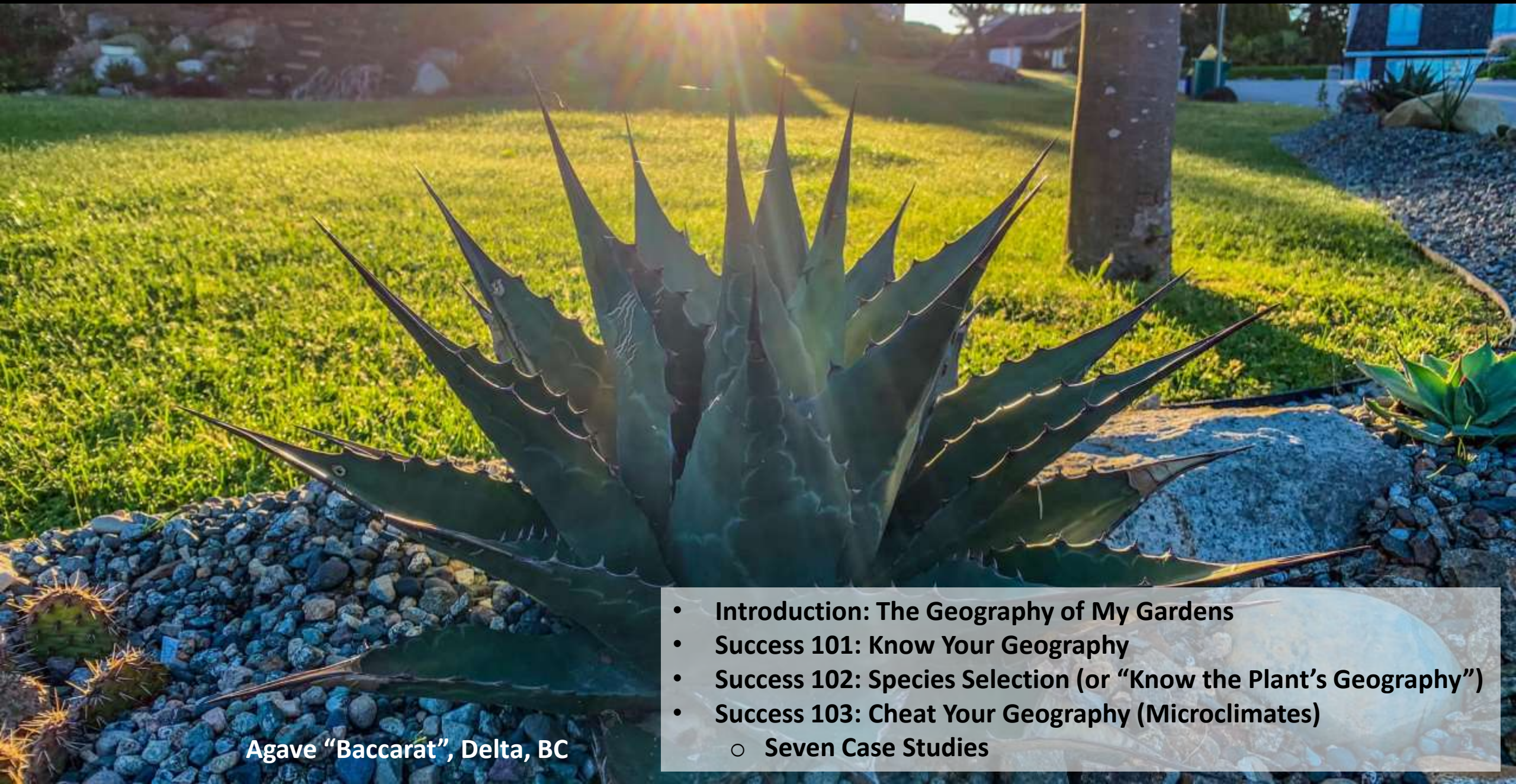
C&S in the Canadian Garden, From Sea to Sky

NORTH AMERICAN ROCK GARDEN SOCIETY

Jay Akerley | Jan. 15, 2022

Agenda



- Introduction: The Geography of My Gardens
- Success 101: Know Your Geography
- Success 102: Species Selection (or “Know the Plant’s Geography”)
- Success 103: Cheat Your Geography (Microclimates)
  - Seven Case Studies

Agave “Baccarat”, Delta, BC

Introduction: The Geography of My Gardens

Delta, BC, since 08/2018

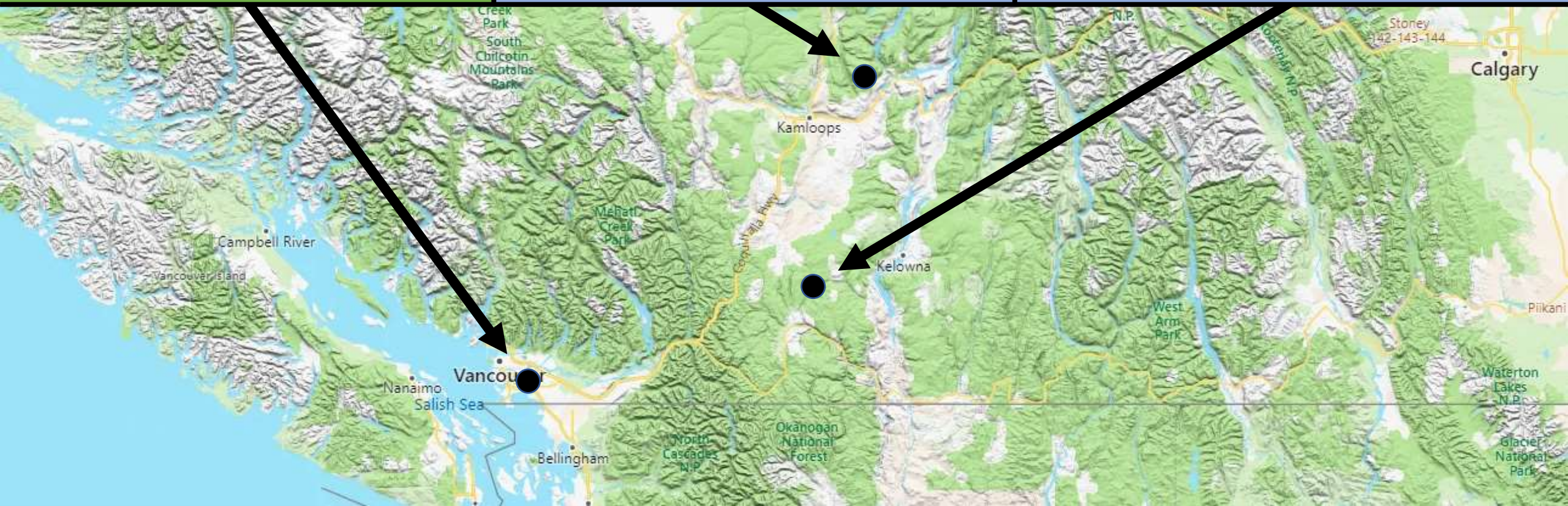
USDA Z8
Elevation 100m / 328ft
Annual Precip: 1409mm / 55in
Frost-Free Period: 180 days

Sun Peaks, BC, 07/2021 - ?

USDA Z3 but <-40F every few years
Elevation 1250m / 4100ft
Annual Precip: 755mm / 30in (220in snow)
Frost-Free Period: None
Reliable Snow Cover: October – May

Erris, BC, 2004 - 06/2021

USDA Z3
Elevation 915m / 3000ft
Annual Precip: 493mm / 19in
Frost-Free Period: None
Reliable Snow Cover: November – April



Delta, BC

Suburb of Vancouver

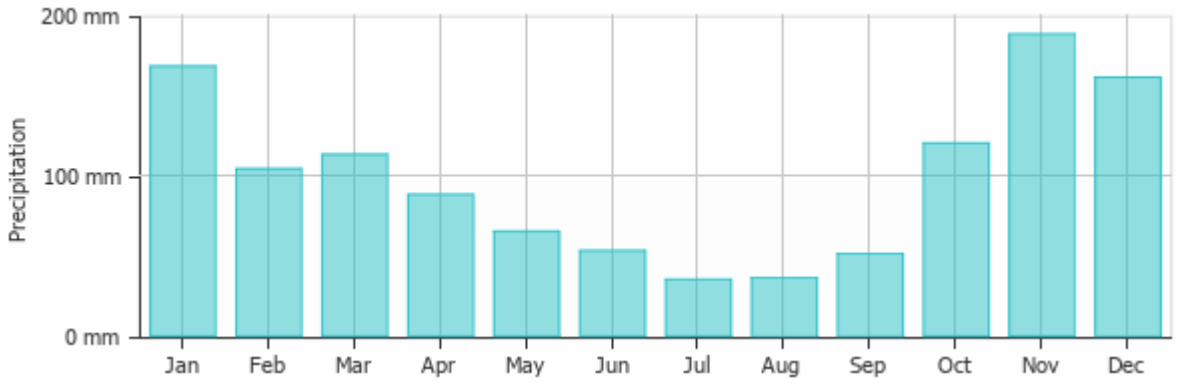
Thompson Plateau, BC

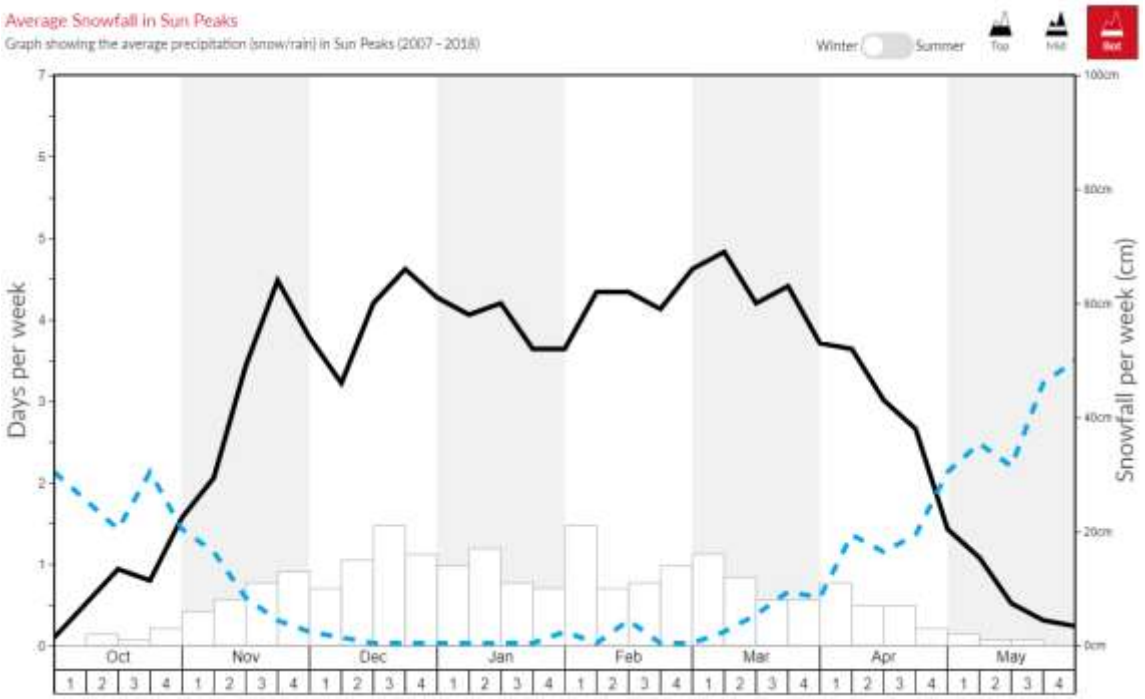
Sun Peaks: 7th largest ski resort in North America
(2nd in Canada)

Keys to Success: Succulents on the Rocks, in Maritime or Mountain Environments

- What are the opportunities your site offers? Limitations?
- Choosing appropriate species.
- Are there microclimates; ones you can build or existing ones in your garden that you can enhance?

Success 101: Know Your Geography



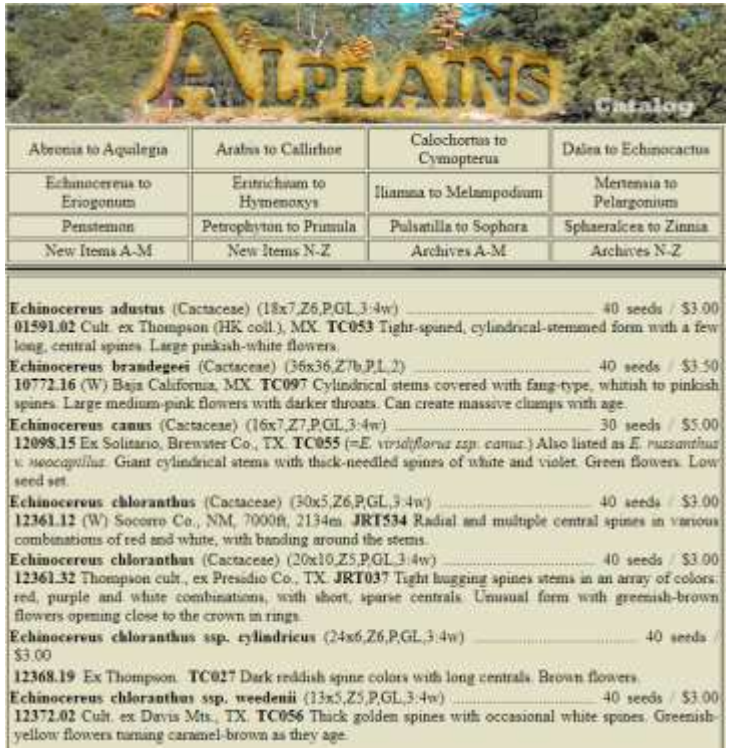


- Consider your geography from outside your geography (be honest)
- Precip? When?
- Snow? When? Amount?
- How long does snow last?
- Prevailing Winds?
- Summer Heat?
- Soils?

My feeling about USDA Zones: Vancouver does not equal Dallas does not equal Pensacola! And shouldn't Summer be dry?

Success 102: Species Selection

- What is the plant's natural range?
- What conditions can one expect in that range?
  - Temperatures?
  - Precipitation?
  - Snow? When? Amount?
  - Soils? (Or no soil?)
- Study literature. Plant and seed catalogues are great!
- Has anyone else had success with this plant in similar environs?
- Introspection:
  - A: "Is this realistic for my garden?"
  - B: "How can I help it live in my garden?"

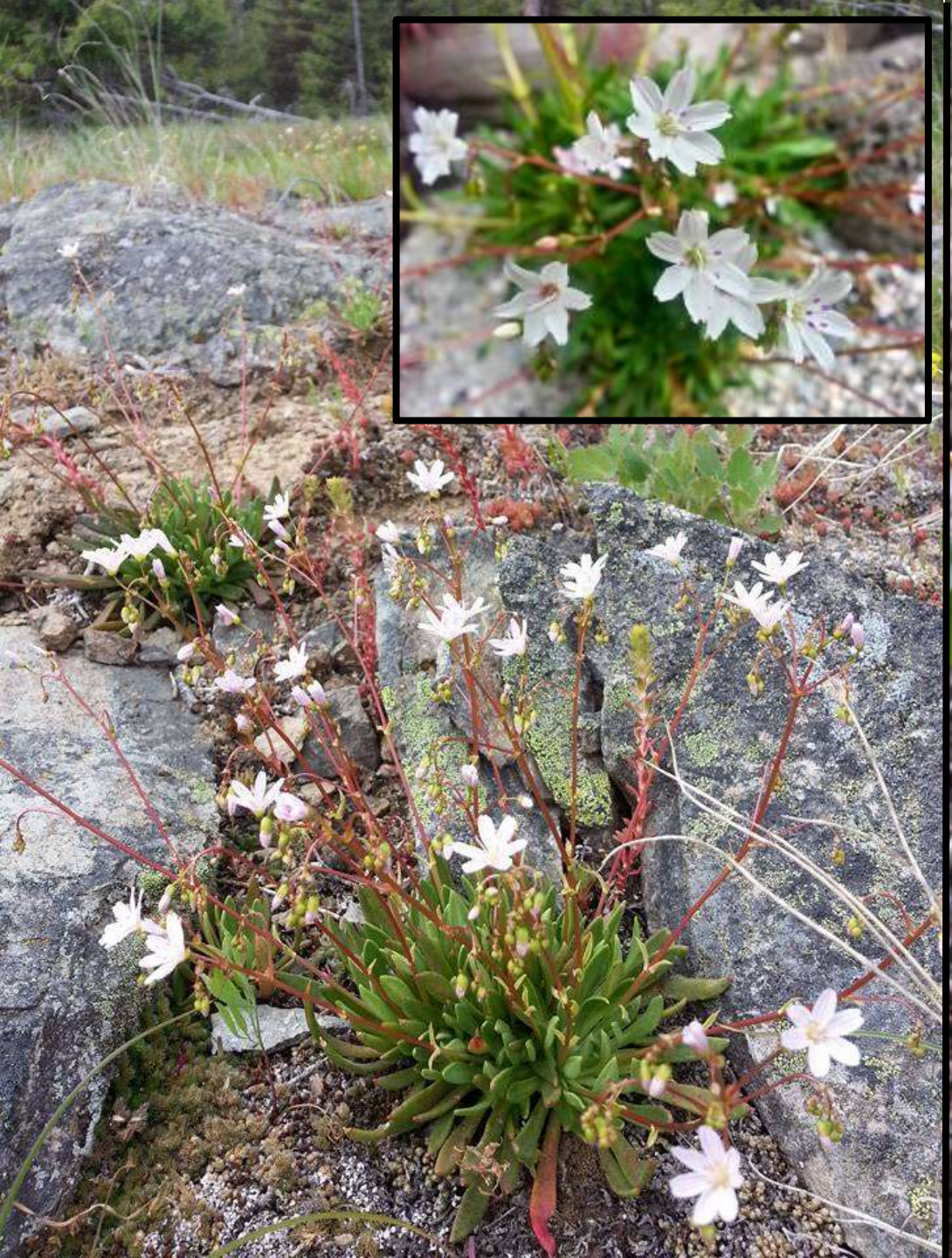


This is (or should be) the main takeaway of this presentation.

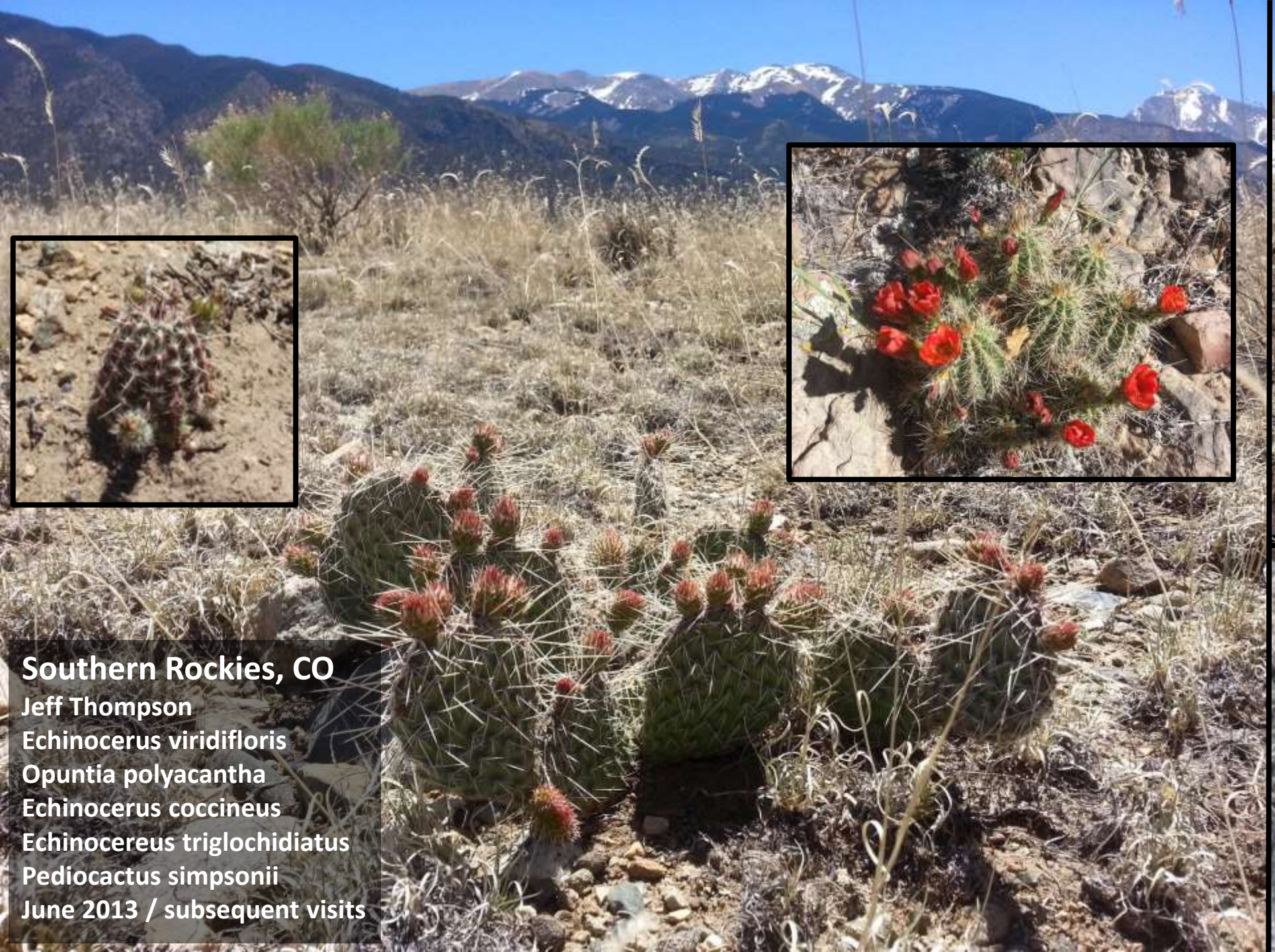
- If you can, go look at the plant and its habitat!
- Tip: Take note of its companion plants in habitat.

Quilomene Wilderness, WA

Dixie Dringman & 'Baby'
Pediocactus sp.
Phemeranthus spinescens
Sedum leibergii
May, 2011



Cascades, British Columbia
Jiri Papousek
Lewisia columbiana
Lewisia tweedyi

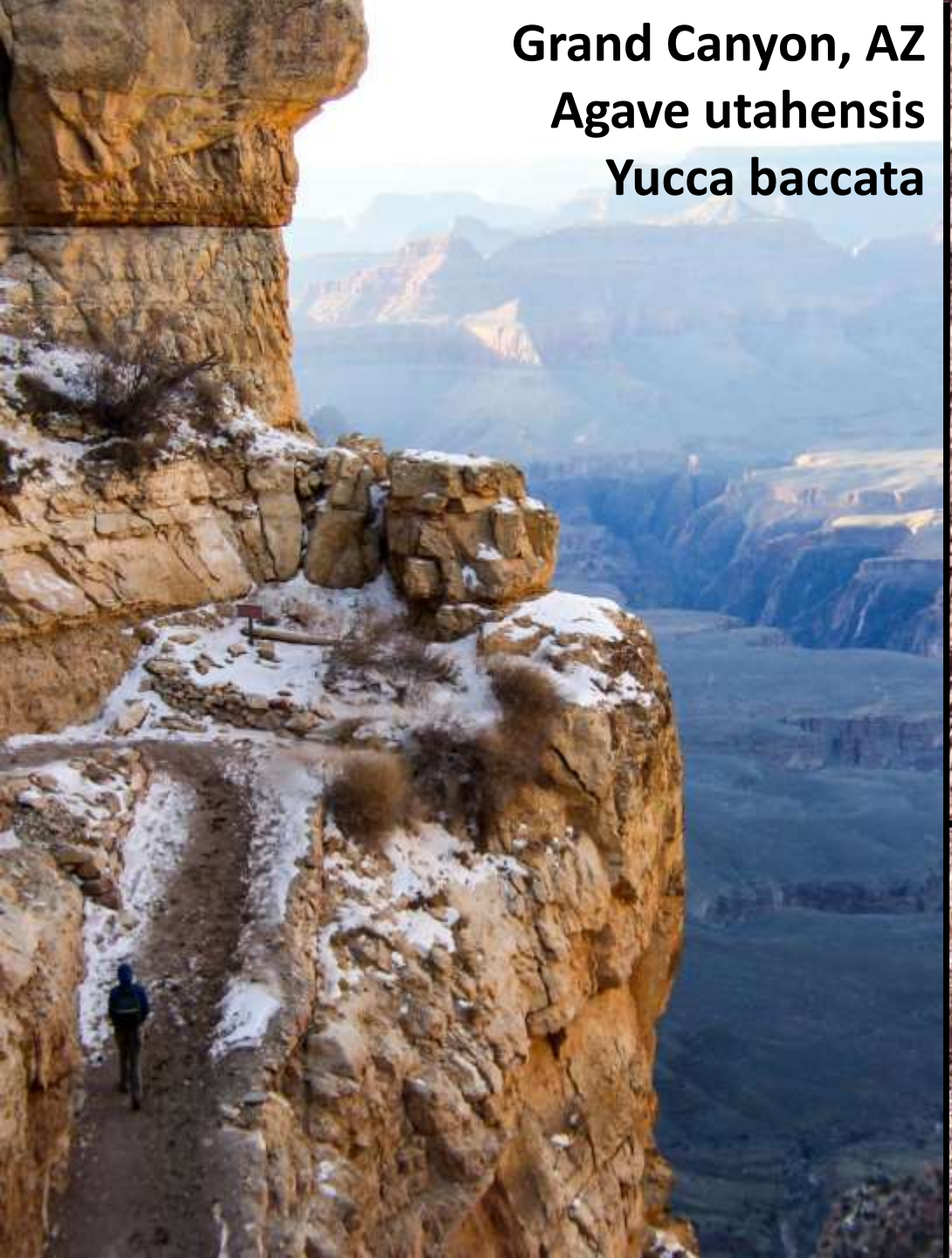


Southern Rockies, CO

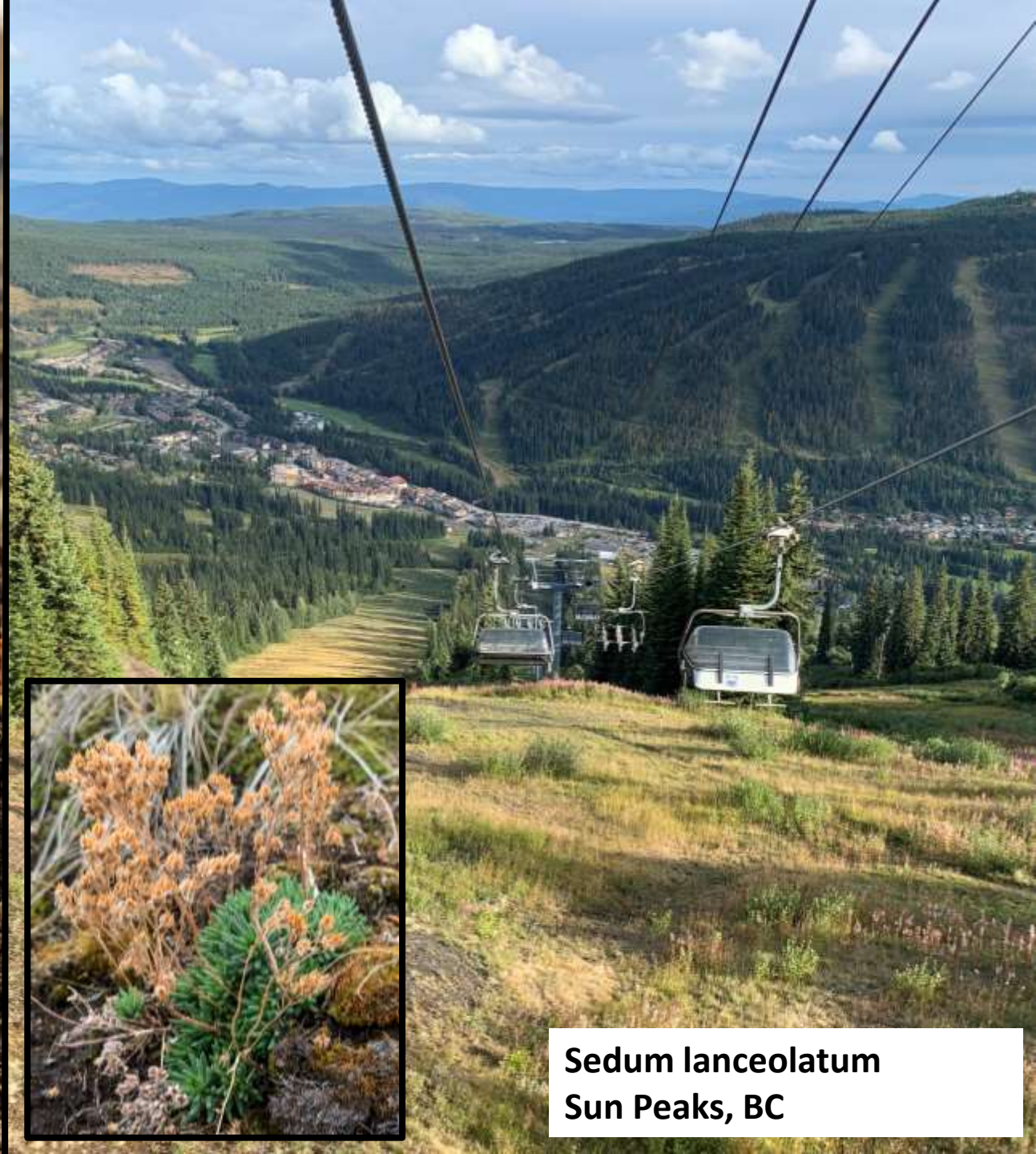
Jeff Thompson
Echinocerus viridifloris
Opuntia polyacantha
Echinocerus coccineus
Echinocereus triglochidiatus
Pediocactus simpsonii
June 2013 / subsequent visits

Canadian Prairies
Opuntia fragilis x polyacantha?
Escobaria vivipara
Opuntia polyacantha

Grand Canyon, AZ
Agave utahensis
Yucca baccata



Coastal British Columbia / Coast Range
Opuntia fragilis
Opuntia columbiana
Sedum divergens
Sedum spathulifolium



Sedum lanceolatum
Sun Peaks, BC

Species Selection: Simple Conclusions

- Great succulents for the rock garden are often from arid environments.
- Those that are not from arid environments inhabit sites with stellar drainage.
- For me, the key to success has been choosing species that are arguably cold hardy, and then mitigating the risk of humidity, rain and snow killing them. But they've got to be cold hardy!

Success 103: Cheat Your Geography (Microclimates)

Seven case studies, from least innovative to (in my opinion) to most. But all work!

Case Study #1: Portable Pots / Troughs and Winter Structures

- **You can pot hardy succulents or plant them in a portable trough, and move them into dry spots over the winter**
- **You can build a temporary winter structure over garden beds to keep your hardy succulents dry over the winter. I don't do this.**

Echinocereus reichenbachii
Delosperma ‘Jewel of Desert’ CV
Agave cf gracilipes
Aloinopsis x Nananthus
Delta, BC

Echinocereus viridifloris
Pediocactus simpsonii
Opuntia fragilis
Escobaria vivipara
Delta & Sun Peaks, BC

Success 103: Cheat Your Geography (Microclimates)

Case Study #2: Erris BC "High and Dry Garden" 

- **Entire garden devoted to dryland / native plants – succulents as part of a larger plant community**
- **The most basic treatments for growing succulents among non-succulent companion plants:**
  - **Raised Beds / Swales**
  - **Orientation – use of southerly aspects**
  - **Abundant Rock**
  - **Amended Soil (50/50 gravel and native soil)**
- **Very much "common rock garden culture", successful for many succulents, in many climates!**

Graphic

Orostachys spinosa
Phemeranthus spinescens
Opuntia macrocentra (potted)
Sempervivum cv
Sedum spurium cv
Sedum album (careful)
Eriogonum ovalifolium v. nivale
Penstemon procerus

Erris, BC

Lewisia rediviva
Lewisia tweedyi (volunteer!)
Sedum ewersii
Penstemon fruticosus
Erris, BC

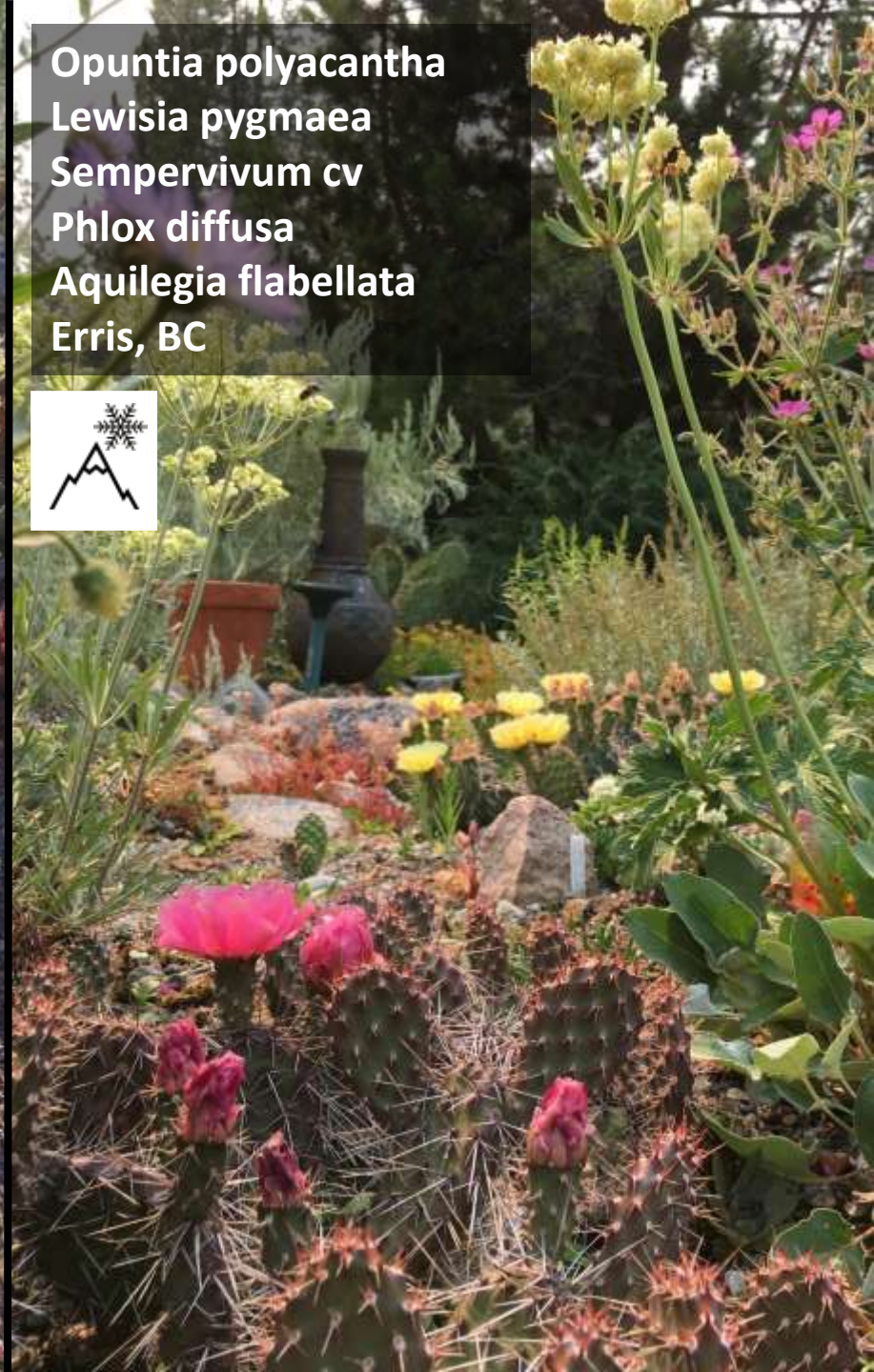
Opuntia “Fussen”
Talinum brevicaule
Lewisia tweedyi

Rhodiola rosea
Opuntia aurea hybrids
Opuntia polyacantha
Hylotelephium populifolium
Lewisia nevadensis
Erris, BC

Opuntia aurea hybrids
Opuntia polyacantha
Phemeranthus spinescens
Agave americana
Yucca glauca
Castilleja miniata
Sedum kamtschaticum

Erris, BC

Opuntia polyacantha
Lewisia pygmaea
Sempervivum cv
Phlox diffusa
Aquilegia flabellata
Erris, BC



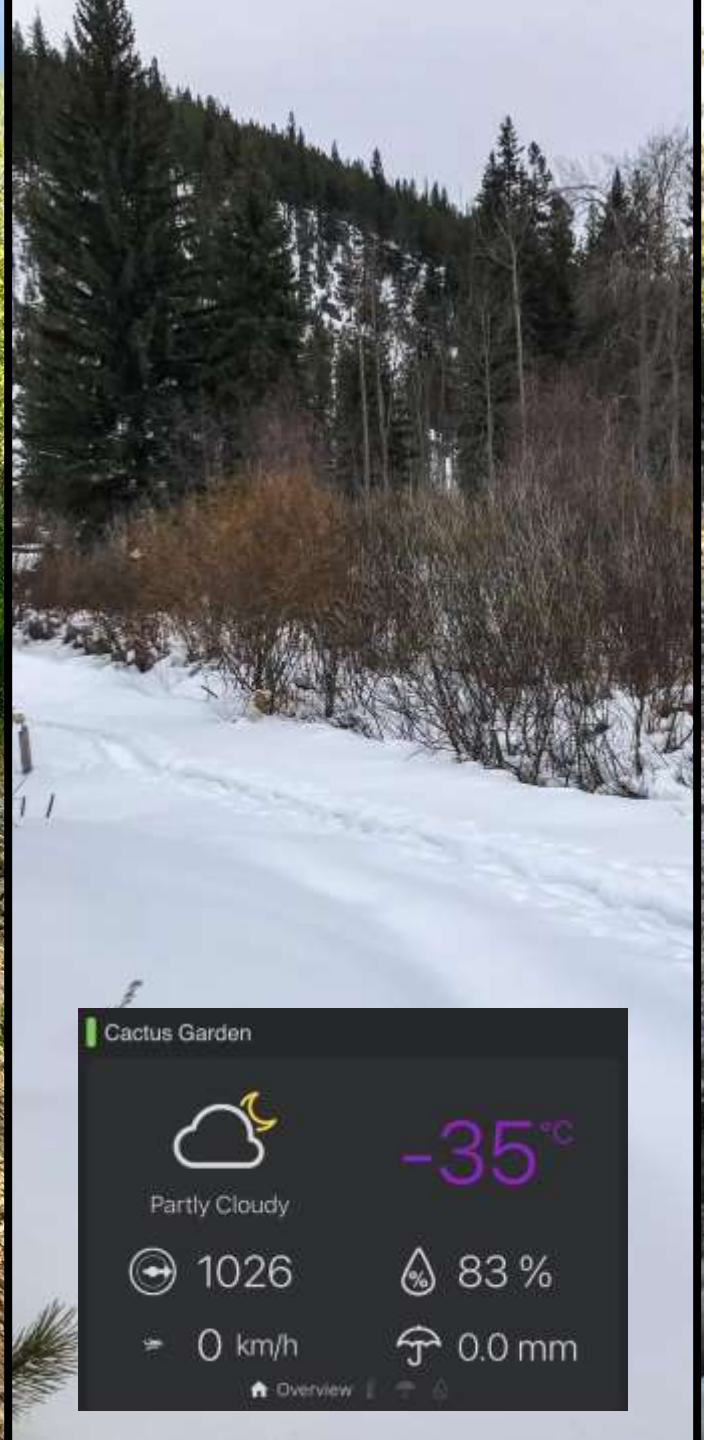
Success 103: Cheat Your Geography (Microclimates)

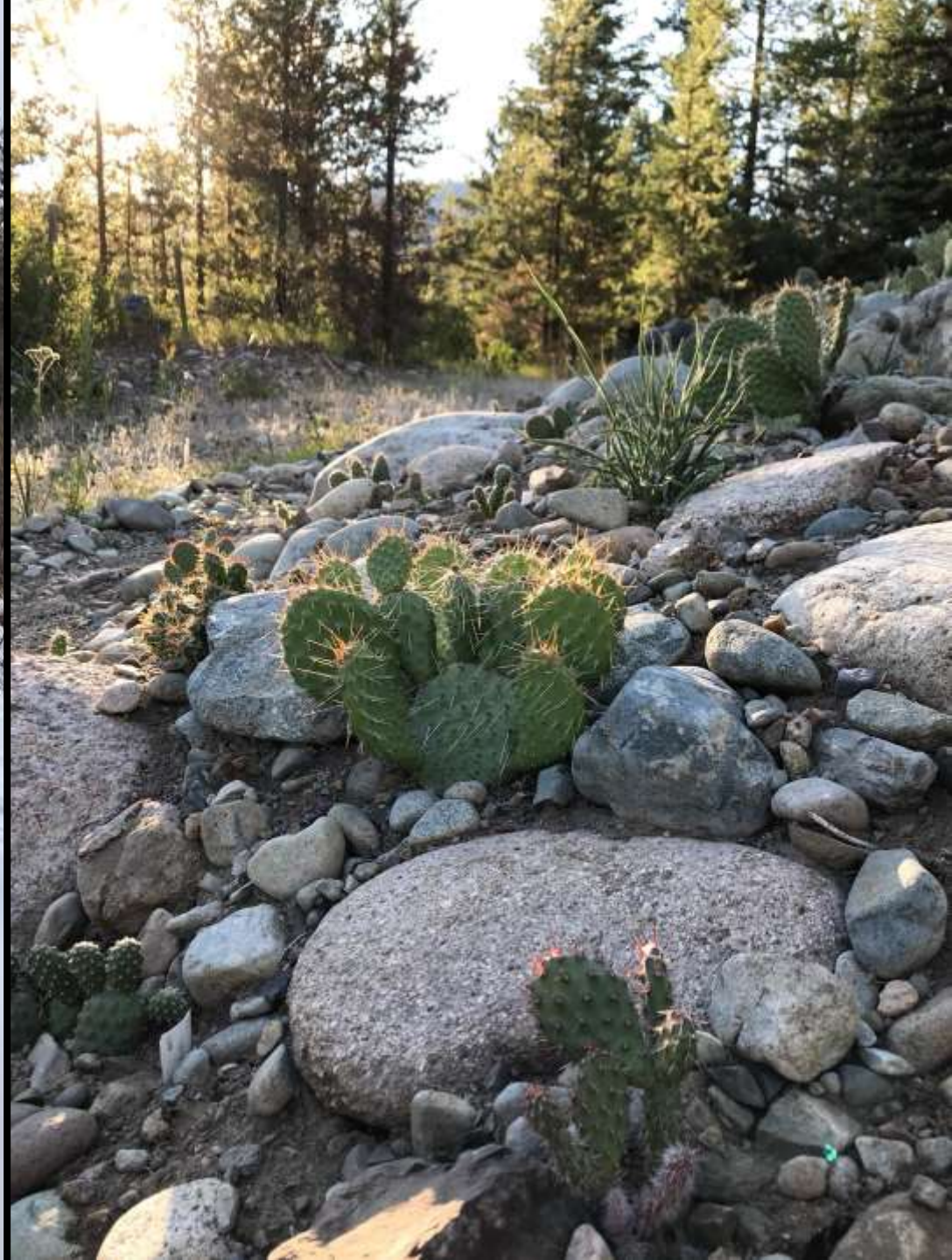
Case Study #3: Erris BC “Hillside Demonstration Garden”

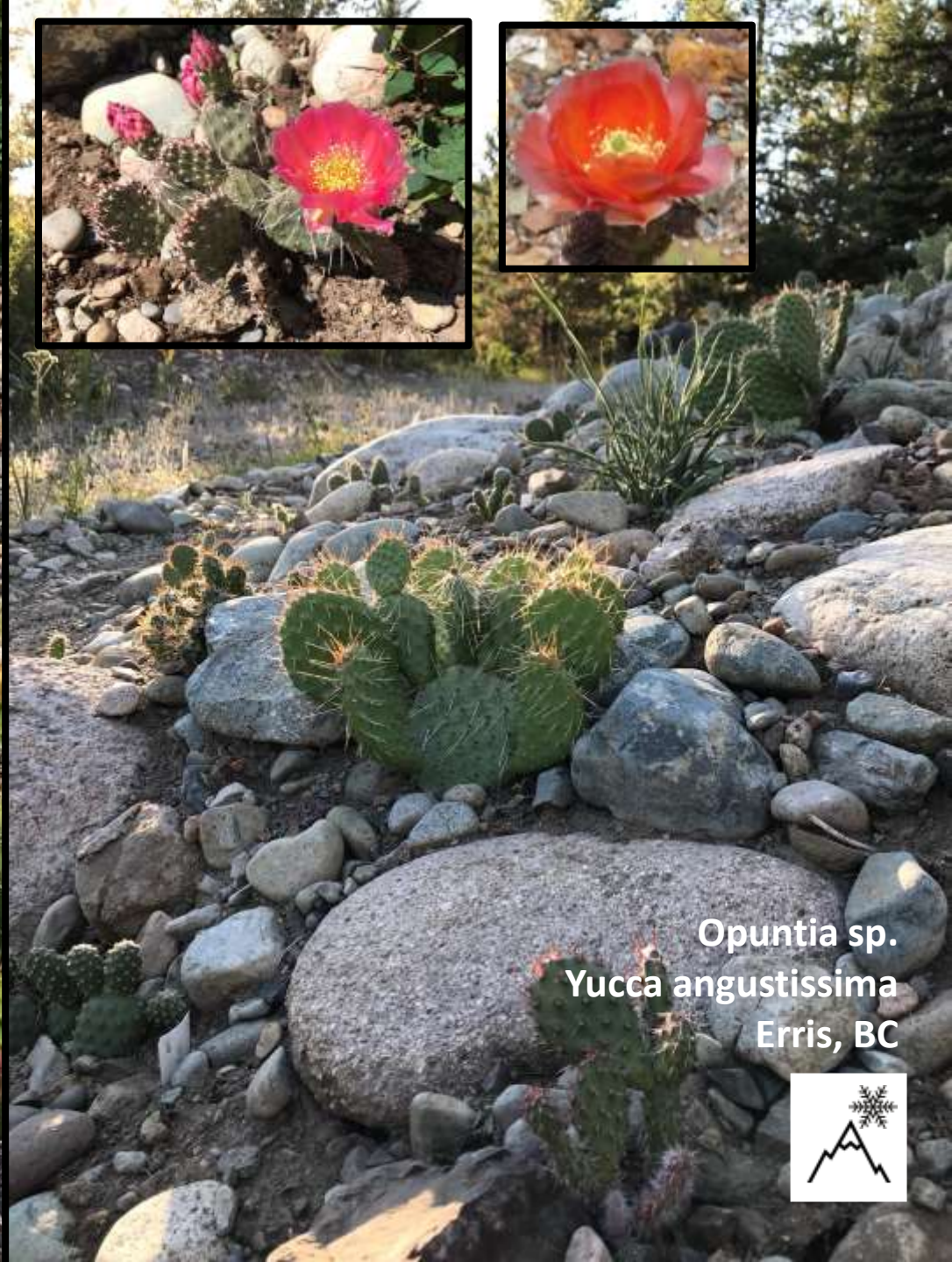
- Garden is largely devoted to hardy cacti, Yucca and Agave, volunteer native plants allowed on case-by-case basis
- Innovations:
  - Use of a natural rocky hillside with southerly aspect - nothing else would grow there!
    - Snow more shallow, melts faster in Spring
    - Maximum Summer heat in a place where hard frost occurs in any month
  - Use of native in-situ creek cobble and sand – no amendment
    - Incredible drainage, dries quickly in combination with Southern aspect
  - Augmented with native boulders for aesthetics, but they also held daytime heat
- Drawback: Situation at valley bottom – brutally cold mornings

Graphic

Opuntia sp.
Erris, BC



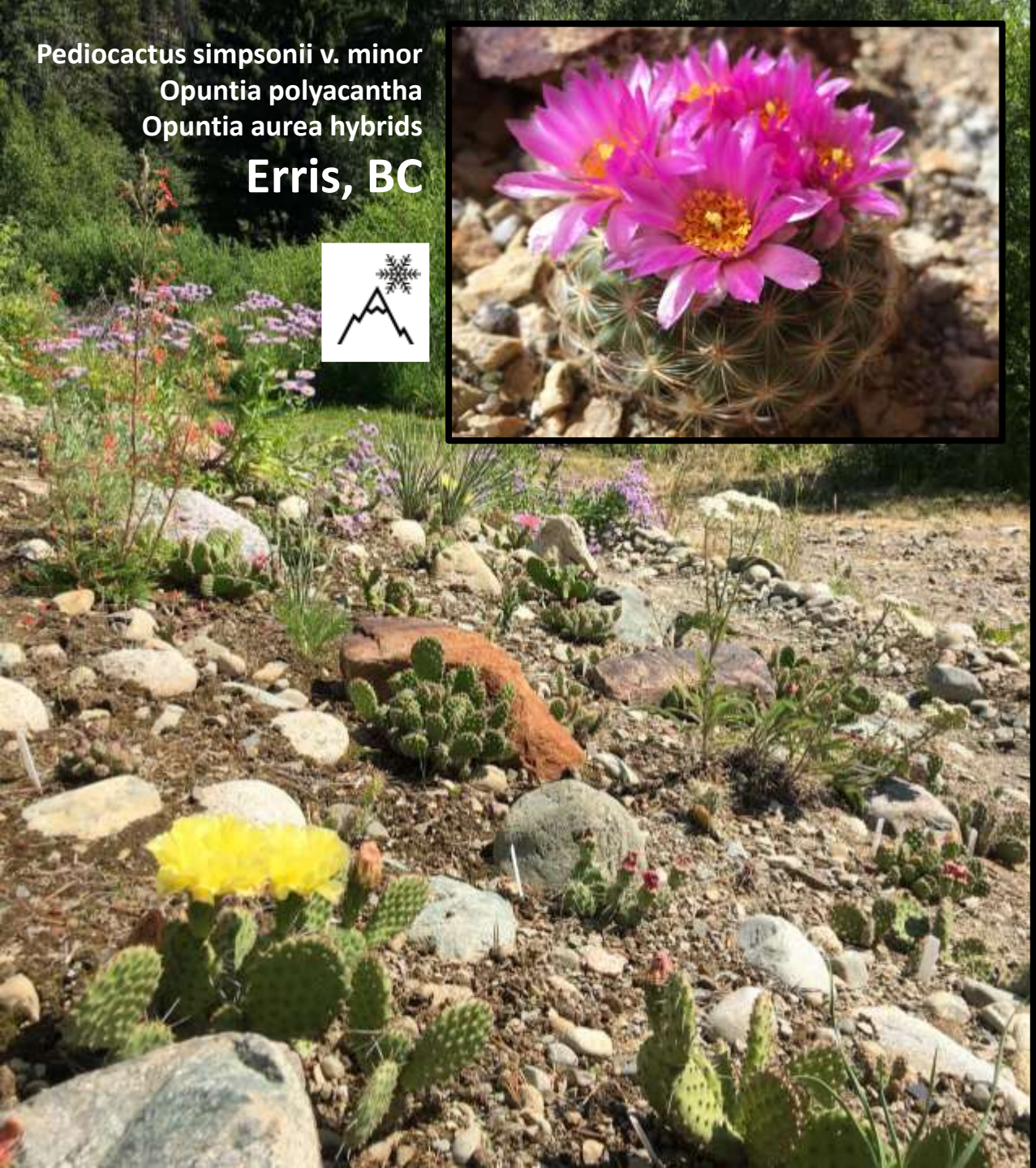




Opuntia sp.
Yucca angustissima
Erris, BC

Pediocactus simpsonii v. minor
Opuntia polyacantha
Opuntia aurea hybrids

Erris, BC



Success 103: Cheat Your Geography (Microclimates)

Case Study #4: Erris BC "Under-Eaves Trough"

- Permanent trough is entirely devoted to hardy cacti and Yucca
- Innovations:
  - Permanently placed against the sunny, south-facing wall of a shed
  - Shed's roof overhang enabled me to almost completely control how much moisture the trough got – very little wind in winter, always from the North!
    - Snow or no snow – almost entirely my call
    - Hardy Opuntia, Escobaria vivipara and Pediocactus fine to -40C and were best with no snow
  - Use of topsoil augmented about 50/50 with coarse, fine gravel

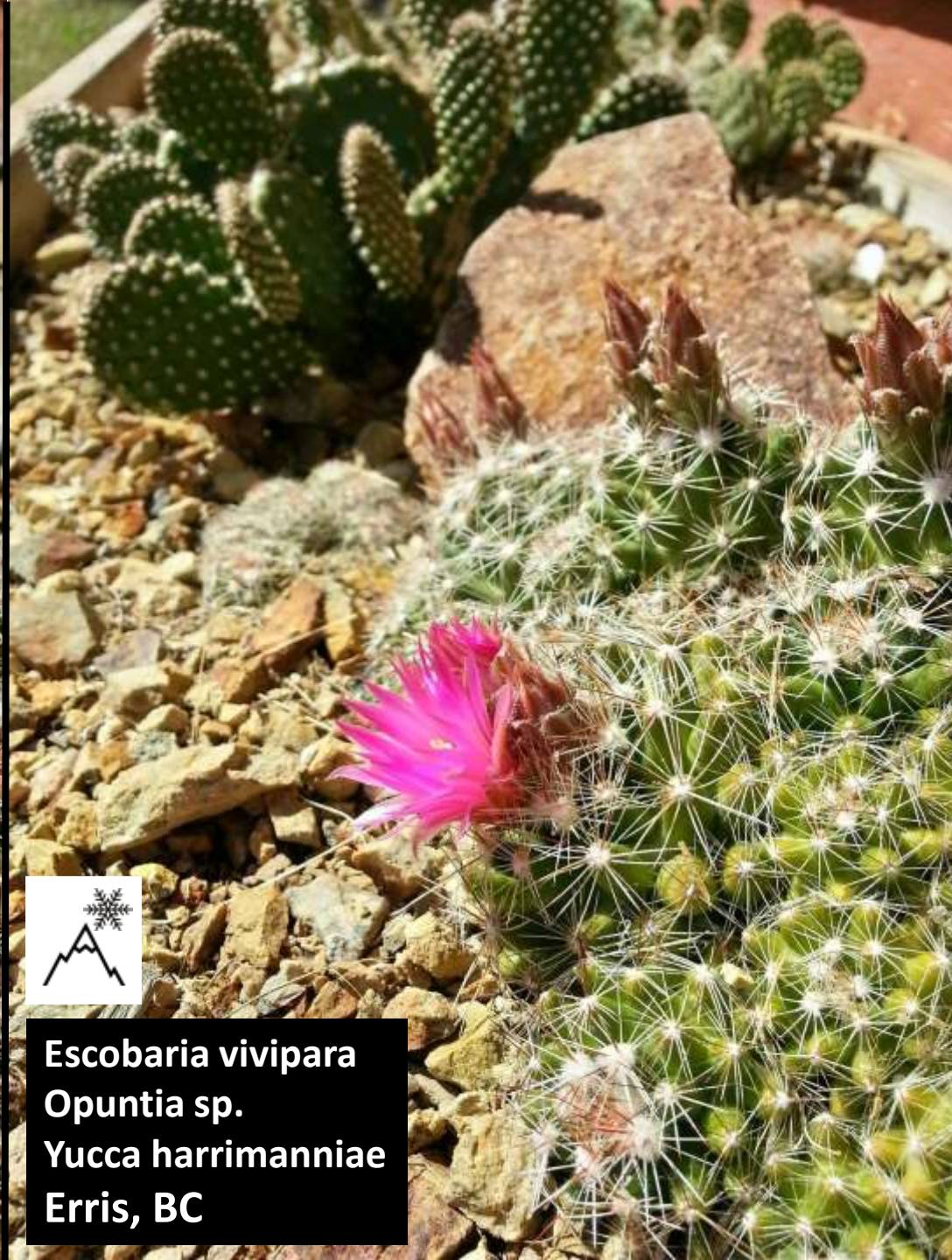
Graphic


A Microclimate!
Escobaria vivipara
Pediocactus sp.
Opuntia sp.
Yucca harrimanniae
Erris, BC

Escobaria vivipara
Pediocactus sp.
Opuntia sp.
Yucca harrimanniae
Erris, BC

Escobaria vivipara
Pediocactus sp.
Opuntia sp.
Yucca harrimanniae
Erris, BC


Escobaria vivipara
Erris, BC



Escobaria vivipara
Opuntia sp.
Yucca harrimanniae
Erris, BC

Pediocactus simpsonii
Erris, BC

Pediocactus simpsonii x knowltonii?
Pediocactus knowltonii
Erris, BC


Pediocactus simpsonii
Erris, BC

Success 103: Cheat Your Geography (Microclimates)

Case Study #5: Delta, BC “Under-Eaves Beds”

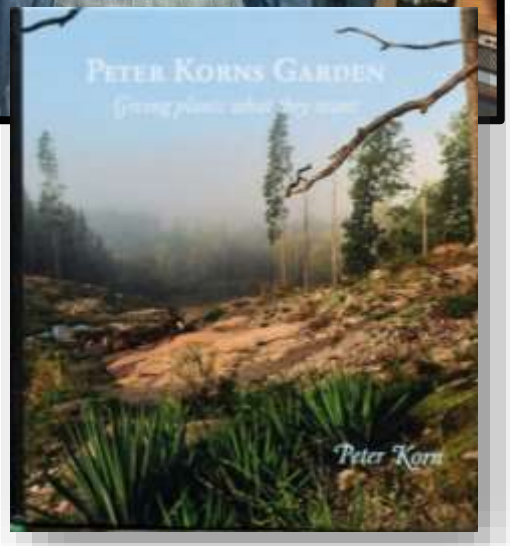
- **Two beds entirely devoted to hardy cacti, Agave, rare Euphorbia and Mesembs**
- **Innovations:**
  - **100% pure coarse sand medium, but only maximum 7 inches deep.**
  - **Abut to the sunny, South-facing wall of my home and pool house – microclimates so dry and hot that literally nothing else would grow there.**
  - **Roof overhangs greatly reduce the amount of precipitation the bed receives. BUT, …**
- **Drawback: Almost all winter weather approaches from the South ☹**

Graphic

Sechelt Sand
Delta, BC

About coarse sand: You don't have to take my word for it….

Peter Korn



"Now that I have been growing plants in sand for quite a few years, I do not see any reason whatsoever anymore for making a new flowerbed with soil."
– Peter Korn

David Sellars

To See a World in a Grain of Sand

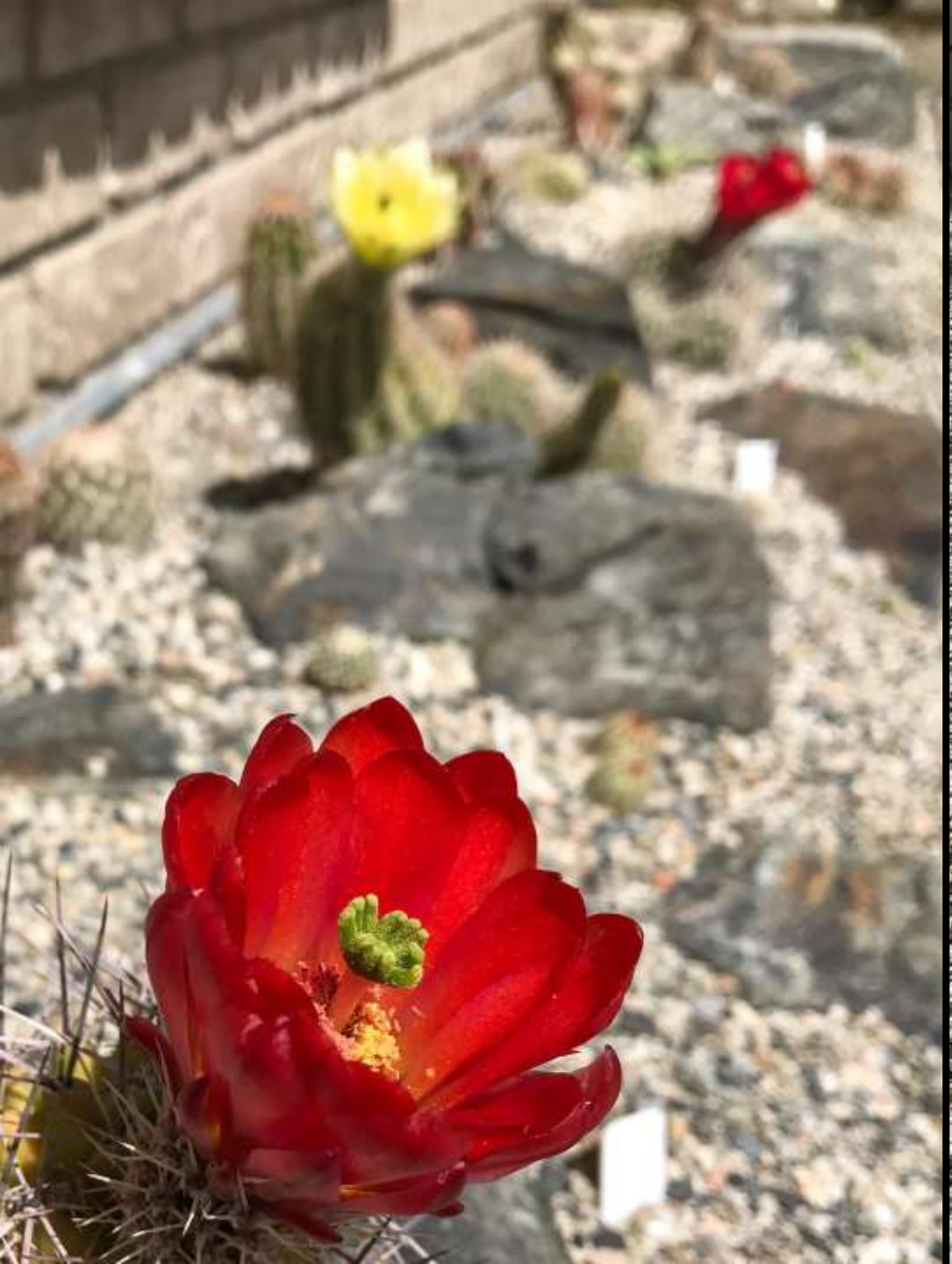
David Sellars

To see a world in a Grain of Sand,
And a Heaven in a Wild Flower,
Hold Infinity in the palm of your hand,
And eternity in an hour.
— William Blake

"Most alpines, particularly Saxifrages, cushion Androsaces, Daphnes and Dianthus, seem to like growing in Sechelt Sand without additional organic material, as the rock dust component seems to provide sufficient nutrients." – David Sellars

Echinocereus viridifloris
Cylindropuntia whipplei
Cylindropuntia viridifloris
Agave sp.
Escobaria vivipara
Opuntia fragilis

Delta, BC



Echinocereus triglochidiatus
Opuntia fragilis
Delta, BC

Echinocereus coccineus
E. mojavensis
E. reichenbachii
E. triglochidiatus
Agave “Leopoldii”
Delta, BC

Echinocereus reichenbachii
Echinocereus triglochidiatus
Delta, BC

Echinocereus x roetteri
Gymnocalycium baldianum
Gymnocalycium schickendantzii
Delta, BC

Titanopsis calcarea
Aristaloe aristata
Euphorbia clavarioides
Delta, BC

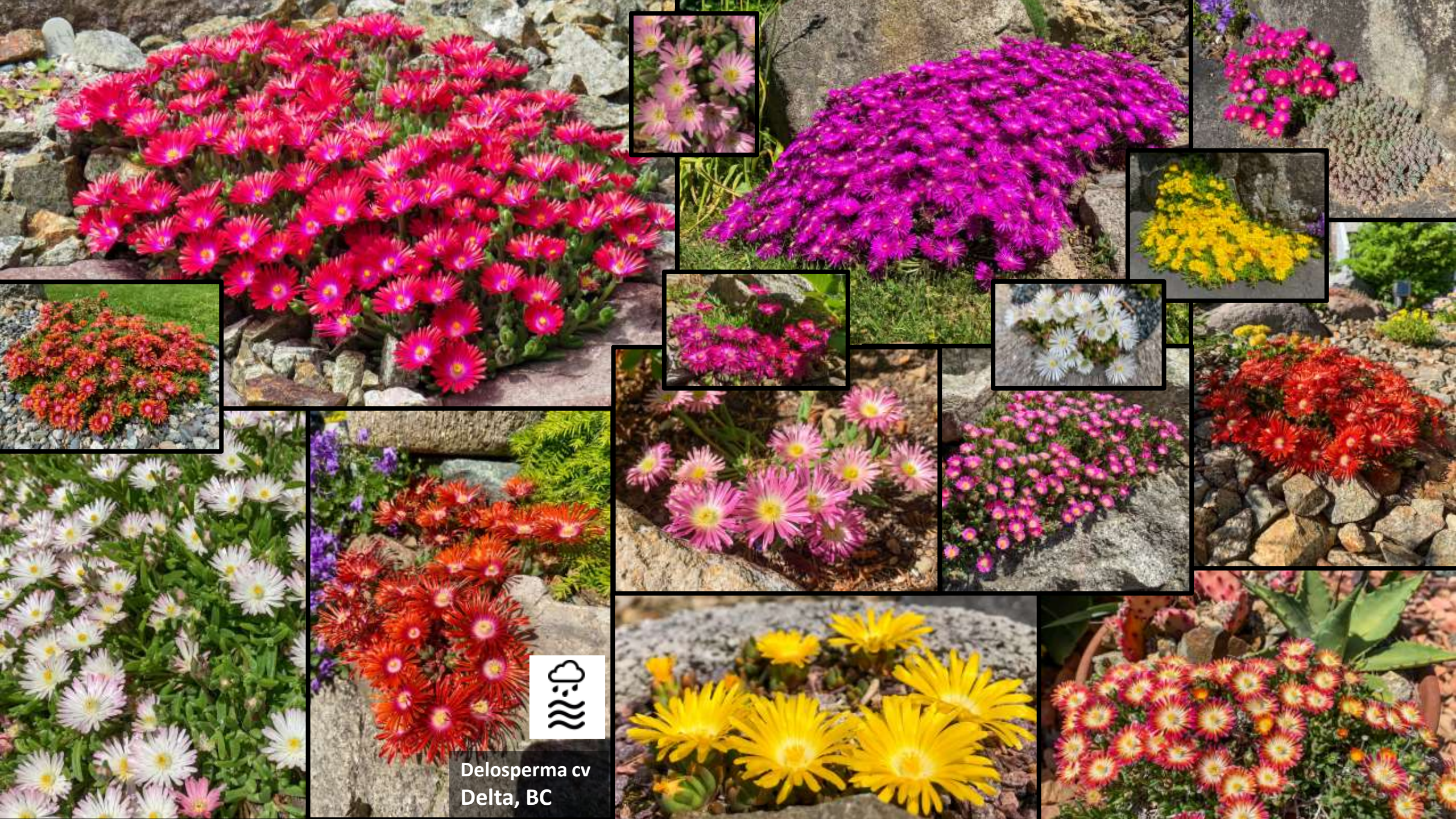
“The Pool House Under-Eaves Garden”
Agave montana or A. gentryi
Delta, BC


Sechelt Sand
Roadside Boulders
Cacti, Mesembs, Agave
Delta, BC

Mesembs from Mesa Gardens
Agave montana from Mark Williams Seeds
Alleged Yucca nana (which it is not) seed from eBay
Echinocereus viridifloris x triglochidiatus
Delta, BC

Rabiaea albipuncta
Nananthus transvaalensis
Delta, BC

Delosperma cv
Bergeranthus jamesii
Phemeranthus sediforme
Dudleya farinosa
Delta, BC


Delosperma cv
Delta, BC

Success 103: Cheat Your Geography (Microclimates)

Case Study #6: Delta, BC “Lazy Man’s Sand Bed”

- Previous homeowner had planted Yucca filamentosa in a gravel bed
- My original plan was to excavate and replace with pure sand
- Would have required a jackhammer!
- Innovations:
  - Bare-rooted and planted succulents in oversized pots of pure sand
  - Sank the entire pots in the ground
  - Hid the rims of the pots from view with broken terra cotta top dressing

Yucca filamentosa (groan)
Trachycarpus fortunei
Opuntia humifusa
Delta, BC

Agave parryi “JC Raulston”
Delta, BC

Agave parryi “JC Raulston”
Agave montana
Hesperaloe parviflora
Delta, BC

Agave parryi “JC Raulston”
Yucca rostrata “Sapphire Skies”
Hesperaloe parviflora
Chamaerops humilis v. cerifera

Delta, BC

Success 103: Cheat Your Geography (Microclimates)

Case Study #7: Delta, BC “Hell Corner” becomes “Street-Side Bed”

- Bed devoted to hardy cacti and myriad dryland perennials
- Innovations:
  - Sloped street-side corner so dry even weeds couldn’t grow there.
  - Excavated turf and top layers of “soil”. Laid down landscaping fabric.
  - 100% pure coarse mineral medium, up to 0.75m (~2ft) deep.
  - ½ to ¾ inch pea gravel 3:1 with Sechelt Sand, with fine scoria added.
  - Takes advantage of curb to avoid street runoff
  - Large boulders to discourage traffic, but not so many to prevent access to utilities
  - South to southwest orientation.

“Hell Corner” – An Existing Microclimate
Delta, BC

“Hell Corner”
Delta, BC


Street-Side Bed
Delta, BC


Dasylirion wheeleri
Agave (various)
Oleander “Dwarf Pink Ice”
Rhodiola rosea
Yucca nana
Opuntia phaeacantha
Halimium lasianthum
Salvia sp.
Zauschneria garrettii cv
Delta, BC

Dasylirion wheeleri
Agave montana
Agave ovatifolia
Yucca linearifolia
Sedum divergens
Sedum cf hispanicum

Thank You and Good Luck!