

KIM SUNDEEN

Full Stack Sr. GIS Software Engineer, GISP

<https://ksundeen.github.io> kim.h.sundeen@gmail.com 218.590.1330 Duluth, MN

LIFE PHILOPHY *"The only mistake is one from which you didn't learn" -A Friend*

[@ksundeen](#)
<https://github.com/ksundeen>
<https://www.linkedin.com/in/kim-sundeen-63007a16/>

SUMMARY

Kim Sundeen has over 15 years as a GIS analyst & 7 years as a GIS software engineer working on a wide variety of geostatistical data visualizations, web, mobile & enterprise GIS solutions for all levels of government (university, tribal, local, county, state & federal), utilities, & opensource GIS companies. She brings a passion for clean data & simple, yet innovative solutions for long term maintenance & design. She is a full stack developer with experience in databases, backend development, & modern front-end frameworks & web APIs. She has been a critical member of the development life cycle in her project with experience creating solutions from scratch as well as extending mature, existing solutions. She has experience working with a range of third-party tools, including, but not limited to, ArcGIS Enterprise, ArcGIS Collector, Workforce, Survey123, ArcMap, ArcGIS Pro, ArcGIS Online, GPS systems, & opensource GIS systems & OGC standards. She contributes to the GIS & development community through volunteering & leading user groups & workshops especially through COVID using Azure remote lab to support workshops.

LANGUAGES & TECHNOLOGIES

- **Web Development:** Typescript, HTML5, CSS, JavaScript frameworks, node.js, npm/yarn, Angular, React, IIS
- **Code Versioning:** Git, Github, Mercurial, TortoiseSVN, TFS
- **OS:** Windows, Linux, Mac
- **Server-side/desktop programming:** Python, C# .NET, SQL/PLSQL, ASP.NET MVC, .NET Framework 4.8, GeoServer web publishing
- **Database design/structures:** Microsoft SQL Server, 11g/12c Oracle, PostgreSQL, MySQL, MS Access, Excel
- **Cloud Solutions:** Microsoft Azure, TFS, DevOps
- **ArcGIS Enterprise stack:** ArcGIS Server, Web Adapter, Branch Versioning, Portal, Data Store, ArcGIS Online
- **Mapping APIs:** Esri's JavaScript API 3.x, 4.x, Leaflet, Mapbox, Google Maps, Openlayers 5/6, Boundless SDK (React-based OpenLayers)
- **GIS/GPS/Mobile Apps:** ArcGIS 9.x-10.x, ArcGIS Pro 2.x, QGIS 2-3, Google Earth KML, Garmin, ArcPad, Terrasync, & Pathfinder Office, Survey 123, ArcGIS for Collector, Web AppBuilder Developer Edition, ArcGIS Online

SOFT SKILLS

- **Personnel Management:** Currently manage 4 direct reports & direct work for 4 software engineers on 2-year client project for **SSP Innovations**. Managed remote development teams for software development, performing code reviews collaboratively, & database configuration using agile project management with **GCR, Inc.** & **RAMTeCH**. Oversaw & trained student GIS technicians on GIS data entry procedures for **UW Nursing School** mapping projects & LTE staff for short-term land ownership projects with the **Bad River Tribe**.
- **Agile Scrum:** Managed as tech lead to facilitate scrum ceremony meetings for **SSP Innovations**. Coordinated team of 10 spatial & non-spatial developers as scrum master role to improve team collaboration & improve development efficiency for **GCR, Inc.** Lead two teams as scrum master for 10-member client software development team & internal projects for **MN Power** (3-person team).
- **Workshops & Training:** Lead several integration workshop & presentation to clients for **SSP Innovations**. Taught introductory Python, JavaScript, GPS & GIS sessions for small group workshops on: (1) using new mapping & GPS programs (2) ArcGIS Desktop & opensource QGIS, (3) process for updating website front ends, & (4) GIS user needs & feasibility assessments, (5) Lead yearly workshops Esri's Utility Network Tools, Opensource GIS, & Jupyter Python notebooks (see full details: <https://ksundeen.github.io/portfolio.html#media>)
- **Presentations & Graphic Design:** See my web-portfolio for examples: <https://ksundeen.github.io/gallery.html>; Awarded 1st Place: Large-format map, 2014 National Tribal GIS Conference, "A Bird's Eye View of the Bad River Watershed & Proposed Mine."
- **Technical & Scientific Writing:** Wrote & awarded **\$3,000** free Azure credits grant for MN GIS/LIS non-profit. **\$127,000** FEMA grant, **\$10,000** University of Wisconsin-Madison research grant, & **\$5,200** ESRI Conservation Grant Program grant. Published per-reviewed research articles on GIS, modeling, & wildlife research.






EDUCATION & CERTIFICATIONS

- **2021 C# Programming Certificate, University of California-San Diego**
- **Continued Education:** software engineering through Lake Superior College, PluralSight, LinkedIn Learning
- **2017 – 2018 Graduate Courses in University of Wisconsin-Madison, Master of Science (GIS Web Map Programming)**
 - Biking Route Finder (Google Maps API & Postgresql database to highlight optimal biking routes around Duluth based on the user's preference for terrain, slope, social media tweets, & proximity to bikes - https://ksundeen.github.io/assets/videos/CycleRoutesIntro_small.mp4)
- **2012 – Certified Geographic Information Systems Professional (GISP) #84940**
- **2012 – University of Wisconsin-Madison, Graduate Certificate: Geographic Information Systems**
 - *Focus: geostatistical regression of remotely-sensed mercury concentrations & data science methods.*
- **2011 - University of Wisconsin-Madison, Master of Science: Conservation Biology & Sustainable Development**
 - *Focus: predictive spatial models to detect wildlife & electric distribution power line risks.*
- **2006 - University of Wisconsin-Madison, Bachelor of Science: Wildlife Ecology, Certificate: Environmental Studies**

PROJECT EXPERIENCE

- **Web Map App Development & Implementation:** Planned, designed, trained, & coded custom ArcGIS Enterprise apps, opensource OpenLayers & ArcGIS web mapping applications such as:
 - **SSP Innovations:** Esri APIs for web app development using angular Esri SDK,
 - **GCR, Inc.:** Boundless SDK, Open Layers web viewer built within MVC .NET framework.
 - **Lake Superior Consulting:** Engineering web viewers in Angular & C# MVVM .NET framework using Esri's API 3.x,
 - **Bad River Tribe:** Ownership & Lease Viewer (ArcGIS Flex Viewer & SDE database),
 - **City of Duluth:** Street Update Viewer (Esri's Web App Builder & SDE database),
 - **MN Power:** Electric Utility Asset Identification (Esri's JavaScript API & Web AppBuilder Developer's Edition & SDE database),
 - Biking Route Finder (Google Maps API & Postgresql database).
- **Best Practice Code Standardization & Unit Testing:** Researched & implemented best practices for UI design, unit testing for React, JavaScript, Python, & React.js code design for **GCR, Inc.**
- **ArcGIS Service Publishing Automation:** Developed configuration-driven python solutions for other clients to quickly publish 20-40 GIS web services between different development/staging/production environments through ArcMap into ArcGIS Server 10.6. This process saved 3-4 hours/day of manual error-prone service publishing. Created ArcGIS add-ins & published REST geoprocessing tools into ArcGIS Server to simplify **City of Duluth's** street & pavement updates for users.
- **GIS Data Migration for Gas UPDM New Utility Network:** Lead agile software development & project planning for client teams for **RAMTeCH** to customize python-plsql oracle database migration solutions to handle ETL from 5 source databases to one unified model. Managed multiple Esri alpha/beta software releases for changes in the new Utility Network model.
- **GIS Workflow & Process Improvement:** Coordinated GIS feasibility study to understand how users interact & use the applications. The results are used to develop clear tool requirements for **Lake Superior Consulting** app tool development. Documented workflows for engineering staff at **City of Duluth** to identify areas for improvement. Learned established GIS data entry policies.
- **Full Cycle Project Development & Implementation:** Implemented new software release & testing standards with **GCR, Inc.** including: 1) software development & unit testing, 2) software code review & testing), 3) code documentation & architecture design. Coordinated GIS user needs assessment & implementation plans for 19 projects for software development, database development & improvements, training, & website enhancements for **City of Duluth IT Dept. & Public Works & Utilities Dept.** **Priorities** were used to direct funding to most important projects. Conducted GIS feasibility & UX/UI study for **Lake Superior Consulting** that clearly identified user, business, & technical requirements for 10 new development tools.
- **GIS Data Security:** Implemented new ArcGIS Server security protocol for publishing GIS services online; Researched & re-wrote external & internal data-sharing agreements & policies for the **Bad River Tribe**.

WORK EXPERIENCE

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- 9/2017 - Present **Azure Virtual Environment Administrator**  Duluth, MN
MN GIS/LIS
Summary: Volunteer & contract services to the MN GIS/LIS Board to coordinate yearly virtual workshops at spring & fall workshops for 5-20 students. I won a yearly grant for \$3,500 free credits Azure credits for non-profit (<https://www.mngisliis.org/>).
- **Training & Workshop Facilitation** – Conducted initial 3-hour Amazon Web Services workshop in 2017. Started working with the Board to move all labs & coordinate workshops in Azure. Conduct training to both MN GIS/LIS Board, workshop instructors. Provide IT support for all pre-conference workshops to students to support virtual workshops throughout the COVID pandemic.
 - **Azure Virtual Machine Configuration** – Gather software & hardware requirements, configure, & publish all VMs, update any necessary licenses, & maintain strict schedule of hardware usages to minimize costs.
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- 9/2020 - Present **Team Lead, Tech Lead, GIS Software Engineer**  Centennial, CO (remote in Duluth, MN)
SSP Innovations, LLC – Systems Implementation
Summary: Work as a Tech Lead & software engineer & consultant in an agile team for gas, electric, telecommunications client projects to manage 4 software engineers for a 2-year, \$1 million project. Lead project with presentations & demos for clients. Lead integration design workshops with client to gather requirements & translate to Agile user stories for developers. Wrote design documents from workshops to convert business requirements to technical requirements.
- **Architecture & Patterns** – Implemented standards & coached software engineers on code reuse, code patterns (for creating .NET Web APIs & ArcGIS Pro Addins), CI/CD TFS build pipelines (using cake to create Windows installer MSI files).
 - **GIS App & Tool Development** – Developed Python & C#. NET Framework tools for web APIs, token authentication, swagger API documentation, maps, analyses, & automation for editing gas & electric utilities in the web & through desktop Addins, Windows services. ArcGIS Arcade for attribute rules; TFS 2020 build pipelines, Azure DevOps; Oracle databases.
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- 5/2019-9/2020 **Lead GIS Developer**  New Orleans, LA (remote in Duluth, MN)
GCR, Inc (Now Civix) – Software Development
- **GIS Business Strategy** – Lead strategy & technical requirements meetings with business analysts & software developers to clarify user & software requirements, which reduced software release to QA testing down from 3 weeks to 1 week.
 - **Team Leadership & Collaboration** – Improved onboarding process to improve new developer productivity. Facilitated independent learning environment leading to higher quality software output. Served as technical manager for team of three developers to prioritize work, & unblock their issues, & provide team guidance & mentorship.
 - **GIS App & Tool Development** - Worked as lead GIS Developer & Spatial Architect in an Agile software development team to engineer modular map-centric applications using React.js framework (Boundless SDK), OpenLayers, PostgreSQL, & Geoserver with SQL Server databases for parcel research & management.
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- 5/2018-5/2019 **GIS Developer**  Duluth, MN
Lake Superior Consulting – Software Development
- **GIS Business Strategy** - Conducted GIS feasibility & UX/UI study that clearly identified user, business, & technical requirements for 10 new development tools. Lead clearly defined research efforts & client presentations on implementing & architecting new mobile mapping systems that delivered immediate use for client projects with aggressive deadlines.
 - **Team & Project Management** - Implemented new team & meeting planning to reduce meeting & improve productivity. Reduced the time from idea to implemented solution from 2 months to 3 weeks.
 - **GIS App & Tool Development** - Engineered applications using Esri, SharePoint, Primavera, & SQL Server integrations used by over 200 users. Used web frameworks to align, extend, & develop existing tools & programs (Angular, TypeScript, jQuery), backend internal applications (ASP.NET MVVM, C#, .NET), & GIS tools (Python 2.7, 3.x, Esri's JavaScript API 3.26).
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- 2/2017-5/2018 **GIS Analyst/Developer**  Stillwater, MN (remote in Duluth, MN)
RAMTeCh Software Solutions – Professional Services
- **Redesigned Practices & Coached Clients in Agile** – Lead as Scum Master for 10-member team to re-architect client software development life cycle & direct funds for applications & tools. Lead general & detailed client-focused user-training/demos.
 - **Engineered Data Migration & ETL Software Tools for Clients** – Designed, built, tested, & released C#, Python & SQL gas & electric utility network migration toolsets accessing Oracle 11g/12g SDE databases, ArcMap & Pro desktop tools that seamlessly handled ETL from 5 source databases to one unified model for Esri's new Utility Network as 1st official Esri implementation.
 - **Developed & Presented AWS Workshops for Clients & Conferences** – Worked with MN GIS/LIS Consortium to use ArcGIS Enterprise software for gas, electric, water, & utility operators using virtual AWS production environments.

4/2016-2/2017

GIS Programmer Analyst

 Duluth, MN

Minnesota Power – Facility Operations

- **Mobile Mapping Application/Survey Tool Development** – Developed, implemented, & trained staff on GIS services & geoprocessing tools through ArcGIS Server/ArcGIS Online for mobile data entry & data-transfer. Created Python routines to download & extract ArcGIS Online data & images from a Survey123 app & export to PDF with hyperlinked images & a summary of data from multiple related tables within a database. Developed MN Power's Electric Utility Asset Identification using Esri's JavaScript API & Web AppBuilder Developer's Edition & SDE database.
- **Software Training & Developing Documentation Standards** - Trained staff on Esri's Model Builder, Python, & ArcGIS Online for utility edits, work order, & field tools systems. Documented publishing workflows in Survey123, ArcGIS Collector, & web maps.

2/2015-4/2016

GIS Specialist

 Duluth, MN

City of Duluth – Engineering Division

- **GIS Web Map Software Project Management** - Designed & managed a GIS user needs assessment & implementation for 19 projects for software development, database development/improvements, & training for City of Duluth IT Department, Public Works, & Utilities. Developed City of Duluth Street Update Viewer web application.
- **User Training & Presentations** – Lead monthly knowledge transfer user groups & designed new user training for new systems.
- **Multuser Database Management & Data Editing** - Edited gas, water, & storm GIS data in versioned SQL Server SDE databases. Expanded existing GIS map services to Python-built geoprocessing services to automate web map updates.

9/2012-2/2015

GIS Specialist

 Odanah, WI

Bad River Tribe – Natural Resources Department

- **Survey Field Collection, Processing, & Training** - Managed diverse field data collection preparation, training, pre- & post-processing for surveys on roads, historical properties, utilities, & tree inventories using Esri's ArcPad, in Trimble GeoXH series.
- **Map Creation, Analysis, & Automation** - Designed & trained non-developers to use Python to manipulate, re-write, or edit raster/vector data for use in GIS analysis & remote sensing apps (image enhancements, transforms, & radiometric/atmospheric correction). Deployed Tribal Ownership & Lease Viewer (ArcGIS Flex Viewer & SDE database).
- **Data Creation, Maintenance & Standardization for Natural Resources Website** - Designed GIS databases for all depts., planned & published data-entry web maps, & updated tribal website. Added secured & public Google, Esri's JavaScript API, ArcGIS Online, & GeoMoose OpenLayers web maps. Implemented ArcGIS Server security protocol for REST services.

ACHIEVEMENTS

Notable Presentations & Workshops

- 2019. "Building, Branding, & Boosting your Web Portfolio with Github Pages & Google Analytics." Women in Tech Duluth User's Group, Feb.
- Sundeen, K.H. (2018). "Exploring the Utility Network in ArcGIS Pro for Water, Electric, & Gas Networks." MN GIS/LIS Fall Workshop, Oct.
- 2018. Sharing Code, Maps, & Data Science Through a Digital Jupyter Notebook." Duluth.NET Meetup group, June.
- 2017 & 2018. "Exploring the Utility Network in ArcGIS Pro." MN GIS/LIS Spring & Fall Workshop.
- 2017. Early Adopters of the Gas Utility Network: Are You the Tortoise or the Hare? Esri's GeoConX Conference, Sept.
- 2016. "Simplifying Metadata Editing for the Non-Programmer." Northern MN GIS User Group, April.
- 2016. "Designing a Long-Term GIS Vision & Implementation Plan." MN GIS/LIS Pre-Conference Workshop, Oct.
- 2015. "From the Field through the Firewall: An Approach to Streamlining Utility GIS Data Access in the Field, Office, & Web." MN GIS/LIS Conference, Oct.
- 2015. "Bringing Free & Open Source GIS to India Country." WI Land Information Association, Feb.

Organizations & Affiliations

- Affiliate Member (2018-2021): Support MN GIS/LIS Consortium with Azure virtual environments for virtual workshops.
- Director (2018-2019): Launched & lead Duluth Women in Tech/Women Who Code groups to learn & present professionally.
- Co-coordinator (2018) .NET Duluth meetup groups for developers for presentations & professional development
- Conference Committee Member (2015-Present): Minnesota GIS/LIS Conference
- Conference Committee Member 2016-2017: Minnesota GIS/LIS Conference, *Workshop Committee*
- Board of Directors (2014-2015): Wisconsin Land Information Association (WLIA), *Chair of Membership Committee*
- Committee Member (2014-2015): National Tribal Geographic Information Support Center (NTGIS), *Publications Committee*