The Role of Research in the Transformation of San Diego's Economy

Mary Lindenstein Walshok, Ph.D.
Associate Vice Chancellor, Public Programs
Dean, University Extension
University of California, San Diego

E Kamakani Noi'i
Waikiki, Hawai'i
January 2011

GlobalCONNECT™

globalconnect.ucsd.edu

In the Late 1950s

San Diego had **NONE** of the assets one associates with technology hubs today

- Land and facilities dedicated to research and education
- Large, competitive basic research institutions
- High levels of patenting and licensing
- Angel and venture capital essential to starting and developing businesses
- The talent – technology entrepreneurs and technology business start-up know-how
- Access to global partners and markets for advanced technology products

In the 1960s

San Diego was a tourism and real estate development center on the Pacific Ocean which was losing its valuable defense contracting industries developed during World War II. It was referred to in the August 17, 1962 *TIME Magazine*, as “Bust Town, U.S.A.” (failed city)

Today

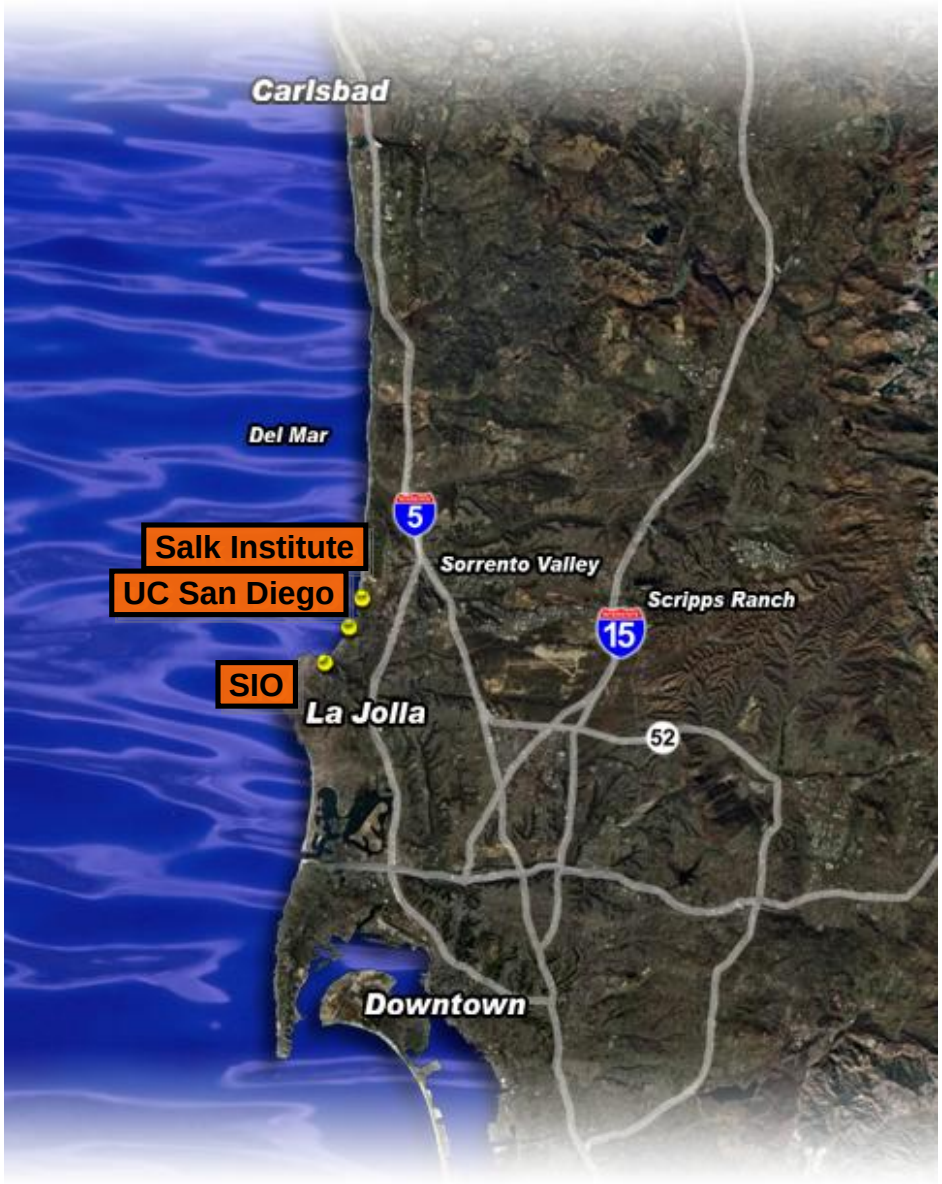
San Diego (a city of 1.3 million) is a major global science and technology hub

RESEARCH

- UC San Diego – with > 29,000 students, > 1,000 faculty, > 2,000 researchers and post docs, is #6 in research funding in the United States and ranked #13 in the world by Shanghai Jiao Tong University in *Academic Ranking of World Universities* (2008).
- The once barren Torrey Pines Mesa now has 50 research institutions which combined competitively receive more than $2 billion annually in basic research funding and +/- 7,000 filings/awards of patents annually

At Our Core

The Scripps Institution of Oceanography (1903)
General Atomics (1955)
U.C. San Diego (1960)
Salk Institute (1960)



GlobalCONNECT™

At Our Core

The Scripps Institution of Oceanography (1903)
General Atomics (1955)
U.C. San Diego (1960)
Salk Institute (1960)

Today there are over 50 major research institutes in San Diego, with five founded in the last two years.

GlobalCONNECT™

Today

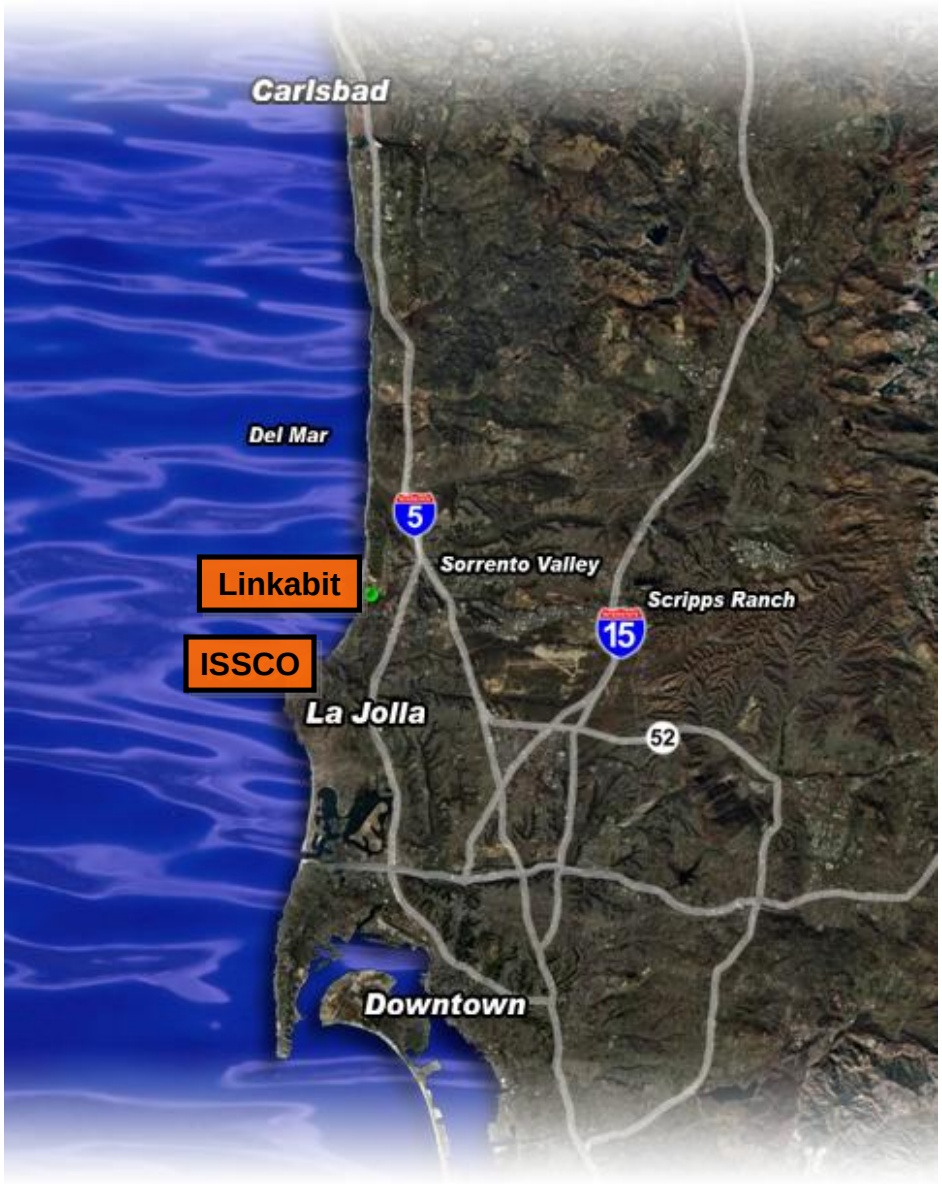
SAN DIEGO IS A HUB OF DIVERSE TECHNOLOGY COMPANIES

- 300 defense and security companies
- > 1,000 wireless communications and software companies, anchored by Qualcomm
- > 600 life science companies, anchored by Biogen Idec, Gen-Probe and Life Technologies
- 250 energy and environmental companies
- 600 action sports companies

IT/Wireless/Software

***Linkabit** was founded by UC San Diego professor Irwin M. Jacobs in 1968 as the first high-tech communications company in San Diego.*

Peter Preuss developed his first software package in 1969 and founded **ISSCO** in 1970.



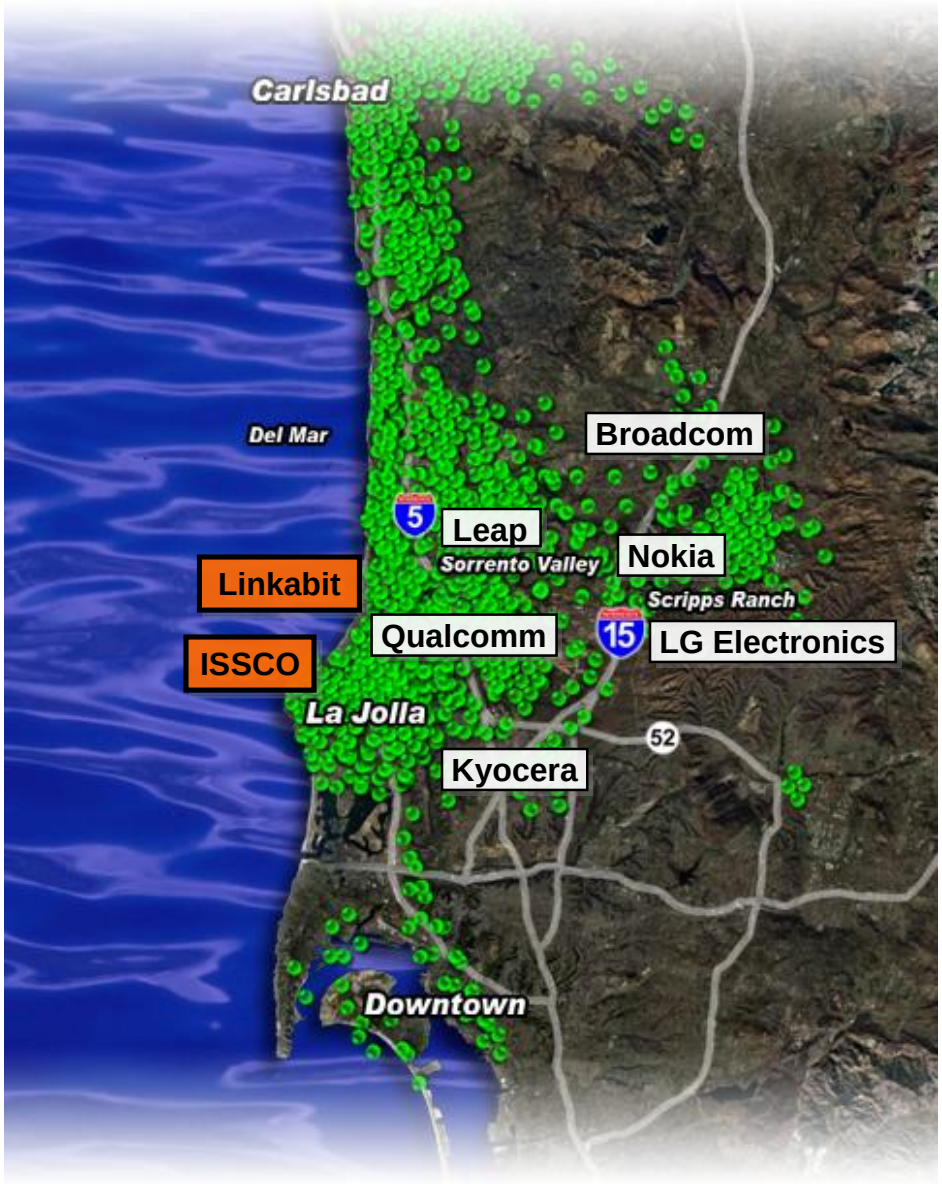
GlobalCONNECT™

IT/Wireless/Software

***Linkabit** was founded by UC San Diego professor Irwin M. Jacobs in 1968 as the first high-tech communications company in San Diego.*

Peter Preuss developed his first software package in 1969 and founded ISSCO in 1970.

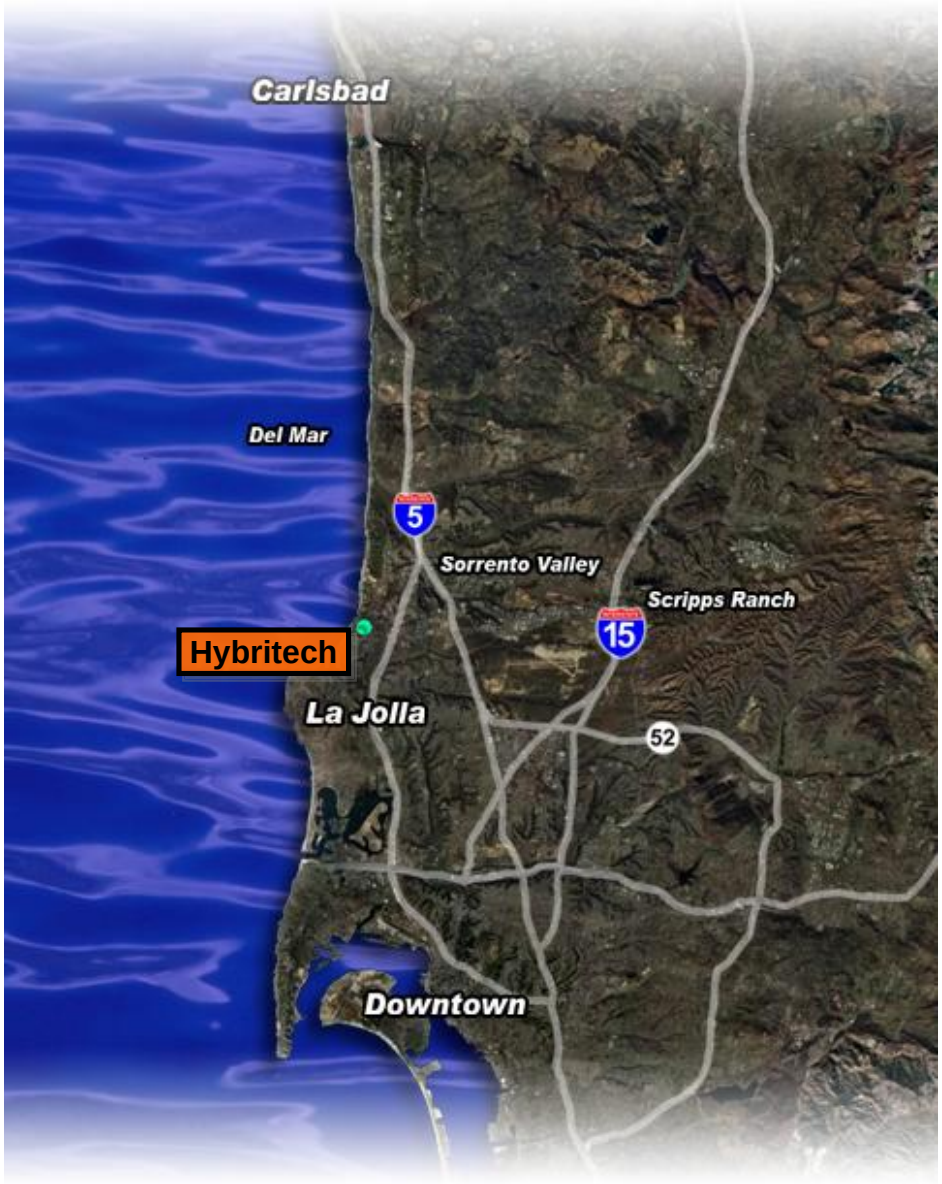
Today there are more than 1000 IT, wireless and software companies operating in San Diego.



GlobalCONNECT™

Life Sciences

***Hybritech** was founded in 1978 by UC San Diego professors Ivor Royston and Howard Birndorf as the first "biotech" company in San Diego.*

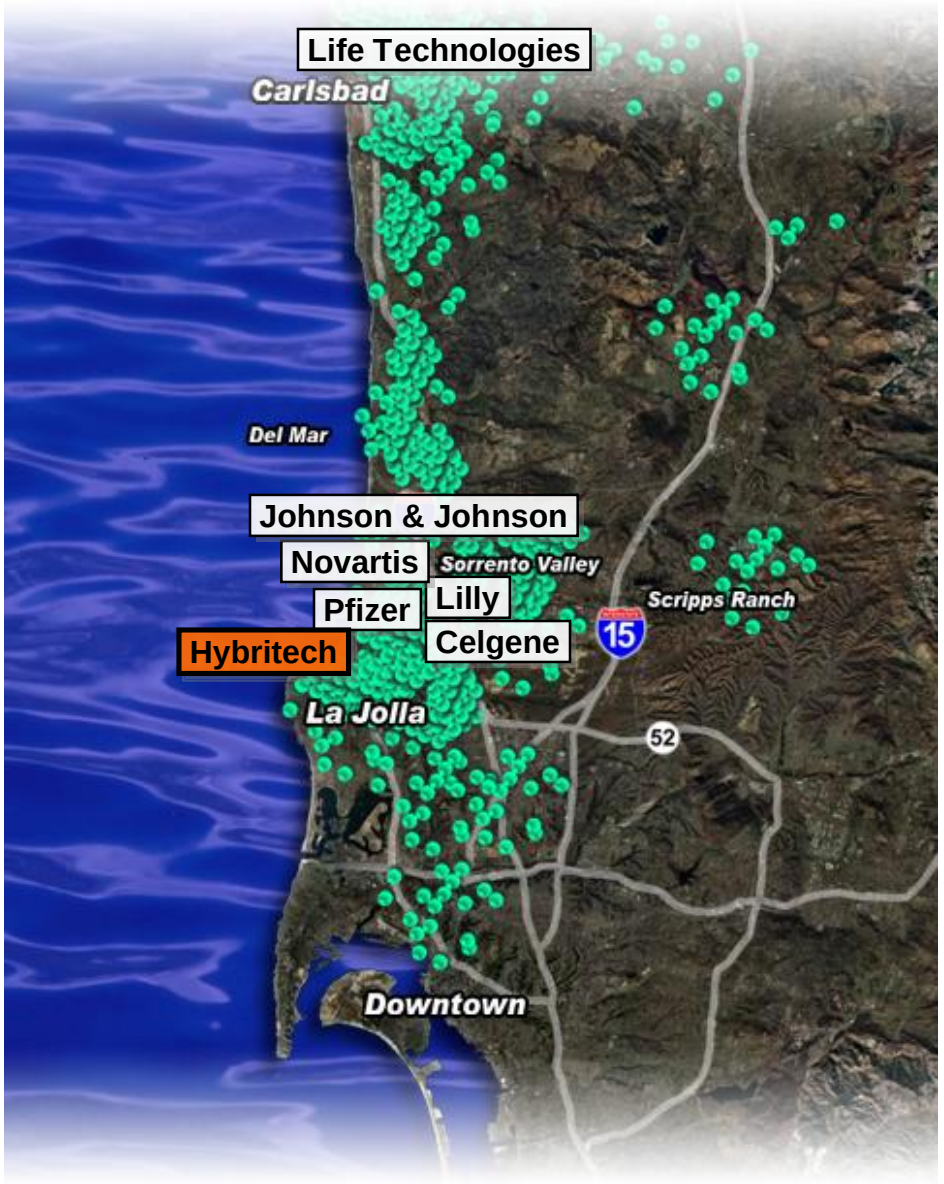


GlobalCONNECT™

Life Sciences

***Hybritech** was founded in 1978 by UC San Diego professors Ivor Royston and Howard Birndorf as the first "biotech" company in San Diego.*

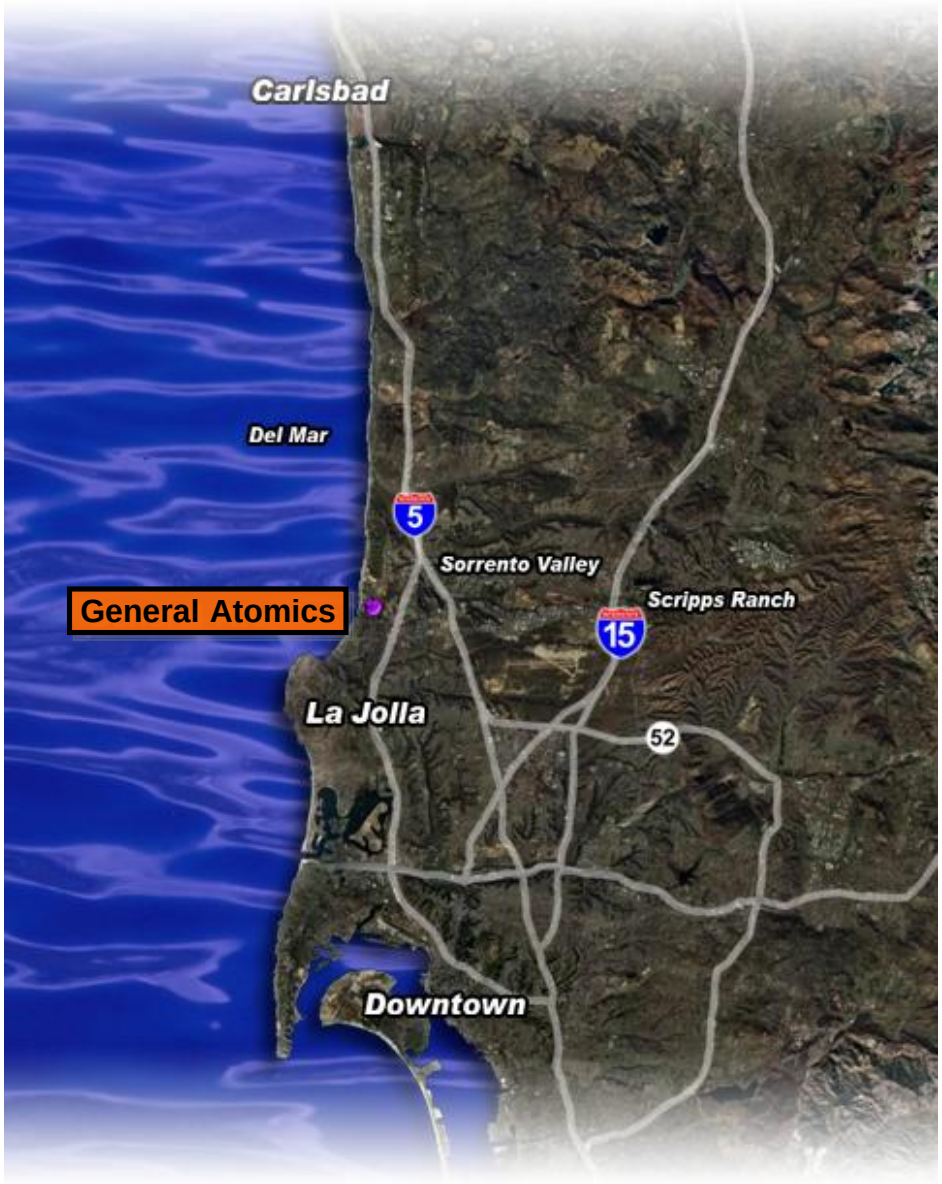
Today there are more than 600 life science companies operating in San Diego.



GlobalCONNECT™

Energy & Environment

General Atomics was founded in 1955 as San Diego's first R&D energy company by General Dynamics.

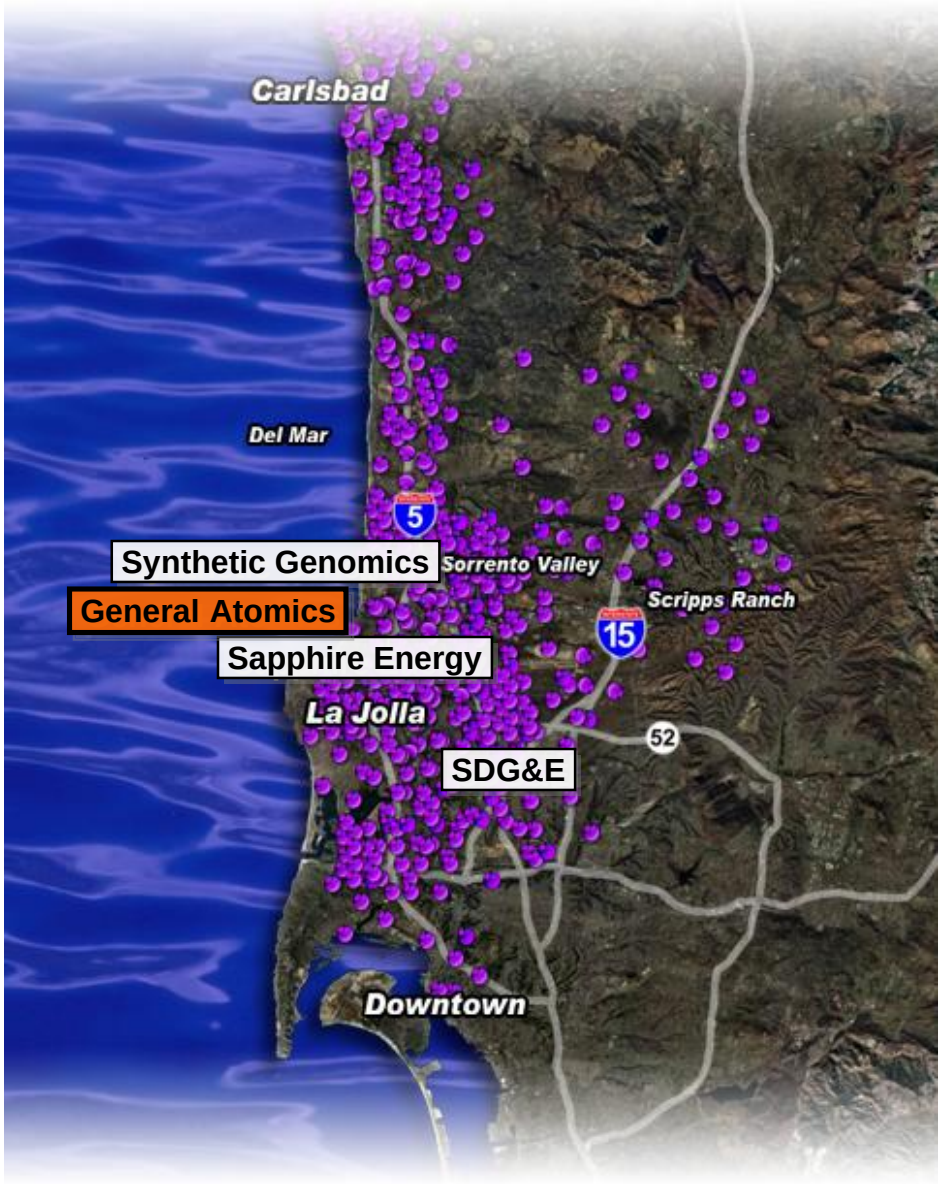


GlobalCONNECT™

Energy & Environment

General Atomics was founded in 1955 as San Diego's first R&D Energy Company by General Dynamics.

Today there are more than 250 energy and environmental companies operating in San Diego.



GlobalCONNECT™

Action & Sports

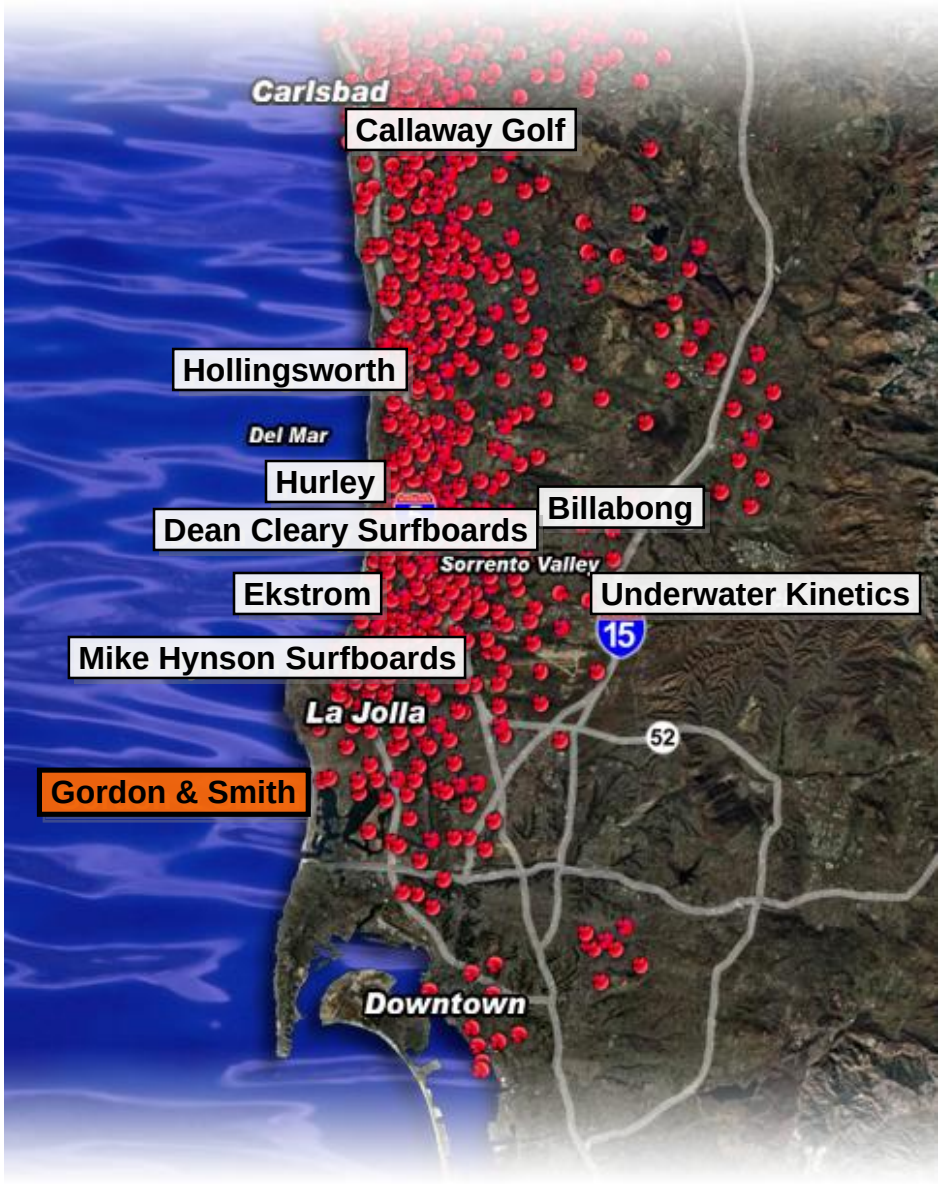
San Diego's action sports industry traces back to the founding of Gordon and Smith Surfboards in 1959.

GlobalCONNECT™

Action & Sports

San Diego's action sports industry traces back to the founding of Gordon and Smith Surfboards in 1959.

Today there are more than 600 action and sports related companies operating in San Diego.



GlobalCONNECT™

Why This Transformation?

This phenomenal transformation into a leading science and technology center is a result of the interplay of six critical factors

Factor One

Land Use and Infrastructure

- The role of regional land use decisions and of state infrastructure investments in the 1950s and 1960s.
  - Examples: The development of a new University of California campus through the conversion of a military camp and incentives of free land to research organizations such as General Atomics and the Salk Institute contiguous to UC San Diego

Factor Two

World Class Research

- The focus, from day 1, was on building globally competitive basic research institutions. General Atomics, TSRI, Salk, UCSD, Sanford-Burnham, etc. were all "start-ups" in the 1960s and 1970s.
  - Examples: Senior scientists recruited to the region - people who brought research with them and were magnets for talented "world class" scientists and research professionals

Factor Three

Private Sector Investment

- A major commitment of time and resources by the private sector to grow a knowledge economy represented by a collection of small and medium sized enterprises, business and professional services, as well as local philanthropy, all “pooling” assets in order to support new and uncertain ventures.
  - Examples: Early (1907) private support for SIO, venture realtors (1978), CONNECT (1985), pro bono services, significant private dollars to fund research positions and facilities (1980) and expansion of angel networks and venture capital (1990)

Factor Four

Entrepreneurial Culture

- A culture of collaboration which goes **beyond networking** and involves shared agenda setting, shared investment, shared risk and shared rewards. Supported by physical proximity, informal relations and formal social networks
  - Examples: CONNECT, Center for Magnetic Recording, the Supercomputer Center, Calit2, the Stem Cell Collaborative and BIOCOM
  - Multiple collaborative education and training initiatives

Factor Five

Talent Development

- An industry led focus on the skills needed for emerging technology companies in the region – undergraduate, graduate and continuing education
  - CDMA and wireless technology
  - Clinical research and clinical trials management
  - Global business skills
  - Computational biology
  - Entrepreneurship
  - Stem cell technician training

Factor Six

Commitment to “Place”

- A powerful “sense of place,” which binds people, if only for lifestyle, to the region and creates incentives for making things work, helping new initiatives and enterprises start and succeed through a investments of personal time, connections and cash
  - Talent stays, i.e. growth of a world class research community
  - Links between early entrepreneurs and multiple generations of companies, i.e. serial entrepreneurs
  - Time and dollars reinvested in social initiatives and the growth of local philanthropy

San Diego Today

- What San Diego did over a 40-year period, to enable its transformation and leadership position today:
  - Made good land use decisions and infrastructure development
  - Built excellence and reputation quickly through great scientists and world class science
  - Engaged a major commitment of time and resources from the private sector
  - Had the wisdom to develop the talent needed to commercialize and run science based enterprises
  - Relied on an entrepreneurial and collaborative culture
  - Nurtured a commitment to building a special “place”

Conclusion

"…San Diego has a unique level of seamless collaboration among public, private, and academic institutions in the region…(for) the transfer of science and technology to entrepreneurial companies…"

Michael Porter, *Harvard Business School*

Conclusion

"Before wealth can be created, human beings have to learn to work together and, if there is to be subsequent progress, new forms of association have to be developed.

"While we associate economic growth with technological development, organizational innovation has played an equal, if not more important role since the beginning of the industrial revolution."

Economic historians Douglass North and Robert Thomas (P47 of "Trust")