Image-Guided Weathering: A New Approach Applied to Flow Phenomena - Supplementary Material

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1 Introduction

This document contains additional material for the paper "Image-Guided Weathering: A New Approach Applied to Flow Phenomena". This material consists of a set of maps and parameters obtained for different stain exemplars. For each exemplar, the following maps are shown: the input stain image, the extracted degree map, the simulated stain after fitting the parameters, the synthesized detail map, and the non-linear color function. The fitted parameters for all the exemplars are included in Table 1 for reference.

Figures 1 to Figure 3 first show results for stains fitted without using our flow deflection model. In Figure 3, the fittings were done using multiple stains at the same time. Two groups of stains are shown, one corresponding to three efflorescence stains (top) and another corresponding to two mold stains (bottom). As each group of stains belongs to the same surface and stain material, the stains were fitted using shared parameters for both the target surface and the stain material.

Figures 4 to Figure 7 show results for stains fitted using our flow deflection model. Finally, Figure 8 shows exemplars of stains on more complex target objects, where non-flat proxies are used to approximate the targets during the fitting.

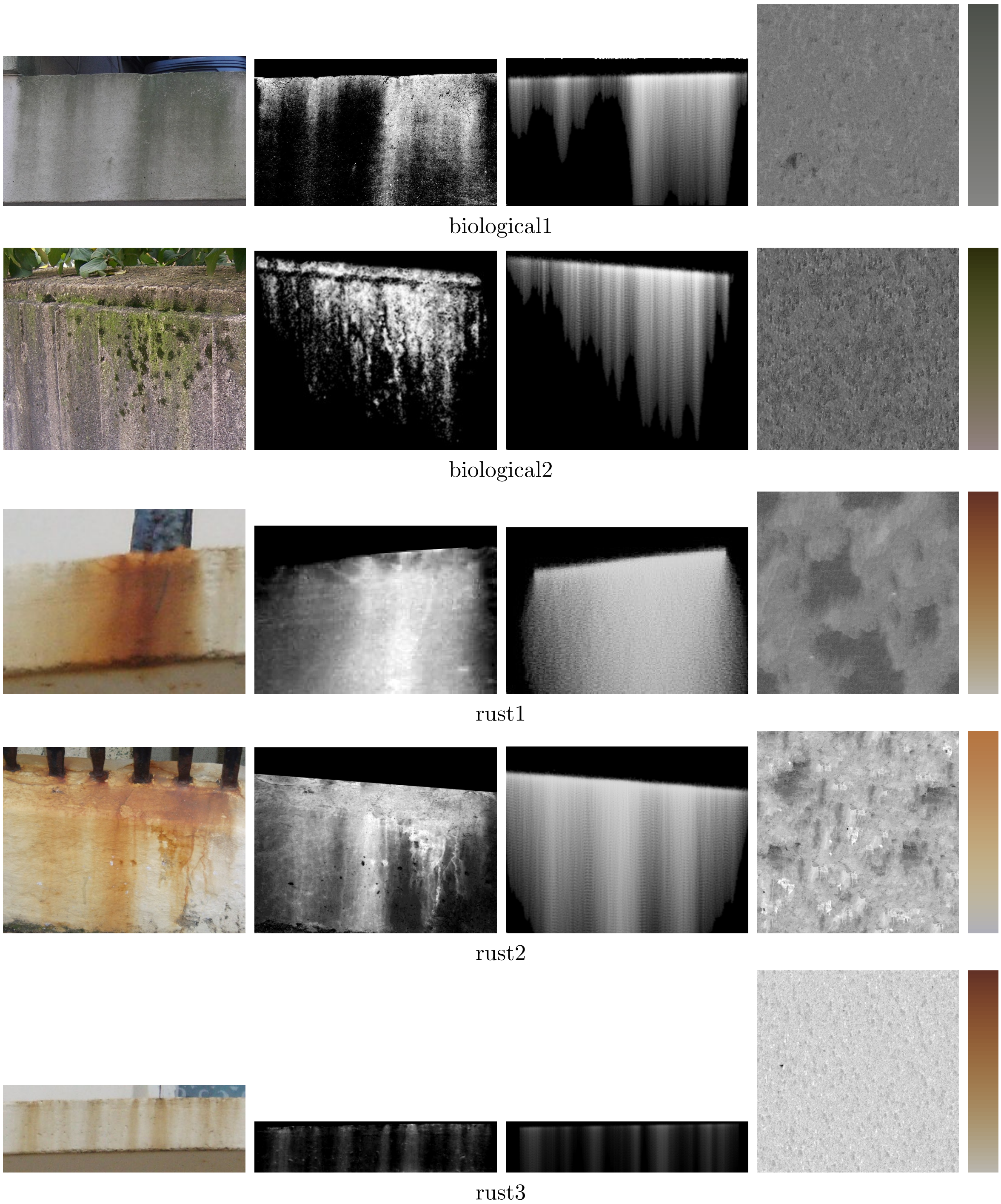


Figure 1: Stains exemplars and obtained data. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.

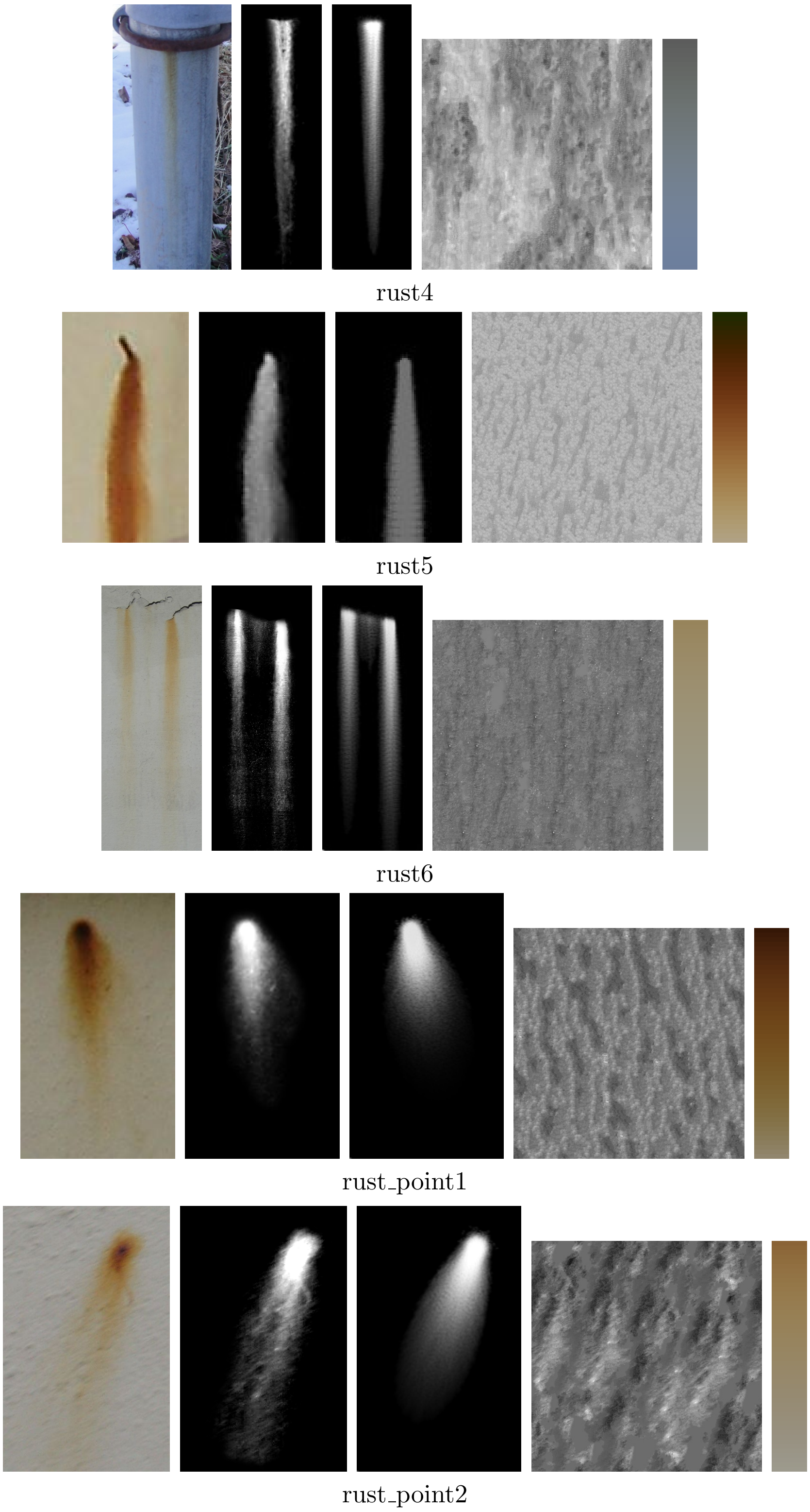


Figure 2: Stains exemplars and obtained data. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.

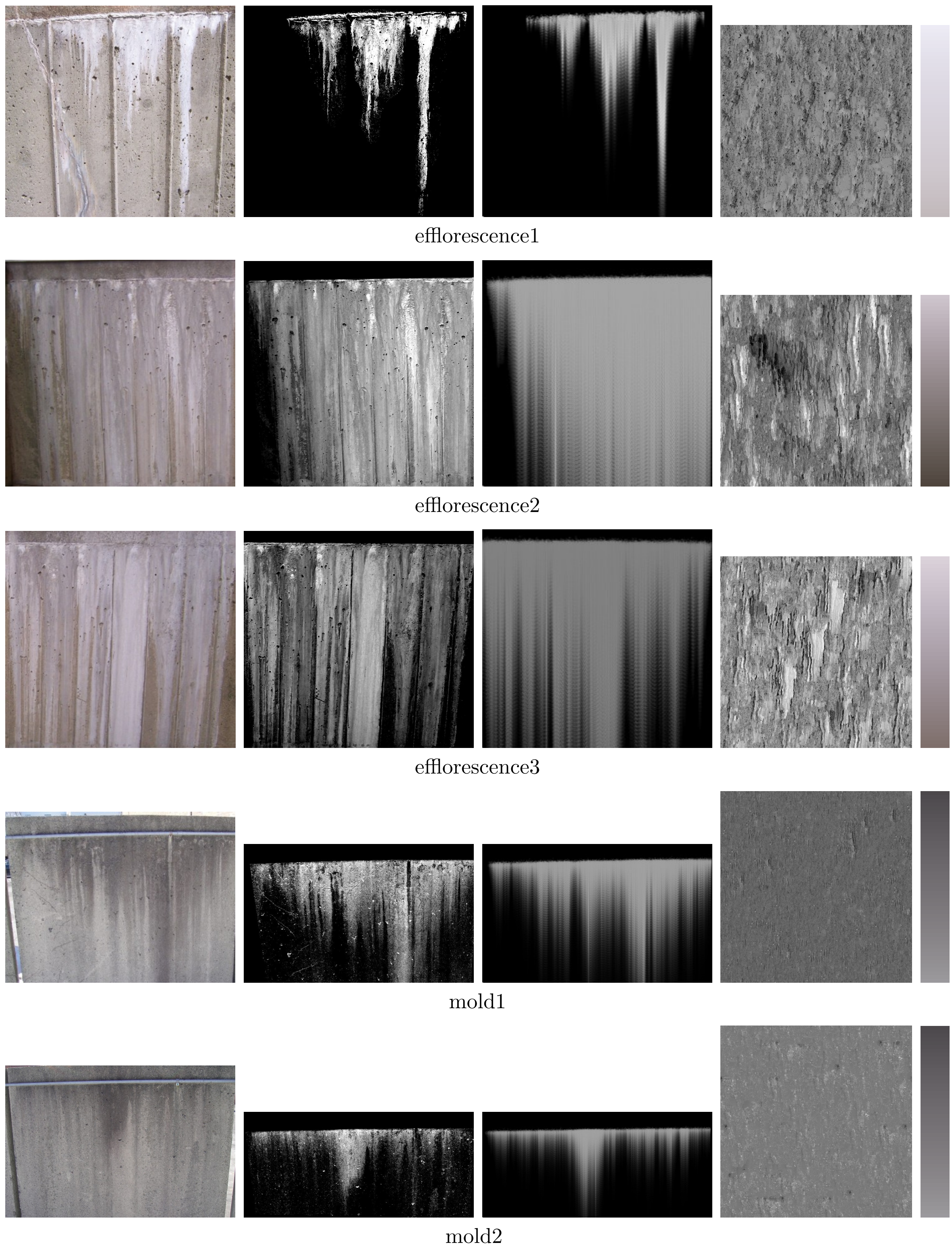


Figure 3: Stains exemplars and obtained data using combined fitting. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.

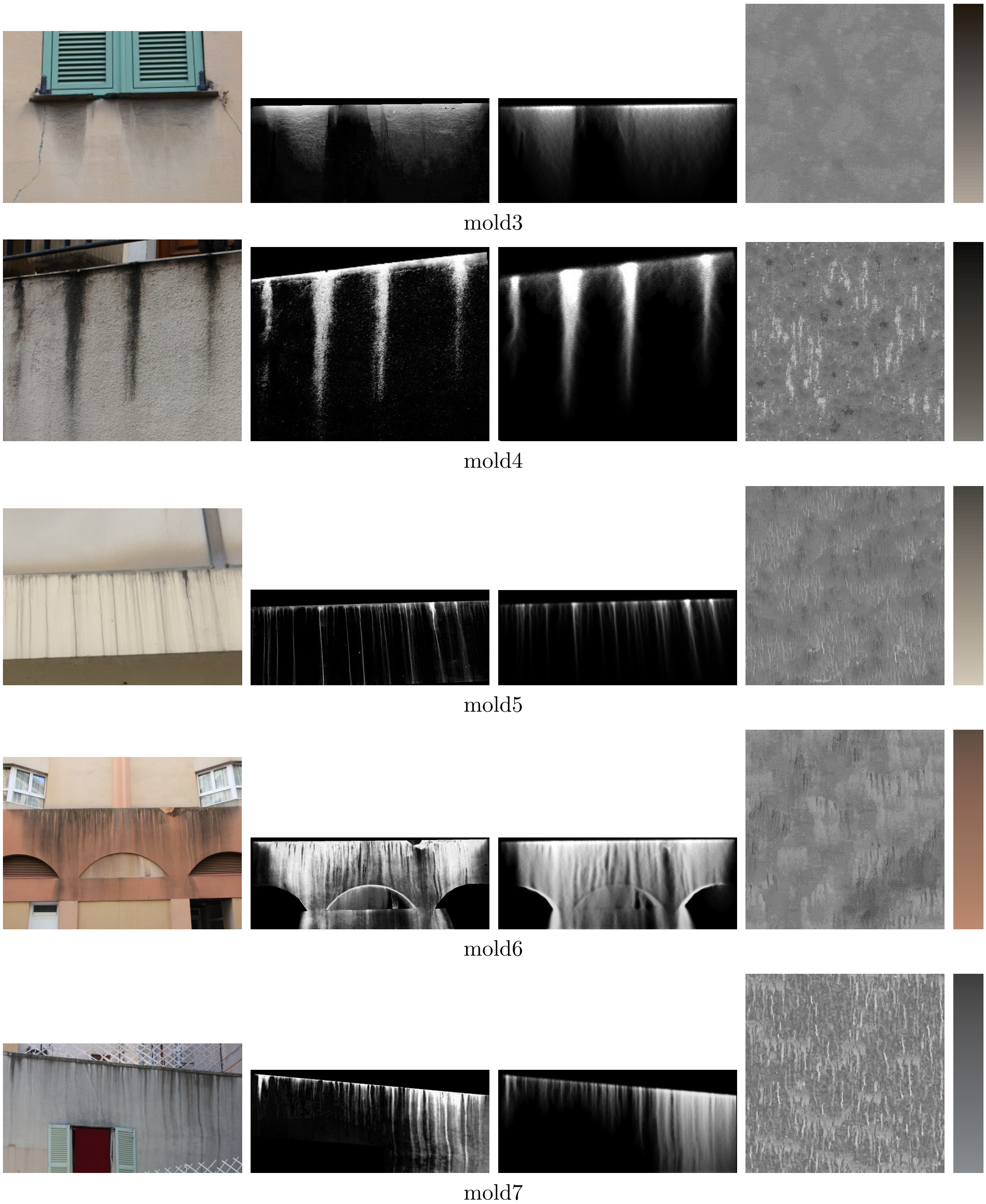


Figure 4: Stains exemplars and obtained data using our flow deflection model. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.

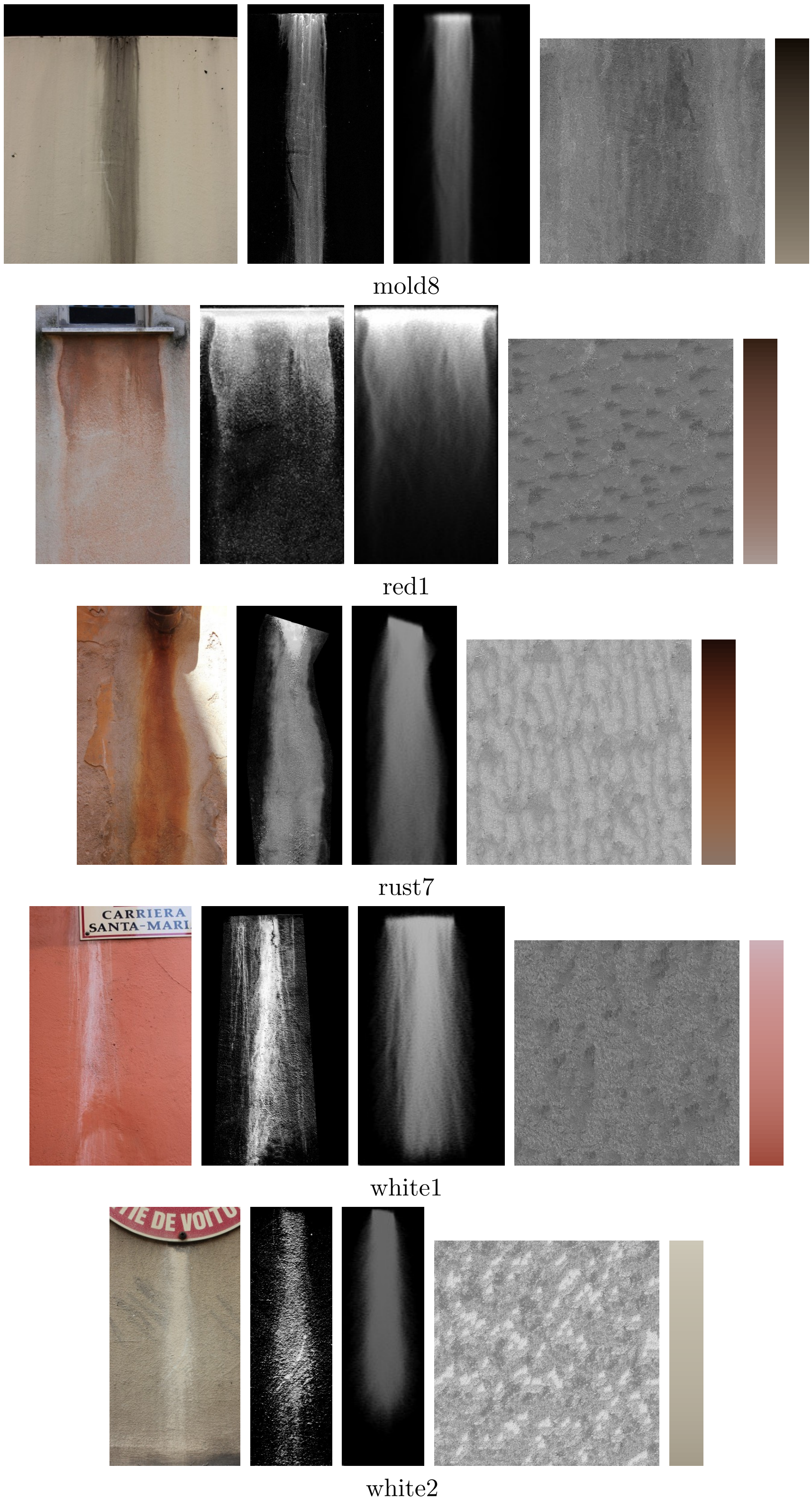


Figure 5: Stains exemplars and obtained data using our flow deflection model. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.

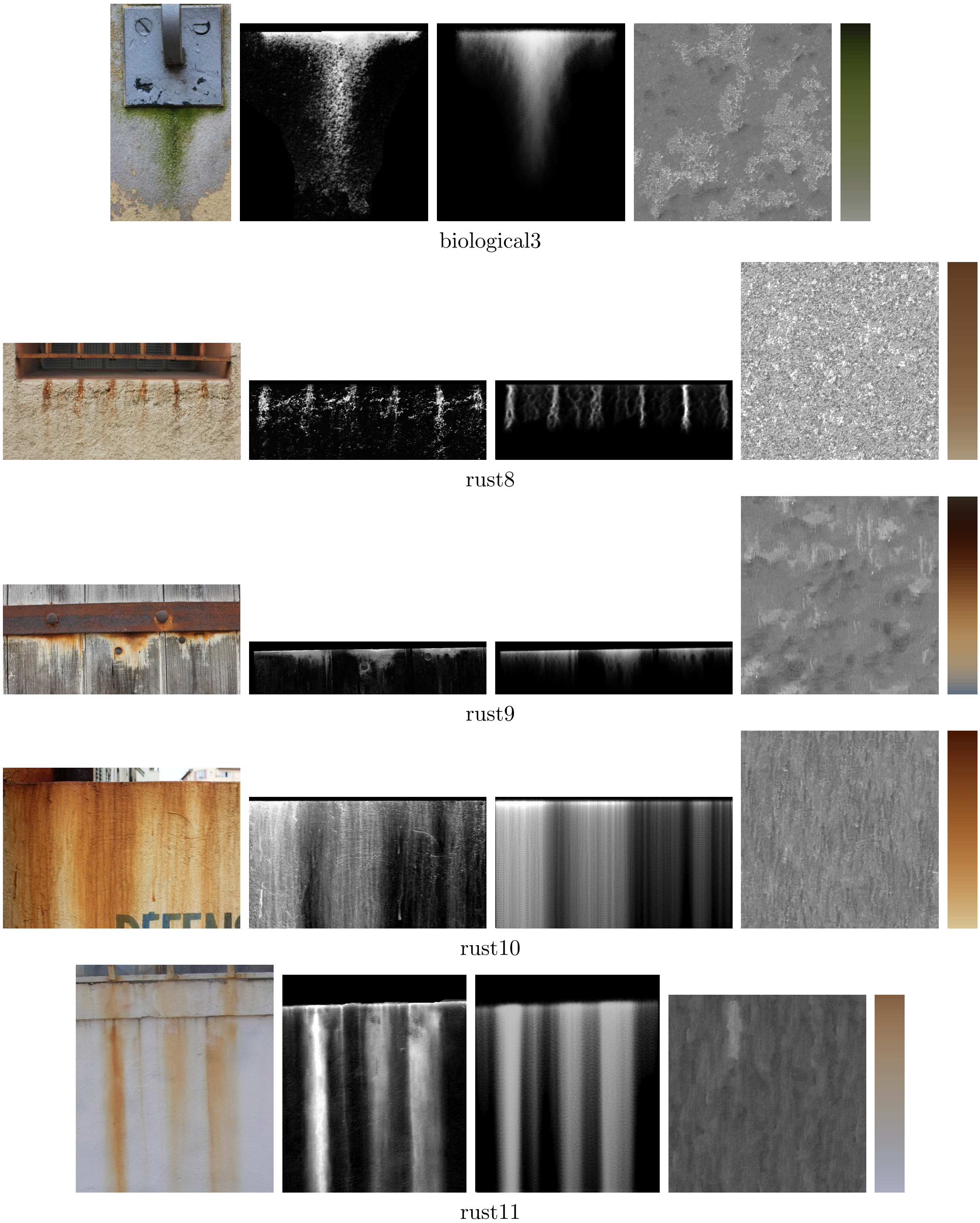
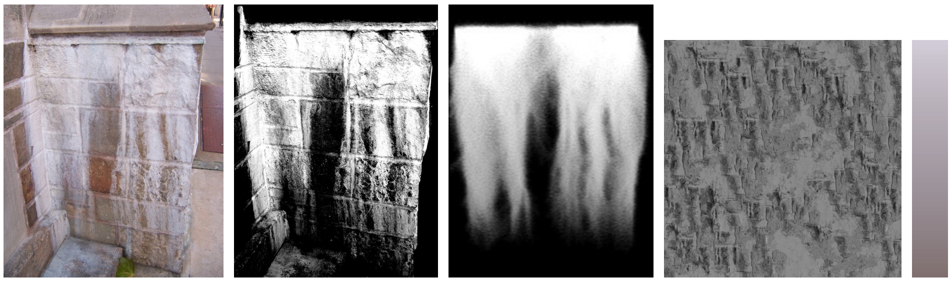
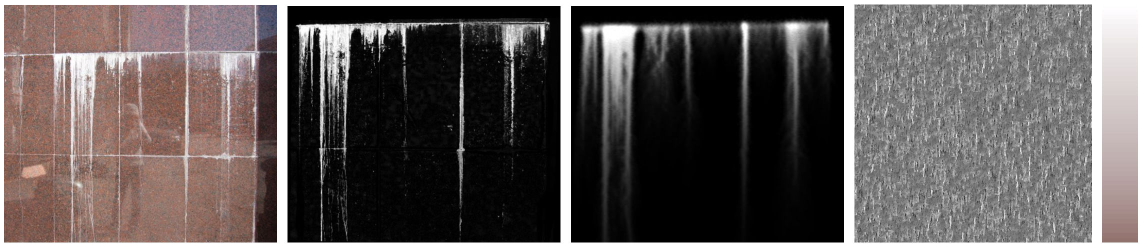


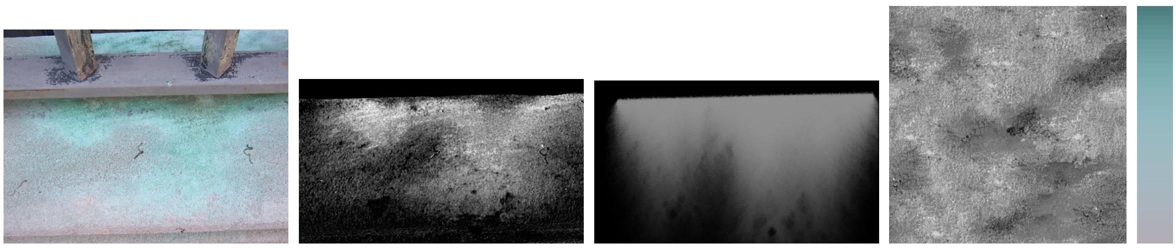
Figure 6: Stains exemplars and obtained data using our flow deflection model. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.



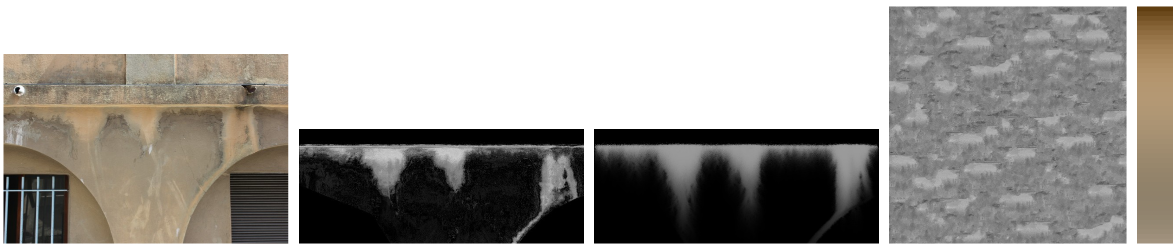
efflorescence4



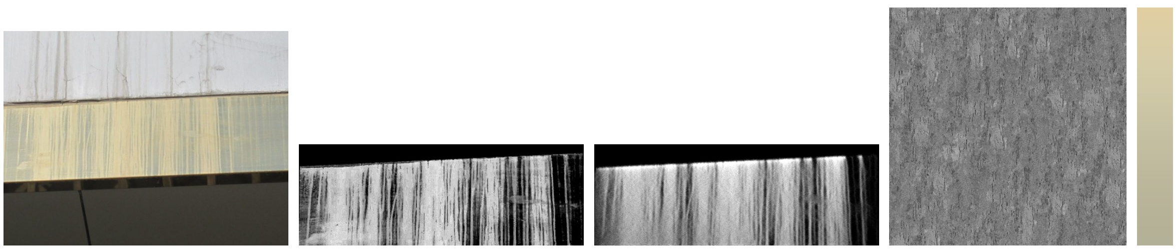
efflorescence5



patina1

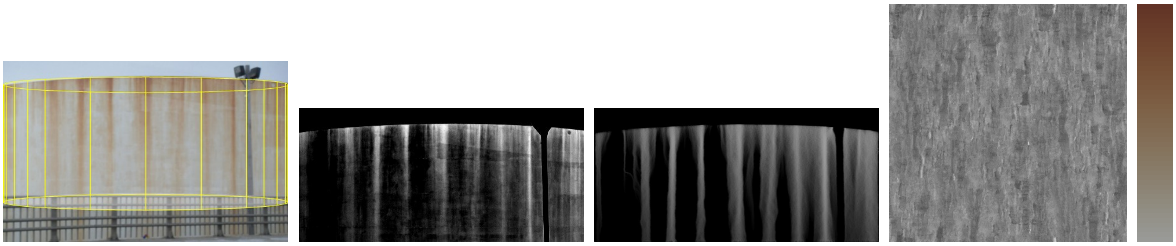


washing1

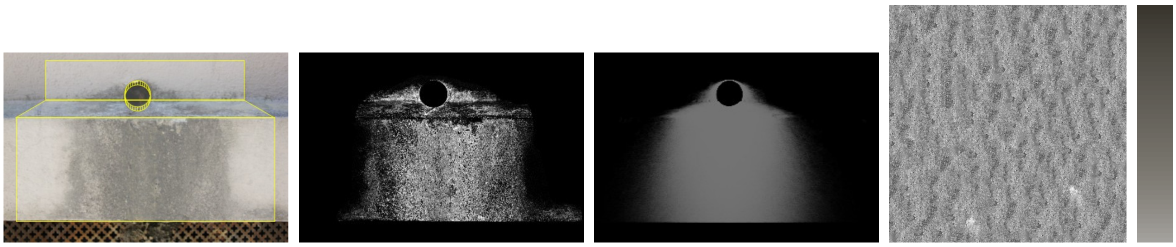


washing2

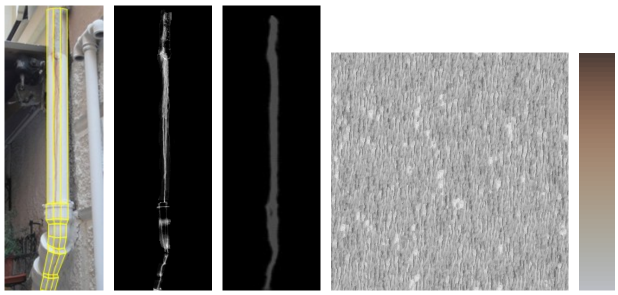
Figure 7: Stains exemplars and obtained data using our flow deflection model. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation.



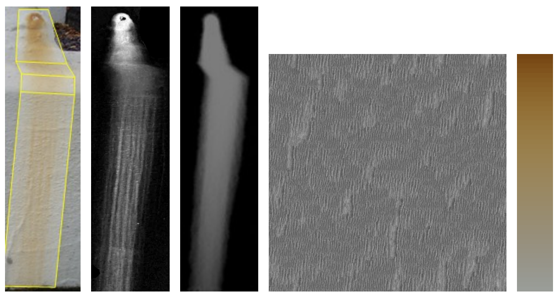
rust12



mold9



rust_point3



rust_point4

Figure 8: Stains exemplars and obtained data using non-flat target proxies. From left to right: Input image, extracted degree, fitted simulation, detail map, and color variation. Target proxy is shown in yellow on the left image.

Stain name	$S_i(0)$	k_S	k_D	r_t	a_t	$k_{a,t}$	T	error
biological1	0.9904	0.0375	0.0388	0.1515	0.2999	0.0527	1290	1178.03
biological2	0.9997	0.0395	0.0405	0.1001	0.3005	0.0523	1355	1680.69
rust1	2.2470	0.0161	0.0439	0.4568	0.2848	0.0777	1979	551.67
rust2	0.6385	0.0555	0.0382	0.1355	0.3016	0.0017	2751	956.92
rust3	0.2516	0.0165	0.0083	0.0353	0.2392	0.0962	5001	106.94
rust4	0.9193	0.0186	0.0102	0.1561	0.2869	0.0507	231	43.15
rust5	0.8925	0.0151	0.0381	0.2699	0.3117	0.0332	525	75.79
rust6	0.5581	0.0531	0.0321	0.1796	0.2614	0.0943	385	193.82
rust_point1	0.3633	0.1967	0.0713	0.6016	0.3815	0.0114	703	43.88
rust_point2	0.3719	0.1301	0.0418	0.5245	0.3211	0.0106	776	150.77
efflorescence1	0.6214	0.1620	0.1091	0.0101	0.3605	0.1060	854	862.45
efflorescence2	0.4356	0.1620	0.1091	0.0101	0.3605	0.1060	5499	685.24
efflorescence3	0.3516	0.1620	0.1091	0.0101	0.3605	0.1060	4607	956.08
mold1	0.2838	0.2267	0.1019	0.0114	0.2460	0.1476	4803	1148.6
mold2	0.2865	0.2267	0.1019	0.0114	0.2460	0.1476	3011	1019.17
mold3	0.3803	0.0288	0.0012	0.2955	0.2673	0.0673	3289	495.95
mold4	0.4806	0.0384	0.001	0.2518	0.2810	0.0862	1445	764.26
mold5	0.1069	0.0622	0.0046	0.2802	0.2109	0.0197	4195	423.03
mold6	1.1738	0.0096	0.0101	0.8525	0.2260	0.0818	1377	2983.33
mold7	0.5086	0.0441	0.0243	0.0259	0.2348	0.1298	1937	1306.89
mold8	0.0789	0.0211	0.0016	0.2240	0.2009	0.1672	3350	192.46
red1	0.2446	0.0598	0.0087	0.2241	0.2811	0.0117	2342	345.24
rust7	0.6006	0.0143	0.0150	0.1973	0.2535	0.0518	1401	515.42
white1	1.3206	0.0210	0.0393	0.1531	0.1485	0.2248	875	482.85
white2	0.7483	0.0201	0.0375	0.2042	0.1555	0.1553	761	184.29
biological3	0.2861	0.1141	0.0304	0.0336	0.2996	0.0956	1434	641.71
rust8	1.9254	0.0010	0.0002	0.8342	0.1917	0.2569	7003	2887.46
rust9	0.2783	0.1123	0.0372	0.4691	0.1927	0.1898	5424	954.12
rust10	3.7521	0.0020	0.0031	0.0118	0.1946	0.1945	7002	919.12
rust11	0.7363	0.0213	0.0208	0.1023	0.2614	0.1671	2878	432.01
efflorescence4	0.7365	0.0376	0.0233	0.1473	0.2996	0.1967	2882	1117.00
efflorescence5	0.1459	0.0535	0.0060	0.0521	0.2911	0.0054	2646	668.05
patina1	0.6213	0.1487	0.1632	0.4830	0.1118	0.1246	2848	1541.66
washing1	0.2894	0.2749	0.1305	0.4159	0.1747	0.0491	3770	986.14
washing2	4.5800	0.0050	0.0179	0.4143	0.0013	0.0218	2637	1429.36
rust12	0.6248	0.0053	0.0051	0.3139	0.1286	0.0010	2995	938.98
mold9	0.6121	0.0593	0.0801	0.8877	0.0011	0.0688	3482	1655.18
rust-point3	3.4359	0.0026	0.0236	0.6091	0.2416	0.0621	229	77.33
rust-point4	0.5062	0.0196	0.0204	0.2176	0.2638	0.0151	708	135.23

Table 1: Fitted parameters for the exemplars.