The SIDE Project

(Spatially Interpolated Demographic Estimates)

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National Center for Education Statistics

Education Demographic and Geographic Estimates (EDGE) Program

NCES Forum

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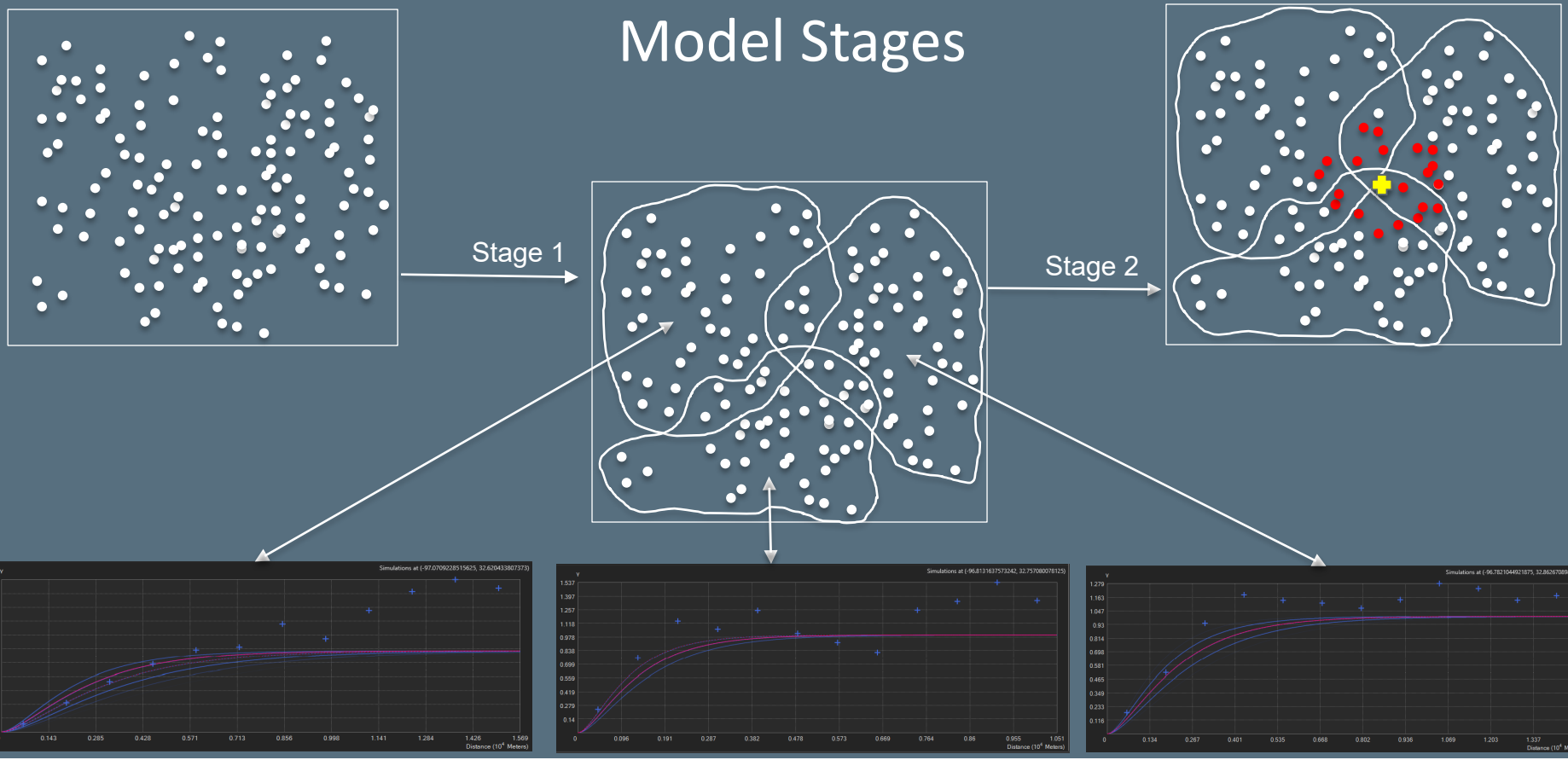
Issues with traditional school poverty indicator

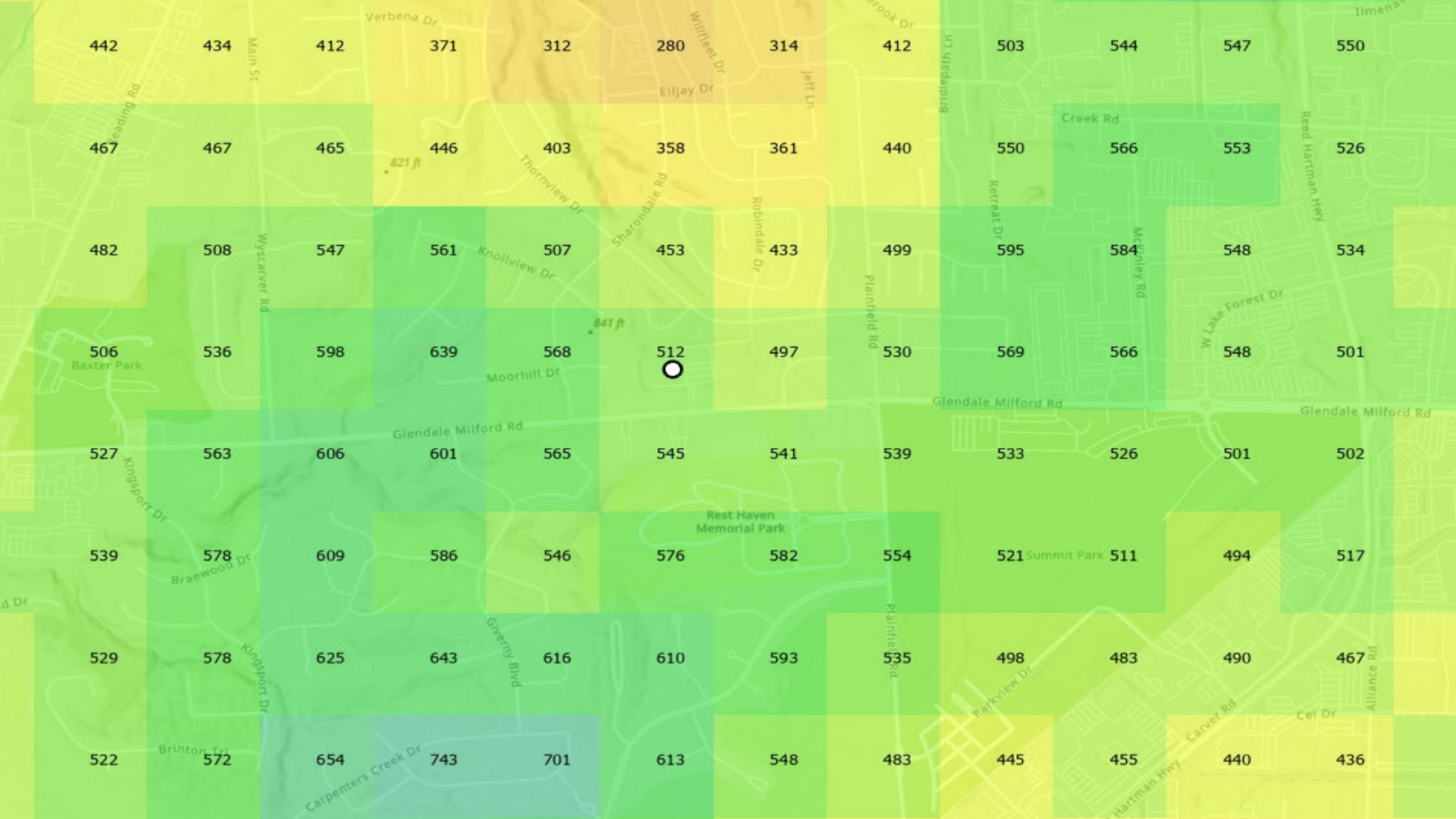
- Education programs tend to rely on indicators of Free/Reduced-price lunch eligibility to identify economic need for students and schools
- Notable limitations:
  - Multiple uses create incentives for over-participation
  - Misidentification results in over-participation
  - Little capacity for income verification
  - Categorical measure (eligible/not)
  - Program changes affect data comparability and usability
- *We need multiple measures of poverty in/around schools*

Designing a new poverty indicator

- What's our best guess of the economic condition for household at XY location? (Point-based estimate; not area-based)
- Use a common metric from an authoritative source
  - Income-to-poverty ratio (IPR) from the American Community Survey (ACS)
  - Continuous measure (0-999); standard poverty criteria (IPR <=100)
  - Free and Reduced-price lunch eligibility relies on IPR of <130 and 130-185
- Apply a location-specific, privacy-protected estimation approach
  - Bayesian kriging produces a continuous prediction surface
  - Point-based estimates informed by neighbors (neighbor-based neighborhoods)
- Rasterize estimates to support simple, scalable application

Model Stages

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539 578 609 586 546 576 582 554 521 511 494 517
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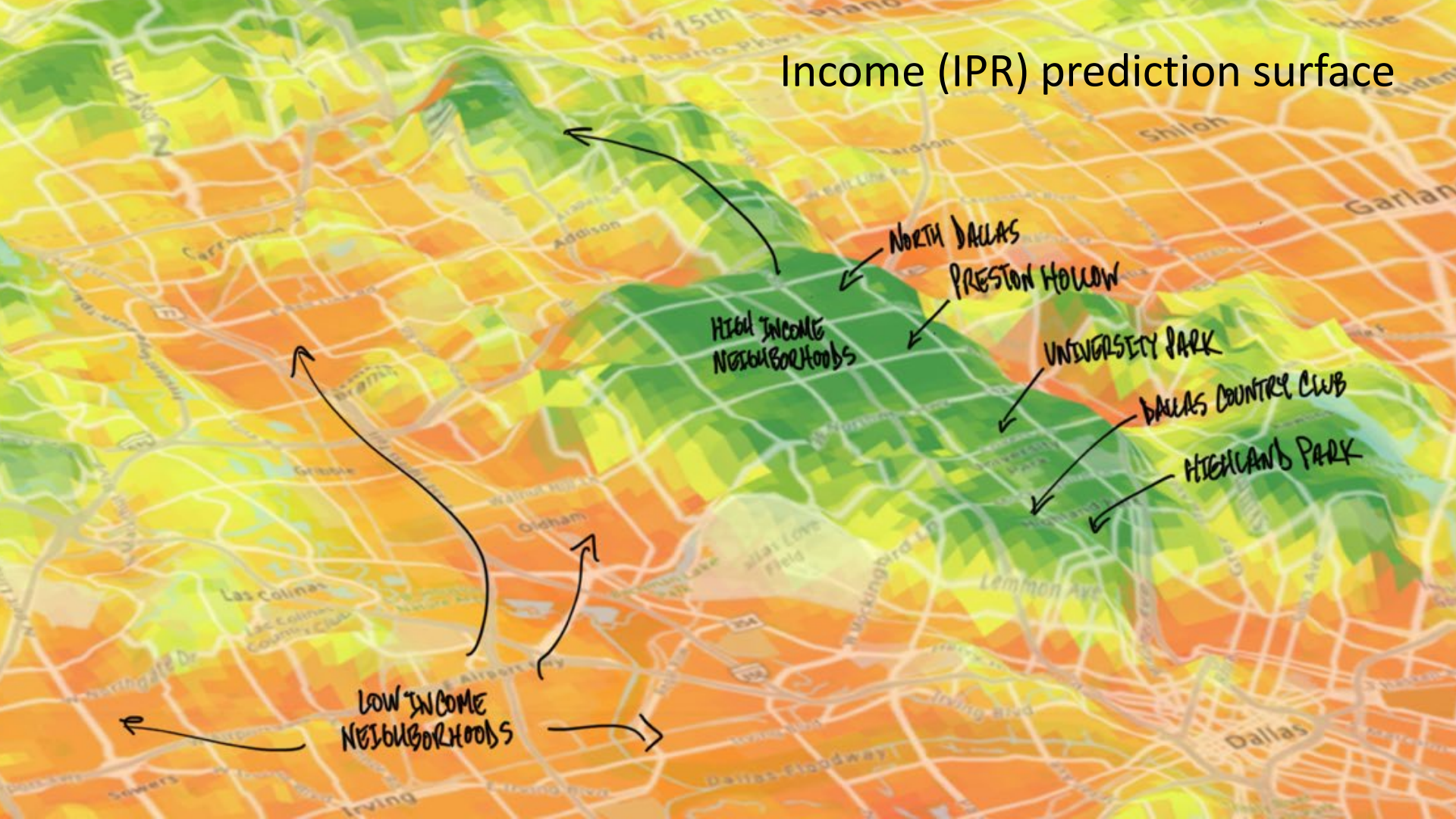
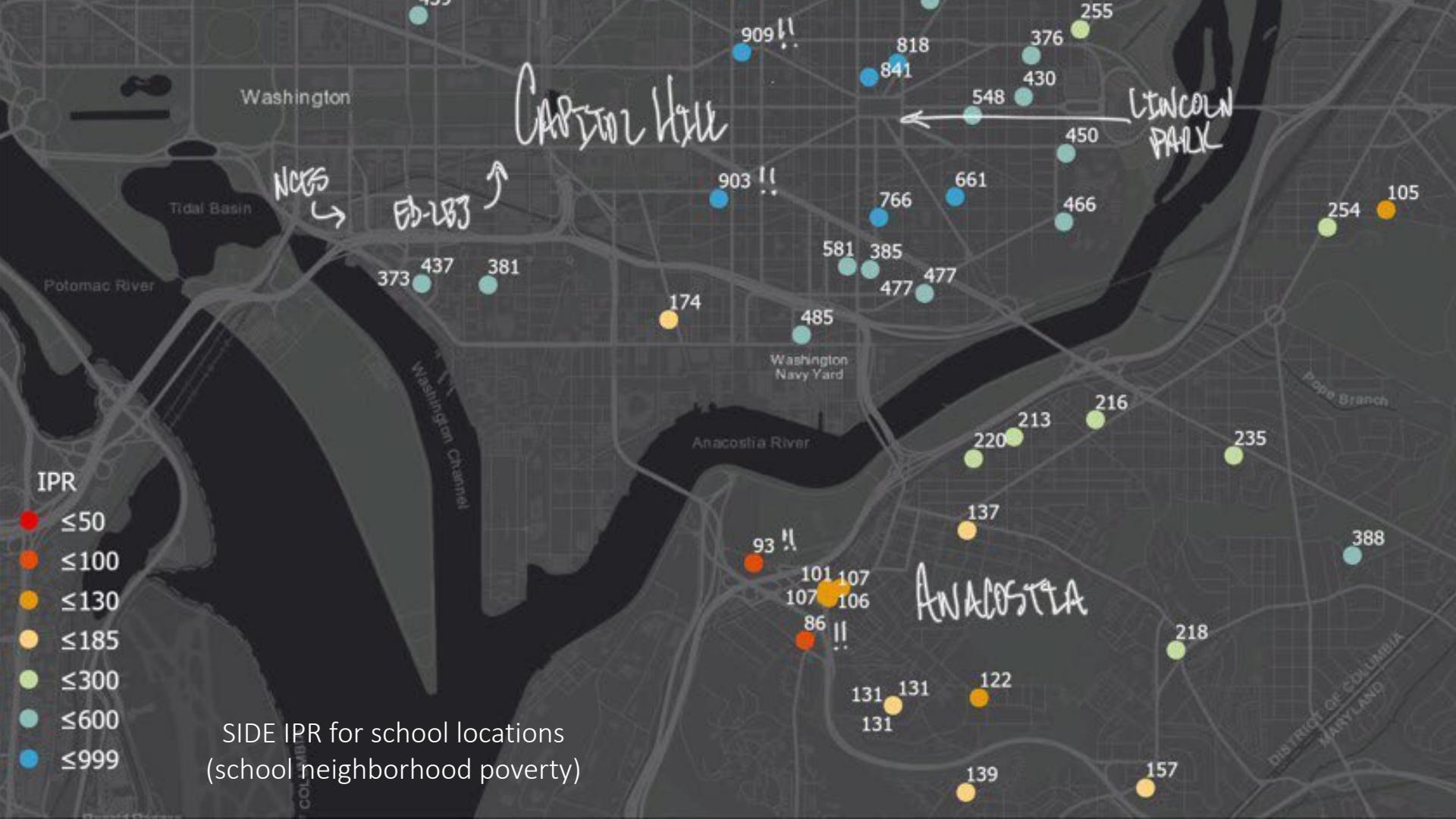
522 572 654 743 701 613 548 483 445 455 440 436
Verbena Dr
Willneet Dr
Elijay Dr
Jeff Ln
Bridlepath Ln
Creek Rd
Reed Hartman Hwy
821 ft
Thornview Dr
Sharondale Rd
Robindale Dr
Retreat Dr
Mcginley Rd
Knollview Dr
Wyscarver Rd
Main St
Plainfield Rd
W Lake Forest Dr
841 ft
Baxter Park
Moorhill Dr
Glendale Milford Rd
Glendale Milford Rd
Glendale Milford Rd
Kingsport Dr
Rest Haven
Memorial Park
Summit Park
Braewood Dr
Giverny Blvd
Kingsport Dr
Plainfield Rd
Parkview Dr
Carver Rd
Alliance Rd
Cel Dr
Brinton Trl
Carpenters Creek Dr

Income (IPR) prediction surface

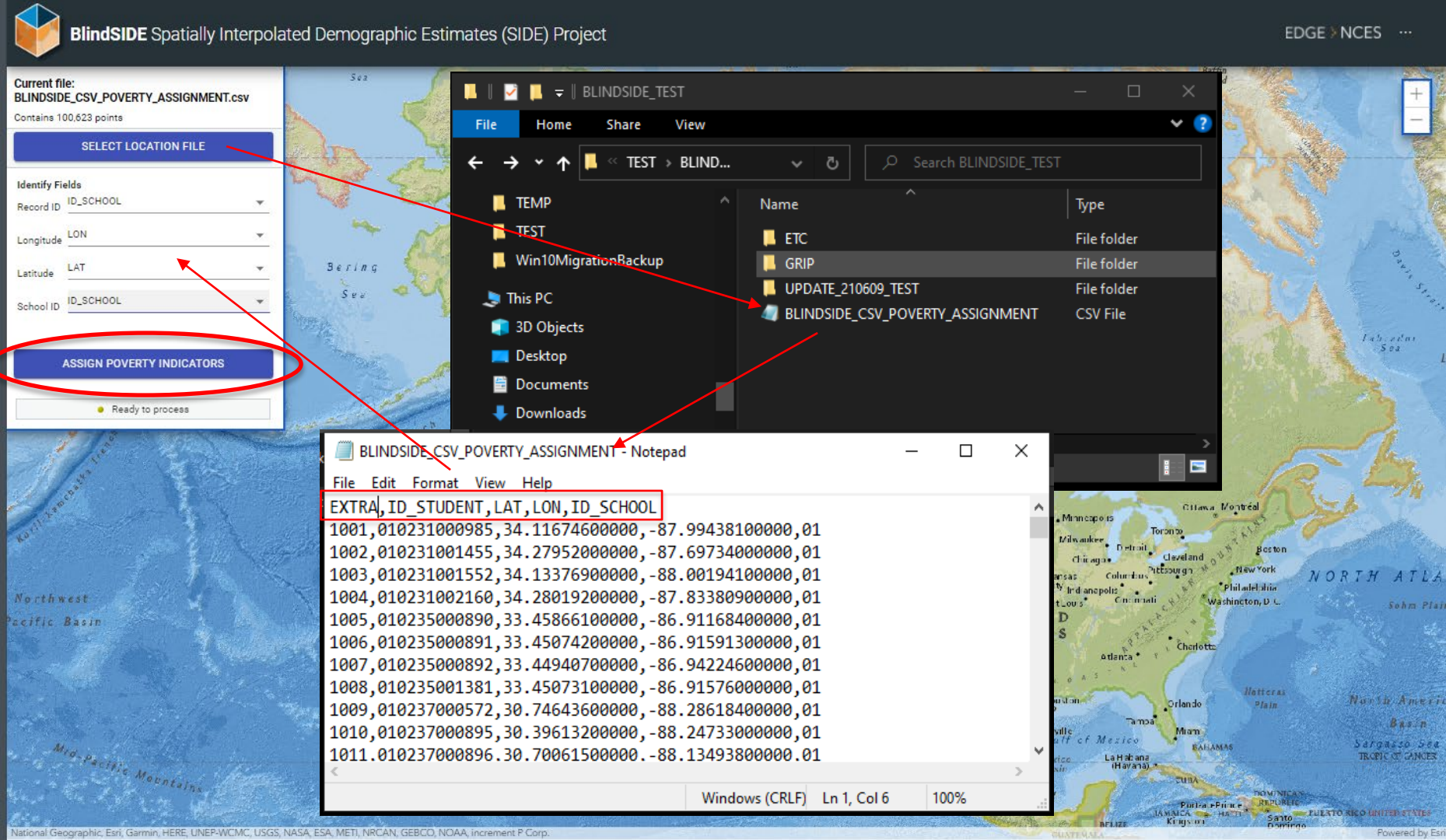




SIDE IPR for school locations
(school neighborhood poverty)

Deploying a new poverty indicator

- How to assign a location-based indicator if we don’t know student locations?
- Share SIDE data with states so they don’t have to share student data with us
- Create assignment tool (BlindSIDE) that allows states to apply SIDE indicators to student address geocodes safely behind organizational firewalls
- Converts and integrates SIDE surface into native browser environment
- Robust, account-controlled, and easy to use


BlindSIDE Spatially Interpolated Demographic Estimates (SIDE) Project
EDGE > NCES
Current file:
BLINDSIDE_CSV_POVERTY_ASSIGNMENT.csv
Contains 100,623 points
SELECT LOCATION FILE
Identify Fields
Record ID ID_SCHOOL
Longitude LON
Latitude LAT
School ID ID_SCHOOL
ASSIGN POVERTY INDICATORS
Ready to process
BLINDSIDE_TEST
File Home Share View
TEST › BLIND...
Search BLINDSIDE_TEST
TEMP
TEST
Win10MigrationBackup
This PC
3D Objects
Desktop
Documents
Downloads
Name
Type
ETC
File folder
GRIP
File folder
UPDATE_210609_TEST
File folder
BLINDSIDE_CSV_POVERTY_ASSIGNMENT
CSV File
BLINDSIDE_CSV_POVERTY_ASSIGNMENT - Notepad
File Edit Format View Help
EXTRA,ID_STUDENT,LAT,LON,ID_SCHOOL
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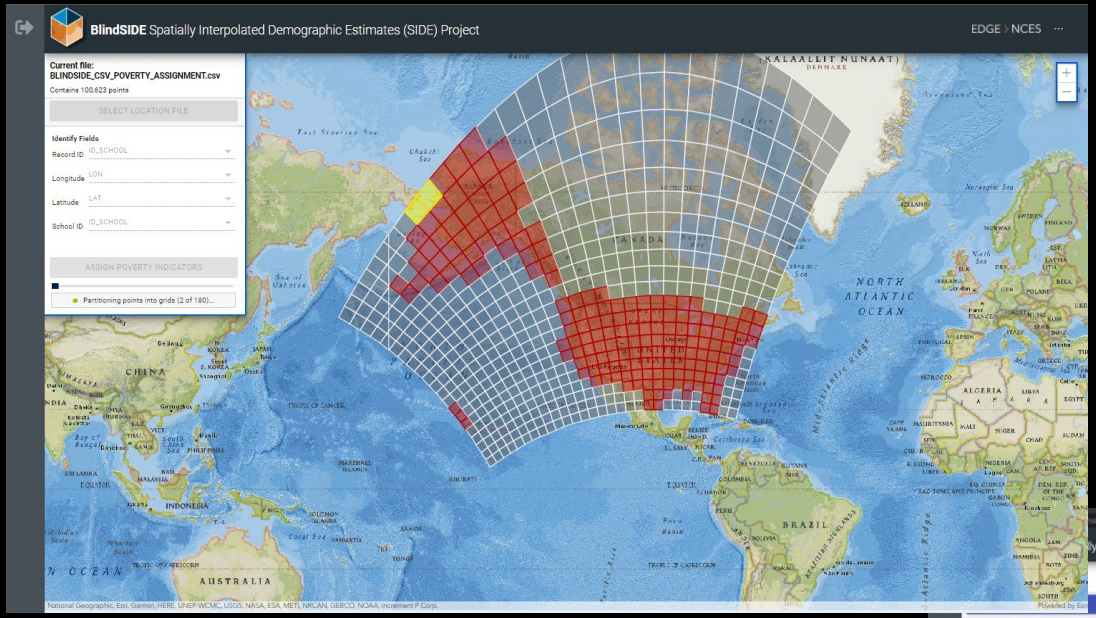
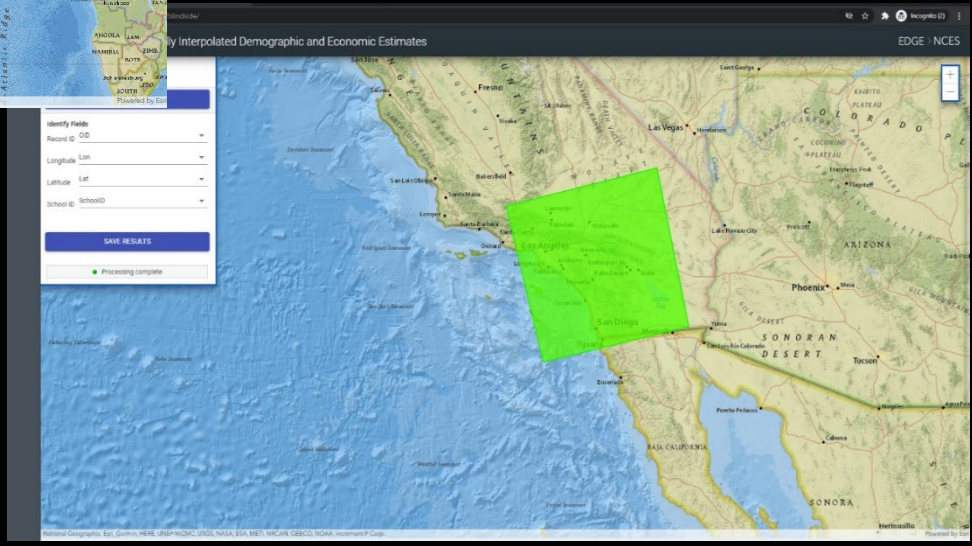
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
Powered by Esri



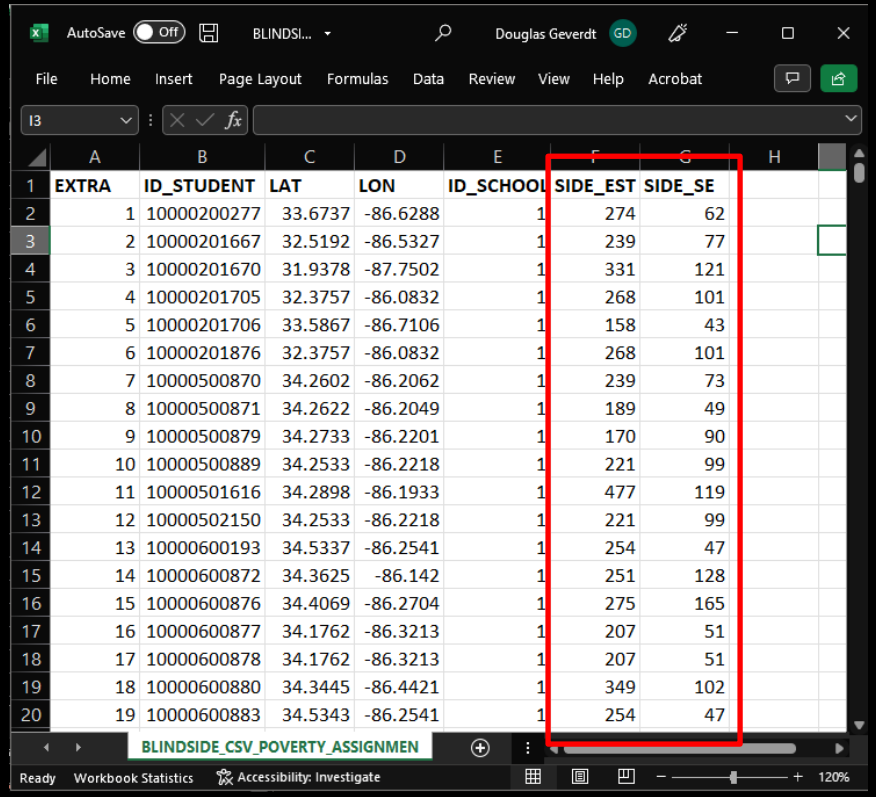
What part of the poverty prediction fabric is needed to make assignments for a district in southern California?

Send the necessary data parcel needed to assign student geocodes in local browser.



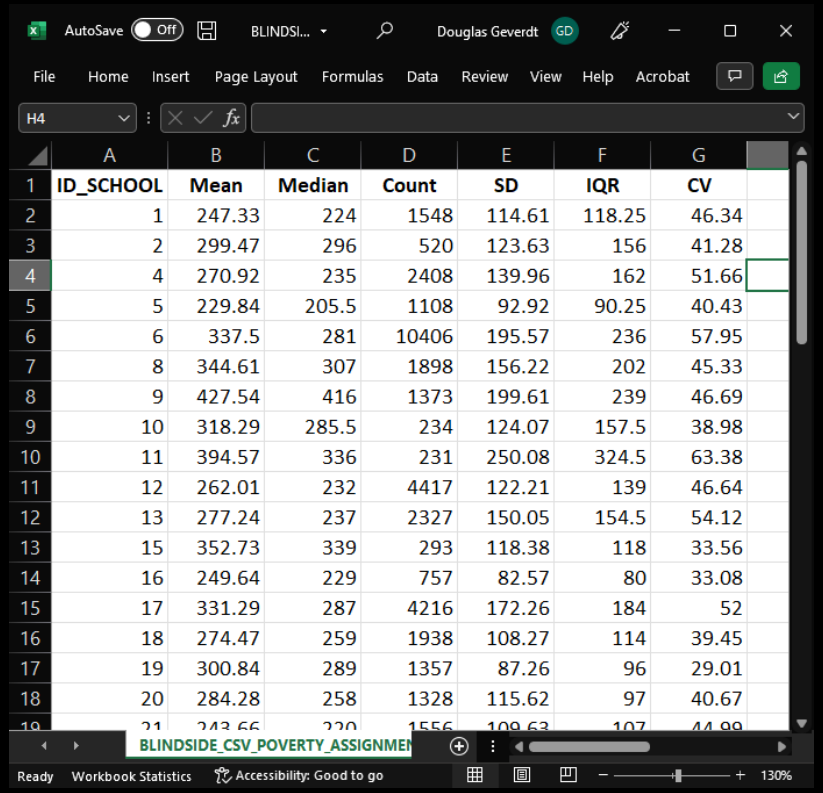
Resulting output: Student and School files

Original Student file items + SIDE assignment



	A	B	C	D	E	F	G
1	EXTRA	ID_STUDENT	LAT	LON	ID_SCHOOL	SIDE_EST	SIDE_SE
2	1	10000200277	33.6737	-86.6288	1	274	62
3	2	10000201667	32.5192	-86.5327	1	239	77
4	3	10000201670	31.9378	-87.7502	1	331	121
5	4	10000201705	32.3757	-86.0832	1	268	101
6	5	10000201706	33.5867	-86.7106	1	158	43
7	6	10000201876	32.3757	-86.0832	1	268	101
8	7	10000500870	34.2602	-86.2062	1	239	73
9	8	10000500871	34.2622	-86.2049	1	189	49
10	9	10000500879	34.2733	-86.2201	1	170	90
11	10	10000500889	34.2533	-86.2218	1	221	99
12	11	10000501616	34.2898	-86.1933	1	477	119
13	12	10000502150	34.2533	-86.2218	1	221	99
14	13	10000600193	34.5337	-86.2541	1	254	47
15	14	10000600872	34.3625	-86.142	1	251	128
16	15	10000600876	34.4069	-86.2704	1	275	165
17	16	10000600877	34.1762	-86.3213	1	207	51
18	17	10000600878	34.1762	-86.3213	1	207	51
19	18	10000600880	34.3445	-86.4421	1	349	102
20	19	10000600883	34.5343	-86.2541	1	254	47

School summary file



	A	B	C	D	E	F	G
1	ID_SCHOOL	Mean	Median	Count	SD	IQR	CV
2	1	247.33	224	1548	114.61	118.25	46.34
3	2	299.47	296	520	123.63	156	41.28
4	4	270.92	235	2408	139.96	162	51.66
5	5	229.84	205.5	1108	92.92	90.25	40.43
6	6	337.5	281	10406	195.57	236	57.95
7	8	344.61	307	1898	156.22	202	45.33
8	9	427.54	416	1373	199.61	239	46.69
9	10	318.29	285.5	234	124.07	157.5	38.98
10	11	394.57	336	231	250.08	324.5	63.38
11	12	262.01	232	4417	122.21	139	46.64
12	13	277.24	237	2327	150.05	154.5	54.12
13	15	352.73	339	293	118.38	118	33.56
14	16	249.64	229	757	82.57	80	33.08
15	17	331.29	287	4216	172.26	184	52
16	18	274.47	259	1938	108.27	114	39.45
17	19	300.84	289	1357	87.26	96	29.01
18	20	284.28	258	1328	115.62	97	40.67
19	21	243.66	220	1556	109.63	107	44.99

State/Local Capacity

- How to build State and District capacity to apply the SIDE/BlindSIDE solution?
- Statewide Longitudinal Data System (SLDS) pilot
  - Provided modest funding in the most recent funding cycle for a pilot project
  - Working with states to explore and test
- Early exploration (What do we know?)
  - Do States have student addresses?
  - Do States routinely geocode student addresses?
  - Do States use spatial data for analysis and decision-making?

Early Findings

- Substantial variation, but mostly modest capacity
  - Some states have full geocode coverage and regularly analyze spatial data
  - Some states aren't allowed to have student addresses
  - Most states are getting more questions that require geo data to answer
- BlindSIDE is easy to use
- Produces lower IPR counts relative to NSLP, but similar behavior
- Limited looks at income diversity suggest high level of homogeneity

Preliminary Outlook

- Benefits:
  - Standard sources and definitions
  - Spatially focused income indicator optimized for any location
  - Safe to develop and apply
  - Good potential as a school poverty indicator
- Limitations:
  - Does not provide area-based estimates (e.g., not for school districts)
  - Does not fully address potentially meaningful boundaries
  - IPR is not familiar (How to intuitively calibrate? What does 317 mean?)

Questions?

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