Frank L. Engel

Geographer

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Geographer and researcher with **6+ years of experience** in 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 – Water Mission Area Hydrologic Remote Sensing Branch
(Jan 2022 – Present)

EDGE Geographer | 40 hours/week | GS 13

U.S. Geological Survey – Oklahoma-Texas Water Science Center
(Jun 2017 – Dec 2021)

Geographer | 40 hours/week | GS 12

U.S. Geological Survey – Illinois Water Science Center

Geographer | 40 hours/week | GS 12 (Jun 2015 - Jun 2017)
Geographer | 40 hours/week | GS 11 (Mar 2014 - Jun 2015) (Mar 2014 - Jun 2015)
Geographer | 40 hours/week | GS 7 (Apr 2013 - Mar 2014)
Hydrologist-Student Trainee | 20-30 hours/week | GS 5 (Apr 2012 - Apr 2013)

EDUCATION

University of Illinois at Urbana-Champaign
3.92 GPA
(Sep 2007 - May 2014)

PhD in Geography (Civil & Env Engineering Minor)

Texas State University-San Marcos
3.88 GPA
(Sep 2005 - Dec 2007)

MS in Geography

Texas State University-San Marcos
3.34 GPA
(Sep 1999 - May 2005)

BS in Physical Geography (Music Minor)

SELECT PUBLICATIONS

Fulton, J.W., **Engel, F.L.**, Eggleston, and Chiu, C.-L., *in review*, Computing river discharge using the probability concept algorithm: U.S. Geological Survey Techniques and Methods 3–A26.

Duan, J.G., Cadogan, A., and **Engel, F.L.**, *in review*, Flow discharge estimation using video recording from small-unoccupied aircraft systems. *Journal of Hydraulic Engineering*.

Despax, A., Le Coz, J., Hauet, A., Mueller, D. S., **Engel, F. L.**, Blanquart, B., Renard, B., and Oberg, K.A., 2019, Decomposition of uncertainty sources in acoustic Doppler current profiler streamflow measurements using repeated measures experiments. *Water Resources Research*, 55, 7520–7540. https://doi.org/10.1029/2019WR025296.

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.

SELECT DATA PRODUCTS

Prater, C.D., LeRoy, J.Z., **Engel, F.L.**, Johnson, K.K., 2021, Discharge measurements at USGS streamgage 05536890 Chicago Sanitary and Ship Canal near Lemont, Illinois, 2005-2013: U.S. Geological Survey data release, https://doi.org/10.5066/F7X63K41.

Engel, F.L., Hartmann, C.A., Petri, B.L., Bryan, P.W., Ockerman, D.J., and Schnoebelen, D.J., 2020, Oceanographic Observations Made Near South Padre Island, Texas, as Part of the South Padre Island Beach Replenishment Study, August 2018–February 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P9HDIZOC.

Engel, F.L., Fulton, J.W., Lane, J.W., Eggleston, Corbett, S.C., Kohn, M.S., Pulli, J.J., J.R., Adams, J.D., Burton, T.A., Nicotra, M.S., Stephens, V.C., and Dawson, C.D., 2020, Near-field Remote Sensing of River Velocity, Bathymetry, Floodplain Topography, and Discharge at the Arkansas River at Parkdale, Colorado, USA, March 2018: U.S. Geological Survey data release, https://doi.org/10.5066/F7VT1RDH.

Keele, J.D., and **Engel, F.L.**, 2020, Videos collected for Image Velocimetry at Boneyard Creek at Urbana, IL from 2017 to 2018: U.S. Geological Survey data release, https://doi.org/10.5066/P9VZ6VYM.

SELECT SOFTWARE APPLICATIONS

Engel, F.L., *in review*, Surface Velocity Toolbox (SurfVelTool): U.S. Geological Survey Software Release.
A graphical user interface and modules used to provide users with a method of computing water velocity profile metadata used in the computation of streamflow with non-contact radars and cameras. Written in Python and Qt.

Engel, F.L., *in development*, Image Velocimetry (IVy) Framework: U.S. Geological Survey Software Release.
A graphical user interface and modules for computing water velocity and streamflow from videos collect by handheld cameras, fixed-mounted cameras, drones, or satellites. IVy Framework includes all image processing and data analysis processes needed for end users to product qualified streamflow measurements in the field. Written in Python and Qt.

Engel, F.L., *in review*, CameraDCP: U.S. Geological Survey Software Release.
A python module and custom operating system application which can be installed on a Raspberry Pi single-board computer used to manage, collect, and upload (via cell telemetry) imagery from connected cameras. Written in Python and bash.

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

Doug Schnoebelen
OTWSC South Texas Branch, Chief
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Daniel Pearson
NWIS Modernization Program Coordinator
+1 512-517-6545
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Molly Wood
Hydrologic Networks Branch, Chief
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mswood@usgs.gov

PROGRAMMING LANGUAGES

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

ADDITIONAL INFORMATION

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