UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OLEM Directive 9200.2-191

MEMORANDUM

SUBJECT: Geospatial Superfund Site Data Definitions and Recommended Practices

FROM: James E. Woolford, Director
Office of Superfund Remediation and Technology Innovation

Paul Leonard, Acting Director
Federal Facilities Restoration and Reuse Office

TO: Superfund Division Directors, Regions 1-10

PURPOSE

The purpose of this directive is to recommend national standards for the collection and maintenance of geospatial data for Superfund sites, to be carried out by U.S. Environmental Protection Agency (EPA) regional offices, with an expectation for data collection on proposed, final and deleted National Priorities List (NPL) and Superfund Alternative Agreement sites. Collection of geospatial Superfund site data that follows these standards promotes EPA's ability to share information with the public and to perform analyses to support program implementation and evaluation in a consistent fashion. Generally, these data should be collected and made available strictly for informational purposes.

This directive does not currently extend to time-critical removal actions and emergency response activities. The removal program will work toward developing a concurrent process that comports with this directive to ensure programmatic consistency and continuity.

BACKGROUND

The Office of Superfund Remediation and Technology Innovation (OSRTI) and the Federal Facilities Restoration and Reuse Office (FFRRO) have developed a set of definitions for the purposes of this document and recommended practices for data collection to help promote routine and consistent collection of site geospatial data. EPA currently collects such data for many Superfund sites, but much of this information is not widely available in electronic format at the national level. Specifically, this directive's objective is to help promote consistency in the collection and sharing of site- and operable unit- (OU) level data as well as other site-related geospatial data, such as the location of institutional controls (ICs) and the extent of contamination. Descriptive geospatial data generally should be collected and updated using clear and consistent definitions, as defined for the purposes of this document below, throughout the Superfund life cycle, and this information should be preserved as part of the site records.

Geospatial data, as they relate to Superfund sites, may include point data (latitude/longitude), lines, and/or polygons representing some site-related area of interest. Examples of point data include points representing a site's center, an entrance or other relevant features, such as building locations. In contrast, polygons may represent a site's perimeter, an individual OU's perimeter, areas covered by ICs or documented areas covering a release's known extent of contamination. While a single point may be the only available geospatial information early in the Superfund process, detailed site maps, depicting polygons for a site's perimeter, area of contamination and OUs, generally should all be available by the time EPA issues a Record of Decision (ROD) for a remedial action or signs an Action Memorandum (AM) for a Non-Time-Critical Removal Action, and, potentially, much earlier. Proactive and early collection of geospatial data is beneficial because it may facilitate investigational activities, communication, and decision making processes. As site characterization and cleanup progress, modification to this geospatial information may be necessary.

Superfund site geospatial data may be used for many purposes, both internal and external to the EPA. Externally, they can provide useful community-specific information to the public on EPA activities and the location of key site attributes. Internally, geospatial information can support analyses, such as the health and ecological impacts of cleanups, site characterization, emergency planning and cross-program collaboration.

RECOMMENDED PRACTICES

Collecting Geospatial Data:

Site geospatial data evolve and may be refined during a site's lifecycle. These data generally should be collected and maintained throughout the Superfund process, and as site data are refined, updated data should be collected as they become available. Typically, geospatial data are collected throughout the lifecycle of a site, and eventually may become part of the administrative record. *See* 40 C.F.R. § 300.810(a)(1).

It is important that Superfund geospatial information be collected and retained in a manner that is consistent with both federal and EPA standards and procedures. Please refer to the joint OSRTI and Office of Site Remediation and Enforcement (OSRE) guidance, "Transmittal Model Geospatial Data and Electronic Submission of Deliverables Language for Inclusion in CERCLA Statements of Work," (September 29, 2014) containing model language for collection and electronic submission of geospatial data. In addition, the Office of Land and Emergency Management (OLEM) is developing an OLEM geospatial technical resource document to describe recommended practices for OLEM program offices' data capture activities. When this resource becomes available, EPA regional Superfund program offices may use it as a guide when undertaking site data collection and retention activities.

While EPA does its best to ensure high quality geospatial data, the agency generally does not vouch for data accuracy, completeness or currency. EPA also does not independently verify data provided by external parties. EPA reserves the right to revise Superfund geospatial data at any time. A data disclaimer is provided at the end of this document.

Geospatial Definitions, for purposes of this guidance:

Superfund geospatial data may either be point data (latitude and longitude coordinates) or polygons, depending on the feature being represented and the information available at the time of data collection. Geospatial data should be collected concurrently with descriptive metadata. Please see the attachment for expected metadata fields, as described in the forthcoming OLEM technical resource document.

Point Data (Coordinates): The Superfund program primarily uses point data to identify a site's initial location when EPA adds a new site to the Superfund Enterprise Management System (SEMS) active site inventory. Section V.E of the Fiscal Year 2017 *Superfund Program Implementation Manual* (FY 2017 SPIM, OLEM Directive 9200.3-152) describes site point data entry into SEMS:

> *Regions should add decimal latitude and longitude values and associated metadata in SEMS for new sites added to the SEMS active site inventory once a specific location is determined for a site. To the extent practicable, this requirement extends to sites that have completed Pre-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Screening and do not get added to the active site inventory (VE-3).*

Coordinate data, representing the location of new sites, should be collected for all sites and entered as soon as practicably feasible.

Polygons: Superfund site polygon data may represent a number of site features. The Superfund program generally places the highest priority on the collection and documentation of site and OU polygons:

- Operable Unit Polygons: The OU polygons represent an individual OU's perimeters, which are used to identify a portion of a Superfund site with which assessment and response actions are associated. CERCLA regulations (40 C.F.R. § 307.14) define an OU as a *"discrete portion of a remedial response [that] manages migration, or eliminates or mitigates a release, threat of release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units . . . [that] may address geographical portions of a site."* Determined on a site-specific basis, OUs may represent distinct geographic areas, media or releases. Note that OUs may overlap geographically when representing distinct media or areas of concern.

- Total Site Polygon: The total site polygon represents the footprint of a whole site, defined for purposes of this document as the sum of all of the OUs and the current understanding of the full extent of contamination. For Federal Facility sites, the total site polygon may be the Facility boundary. As site investigation and remediation progress, OUs may be added, modified or refined, and the total site polygon should be updated accordingly.

Polygons may also represent other important site features:

- Institutional Controls: As discussed in existing EPA CERCLA guidance, institutional controls (ICs) are:

  Non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and/or protect the integrity of a response action. ICs typically are designed to work by limiting land and/or resource use or by providing information that helps modify or guide human behavior at a site ("Institutional Controls: A Guide to Planning, Implementing, Maintaining and Enforcing Institutional Controls at Contaminated Sites;" Office of Solid Waste and Emergency Response [OSWER] Directive 9355.0-89; December 2012).

  Generally, an IC polygon should represent the perimeter of an area subject to site ICs. The collection of geospatial data about the location of ICs is recommended whenever practicable. The IC polygon name should be the same as the IC names entered into SEMS, and the polygon description should match the IC type specified in SEMS.

- Extent of Contamination: Polygons of a site's extent of contamination represent areas of contaminated media, as identified during site investigations and as refined as the cleanup proceeds. *See* Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (OSWER Dir. 9355.3-01, Oct. 1988). These polygons are based on the best available data at the time they were created, and are subject to change or further refinement as contamination is found and as cleanup takes place. Polygons should be submitted/updated when possible at major milestones of site contamination definition. Previous polygons should be retained for historical purposes.

- Engineering Controls: Engineering controls (ECs) include physical structures and barriers (e.g., fences, walls, gates, caps) that prevent exposure to contamination. EC polygons may represent the location of specific ECs, such as the perimeter or a cap or fence line boundaries, but may also be captured as points (e.g., a gate) or lines (e.g., a fence), as appropriate.

- Reuse/Continued Use: In existing EPA CERCLA guidance, "Reuse" is discussed as an area where "*a new use, or uses, are occurring such that there has been a change in the type of use (e.g., industrial to commercial), or the property was unused and now supports a specific use*." The agency refers to "Continued Use" as areas that "*are being used in the same general manner as they were when the site became subject to the Superfund or Federal Facilities programs*" (FY 2017 SPIM). A reuse/continued use polygon may represent the perimeter of an area identified as being reused or in continued use. The reuse polygon name should be consistent between the polygon and the data stored in SEMS.

In addition to points and polygons, lines may be used to represent site features, such as fences, pipes or utilities.

Understanding that there may be some sensitivity issues with releasing certain types of geospatial data, regions may flag data for internal use only. Regions are still encouraged to collect these data for internal record keeping and analyses.[1]

[1] Freedom of Information Act (FOIA) discovery and federal records management requirements would still apply to these internal data.

Table 1: Key Types of Geospatial Superfund Site Data

Geospatial Information	Type of Data	May Be Initially Determined by:	Potential Milestones to Prompt Update:
Primary Site Location	Point	Pre-CERCLA Screening, Preliminary Assessment/Site Inspection (PA/SI), NPL Listing	Additional site assessment work, Remedial Investigation (RI) Engineering Evaluation/Cost Analysis (EE/CA)
Operable Units	Polygon	RI/EE/CA, Federal Facility Agreement (including but not limited to), Site Management Plans	Additional RI/EE/CA work, Record of Decision (ROD), Action Memorandum (AM), ROD/AM Amendments, Explanation of Significant Differences (ESD), Remedial Design (RD), Remedial Action (RA) Completion, Partial Deletion
Total Site Polygon (all OUs)	Polygon	RI/EE/CA, Federal Facility Agreement (including but not limited to), Site Management Plans	Additional RI/EE/CA work, RODs/AMs, ROD/AM Amendments, ESDs, RD, RA Completion, Deletion
Institutional Controls	Point, Line or Polygon	ROD/AM, ROD/AM Amendment, ESD, Letter to the file	RODs/AMs, ROD/AM Amendments, ESDs, creation of an ICs Implementation and Assurance Plan (ICIAP), letter to the file, implementation of a new IC instrument
Extent of Contamination	Polygon	RI/EE/CA	Additional RI/EE/CA work, RODs/AMs, ROD/AM Amendments, ESDs, RD, RA Completion, Deletion
Engineering Controls	Point, Line or Polygon	ROD/AM, ROD/AM Amendment, ESD, RD/RA, Letter to the file	RODs/AMs, ROD/AM Amendments, ESDs, Letter to the file
Continued Use/Reuse	Polygon	Defined throughout lifecycle of site	Updated as needed

Site Geospatial Lifecycle:

Regions may submit geospatial data as they become available but at minimum, data should be collected when a site reaches certain cleanup process milestones. Recommended practices for generation of geospatial data are outlined below.

Highest Priority:

- Primary Site Location Data should be recorded and entered into SEMS as part of the Pre-CERCLA screening (PCS) checklist/decision form (OLEM Directive 9200.3-107). Point data may be improved, refined or corrected as data become available.

- Operable Unit Polygons should be entered into SEMS when EPA issues a ROD (or AM) to address a corresponding OU, but regions are encouraged to enter them earlier in the Superfund lifecycle.
- Total Site Polygons may represent the sum of the OUs or the extent of the Federal Facilities Agreement, and their entry into SEMS is recommended to be done concurrently with a ROD's (or AM's) publication. Regions are encouraged to submit total site polygons early in the Superfund process, and update them as they change, but a preliminary site polygon should be captured no later than the completion of the first ROD (or AM) associated with a site.

Additional information, in order of priority for collection, when available:

- Institutional Controls location data should be captured when ICs are implemented.
- Extent of Contamination polygons, while sometimes difficult to define and subject to revision, are valuable information, which regions are encouraged to share when possible. Typically, these data would be defined during the RI and would be entered into SEMS after the RI (or EE/CA) is approved.
- Engineering Controls location data may be captured when ECs are implemented.
- Continued Use/Reuse Polygons may be entered into SEMS concurrently with the identification of continued use and/or determination of acres ready for reuse.

To ease collection and submission of geospatial data, regions are encouraged to require electronic submission of geospatial data as part of enforcement agreements with potentially responsible parties and in statements of work (SOWs) for site-specific contract work. Please see the joint OSWER/OSRE memorandum "Transmittal of Model Geospatial Data and Electronic Submission of Deliverables Language for Inclusion in CERCLA Statements of Work" (September 29, 2014) for appropriate model language for enforcement documents and contracts.

Updating and Revising Geospatial Data:

Accurate data are desired for all remedial sites that have a ROD, but this information may not be readily available in electronic format for all sites, and so the regions generally should prioritize obtaining this information as it becomes available. Site milestones, such as five-year reviews, ROD amendments or explanations of significant differences, may present opportunities to collect new, and update existing, site geospatial data.

Submission of Geospatial Data to Headquarters:

Ultimately, the Superfund Enterprise Management System (SEMS) will be the repository for linking Superfund geospatial data, metadata and vintage information to the site-specific data as well as storing and providing access to this information. However, because the modifications required for SEMS to appropriately store and distribute geospatial data are non-trivial, OSRTI is taking a phased approach, initially focusing on assisting the regions with development of

regional geodatabases that are synchronized with SEMS data and fed into an EPA enterprise geospatial framework.

Responsibilities as part of this initial phase are proposed as follows:

- Regions will be responsible for creating and maintaining regional geodatabases, following a standardized schema (see attachments). To assist in this process, Regions 2 and 8 have developed a template that will be made available at https://usepa.sharepoint.com/sites/oei/GISWORKGROUP/.
- The SEMS team will develop web services to allow joining of attributes and data synchronization between the regional geodatabases and SEMS.
- A process will be developed for the regional geodatabases to use the SEMS web service and to be harvested and merged into national data sets residing on the Shared Enterprise Geodata and Services (SEGS) servers.
- The Shared Enterprise Geodata and Services (SEGS) will create national geospatial web services from the data layers residing on an EPA enterprise geospatial framework that can be used by other EPA data systems and applications such as the EPA GeoPlatform Online (GPO), the Environmental Dataset Gateway (EDG), the Facility Registration Service (FRS) and Cleanups in My Community (CIMC).

The planning, design and implementation of a national solution in SEMS is a priority and will include representatives from all stakeholder groups and will coordinate closely with the EPA National GIS Workgroup.

Collection of Federal Facility Data:
Regions are encouraged to work with their Federal Agency counterparts to collect Federal Facility total site polygons (Facility boundary) and Operable Unit (OU) polygons. If data are received from another Federal Agency, States, or third parties such as potentially responsible parties or contractors, regional staff should work with the dataset to conform to the guidelines outlined in this directive, the "Transmittal Model Geospatial Data and Electronic Submission of Deliverables Language for Inclusion in CERCLA Statements of Work" (September 29, 2014) document and attachment and any OLEM technical resources guides that become available to the extent practicable.

Disclaimer:
When Superfund geospatial data are shared internally or with the public, OSRTI recommends the following caveat be included:

> *The Agency is providing this geospatial information as a public service and does not vouch for the accuracy, completeness or currency of data. Data provided by external parties is not independently verified by EPA. These data are made available to the public strictly for informational purposes. Data do not represent EPA's official position, viewpoint or*

opinion, express or implied. This information is not intended for use in establishing liability or calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States or third parties. EPA reserves the right to change these data at any time without public notice.

This directive and its attachments are intended as guidance for EPA employees. It is not a rule and does not create any legal obligations. Consistent with EPA's Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by The Environmental Protection Agency (EPA/260R-02-008, October 2002), EPA will include the above disclaimer to notify users of the status of the data and that its distribution does not support or represent official Agency viewpoints.

CONCLUSION

Geospatial data relating to Superfund sites serve important internal and external purposes that are furthered by gathering and maintaining these data in a nationally consistent manner. If you have any questions or concerns about the information in this directive, please have your staff contact: Alicia Frame, Julia Field or Jennifer Sutton for OSRTI data, John Burchette for FFRRO data, or direct your inquiries and feedback to OSRTI_GIS@epa.gov.

Attachments:

Attachment A - Metadata Definitions
Attachment B - Geospatial Dataflow Schema

cc: Barry Breen, Acting Assistant Administrator, OLEM
Nigel Simon, Acting Principal Deputy Assistant Administrator, OLEM
Stephen Schmidt, OLEM Information Management Officer
Reggie Cheatham, OLEM/OEM
Cyndy Mackey, Director, OECA/OSRE
John Michaud, Associate General Counsel, OGC/SWERLO
Dr. Steven Fine, Acting Assistant Administrator, OEI
Harvey Simon, Acting Principal Deputy Assistant Administrator, OEI
Lee Pera, Acting Geospatial Information Officer, OEI
Jennifer Sutton, Information Management Branch Chief, OLEM/OSRTI
Superfund Regional Counsel Branch Chiefs, EPA Regions I-X
Superfund Remedial Branch Chiefs, EPA Regions I-X
Superfund Information Management Coordinators, EPA Regions I-X
Superfund Regional Geospatial Coordinators, EPA Regions I-X
National Association of Remedial Project Managers (NARPM) Co-Chairs

ATTACHMENTS

Attachment A – Metadata Definitions

Metadata Fields, as excerpted from the forthcoming OLEM geospatial technical guidance:

Field Name	Description
EPA_ID	Assigned EPA program site identification number.
POINT_GEOMETRY	ESRI Feature Class or equivalent Oracle Spatial binary format, projected in WGS84.
POLYGON_GEOMETRY	
POINT_TYPE	Total Site, Operable Unit, Institutional Control, Extent of Contamination, Engineering Control, Use/Reuse, or Other.
POLYGON_TYPE	
POINT_NAME	A descriptive title for the data may in some cases duplicate the feature type, but should indicate the type of feature *especially* if the type is "other." Example names include Site, OU, Extent of Contamination, Institutional Control, Engineering Control, Facility, Storage tank, Utility corridor, Adit, Berm, Cap, Clean-up area, Cultural resource, Ditch, Excavation, Impoundment, Lagoon, Pile, Pit, Pond, Surface mine, Waste in place, Waste treatment unit, Well.
POLYGON_NAME	
POLYGON_DESCRIPTION	Create a short narrative description of the line. For example, explain how the polygon may include property boundaries, extent of contamination, or observance of geographic boundaries such as streams.
COLLECTION_DATE	Date the information was collected.

TIER_ACCURACY_CODE	**This dropdown supplies the Tier number to the system (values 1 - 6 used for cleanup sites in both programs).[1]**
HORIZ_COLLECT_METHOD	The collection method implies the accuracy tier for the measurement.[2]
HORIZ_ACCURACY_MEAS	**Specific accuracy for this measurement in meters, if available.**
HORIZ_REFRNC_DATUM	Select from dropdown. POINT_COLL_METHOD. Values can include NAD83, WGS84. Any measurements in NAD27 should be converted to WGS84.
POINT_INFO_URL	**A URL to an address that documents the polygon feature in more detail.**
POLYGON_INFO_URL	
POINT_INFO_URL_DESC	A very short description of the URL, such as the name of the system (e.g., SEMS, RCRAInfo) or the content of the URL target (e.g., Institutional Control)
POLYGON_INFO_URL_DESC	
HAS _CONTROL	**Flag for whether the feature includes at least one Boundary Control, either Institutional or Engineering.**
CONTROL_TYPE	If the feature has a polygon control (EC or IC) specify the type of control: values are Enforcement & Permitting Tools (EP); Government Control (GC); Proprietary Control (PC); Information Device (ID); Groundwater Control (GW); Non-Groundwater Control (NG).
REGIONAL_SUPP_CONTROL_ID	**This is an optional field to receive supplemental regional IDs that may be developed for the Long Term Stewardship program or other functions.**
CONTROL_DESC	Briefly describe the Control.

[1] Tier Accuracy is described in the National Geospatial Data Policy (NGDP), CIO Policy Transmittal 05-002, https://www.epa.gov/geospatial/epa-national-geospatial-data-policy

[2] Ibid.

CONTROL_URL	URL of the document(s) defining the Point Control. This may be a pointer to SEMS RM, a Drupal page of RCRA CA documents or some other repository.
CLEARED_PUBLIC_RELEASE	(Y/N) flag indicating if the feature is cleared for public release via associated web services. Default would be Y. Features not cleared for public release would be available to internal EPA staff via the intranet GeoPlatform or other internal platforms.

Attachment B - Geospatial Dataflow Schema

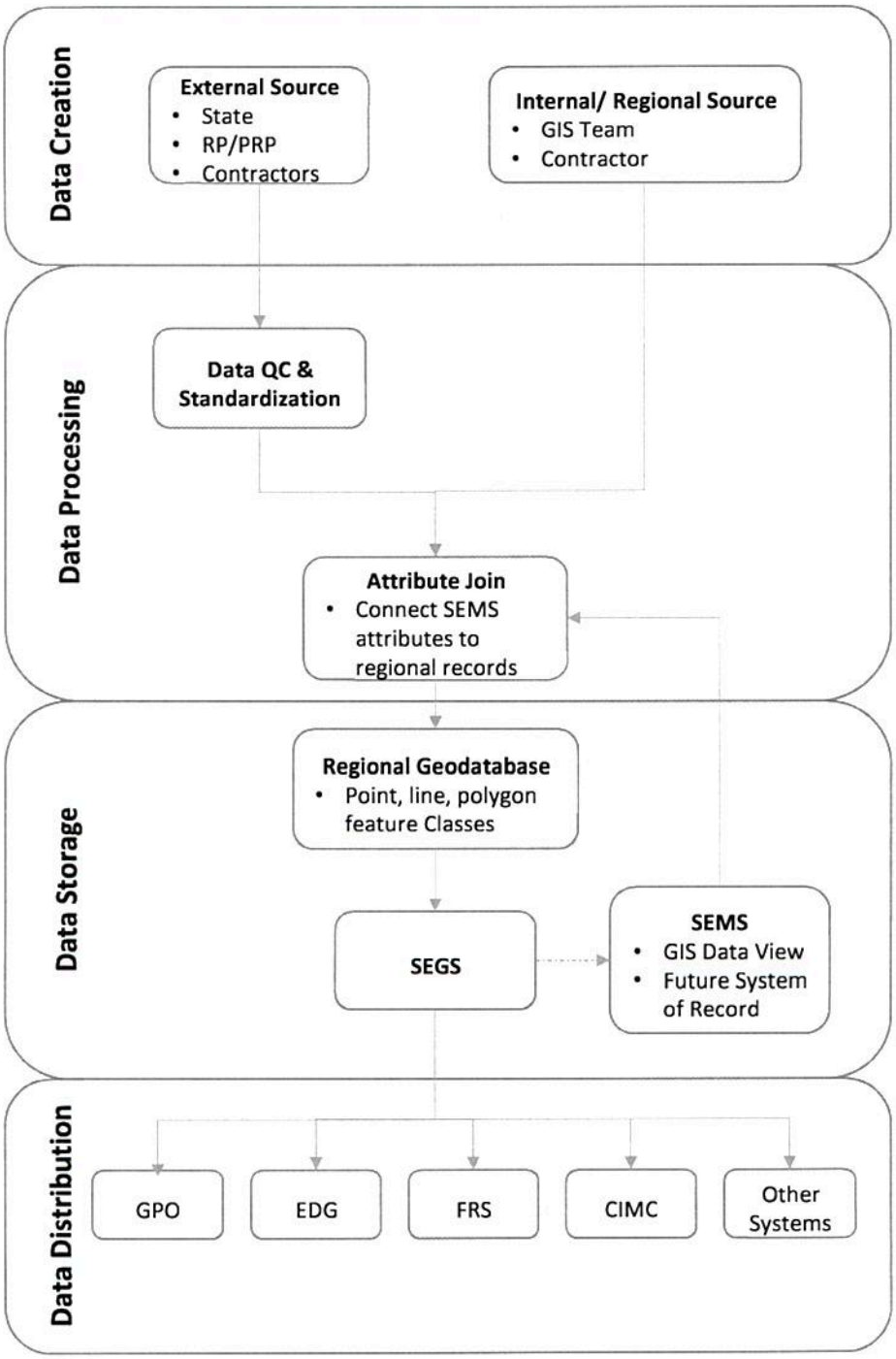

Figure 1: Geospatial Data Flow Schema