

— UDAQ Dust Research Initiatives

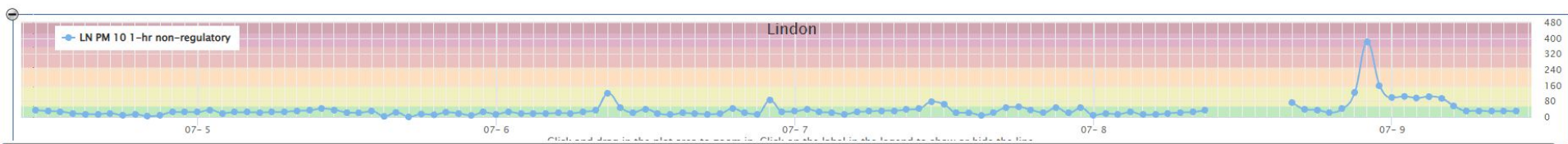
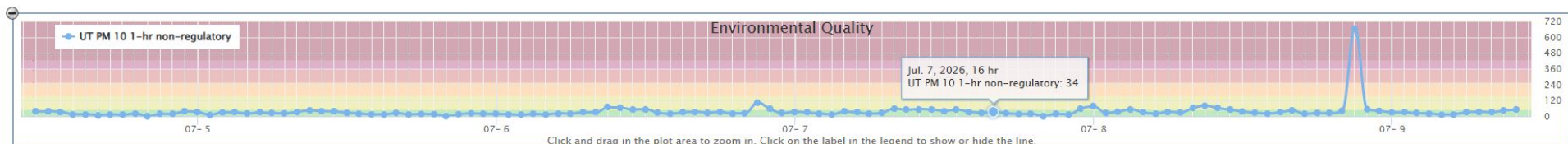
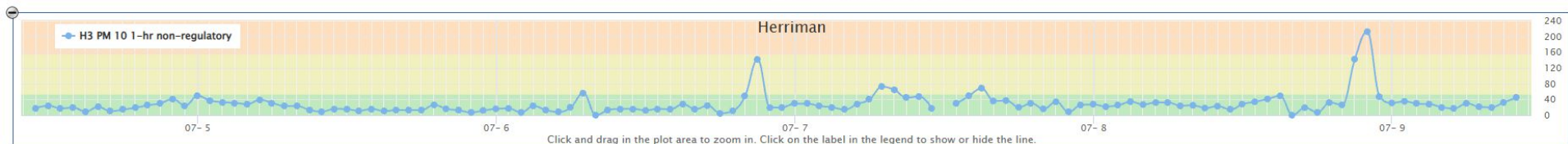
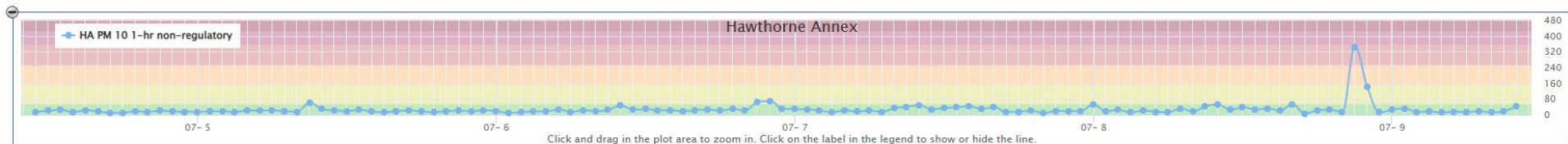
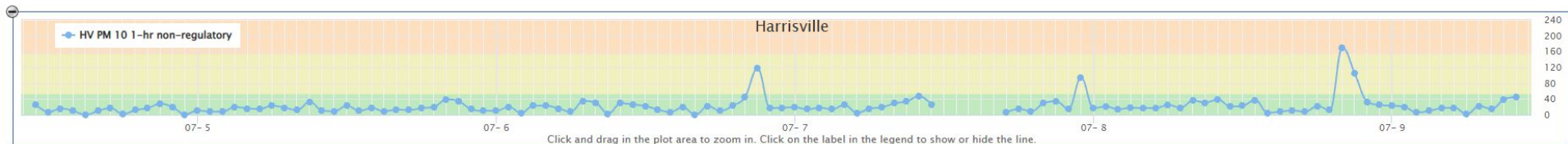
Bryce Bird



**Department of
Environmental Quality**

Division of Air Quality

(Data Not Quality Assured)



Questions – Urban Dust Deposition

- What are the predictable patterns and characteristics (e.g., frequency, duration, and intensity) of dust?
- What are the concentrations of metals in dust?

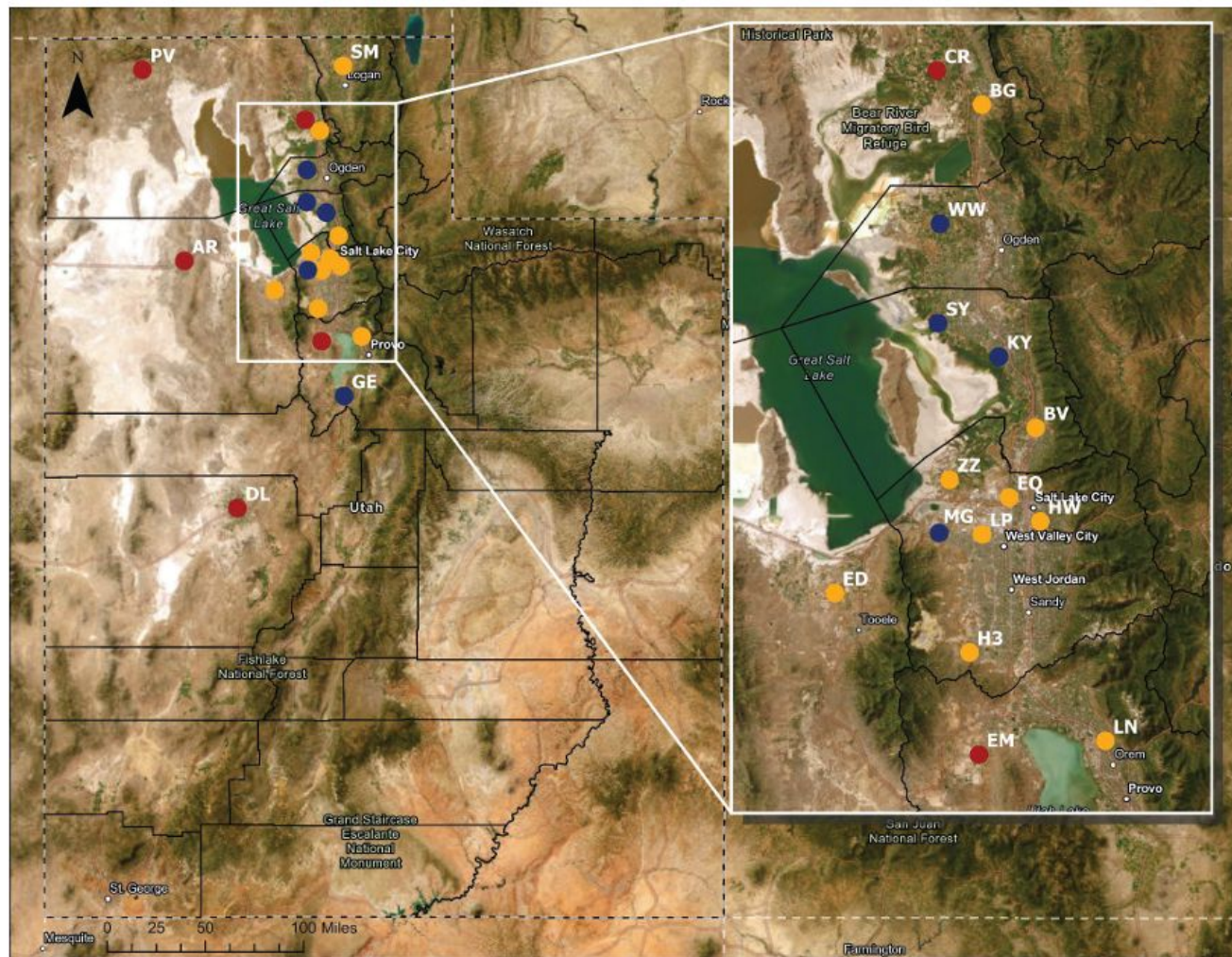
Three data-driven initiatives

- *Expanding Monitoring Infrastructure* – Utah Dust Observatory and Research Network
- *Analyzing Historical Trends* – Utah Dust Event Legacy Database
- *Decoding Chemistry* – Utah Dust Heavy Metals Inventory

UDORN: Utah Dust Observatory and Research Network



UDORN, a network of approximately 20 monitoring stations (long-term neighborhood records and flexible study sites) – providing near real-time data on PM and meteorological conditions for the next decade



#	Station Name	Type	Abbrev.	Rationale	lat	long
1	Brigham City	Core	BG	GSL Dust/North Wasatch Front Central Communities (WFCC)	41.485	-112.022
2	Bountiful Viewmont	Core	BV	GSL Dust/Farmington Bay Hot Spot/Central WFCC	40.903	-111.885
3	Environmental Quality	Core	EQ	GSL Dust/Salt Lake City (SLC) WFCC	40.777	-111.946
4	Erda	Core	ED	GSL Dust/Stansbury Bay	40.601	-112.356
5	Herriman	Core	H3	Regional Dust Background/Southern Sources/Urban Construction/Mining	40.496	-112.036
6	Hawthorne	Core	HW	GSL Dust/Salt Lake City WFCC	40.734	-111.872
7	Lindon	Core	LN	Dust/Utah County Wasatch Front Communities	40.340	-111.713
8	Lake Park	Core	LP	GSL Dust/WFCC South/Mining/Inland Port	40.710	-112.009
9	Prison	Core	ZZ	GSL Dust/Farmington Bay/Central SLC WFCC/Mining/Inland Port	40.808	-112.088
10	Smithfield	Core	SM	Regional Dust Background/Idaho/West Desert/GSL	41.843	-111.852

#	Station Name	Type	Abbrev.	Rationale	lat	long
11	Genola	Satellite R1	GE	Anthropogenic/Aggregate mining	39.993	-111.836
12	Kaysville	Satellite R1	KY	GSL Dust/Farmington Bay/WFCC Central	41.031	-111.974
13	Magna	Satellite R1	MG	Anthropogenic/GSL Adjacent Hot Spot/Construction/Mining	40.712	-112.111
14	Syracuse	Satellite R1	SY	GSL Dust/Farmington Bay/WFCC Central	41.090	-112.120
15	West Weber/Reese	Satellite R1	WW	GSL Dust/Farmington Bay/Bear River Bay/WFCC North	41.269	-112.118
16	Aragonite/Grassy (IRA)	Satellite R2	AR	Regional/Dust Background/West Desert	40.762	-113.021
17	Eagle Mountain	Satellite R2	EM	Regional Dust Background/Sevier Lake 2/Great Basin Desert	40.314	-112.007
18	Delta	Satellite R2	DL	Regional Dust Background/Sevier Lake	39.369	-112.630
19	Corinne	Satellite R2	CR	GSL Dust, Bear River Bay/WFCC North	41.545	-112.131
20	Park Valley	Satellite R2	PV	Regional Dust Background/Idaho/Spring Bay	41.820	-113.330

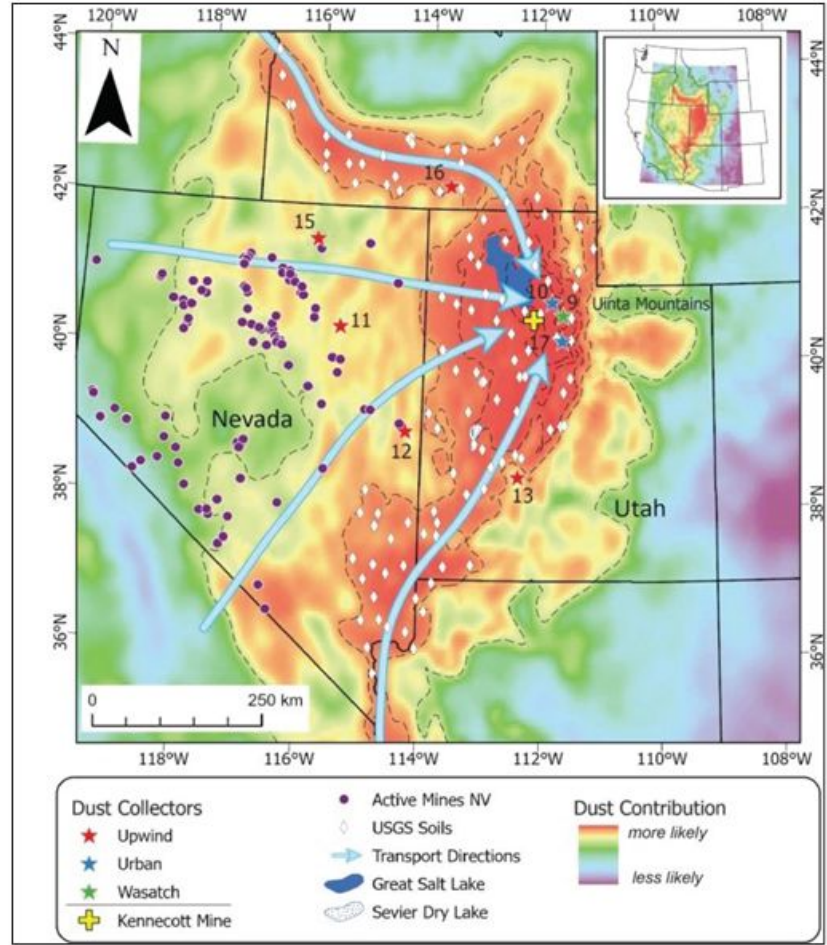
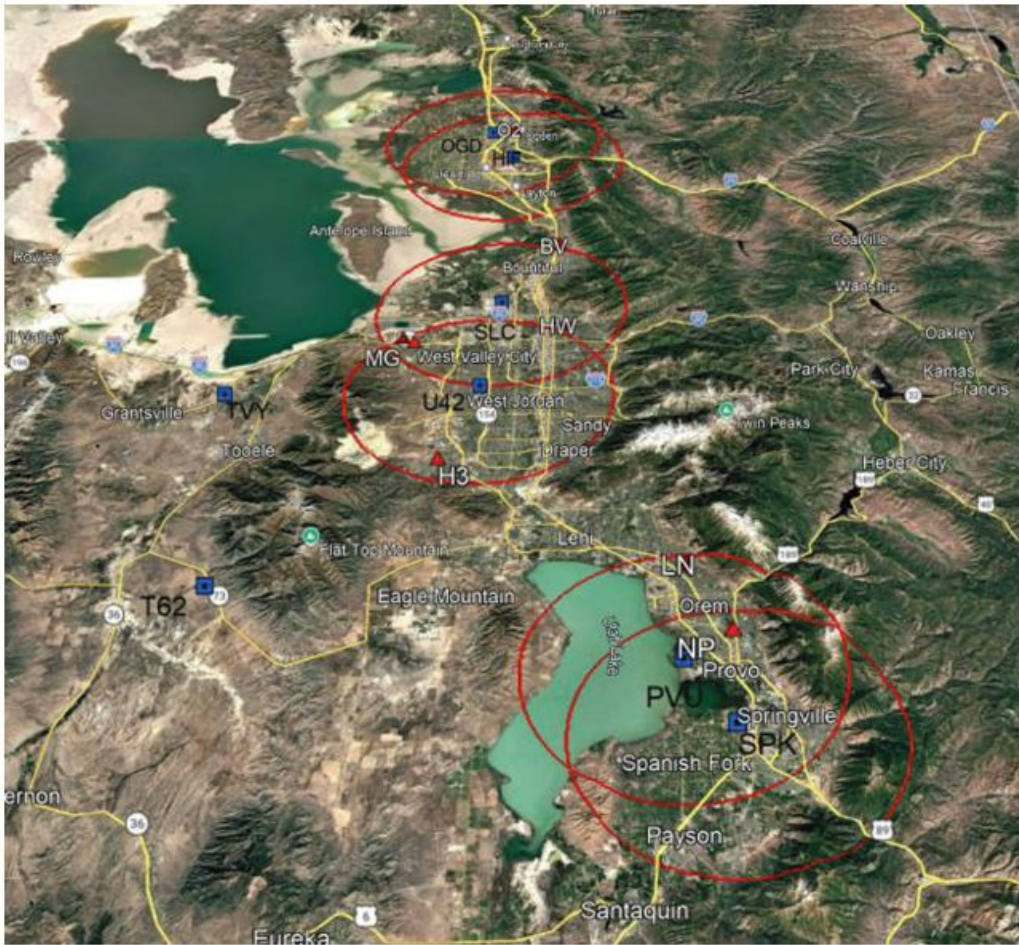
Monitoring

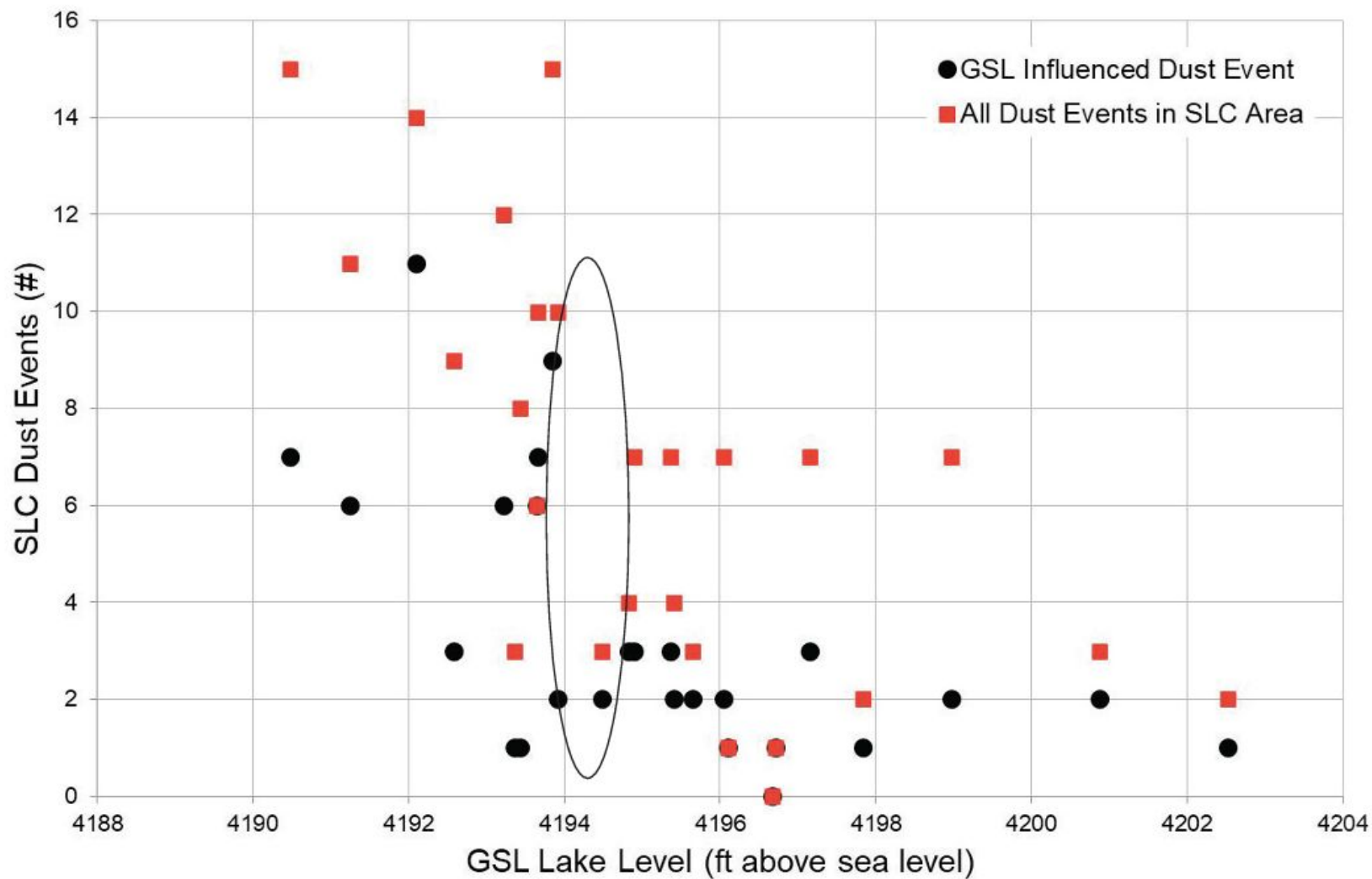
- ES-405 (Met One) provides accurate real-time measurements of TSP, PM10, PM4, PM2.5, and PM particulate concentrations simultaneously
- Partisol™ 2025i Sequential Air Sampler (Thermo Scientific) stores 16 filter cassettes, allowing for a month of unattended sampling of PM on a 48 hour increment
- Meteorological tower with weather equipment



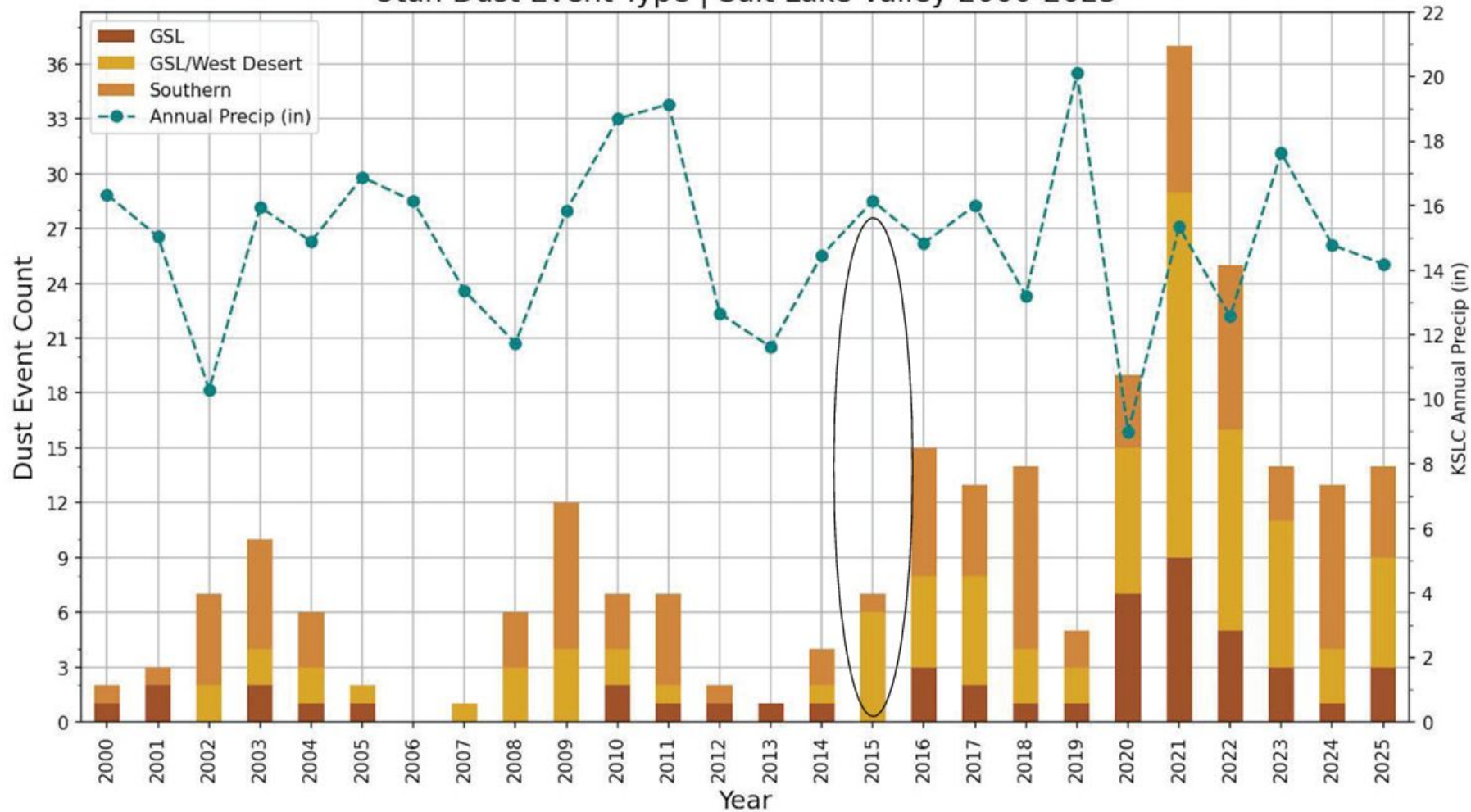
Utah Dust Event Legacy Database

UDAQ researchers (i.e., Mark Sghiatti, Rachel Edie, Bart Cubrich) compiled a dust legacy database of 25 years of events across multiple locations across the state based on dust event information from multiple Utah airport's Automated Surface Observing System (ASOS) combined with PM data (continuous and particulate) from UDAQ's State or Local Air Monitoring Stations

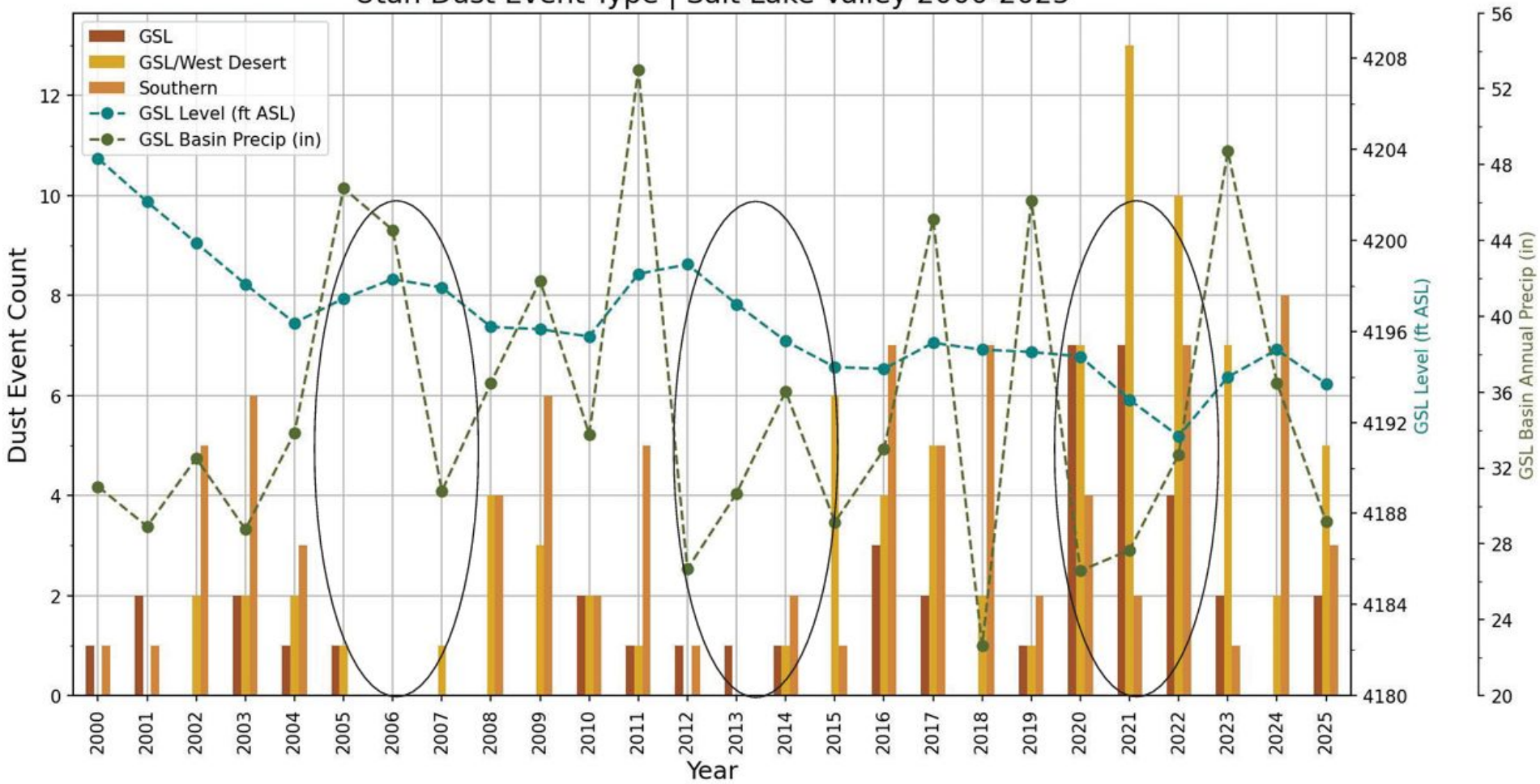




Utah Dust Event Type | Salt Lake Valley 2000-2025



Utah Dust Event Type | Salt Lake Valley 2000-2025



Utah Dust Metal Inventory

UDAQ is investing \$200,000 to perform advanced chemical analysis (ICP-MS at the Desert Research Institute in Reno, NV) on dust filters dating back to 2010 to identify the specific elements—such as arsenic or lead—carried in the wind

Date	Actual net mass (ug)	UDAQ sample ID	LIPC	LIPU	BEPC	BEPU	NAPC	NAPU	MGPC	MGPU
1/19/2025	192	2597701	0.00219	0.00169	0.00019	0.00330	23.61759	2.29558	0.91161	0.06383
1/20/2025	872	2597703	0.04092	0.00442	0.00037	0.00330	16.10237	1.56513	34.14213	2.36639
2/3/2025	588	2597760	0.02541	0.00304	0.00034	0.00330	13.02849	1.26636	9.59821	0.66531
2/4/2025	1239	2597761	0.10683	0.01081	0.00101	0.00331	25.20429	2.44981	38.39704	2.66129
4/24/2025	281	2598564	0.00620	0.00178	0.00017	0.00330	3.31479	0.32228	3.45406	0.23957
4/25/2025	349	2598616	0.00690	0.00181	0.00019	0.00330	3.58304	0.34835	4.27473	0.29642
5/11/2025	691	2598742	0.01384	0.00217	0.00054	0.00330	2.08774	0.20307	7.71789	0.53500
5/12/2025	2725	2598744	0.16302	0.01639	0.00244	0.00331	42.23298	4.10495	69.52990	4.81909
5/13/2025	1151	2598745	0.11322	0.01144	0.00088	0.00331	31.79005	3.08992	41.26743	2.86024
6/10/2025	504	2598995	0.00692	0.00181	0.00029	0.00330	2.04416	0.19883	4.52992	0.31410
6/11/2025	913	2598996	0.02140	0.00272	0.00067	0.00330	4.41280	0.42898	12.40239	0.85965

Past Dust Selection Criteria

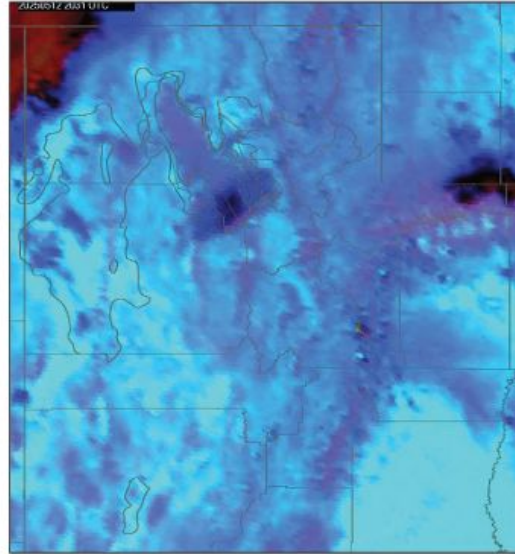
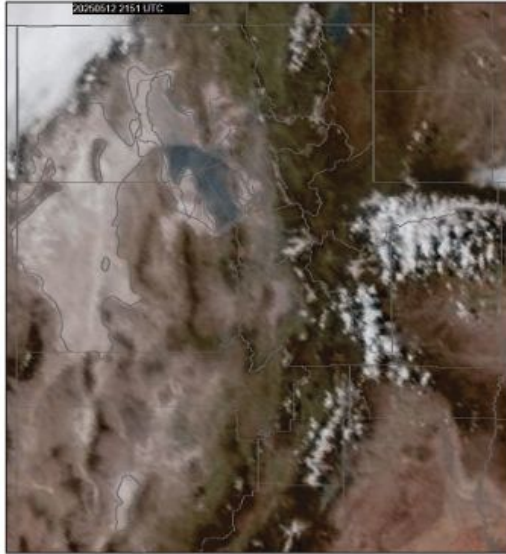
- 1) Metals in dust falling on surrounding Salt Lake City communities in 2023, 2024, and 2025 (PM10)
- 2) The human health implications of inhalable versus respirable dust (PM2.5)
- 3) The potential of fluctuating Great Salt Lake sediments to impact metal concentrations in dust (three low [2021, 2022, 2025] and three high water years [2011, 2012, 2013])
- 4) Extreme weather system characteristics and dust metal chemistry



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
**AIR
QUALITY**



Utah Department of
Health & Human
Services



Dust Metal Health Guidelines

Questions?



Bryce Bird



bbird@utah.gov



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