Streamlining U.S. Army Military Installation Map (MIM) Production

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What is a MIM?

Provide a historical look at MIM development.

Highlight the Memorandum of Agreement (MOA) between Army G-2, Army SRP, and NGA.

Detail SRP-created procedures and tools which streamline and automate MIM production.

Provide SRP MIM completion and current development figures.

Reiterate the importance of unifying and streamlining MIM Production.

So, how can Parsons support your geospatial mission?
Purpose of the MIM

- Primary use is for military personnel to gain the skill of map reading under diverse and challenging conditions resembling combat environment.

- Military personnel are required to learn all components of the MIM in order to make sound tactical decisions.

- Directly improves the ability to properly train Soldiers.

- Utilization of the MIM during training maintains high relevance for the Armed Forces’ combat engagement capabilities.

- However, MIM valued by all installation directorates for planning and decision making purposes.
MIMs were first developed in the 1950s by the Army Map Service, currently known as the National Geospatial-Intelligence Agency (NGA).
Historically, NGA created MIMs for the larger Army / Marine Corps installations, at a rate of 1 per year, and with updates on a 10-15 year rotation.

Most recent NGA-produced Army MIM – Fort Lewis (2007).

Many smaller installations have never had a MIM produced by NGA and stocked for ordering.

NGA’s current focus is on OEF / OIF / Anti-terrorism products, making MIM production a lower priority.
Beginning in 2004, DRAFT MIMs were created by SRP for 180 installations, training centers, and range complexes worldwide, but without overarching guidance or standardization of processes.
During FY07, the Department of the Army G-2 (Intelligence), Army SRP (Ranges and Training) and NGA began collaborating on production of MIMs.

G-2, SRP and NGA signed Memorandum of Agreement (MOA) on 9 Feb 09 to formalize support for MIM production.

SRP MIM Production Team now consults G-2’s list of priority MIM updates in order to prioritize MIM production list.

Also coordinates with NGA to request NRN/NSN for new MIMs.

NGA has agreed to print MIMs for 15-20 installations per FY, thus saving a significant amount of SRP funding traditionally used towards the printing of maps in-house.
G-2, SRP and NGA agreed that future MIM production should be based on existing military cartographic standards to ensure consistency across all Army training and testing installations.


SRP MIM Production Team adopted these existing standards, and then further clarified and documented guidelines to meet both current training and cartographic requirements.

Collaborative effort resulted in an extensive overhaul of the initial MIM template, margin information, and symbology.
As a result, SRP MIM Production Team developed a complete set of guidance documentation for Army personnel to use when updating and finalizing MIMs.

MIM Production Guidance Documentation
The SRP GIS Program has worked closely with Army G-2 and NGA to standardize symbology and graphics they train across Army training and testing installations. As a result of these collaborations, the MIM guidance documentation (MPGD), are available for download below.

NOTE: Previously, the MPGD was available for download collectively as a ZIP file. As of 5 June 2009, using the SRP Web site (https://srp.army.mil), Army personnel can now access the documentation, including the latest versions of the documents. The details below are currently released and will ensure that persons can be notified when updates to individual files occur.

- Memorandum - Production of Military Installation Maps (MIMs)
- Production Specifications for Military Installation Maps (MIMs)
- Appendix A - Required Data Layers for the MIM
- Appendix B - Additional SRP Proponent Data Layer Requirements
- Appendix C - Non-Proponent Data Layer Requirements
- Appendix D - MIM Spacing & Font Requirements
- Appendix E - MIM Layout Examples
- Appendix F - FAQ Regarding MIM Development and Quality Assurance
- Appendix G - MIM Final Review Checklist
- Appendix H - MIM Approval Signature Document

MIM Style (An organized collection of predefined colors, symbols, properties of symbols, and map elements used to produce maps)

MIM Template (Map templates make it easy to reuse or standardize a layout, or even the same data as you don’t have to manually reproduce the common parts of the map. Like maps and layers, templates can standardize the maps that we produce.)

Documentation available on SRPWeb (https://srp.army.mil)
SRP MIM Production Team used ESRI ArcGIS Model Builder to create data development processes which expedite development of the MIM.

- Depression Contours
- Digital Vertical Obstruction File (DVOF)
- Elevation Guide
SRP Geospatial Support Center created geodatabase template (.mdb) to meet the requirements of the SRP Geospatial Data Quality Assurance Plans (QAPs).

Serves as the standardized data structure across all Army training and testing installations.

Once populated, this geodatabase feeds directly into the MIM Template, automatically populating the required data layers to be portrayed on the MIM.
SRP MIM Production Team created MIM template (.mxt) based on layout of previously produced NGA MIMs and supporting documentation.

All aspects reflect the layout, fonts, and features which are common to MIMs.

Based on SRP QAP (CIP) and SDSFIE data layers and attribution.

Dictates the required spacing guidelines within and between the data frames and margin elements, as well as margin text font requirements.
SRP MIM Production Team created the MIM.style file, which contains symbols, labels, and tints based on existing DoD and NGA standards.

Military symbology has been reviewed and amended by NGA in order to match existing standards.

Recent addition of several new symbols based on Army training requirements.

Symbology validated to work with both 1:25,000 and 1:50,000 scale products.
MIM Toolkit

SRP MIM Production Team designed MIMT to expedite and standardize the process of creating and locating MIM margin elements within ArcGIS.

- MIM Extent
- MIM Template
- Conversion Graph
- Slope Guide
- Scale Bars
- Projection Information
- Grid Reference
- North Arrow / Declination
- MGRS Grid Lines / Labels

Tool outputs tested to ensure compliance with standards and guidelines established by Army, DoD, and NGA.
SRP MIM Production Team performs QA to ensure consistency with symbology, spacing, and layout requirements.

**Workflow Spreadsheet**
- Created for QA based off of NGA TLM review checklist.

**Following QA, the MIM is then returned to the installation for continued edits or final review.**

**Once validated by SRP, the MIM is sent to NGA for inspection.**
NGA staff conduct an evaluation of the MIM to verify that it meets the required accuracy standards.


Provides numerical results, both inside and outside the installation boundary, for the following parameters:

- Absolute horizontal error
- Relative horizontal (feature to feature) accuracy
- Circular Map Accuracy Standard (CMAS)
- Absolute vertical error
- Relative vertical error

ALL MIMs created by SRP using the MIM Production Guidance Documentation have:

“met NGA horizontal and vertical accuracy standards for TLM mapping.”
Once MIMs pass inspection by NGA, they are exported by SRP MIM Production Team.

NGA’s required output format for MIM printing is 1-bit 1200 dpi color separated TIFF.

SRP MIM Production Team created an ESRI color file (MIM.ect) with the defined MIM colors, which is loaded using PLTS TIFF Color Separator, and assists in export process.

Army is maximizing the benefits of NGA printing by having the SRP MIM Production Team complete the color separation process for MIMs, ensuring a consistent process.
Tens of thousands of maps and charts are printed each year by NGA on presses in a computer-to-plate (CTP) digital environment.

Red-light & blue/green-light options available.

SRP MIM Production Team sends MIM color separates to NGA CTP staff.

NGA CTP staff perform final QA of color separates, and any remaining issues are addressed.

MIM is then printed, and the SRP MIM Production Team is notified upon its completion.

NGA also contacts MIM Production Team when a MIM is up for reprint to determine if an update to that sheet is planned for the near future.
Once the MIMs are printed, they are cut, stacked, loaded on pallets, shipped to Defense Logistics Agency (DLA), and are readily available to all DLA customers.

To date, there is an ~ 90 day turn-around from completion of MIM color separation to MIM being stocked at DLA.

DLA notifies SRP MIM Production Team of newly stocked MIM(s), and the installation personnel are then notified by the MIM Production Team.

In return, SRP MIM Production Team sends DLA updated extent coordinates of the newly stocked MIM(s) in order to keep their map catalog current and accurate.
Hard-copy MIMs stocked at DLA are not the only way for Warriors and civilians to visualize the installation any longer.

SRP MIM Production Team exports finalized MIMs to GeoPDF format, and they are posted to SRPWeb as well as the Army Geospatial Center (AGC) website, and available for download.

GeoPDF is a breakthrough in that the user can view a digital version of the MIM, turn on/off desired data layers, and acquire specific and accurate coordinates without needing to access GIS software.

In addition, the SRP MIM Production Team is currently developing a CADRG-like raster product which can be loaded into both ground and aerial vehicles, as well as be used within FalconView™ and ESRI® ArcGIS.
32 MIM sheets have been finalized and validated by SRP since 2007.

29 of these have been printed by NGA, and are currently in stock at DLA, with 2 more ready for printing.

24 additional MIM sheets are currently in some stage of development by SRP MIM Production Team or installation personnel, or are awaiting validation by installation staff.

SRP projected hourly estimates for the development of ALL geospatial data to extent and the completion of the MIM are 250-350 hours.

As previously noted, estimates by NGA staff for the completion of 1 MIM were approximately 1 man-year (1,920 hours).
In Summary

This overall strategy has proven to be highly successful at streamlining Army MIM Production, and is a win-win-win relationship for G-2, SRP and NGA.

- G-2 priority map updates are completed.
- Existing DoD and NGA topographic standards are utilized.
- SRP funding can be re-directed to enhance other training avenues.
- Most importantly, Warriors gain access to additional training products in a variety of formats.

SRP MIM Production Team’s development of customized geospatial tools, along with incorporation of automation and validation procedures, has been critical to success of this ongoing effort.

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Army G-2  http://www.dami.army.pentagon.mil
Army SRP  https://srp.army.mil
NGA       http://www.nga.mil
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