Frank L. Engel

Geographer

http://https/www.usgs.gov/staff-profiles/frank-l-engel
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San Antonio, TX 78249

Geographer and researcher with **10+ years of experience** developing **new tools, technology, and apps using remote sensing to solve real-world problems**. Very familiar with standard software design practices, operational deployment of technology and hardware, and providing practical training. Passionate about good **project management** and clear communication through **scientific publications, documentation**, and other media.

PROFESSIONAL EXPERIENCE

U.S. Geological Survey – Hydrologic Remote Sensing Branch
(Jan 2022 - Present)
Geographer | 40 hours/week | GS 13

- Project Manager of the National Imagery Management System (NIMS), a cloud infrastructure supporting ingesting over 20,000 images daily from hundreds of cameras at USGS gaging locations nationwide.
- Developed non-contact streamflow methods and software using image velocimetry.
- Recognized Subject Matter Expert in using and deploying cameras for image velocimetry gaging techniques.

Key Achievement: Developed and advocated for national adoption of non-contact streamflow methods, policies, procedures, and training resulting in 100s of new velocity gages and discrete measurements.

U.S. Geological Survey – Oklahoma-Texas Water Science Center
(Jun 2017 – Dec 2021)
Geographer | 40 hours/week | GS 12

- Developed CameraDCP to automate the collection of scientific imagery with single-board computers.
- Developed flood inundation models for the Texas Hill Country.
- Designed & conducted novel hydraulic studies with hydroacoustics to monitor near-shore sediment transport and beach replenishment.

Key Achievement: Helped find significant efficiency in NWIS Imagery project, which led to a reduction in costs to Program of 23%.

U.S. Geological Survey – Illinois Water Science Center
(Jun 2015 - Jun 2017)
Geographer | 40 hours/week | GS 12

- Evaluated new hydroacoustic sensors and technology through the former Office of Surface Water.
- Recognized Subject Matter Expert on hydroacoustics in novel or atypical deployments.

Key Achievement: Published two high-impact multi-agency scientific studies detailing the potential impacts of barge traffic on Asian Carp front progression.

U.S. Geological Survey – Illinois Water Science Center
(Mar 2014 - Jun 2015)
Geographer | 40 hours/week | GS 11

- Co-developed Velocity Mapping Toolbox software; a recognized standard application for use with hydroacoustics.
- Conducted several national training classes on the proper use of hydroacoustics.
- Secured new projects by working with local and national cooperators.

U.S. Geological Survey – Illinois Water Science Center
(Apr 2013 - Mar 2014)
Geographer | 40 hours/week | GS 7

- Formalized code used in Velocity Mapping Toolbox, enabling software look & feel standardization.
- Completed fieldwork and scientific analysis for several projects as assigned.

U.S. Geological Survey – Illinois Water Science Center
(Apr 2012 - Apr 2013)
Hydrologist-Student Trainee | 20-30 hours/week | GS 5

- Completed fieldwork and scientific analysis for several projects as assigned.

EDUCATION

University of Illinois at Urbana-Champaign — **3.92 GPA**
PhD in Geography (Civil & Env Eng Minor) — (Sep 2007 - May 2014)

Texas State University-San Marcos — **3.88 GPA**
MS in Geography — (Sep 2005 - Dec 2007)

Texas State University-San Marcos — **3.34 GPA**
BS in Physical Geography (Music Minor) — (Sep 1999 - May 2005)

SELECT PUBLICATIONS DEMONSTRATING KEY EXPERTISE

Fulton, J.W., **Engel, F.L.**, Eggleston, J.R., Best, H.R., Nicotra, M.J., Gyves, M.C., and Kunkle, G.A., *in review*, Measuring river discharge using Doppler velocity radars: U.S. Geological Survey Techniques and Methods Report.

Legleiter, C.J., Kinzel, P.J., **Engel, F.L.**, Harrison, L.R., and Hewitt, G. 2024. A two-dimensional, reach-scale implementation of Space Time Image Velocimetry (STIV) and comparison to Particle Image Velocimetry (PIV). *Earth Surface Processes and Landforms.* https://doi.org/10.1002/esp.5878.

Duan, J.G., **Engel, F.L., and** Cadogan, A., 2023, Discharge estimation using video recordings from small unoccupied aircraft systems. *Journal of Hydraulic Engineering,* 149 (11). https://doi.org/10.1061/JHEND8.HYENG-13591.

Engel, F.L., Jackson, P.R., and Murphy, E.A., 2018, Flow hydraulics and mixing characteristics in and downstream of Brandon Road Lock, Joliet, Illinois: U.S. Geological Survey Scientific Investigations Report, https://doi.org/10.3133/sir20185094.

Davis, J.J., Jackson, P.R., **Engel, F.L.**, LeRoy, J.Z., Neeley, R.N., Finney, S.T., Murphy, E.A., 2016, Entrainment, retention, and transport of freely swimming fish in junction gaps between commercial barges operating on the Illinois Waterway, *Journal of Great Lakes Research*. 42(4), 837–848, https://doi.org/10.1016/j.jglr.2016.05.005.

SKILLS

Project Management · Image Velocimetry · Computer Vision · Unoccupied Aerial Systems · Remote Sensing · Hydraulics and Turbulence · Geographic Information Systems · Hydroacoustics · AGILE Product Owner · Sediment Transport · Geomorphology · Uncertainty Analysis

REFERENCES

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Molly Wood
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PROGRAMMING LANGUAGES

python	★★★★★
matlab	★★★★★
bash/linux	★★★★
javascript	★★

ADDITIONAL INFORMATION

Gitlab (USGS)	@fengel
GitHub	@frank-engel-usgs
Hobbies	gravelbiking, camping, reading