

Maryland Department of Health
and Mental Hygiene (DHMH)

The CPEST Mapper

A GIS Mapping Application

CDC's Tracking Program Monthly Webinar

October 22, 2007

List of presenters

- Rashid Malik – GIS programmer analyst
Maryland EPHT Program
- Carolyn F. Poppell, MS – Epidemiologist
Maryland Center for Cancer Surveillance and Control
and University of Maryland, Baltimore
- Parveeza Shaikh – Programmer
Maryland EPHT Program
- Diane M. Dwyer, MD - Medical Director
Maryland Center for Cancer Surveillance and Control
- Clifford S. Mitchell, MS, MD, MPH – Principal Investigator
Maryland EPHT Program
- John Braggio, PhD MPH - Coordinator
Maryland EPHT Program

Webinar Overview

- Introduction
- Overview of CPEST Mapper
 - Developmental efforts
 - Purpose, features, and capabilities
- Live demonstration
- Current status and future directions
- Question/answer period

Maryland Cancer Prevention, Education, Screening and Treatment (CPEST) Program

- Began in 2000 with funds from Cigarette Restitution Fund
- Offers cancer education/outreach, no-cost screening, and treatment
- Services for low-income, uninsured residents
- Implemented through local health departments
- Seven priority cancers
- Data maintained in cancer Client Database at DHMH (colorectal, prostate, oral, skin)

CPEST Mapper: Response to a Public Health Need

- Program need: tool for data display and analysis of cancer screening data
- Develop GIS capacity in the Maryland DHMH

How does CPEST Mapper meet these needs?

Development of Solution

- Challenges of using GIS in health department
- As a solution, the GIS unit developed a mapping application using ArcIMS (ESRI)

and

- Tailored to health professionals
- Complex features were simplified
- “Technical” requirements were broken down
- Customized application was named “Interactive Health Application (IHA)”

Development of Solution (cont.)

- Applications of Interactive Health Application (IHA)
 - CPEST Mapper – Used as an analytical tool by Cancer Prevention, Education, Screening and Testing Program within DHMH and for local health departments
 - IHA is also used by other divisions within DHMH
- Features
 - Increases data integration among different data sets from different sources
 - Facilitates data queries, searches, and reports
 - Allows data owners to control data display
 - Provides secure and controlled access to data

Overview

CPEST Mapper

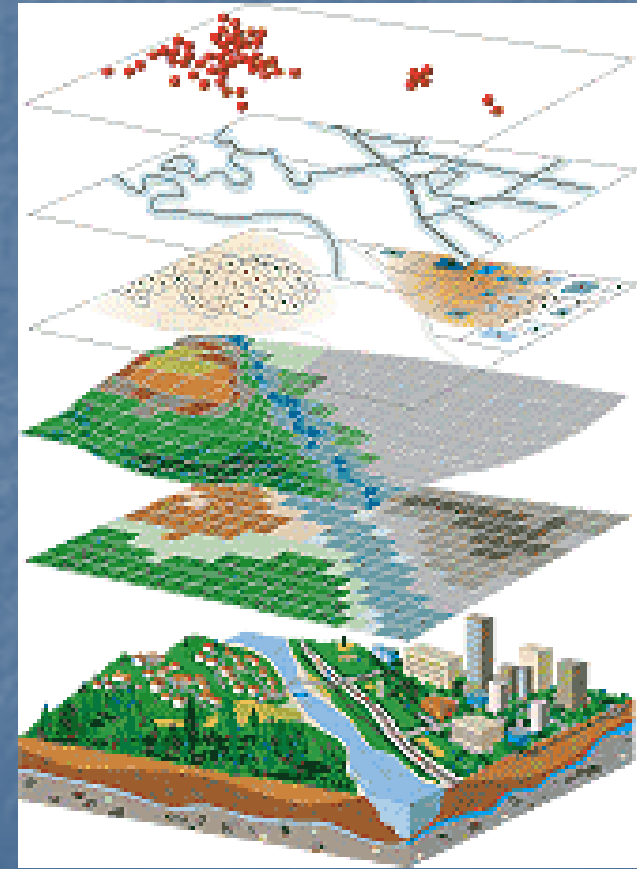
CPEST Mapper helps local health departments and DHMH staff:

- Visualize, query, analyze, and report cancer screening data in the CPEST Client Database
- Assess the extent of CPEST screening
- Integrate information needed for decision-making
- Gain entrée into GIS

Overview

What is CPEST Mapper?

- User-friendly computer application (no GIS experience needed)
- Contains
 - Colorectal cancer (CRC) screening data (de-identified, aggregated)
 - Geographic boundaries (county, Zip code, census tract)
 - Population data (by census tract)
 - Facilities (hospitals, gastroenterologists, health depts.)
 - Infrastructure (roads, major cities)



Source: ESRI

CPEST Mapper Features

- Pilot version
- User selects maps/layers of interest
- Maps display:
 - Number of CRC screening procedures performed (fecal occult blood test [FOBT], sigmoidoscopy, or colonoscopy)
 - Cumulative screening data (2000 through June 2007)
 - No confidential information - no restrictions on sharing output

CPEST Mapper Features (cont.)

- User has option to map aggregated CRC screening data by client's:
 - county or Zip code
 - gender
 - minority status
- Access via DHMH Intranet
- Password-protected access
- Limited the number of users for pilot phase

Sample Maps

Live Demonstration

- Example 1. Fecal occult blood tests (FOBTs) performed, by Zip code, in Carroll County
- Example 2. Washington County Zip code 21740, show:
 - County Health Department
 - Hospitals
 - Expressways and primary highways
 - Number of colonoscopies

Live Demonstration (cont.)

- Example 3. Zip codes with at least 100 colonoscopies
- Example 4. Locations of gastroenterologists within a 3-mile radius of the Baltimore County Health Department.
 - Print map for use in a report.

CPEST Mapper

Status and Evaluation

- Pilot application with colorectal cancer screening data
- Accessible by all local health departments in Maryland
- User support available (Web site and DHMH staff)
- Limited use to date
- Efforts to increase user familiarity and buy-in
 - Soliciting user feedback (user survey and regional meetings)
 - Developing county-specific maps
 - Hands-on training
 - Application enhancements

CPEST Mapper

Future Directions

Future versions could include:

- Screening data for other types of cancer (e.g., prostate, skin, oral)
- Capability to map by screening provider location
- Screening rates (using census population data)
- Other data sets
- Other options, based on user needs/feedback

Conclusion

- CPEST Mapper an example of collaboration between GIS, tracking, and programs to fill a specific need
- Secondary benefit – experience with a potential interface/tool for tracking program
- Ultimate goal – help Department do its job better and use data more effectively

Acknowledgments

- GIS Unit, Information Resources Management Administration
- Environmental Public Health Tracking Program (EPHT)
- Cigarette Restitution Fund Program
- Maryland local health departments
- Health Officers Data Use Workgroup

Supplement

Sample Maps

Example 1.

- Show the cumulative number of fecal occult blood tests (FOBTs) performed, by Zip code, in Carroll County for the period 2000 – June 2007.

Maryland CPEST MAPPER (January 2000 - June 30, 2007) [Password] [Logout]

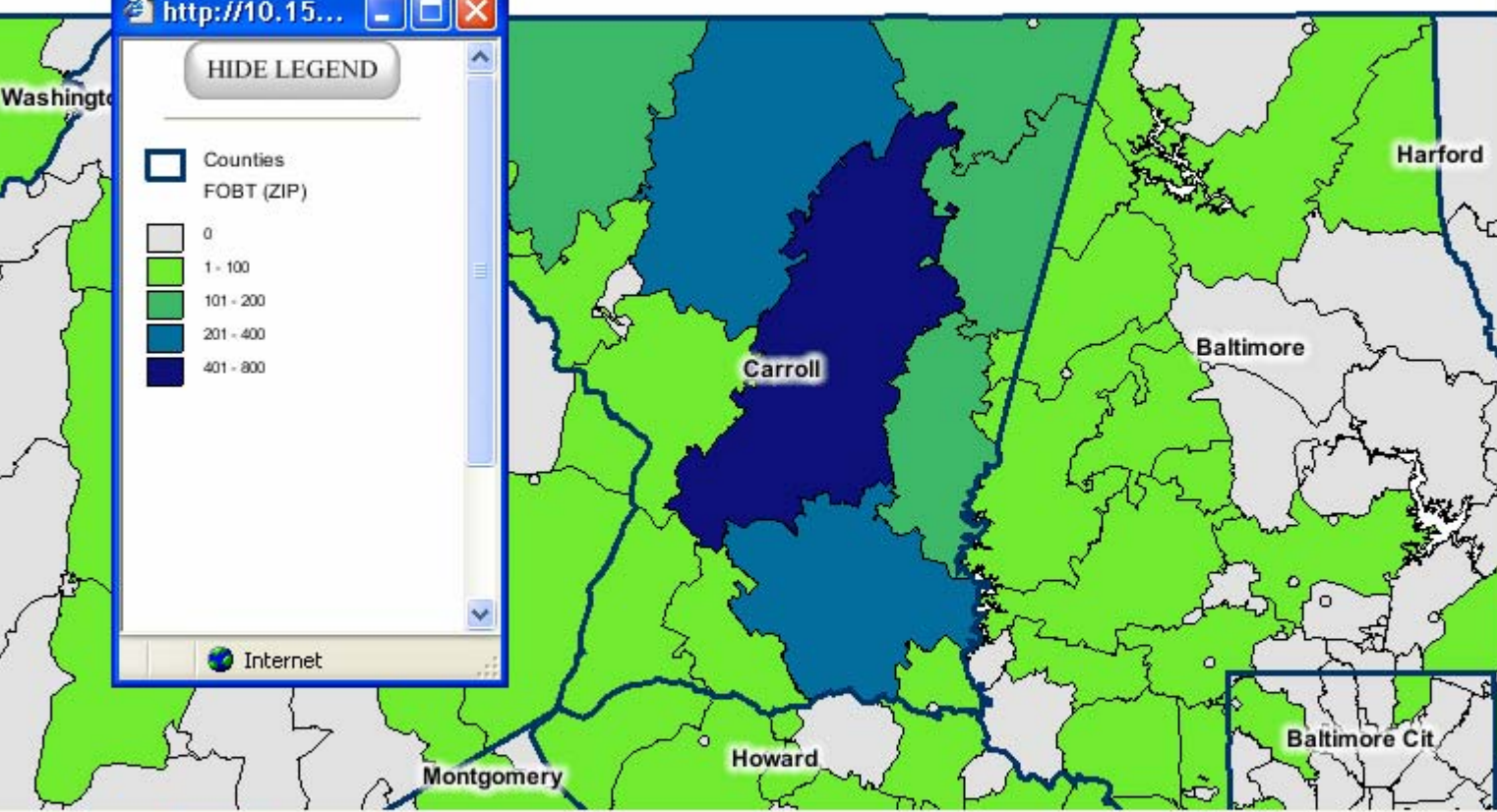
http://10.15... [Close] [Maximize] [Minimize]

HIDE LEGEND

Counties
FOBT (ZIP)

- 0
- 1 - 100
- 101 - 200
- 201 - 400
- 401 - 800

Internet



SHOW LEGEND

[Data Dictionary](#)

REFRESH MAP

Layers

- Visible Active
- Hospitals
 - Gastroenterologists
 - DHMH Locations
 - Health Departments
 - Major Cities
 - Expressways
 - Primary Highways
 - Other Highways
 - Census Tracts 2000
 - Counties
 - FOBT (ZIP)
 - SIG (ZIP)



ZOOM IN ZOOM OUT FULL EXTENT PAN IDENTIFY QUERY FIND
 Geocode BUFFER SELECT AREA SELECT POINT HYPERLINK CLEAR PRINT

Maryland CPEST MAPPER (January 2000 - June 30, 2007) [Password] [Logout]



SHOW LEGEND

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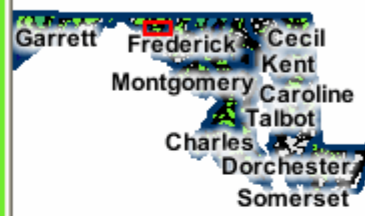


ZOOM IN ZOOM OUT FULL EXTENT PAN IDENTIFY QUERY FIND
 Geocode BUFFER SELECT AREA SELECT POINT HYPERLINK CLEAR PRINT

Example 2.

- For Washington County Zip code 21740, show:
 - County Health Department
 - Hospitals
 - Expressways and primary highways
 - Number of colonoscopies performed for the period 2000 – June 2007

Maryland CPEST MAPPER (January 2000 - June 30, 2007) [\[Password\]](#) [\[Logout\]](#)



SHOW LEGEND

[Data Dictionary](#)

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ZOOM IN ZOOM OUT FULL EXTENT PAN IDENTIFY QUERY FIND

Geocode BUFFER SELECT AREA SELECT POINT HYPERLINK CLEAR PRINT

Example 3.

- Show the Zip codes in Maryland where at least 100 colonoscopies have been performed during the period 2000 – June 2007.

COL (ZIP) is the active query layer.

1. Please select field for which you want to compare the values

COL [dropdown]

2. Please select the comparison operator

greater than or equal to [dropdown]

3. Please type the compare value or select compare value from the database

100 [input] [Select value from database button]

4. Click below to create and display query command

[Build Query Command button] SPATIAL.CPESTZIP.P3 >= 100

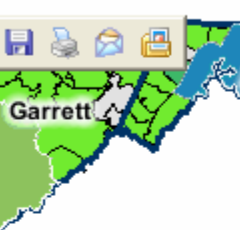
Optional - [View Logical Operator Examples](#)

Click on the logical operator to add it to the query command

[And] [Or] [Not] [()]

Follow steps 1 - 3 and click on Build Query Command to update query command.

[Generate Report] [Delete] [Clear]



[SHOW LEGEND button]

[Data Dictionary](#)

[REFRESH MAP button]

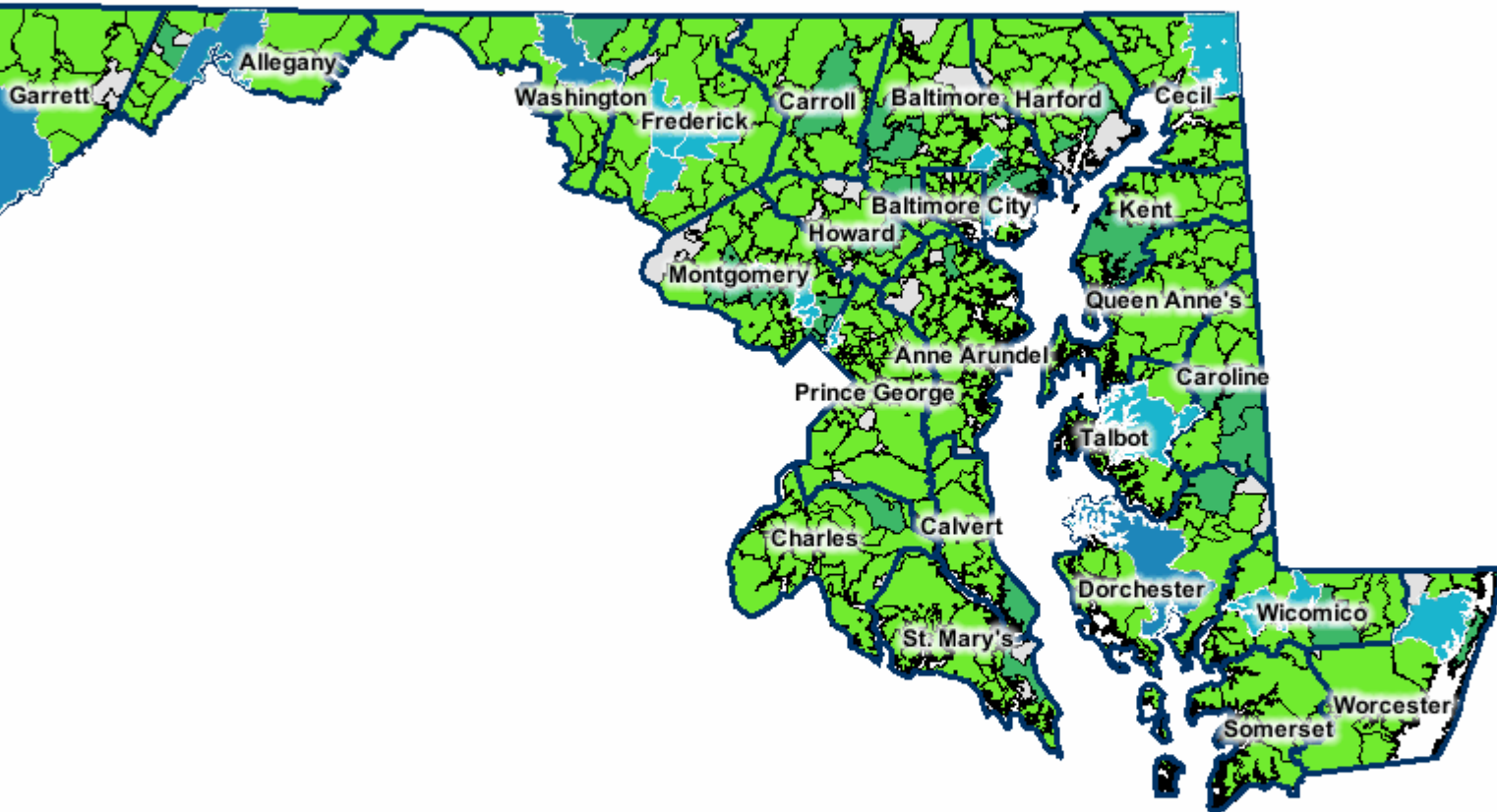
Layers

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- DHMH Locations
- Health Departments
- Census Tracts 2000
- Counties
- FOBT (ZIP)
- SIG (ZIP)
- COL (ZIP)
- SIG & COL (ZIP)
- MALES with FOBT (ZIP)



[ZOOM IN] [ZOOM OUT] [FULL EXTENT] [PAN] [IDENTIFY] [QUERY] [FIND] [Geocode] [BUFFER] [SELECT AREA] [SELECT POINT] [HYPERLINK] [CLEAR] [PRINT]

Maryland CPEST MAPPER (January 2000 - June 30, 2007) [\[Password\]](#) [\[Logout\]](#)



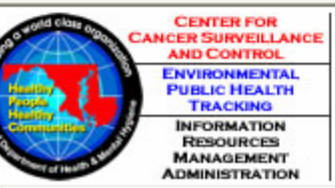
SHOW LEGEND

[Data Dictionary](#)

REFRESH MAP

Layers

- | Visible | Active | | |
|-------------------------------------|----------------------------------|-----------------------|--|
| <input type="checkbox"/> | <input type="radio"/> | Hospitals | |
| <input type="checkbox"/> | <input type="radio"/> | Gastroenterologists | |
| <input type="checkbox"/> | <input type="radio"/> | DHMH Locations | |
| <input type="checkbox"/> | <input type="radio"/> | Health Departments | |
| <input type="checkbox"/> | <input type="radio"/> | Census Tracts 2000 | |
| <input checked="" type="checkbox"/> | <input type="radio"/> | Counties | |
| <input type="checkbox"/> | <input type="radio"/> | FOBT (ZIP) | |
| <input type="checkbox"/> | <input type="radio"/> | SIG (ZIP) | |
| <input checked="" type="checkbox"/> | <input checked="" type="radio"/> | COL (ZIP) | |
| <input type="checkbox"/> | <input type="radio"/> | SIG & COL (ZIP) | |
| <input type="checkbox"/> | <input type="radio"/> | MALES with FOBT (ZIP) | |
| <input type="checkbox"/> | <input type="radio"/> | MALES with SIG | |



ZOOM IN ZOOM OUT FULL EXTENT PAN IDENTIFY QUERY FIND

Geocode BUFFER SELECT AREA SELECT POINT HYPERLINK CLEAR PRINT

COL (ZIP)

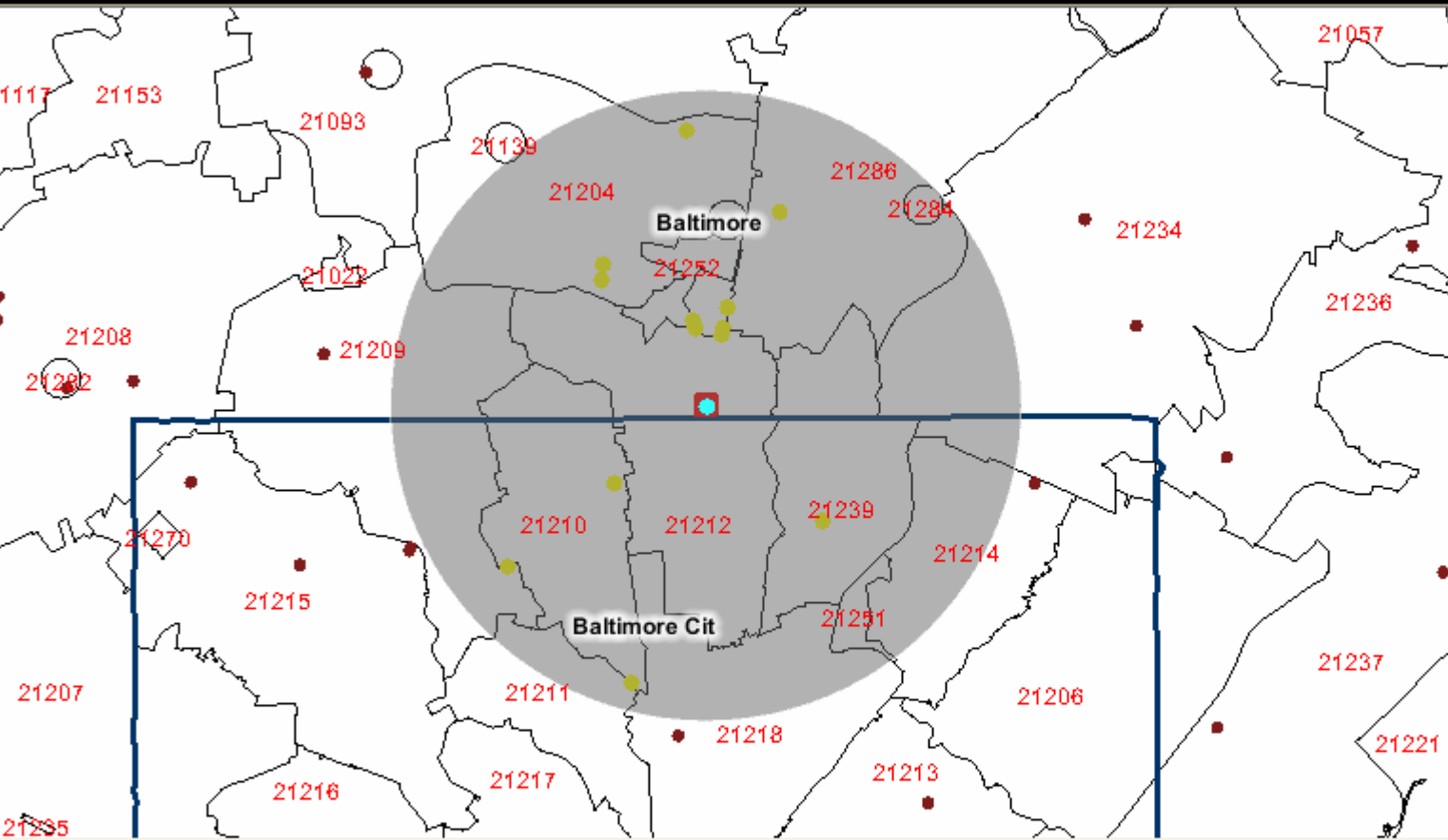
ZIP	ZIPNAME	COUNTY_ZIP	FOBT	SIG	COL	SIGCOL	FOBT_m	SIG_m	COL_m	SIGCOL_m	FOBT_f	SIG_f	COL_f	SIGCOL_f	FOBT_min	SIG_min	COL_min	SIGCOL_min
21921	Elkton	2401521921	49	1	103	104	18	1	29	30	31	0	74	74	13	0	19	19
21221	Baltimore - Essex	2400521221	0	1	104	105	0	0	26	26	0	1	78	79	0	1	30	31
21222	Baltimore - Dundalk - Sparrows Point	2400521222	1	0	129	129	0	0	30	30	1	0	99	99	0	0	28	28
21234	Baltimore - Parkville	2400521234	1	0	113	113	0	0	44	44	1	0	68	68	0	0	57	57
21502	Cumberland	2400121502	23	10	269	279	3	4	77	81	20	6	192	198	1	0	13	13
21613	Cambridge	2401921613	0	2	228	230	0	0	75	75	0	2	153	155	0	2	127	129
21801	Salisbury	2404521801	58	15	152	167	6	2	45	47	52	13	107	120	46	12	113	125
20906	Silver Spring - Aspen Hill	2403120906	136	3	169	172	39	2	49	51	97	1	120	121	81	0	161	161
21740	Hagerstown / Southwest	2404321740	34	3	279	282	7	2	103	105	27	1	176	177	3	0	38	38
21601	Easton	2404121601	2	1	150	151	0	1	31	32	2	0	119	119	0	0	87	87
20877	Gaithersburg - Summit Avenue	2403120877	74	0	118	118	22	0	30	30	48	0	88	88	42	0	117	117
20902	Silver Spring - Wheaton	2403120902	114	0	139	139	34	0	36	36	79	0	103	103	85	0	133	133
21701	Frederick - College Estates	2402121701	8	0	141	141	3	0	40	40	5	0	101	101	2	0	80	80
21702	Frederick - College Estates	2402121702	2	0	138	138	1	0	45	45	1	0	93	93	1	0	107	107
21550	Oakland	2402321550	587	0	247	247	24	0	50	50	563	0	197	197	4	0	2	2
20783	Hyattsville - Adelphi	2403320783	415	0	157	157	171	0	51	51	244	0	106	106	402	0	157	157
21811	Berlin	2404721811	0	2	111	113	0	0	27	27	0	2	84	86	0	1	65	66
21703	Frederick	2402121703	1	0	123	123	0	0	33	33	1	0	90	90	0	0	97	97

[Zoom to these records](#)

Example 4.

- Show the locations of gastroenterologists offices within a 3-mile radius of the Baltimore County Health department. Print map for use in a report.

Maryland CPEST MAPPER (January 2000 - June 30, 2007) [\[Password\]](#) [\[Logout\]](#)



SHOW LEGEND

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ZOOM IN ZOOM OUT FULL EXTENT PAN IDENTIFY QUERY FIND
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Gastroenterologists

Rec	First	Last	Street	City	State	Zip	County	County
1	STANLEY	MORRISON	RUSSELL MORGAN BLDG, 5601 L	BALTIMORE	MD	21239	Balto City	4103236228
2	DAVID	POSNER	100 WEST RD	TOWSON	MD	21204	Baltimore Cnty	4100332093
3	MICHAEL	COX	100 WEST RD	TOWSON	MD	21204	Baltimore Cnty	4103329356
4	JAMES	NOVICK	2 HAMILL RD	BALTIMORE	MD	21210	Balto City	4100433093
5	SALAH	NASRALLAH	201 E UNIVERSITY PKWY	BALTIMORE	MD	21218	Balto City	4104675501
6	CARLTON	GREENE	515 FAIRMOUNT AVE	TOWSON	MD	21286	Baltimore Cnty	4104941315
7	COMFORTCARE	DUREZA	5506 GREENLEAF RD	BALTIMORE	MD	21210	Balto City	4100532086
8	MOMINA	MORRISON	5601 LOCH RAVEN BLVD	BALTIMORE	MD	21239	Balto City	4104645617
9	MICHAEL	BLUME	5601 LOCH RAVEN BLVD	BALTIMORE	MD	21239	Balto City	4104645615
10	LAWRENCE	MILLS JR	5601 LOCH RAVEN BLVD	BALTIMORE	MD	21239	Balto City	4105324372
11	DAVID	HUTCHEON	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4430849026
12	DAVID	KAFONEK	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4430849026
13	MALLIKA	VRANIAN	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4100828071
14	GEORGE	VRANIAN	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4100828071
15	ROBERT	YIN	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4100583003
16	LINDA	ROSENTHAL	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4100583003
17	JOHN	COVINGTON	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4105830300
18	JONATHAN	SCHREIBER	6565 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4103329555
19	SANJAY	JAGANNATH	6701 N CHARLES ST	TOWSON	MD	21204	Baltimore Cnty	4430849023
20	LOC	LE	7300 YORK RD	TOWSON	MD	21204	Baltimore Cnty	4106027782
21	EDWARD	ZIMMERMAN	7300 YORK RD	TOWSON	MD	21204	Baltimore Cnty	4106027782
22	LILA	TARMIN	7300 YORK RD	TOWSON	MD	21204	Baltimore Cnty	0
23	NICHOLAS	BELITSOS	7401 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4108281800
24	GEORGE	VRANIAN	7401 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	0
25	ROBERT	KNODELL	7401 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4102960033
26	MARK	NOAR	7402 YORK RD	TOWSON	MD	21204	Baltimore Cnty	4104941846
27	PETER	HORNEFFER	7505 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4102962520
28	NEIL	GOLDBERG	7505 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4100296042
29	ANDREW	ROSENSTEIN MD	7505 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4100296042
30	LISA	PICHNEY	7505 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4100769093
31	RAKESH	VINAYEK	7505 OSLER DR	TOWSON	MD	21204	Baltimore Cnty	4107699300
32	GEORGE	VRANIAN	7620 YORK RD	TOWSON	MD	21204	Baltimore Cnty	4105393035
33	LISA	PICHNEY	7620 YORK RD	TOWSON	MD	21204	Baltimore Cnty	0