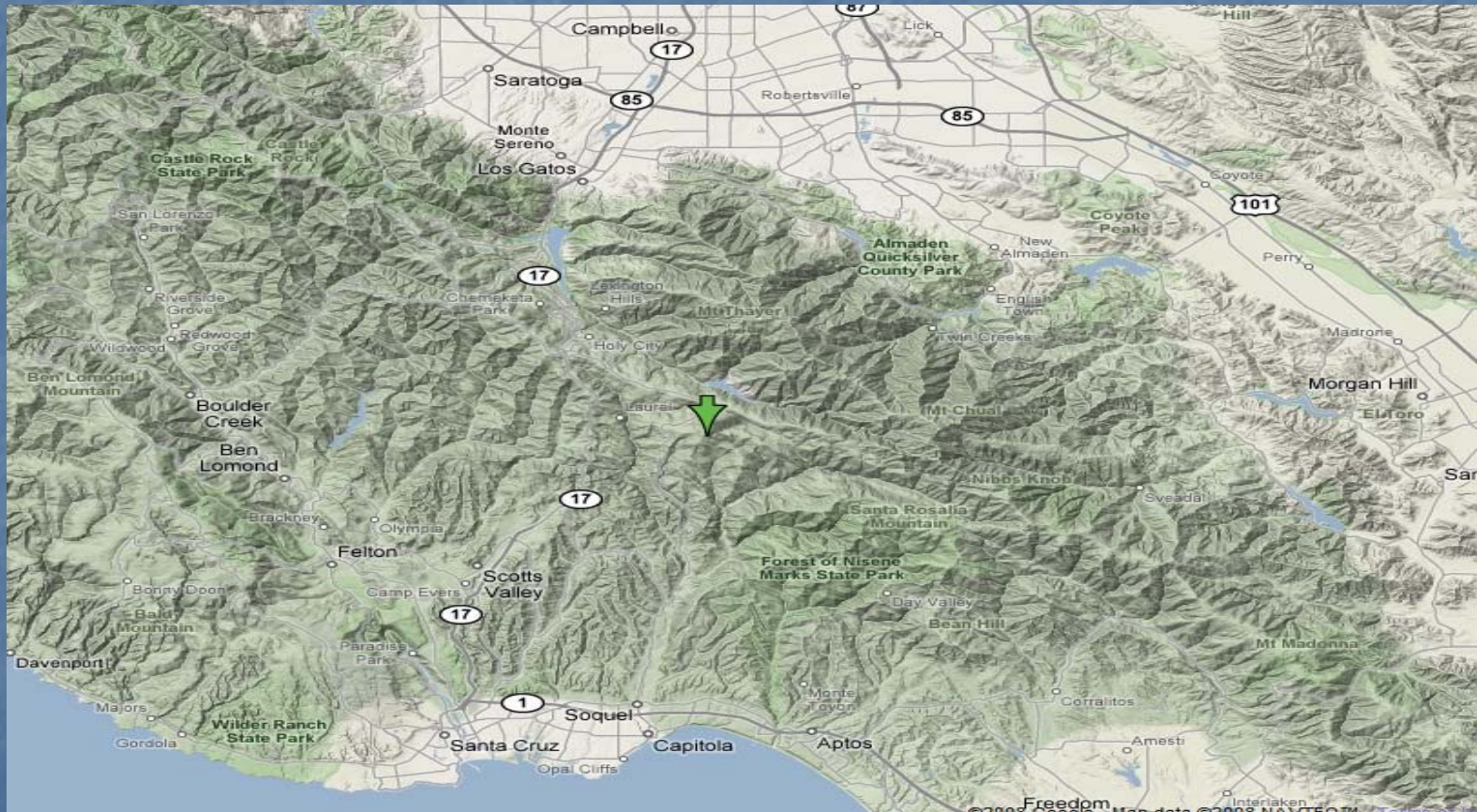


Energy and Water Usage at Skyland Community Church 2002 to 2008

www.skylandchurch.com

Skyland Community Church

25100 Skyland Road
Santa Cruz County



Our Facilities From Space



Our Facilities Back on Earth



Unique Situations at the Church

- **Low occupancy** (the sanctuary is used on Sunday)
- **No permanent residents on site**
- **No custodian** (members take care of everything)

Utility Challenges for our Church

- Eliminating waste, usually things left on.
- Train each other to operate the church.
- Making the best technical and moral choice when installing new appliance or service.

Utilities At The Church

- Heating
 - All heating is done with LPG (liquefied petroleum gas)
 - Each building/floor has its own furnace (6 furnaces total)
 - Kitchen stove is LPG
 - Water heating is LPG
- Electrical
 - All lighting
 - Water pressure pump
 - Dual oven and refrigerator
- Water (All water is trucked in from Soquel water district)

Heating Solutions 1

- All furnaces (6) have thermostatic control with manually set mechanical run down timers.
- Sanctuary (shown) has timer to auto start heating in winter



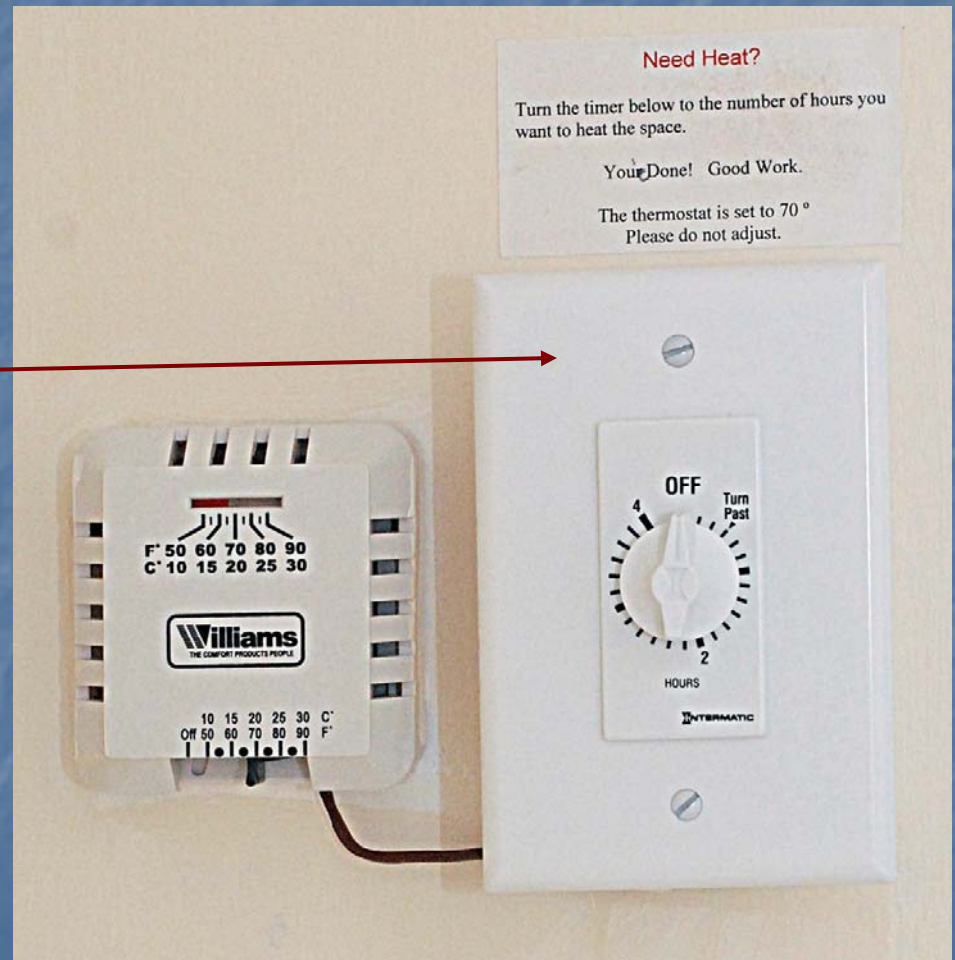
Heating Solutions 2

- Restrooms and nursery have 12k BTU furnaces with the manual set rundown timers.
- Pilot light heat stops mold during the rainy season.



Heat Control System 3

- On 5 furnaces mechanical run down timers are used to activate the system.

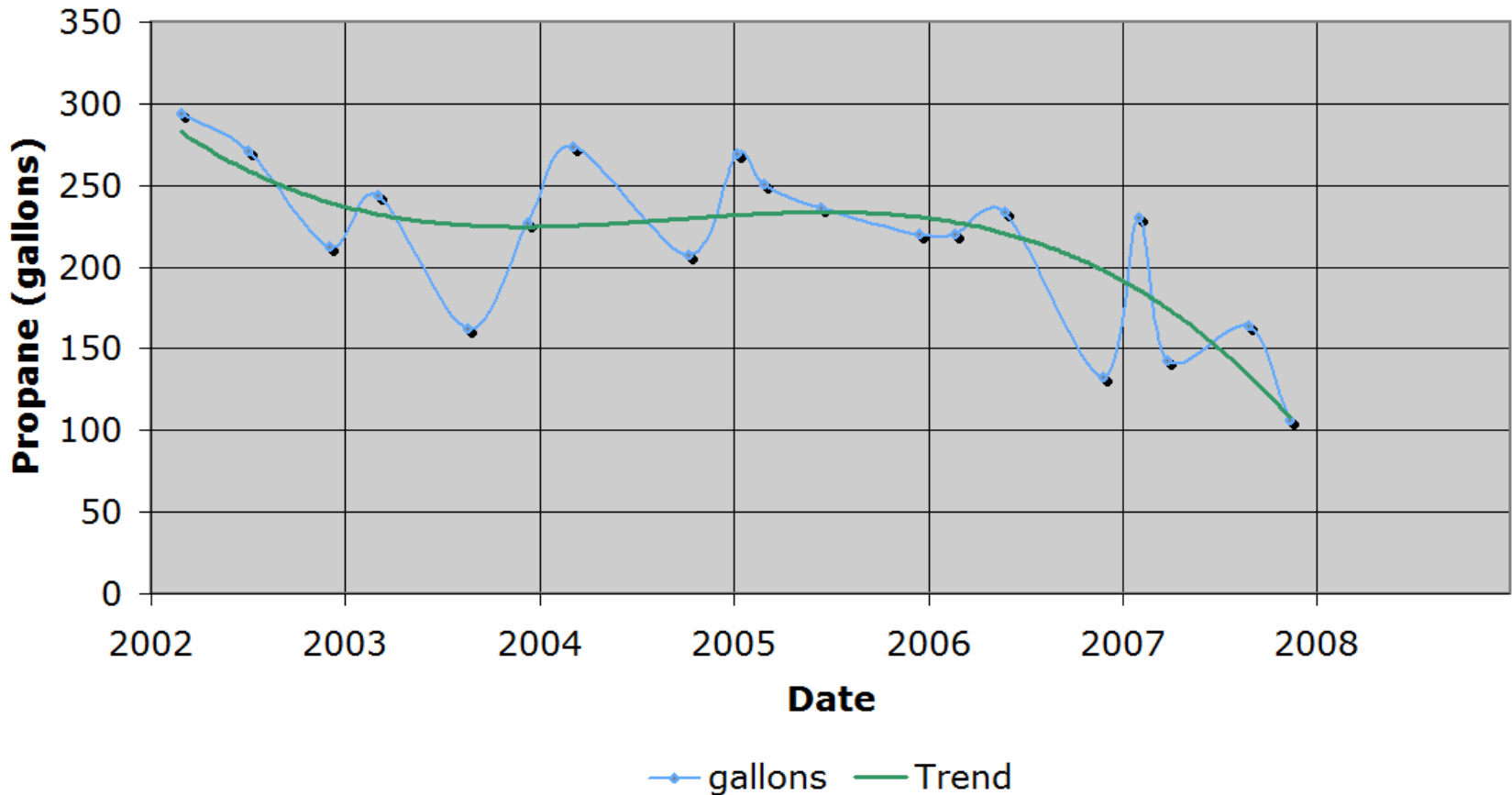


Gas pilot lights

- Sanctuary furnace has no pilot light (no risk from freezing)
- The hall furnaces and water heater have pilots that give freeze protection.
- The Nursery and Restroom get freeze and mold protection.
- Annually the Pilot lights use 39 gallons of LPG that cost ~ \$100 or 456 lbs of CO₂

Propane Use

Skyland Church Propane Use

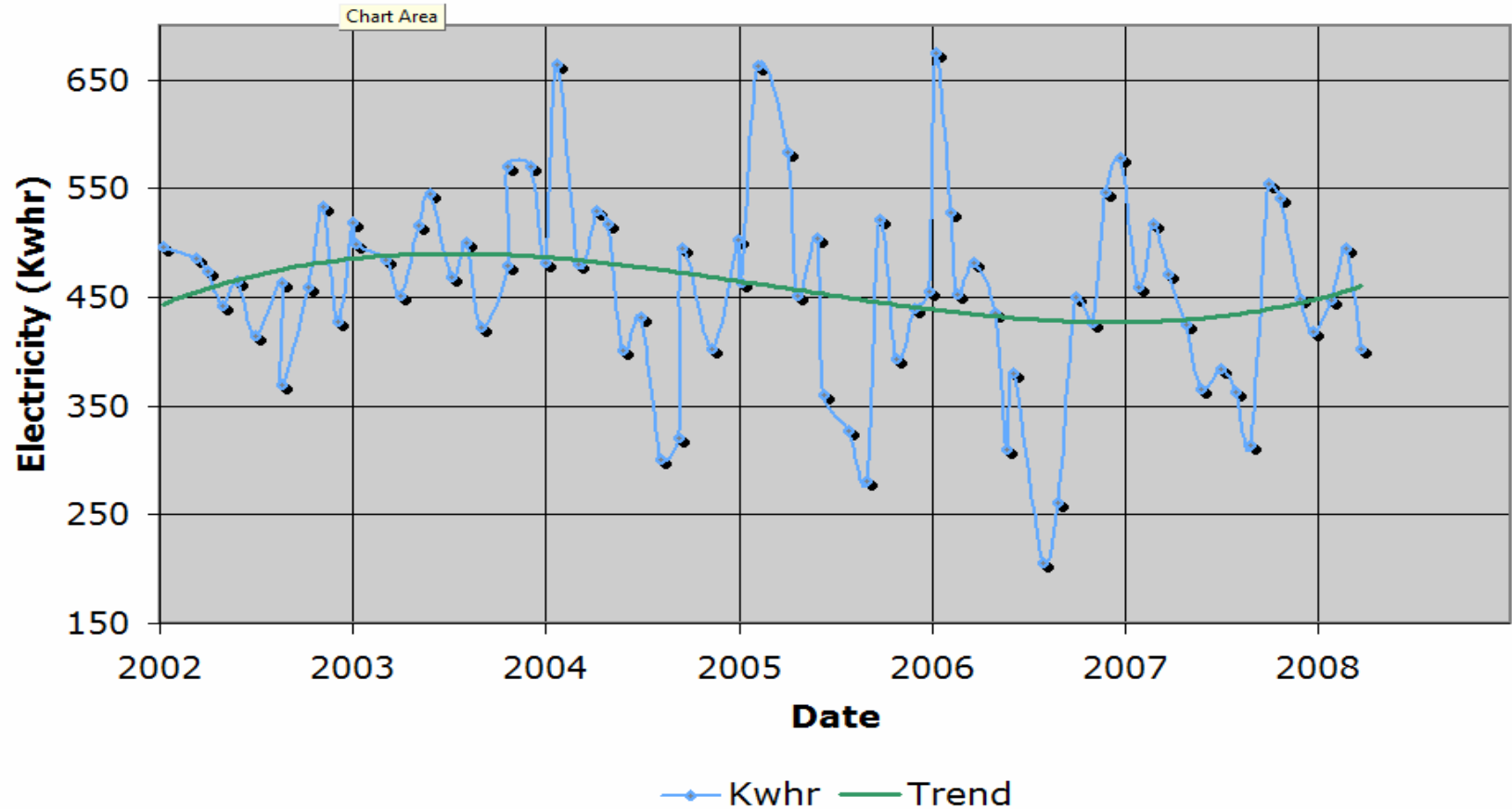


Electrical Usage

- Virtually all lighting has been converted to Compact fluorescent bulbs both inside and out over the last 5 years.
- Lighting zones have been wired to enable us to light only the areas needed.
- Outside security lights are on a photo detector.

Electricity Use

Skyland Church Electricity Use



Water System

- All water is trucked from the Soquel water district to a 2500 gallon on site tank.
- The water pressurization system is fitted with a electric valve and X-10 receiver in the pump house. This valve controls all water flow to our site.

Water Control System 1

- This water flow is controlled by a mechanical run down timer and a X-10 power line transmitter in the kitchen



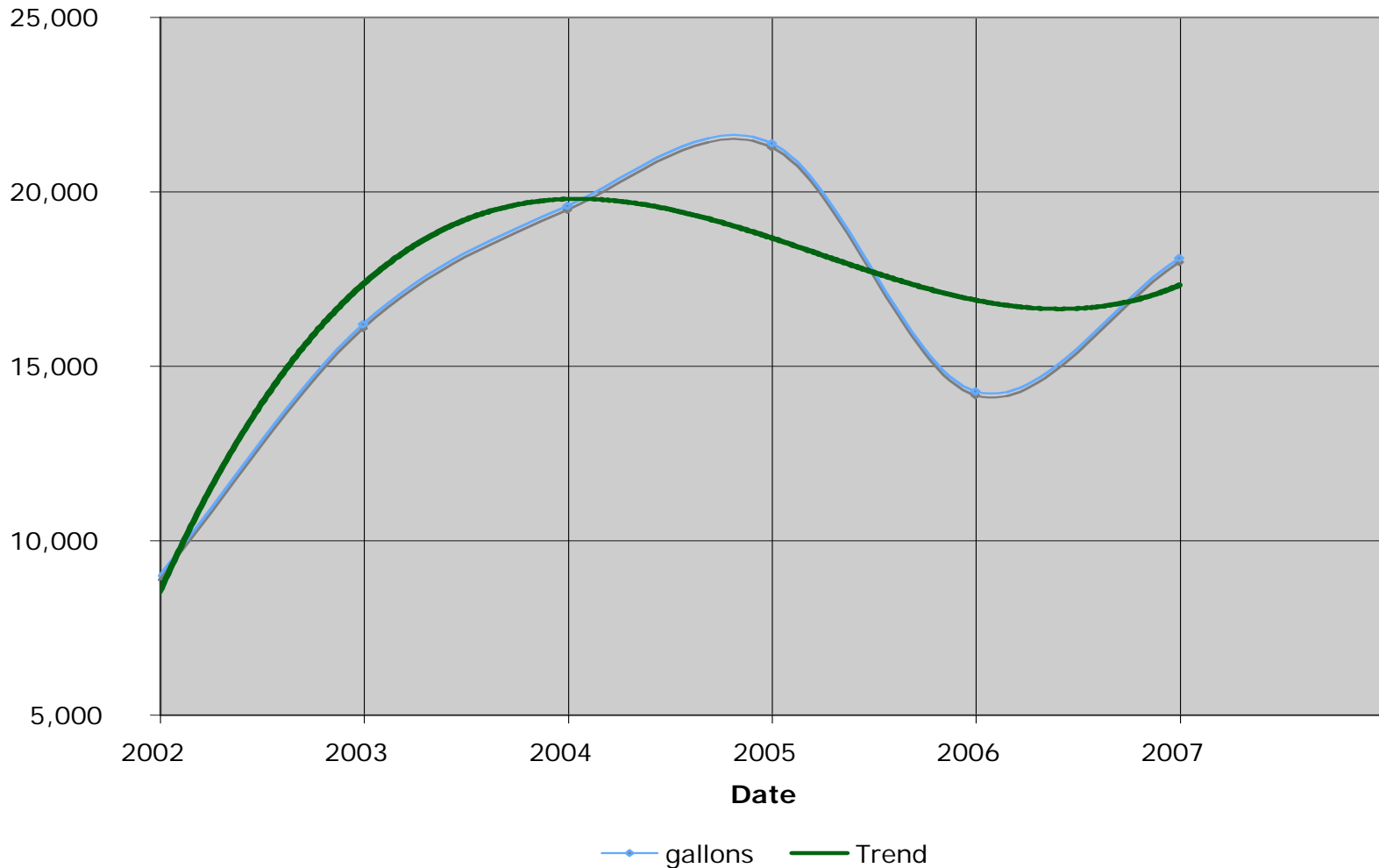
Water Control System 2

- In the pump house a X-10 receiver controls a ON/OFF valve



Annual Water Use

Skyland Church Water Use



Utilities 2002 to 2007 Average

Propane usage - gallons	680
Propane usage - \$	\$1,429
Propane usage energy content - BTU's	57,149,400
\$ per 10,000 BTU	\$0.256
Propane usage - lbs of CO2 released	7,960
Electricity usage - Kwatt hours	5,502
Electricity usage - \$	\$942
Electricity usage energy content - BTU's	18,757,684
\$ per 10,000 BTU	\$0.502
Electricity usage - lbs of CO2 released	2,879
Water usage - gallons	16,430
Water usage - \$	\$822
Annual Utilities \$	\$3,192

Carbon Footprint

2002 to 2007 Average usage

Total Church Utilities - lbs of CO2	10839
Skyland Church membership	120
Utility CO2 footprint per member annually	90
CO2 footprint driving to church annually	262.5
(6 miles round trip @29 miles/gallon)	

However!

- The CO₂ placed in the atmosphere during the generation of electricity is total dependent on the process used to generate the electricity.
- The CO₂ into the air during generation range from
 - 0.0 lbs/Kwh for Hydro, Nuclear, Wind, Solar and Tidal.
 - 1.6 lbs/Kwh for Coal
- PG&E currently claims 0.52 lbs/ Kwh.

Credits

- Story Larry Lopp
- Data Gerald Alonzo
- Usage Graphs Lou Mc Tamaney
- Photography Nancy Jo Lopp
- Control systems Larry Lopp
- Usage and operation The members of Skyland church