KIM SUNDEEN

Full Stack Sr. GIS Software Engineer, GISP

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

SUMMARY

Kim Sundeen has over 15 years as a GIS analyst and 8 years as a GIS software engineer working on a wide variety of geostatistical data visualizations, web, mobile and enterprise GIS solutions for all levels of government (university, tribal, local, county, state and federal), utilities, and open source GIS companies. She brings a passion for clean data and simple, yet innovative solutions for long term maintenance and design. She is a full stack developer with experience in databases, backend development, and modern front-end frameworks and web APIs. She has been a critical member of the development life cycle in her projects with experience creating solutions from scratch as well as extending mature, existing solutions. She has experience working with a range of third-party tools like ArcGIS Enterprise, ArcGIS Collector, Workforce, Survey123, ArcMap, ArcGIS Pro, ArcGIS Online, GPS systems, and open source GIS systems and OGC standards. She contributes to the GIS and development community through volunteering and leading user groups using Azure remote lab to support workshops.

LANGUAGES & TECHNOLOGIES

- **Web Development**: Typescript, HTML5, CSS, JavaScript frameworks, node.js, npm/yarn, React, IIS
- **Code Versioning**: Git, Github, Mercurial, TortoiseSVN, TFS
- **OS**: Windows, Linux
- **Server-side/desktop programming:** Python2/3, C# .NET, SQL/PLSQL, ASP.NET MVC, .NET Framework 4.8, GeoServer web publishing
- **Database design/structures**: Microsoft SQL Server, 11g/12c Oracle, PostgreSQL/POSTGIS, MySQL, JSON
- **Cloud Solutions**: Microsoft Azure, TFS, DevOps

- **ArcGIS Enterprise stack**: ArcGIS Server/Enterprise, Web Adapter, Branch Versioning, Portal, Data Store, ArcGIS Online
- **Using APIs**: Esri's JavaScript API 3.x, 4.x, Leaflet, Mapbox, Google Maps, Openlayers 5/6, Boundless SDK (React-based OpenLayers)
- **Developing APIs:** Python Flask and FastAPI, .NET C#
- **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, Experience Builder, Web AppBuilder Developer Edition

SOFT SKILLS

- **Personnel Management:** Managed 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 ***Heath Consultants***, ***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 workshops & presentations 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 & open source QGIS, (3) process for updating website front ends, & (4) GIS user needs & feasibility assessments, (5) Lead yearly workshops Esri's Utility Network Tools, open source 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 peer-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)**
  - o 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**
  - o *Focus: geostatistical regression of remotely-sensed mercury concentrations & data science methods.*
- **2011 - University of Wisconsin-Madison, Master of Science: Conservation Biology & Sustainable Development**
  - o *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:
  - o *GeoComm: Esri JavaScript web applications using Angular/Bootstrap frontend and Python FastAPI backends.*
  - o *SSP Innovations:* Esri JavaScript APIs for web app development using angular Esri SDK,
  - o *GCR, Inc*.: Boundless SDK, Open Layers web viewer built within MVC .NET framework.
  - o *Lake Superior Consulting*: Engineering web viewers in Angular & C# MVVM .NET framework using Esri's API 3.x,
  - o *Bad River Tribe*: Ownership & Lease Viewer (ArcGIS Flex Viewer & SDE database),
  - o *City of Duluth*: Street Update Viewer (Esri's Web App Builder & SDE database),
  - o *MN Power*: Electric Utility Asset Identification (Esris' JavaScript API & Web AppBuilder Developer's Edition & SDE database),
  - o 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*. Implemented that same best practices except for Angular at *GeoComm.*
- **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 & 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

9/2017 - Present **Azure Virtual Environment Administrator**
 📍 Duluth, MN / Remote

MN GIS/LIS Consortium

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 Azure credits for non-profit (https://www.mngislis.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.

Senior Software Engineer
 📍 DeForest, WI / Remote

GeoComm, Inc

Summary: Collaborated as senior developer on a team supporting backend and frontend web applications designed for managing emergency services 911 call routing and GIS data ETL management.

- *AWS Continuous Integration/Continuous Deployment* – Built and maintained CI/CD pipelines in AWS using CodeBuild, CloudWatch, and Elastic Container Registries (ECR) to build and deploy Docker Ubuntu and CentOS images for Linux servers linked to Git workflows.
- *Front End Web Application Development* – Built new modular tools and Jest/Jasmine unit tests for Esri JavaScript API 4.x web applications with Bootstrap styles aimed at facilitating data sharing, updating, and creation through a custom portal using Esri ArcGIS Pro, Esri ArcGIS Server and Esri Enterprise.
- *Backend Development* – Created and maintained Python FastAPI and Flask APIs, OpenAPI endpoints, and associated unit tests to manage database updates using PostgreSQL with POSTGIS and non-SQL Elasticsearch for data management and searching efficiency.

Team Lead, Tech Lead, GIS Software Engineer
 📍 Centennial, CO (Remote in Duluth, MN)

SSP Innovations, LLC – Systems Implementation

Summary: Worked 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. Led project with presentations & demos for clients. Led integration design workshops with clients 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 for 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.

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.

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).

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.

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.

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.
- **Multi-user 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.

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.
- 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 & led Duluth Women in Tech/Women Who Code groups for professional learning.
- 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 (NTGISC), *Publications Committee*