

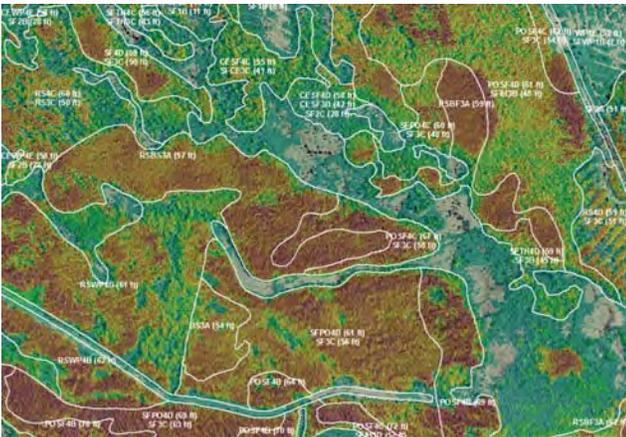
Using Photo Interpretation to Produce Accurate Maps

Covertypes Mapping Services

Since the 1930s, James W. Sewall Company has used aerial photography to classify and map natural resources. Even with the advent of satellite imagery, interpreted aerial imagery has remained the medium of choice for detailed natural resource mapping. During the last 30 years, the process of creating maps from photography has evolved into a highly digital workflow. Analog photography has been replaced by digital imagery, and the end products are almost exclusively digital files that reside in a geographic information system (GIS). Sewall takes advantage of advanced technologies and analytic techniques to produce maps that meet exacting specifications in interpretation and data integrity.

PHOTO INTERPRETATION

Quality photo interpretation begins with experienced photo interpreters who are familiar with the specific resource under classification. Sewall employs a team of skilled interpreters who each have a mixture of field and interpretation experience. These experiences enable them to develop the maps and interpret the forest in a way that is meaningful to forest managers on the ground and in the office.



Coloration depicts CanopyData™ derived heights

Sewall performs photo interpretation digitally using softcopy workstations that allow the interpreter to view digital imagery in stereo (3D). This digital imagery, combined with camera calibration parameters and a digital elevation model (DEM), provide the necessary measurements for the softcopy software. Our photo interpreters pay careful attention to the creation and placement of stand boundaries, making updates in the 3D environment as necessary. The forest covertypes calls are then input into a client specific data entry system that validates the interpretation call and enters it directly

into the covertypes database, drastically reducing the potential for data entry errors to occur. ArcGIS is coupled with the softcopy workstation in the interpretation process, with project deliverables most often provided in geodatabase or shapefile formats.

FIELD VERIFICATION

Following a preliminary review of the aerial imagery, Sewall photo interpreters generally perform “ground-truthing” in the field to address specific questions that arise during photo interpretation. Although most field locations are pre-selected with some consideration to accessibility, a number of sites are randomly chosen. Depending on project scale, accuracy requirements, and budget, Sewall also performs aerial reconnaissance.

In the fieldwork phase, our photo interpreters work closely with client field personnel who are familiar with the subject area and the classification system. The amount of checking and choice of method depend upon the complexity of the classification system and accuracy requirements. On some projects, Sewall performs interpretation in conjunction with an inventory, in which field sampling observations are made independently of the photo interpretation process. Using field sampling data and observations increases the accuracy of the interpretation.

RIGOROUS QUALITY CONTROL

In addition to the quality control procedures followed during the photo interpretation, covertype data is run through a rigorous set of quality control routines to assure top quality data. The data are systematically checked for improbable conditions, and, if present, these areas are reviewed by the interpreters to correct any inconsistencies. In projects where multiple interpreters are needed, additional interpretation cross checks are used to maintain consistency in the product across the different interpreters.

ADDITIONAL DATA PRODUCTS

Generation of forest cover type maps often coincide with the acquisition of new aerial imagery, which can be an excellent opportunity to collect additional information about your land base that complements the forest covertyping product. Examples of additional data that can be collected include road centerlines, refinement of water edges, delineation of gravel pits, and marking of timber harvesting yard areas. Sewall can offer efficient collection of these or other data layers by incorporating them into a forest covertype mapping project.

ADVANCED ANALYSIS

Sewall is constantly working to develop new analyses that rapidly and cost-effectively provide enhanced information at the stand level. Our CanopyData™ product, which can provide one or multiple height estimates per stand, is an example of how we can extract more information from your imagery and incorporate those data into your new covertype map.

HISTORIC METHODOLOGIES

While Sewall’s current workflows utilize some of the most up-to-date methodologies available, our long history of providing photo interpretation supplies us with the tools and skills needed to offer legacy interpretation and geospatial services to clients who require it. This can include interpretation of film and hard copy photography, as well as conversion of maps printed on paper, Mylar, or acetates.

PROFESSIONAL EXPERIENCE

Mary T. McDonald, LPF

GIS Project Manager

Mary McDonald manages Sewall's natural resource mapping projects along with tax map maintenance and data conversion projects. The natural resource mapping projects include extensive forest covertype mapping throughout the northeast and maritime Canada. These projects incorporate project oversight and/or management of aerial imagery capture, orthoimagery production, photo interpretation, GIS compilation and client interface. She is charged with the long-term archiving and maintenance of digital map files as well as training and supervision of GIS technicians.

Martin Curnan, LPF

Imagery Analyst/Photo Interpretation Specialist

Marty Curnan joined Sewall in April of 2016 as a photo interpreter and now also serves as an imagery analyst. Marty is currently responsible for providing GIS and analytic support for forest covertype and vegetation mapping projects, such as compiling spatial databases and related metadata, developing code for geospatial problems, and processing digital and satellite imagery. His background includes providing sustainable forest management services to private landowners, timber cruising, timber marking, harvest inspection, boundary line survey, and composing stewardship plans, and is proficient in utilizing ArcGIS and GPS.

Stephanie Phillips, MS

Photo Interpreter/GIS Specialist

Stephanie Phillips joined Sewall in 2010, quickly developing skills as a photo interpreter. Her broad environmental background with GIS modeling and her education in forest soils prepared her well to interpret forest covertypes, as well as to organize and conduct field reconnaissance at Sewall. She has participated in interpretation projects on approximately 1,000,000 acres of forest land for clients in New England, and vegetation mapping for the US Fish and Wildlife Service in Maine and Virginia.

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