

A series of fortunate events

Prabhjot (Nicky) Sandhu



Act 1 - Foundations (1994 - 2000)

Early neural networks (ANNs)

- Implemented with **Ralph Finch**, building fast ANN methods to estimate **salinity** from flows and barriers.
- Applied ANN tools to **THM formation potential** with guidance from **Paul Hutton**.

Data tools – VISTA & VSCRIPT

- Primary developer of **VISTA** and **VSCRIPT** to retrieve, process, and visualize **time-series data**.

Particle Tracking Model (PTM)

- With **Ralph Finch**, rewrote (Particle Tracking Model) **PTM** from **Fortran** to **Java 1.0** in an object-oriented style.
- Enabled later complex particle behaviors to emulate fish, building on **Tara Smith's** 1993 work.

WRESL 1.0 and CalSim 1.0

- Co-developed **WRESL 1.0** with **Armin Munevar**, guided by **Francis Chung**.
- Became the language and engine behind **CalSim 1.0**, central to California water operations.





Intermission (2000 - 2008)

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- Worked in the **private sector** as a software engineer and IT architect.
- Contributed at various startups and large companies, including **IBM** and **Raleys**.

Act 2 - Returning Home

CalSim evolution

- Guided the rewrite of **WRESL 2** with **Hao Xie** and **Kevin Kao**.
- Guided development of the **CalSim UI**, including an interactive schematic.

DSM2

- Maintained and tuned **DSM2** for better performance.
- Oversaw development of **GTM** (General Transport Model) guided by **Eli Ateljevich**
- Ongoing enhancements by **Kijin Nam** and others.

Deep learning exploration

- Encouraged use of **LSTM networks** to emulate complex processes.
- Supported work on **sediment transport** and **Martinez salinity** emulation (with **Kevin He and others**).

Program leadership

- Since **2017**, serves as **Manager of the Delta Modeling Section**.
- Overseeing Delta modeling and validation across tools like CalSim, DSM2, and related studies.



