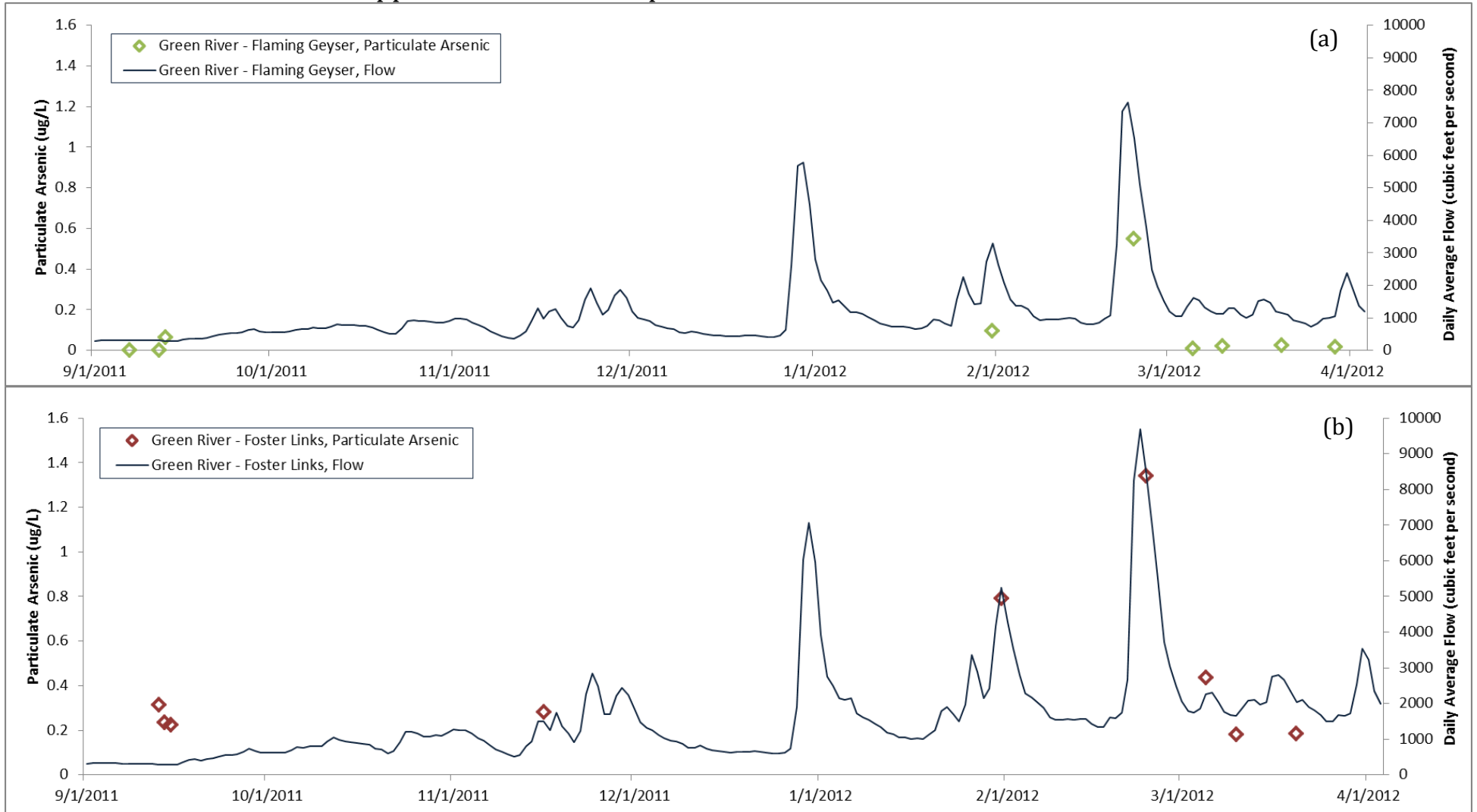


Figure D-7. Particulate Arsenic Concentration* and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links.

*Particulate arsenic concentration estimated by subtracting dissolved arsenic concentration from total arsenic concentration.

Appendix D. Relationships Between Parameters – Flow Charts

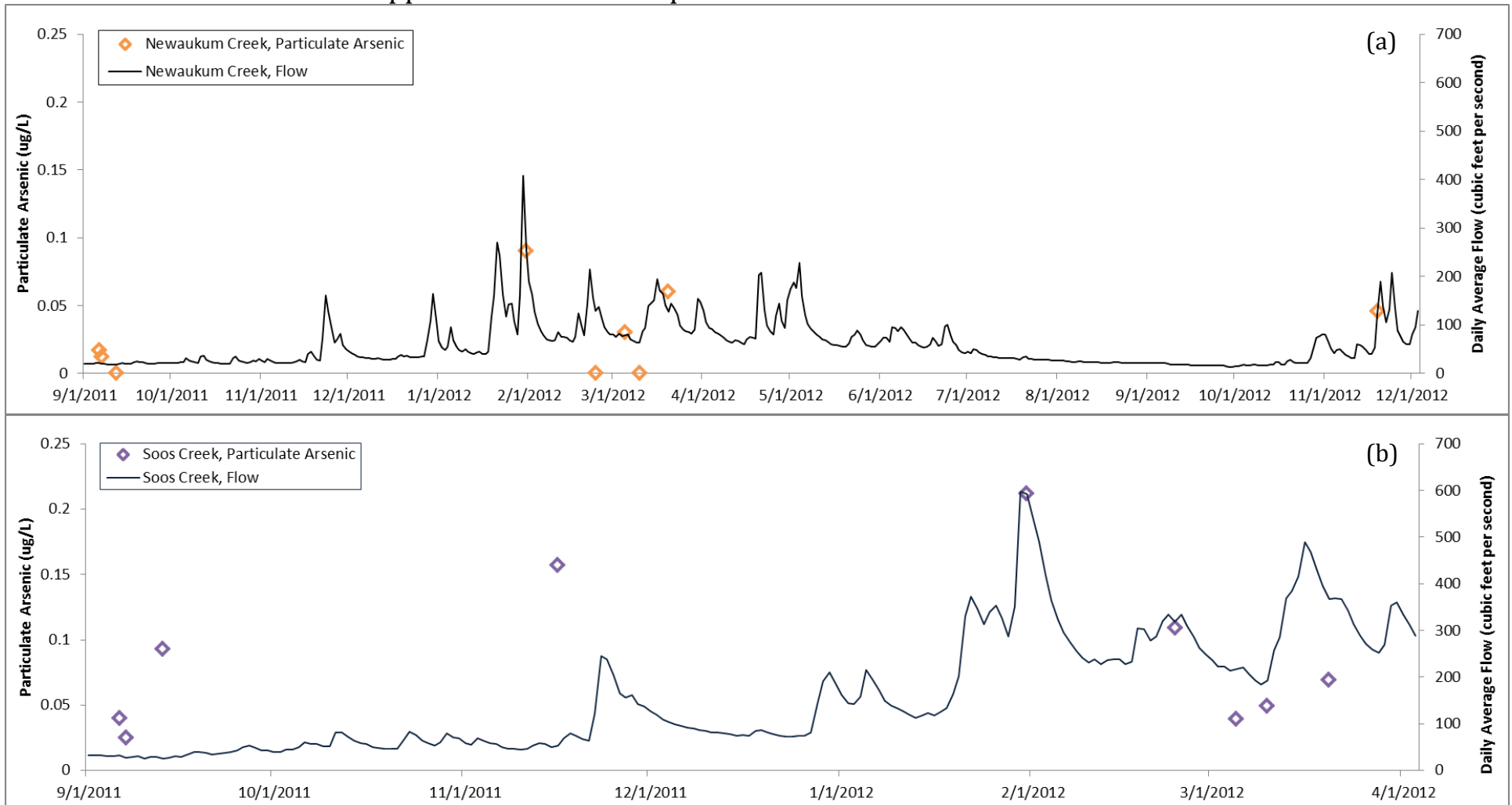


Figure D-8. Particulate Arsenic Concentration* and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek.

*Particulate arsenic concentration estimated by subtracting dissolved arsenic concentration from total arsenic concentration.

Appendix D. Relationships Between Parameters – Flow Charts

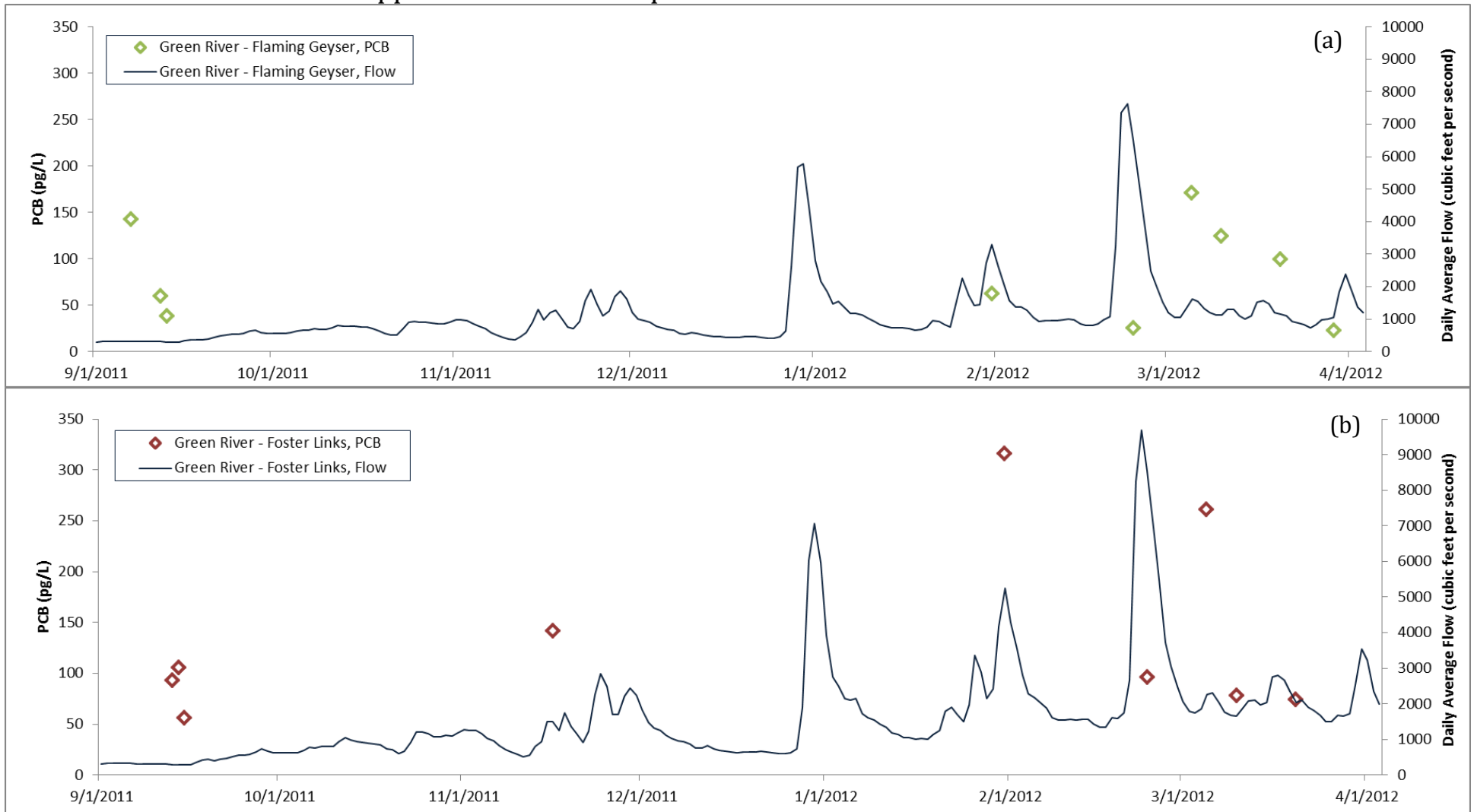


Figure D-9. Total PCB Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Green River – Flaming Geyser, (b) Green River – Foster Links.

Appendix D. Relationships Between Parameters – Flow Charts

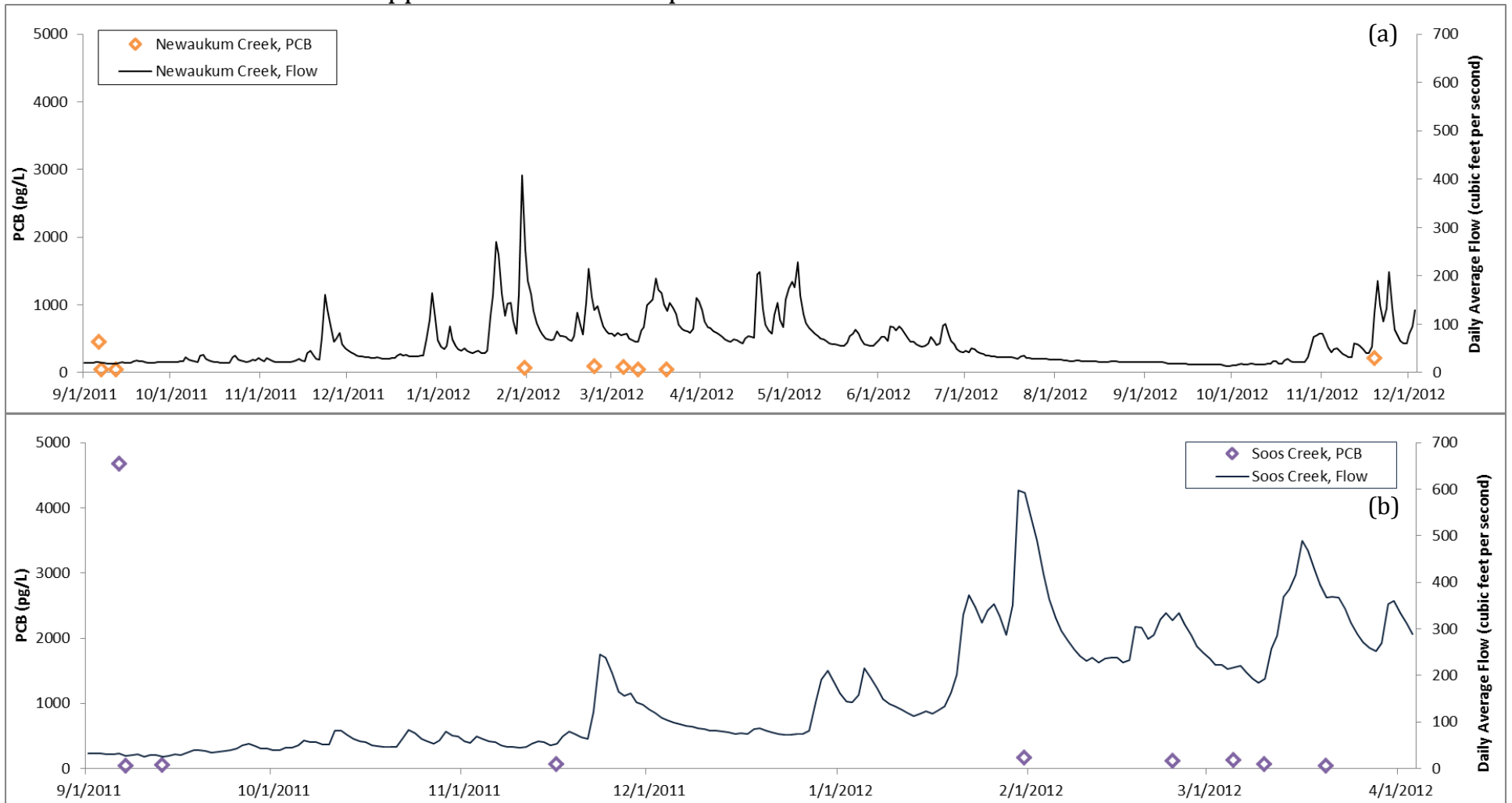


Figure D-10. Total PCB Concentration and Daily Average Flow over Time with Date of Sample Indicated: (a) Newaukum Creek and (b) Soos Creek.