



Alaska Building Science News

A quarterly publication of the [Alaska Building Science Network](#) and [Alaska Cooperative Extension](#)

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ALASKA BUILDING SCIENCE MEMBERSHIP MEETS, ELECTS NEW BOARD, AND PLANS THE COMING YEAR

The 1998 [ABSBN](#) annual meeting was held at the Lake House Bed and Breakfast in Valdez on August 8.

The accomplishments of the past year were reviewed. They include:

- Developing Introduction to Airtightness Testing and Blower Door Certification workshops. Approval for CEU credits was awarded by the University of Alaska. Workshops were provided in Dillingham, Fairbanks, and Anchorage.
- Weatherization 1 workshops were provided in Fairbanks and Juneau.
- A Window Retrofits Workshop has been developed by Marquam George and will be offered in Juneau.
- The Home Energy Rating Program (HERP) grant is in its second year and ABSN has

presented AKWarm workshops all over the state. Energy Rater training, re-certification, and technical assistance has also been provided.

- The [ABS N](http://www.absn.com) website (www.absn.com) is up and running - check it out!
- Each year at the annual meeting, new board members are elected. Congratulations to Gary Ogden, Dale Hirt, Conrad Zipperian, Dan Berube, and [Rich Seifert](#). Randy Nicklas and Ron Anderson will continue to serve on the board for another year. The new board met to elect officers and chart the paths for the upcoming year, on Wednesday, 2nd September. Bob Maxwell, outgoing president, facilitated the election of officers. The officers elected were: [Rich Seifert](#), President of the Board; Randy Nicklas, Vice President; Gary Ogden, Secretary; and Conrad Zipperian, Treasurer. Other items of interest discussed at the annual meeting included:

Alaska State Homebuilder's Convention: the convention is scheduled for November 12-14, 1998. [ABS N](#) has been asked to provide AKWarm and Indoor Air Quality workshops. Both of these are already certified for CEU's. If any new workshops are requested, Bill Bruu (head of the ASHA education committee) has offered to facilitate the accreditation process.

Residential Energy Education Program: [ABS N](#)'s biggest project over the next year will be the Residential Energy Education Program grant from AHFC. The grant, a total of \$250,000 over 18 months, went into effect July 1st. It is designed to provide low cost builder education in urban and rural Alaska. We will be presenting a minimum of 24 workshops in 16 rural communities and 10 workshops in 5 urban areas.

[ABS N](#) finally received the draft license agreement from the Canadian R2000 program. This has been a long time coming (it was first promised to us by the end of 1997). The R2000 program has long been a source of high quality training in energy efficient construction techniques and the "house as a system" concept. We especially like the part of the license that states that it is an agreement between [ABS N](#) and the Queen of England.

A critical component to a successful program will be a broad, strong cadre of building science trainers. [ABS N](#) has a great core group and will be actively seeking to expand this capability, especially in rural areas. Any members who have an interest in sharing their special talents should give us a call. Phone: (907) 562-9927; Fax: (907) 563-8061; Toll free: 800-563-9927. Address: P.O. Box 111097, Anchorage, AK 99511. Website: www.absn.com

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ACE ENERGY AND HOUSING PROGRAM HAS A NEW VISTA VOLUNTEER

A statewide welcome is extended to Andrew Pascale, an electrical engineering and history graduate from the University of Notre Dame in Indiana (yes it's the same fighting Irish). Andrew comes to us through the auspices of AmeriCorps VISTA National Volunteer Program for people of all ages, who wish to work in service areas in the United States for a year.



The Alaska Housing Finance Corporation State Energy Conservation Plan Grant makes his position possible, as his living allowance is partially supplied by that grant. He will be working with Energy and Housing Specialist, Rich Seifert, to improve housing outreach and to provide a liaison with Rural Housing Authorities and any AmeriCorps Volunteers with which RuralCap now works. Some of Andrews duties will also involve helping to produce the Cold Comfort '99 Conference in March 1999 as well as providing housing and energy information to rural residents.

Andrew is well prepared technically, with his science and engineering background and is already "jumping in" and being trained with an Interior Weatherization retrofit team on hands on techniques for housing retrofit. Andrew will also take many of the ABSN trainings over the next year and develop his competencies in those areas. We hope he will become the communications liaison helping to distribute and disseminate information to housing authorities and rural Alaskans.

He is located in Alaska Cooperative Extension building on the UAF campus and available on email at fnacp@uaf.edu or by telephone at 474-5347.

Welcome Andrew! We look forward to an exciting and challenging year with you on the Alaska housing scene.

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MALCOLM FORD, HOME*A* SYSTANT

It's well known in Alaska that although water seems to be everywhere, water quality and access is a continuing problem, as well as the associated difficulties with sewage and sewage disposal. Recently, Housing and Energy Specialist, [Rich Seifert](#), was given responsibility for the Water Quality Program in Cooperative Extension. This includes a program called Home*A*Syst/Farm*A*Syst, renamed Home Environmental Stewardship in Alaska.



Malcolm Ford, was hired by Alaska Cooperative Extension to coordinate the program in June. Malcolm brings broad experience to the position. He was born in Ireland, and raised in a Yorkshire farming community. He completed an undergraduate Bachelor of Education Degree in Biology and Child Psychology at Oxford University. Between teaching, youth work, and six years of intensive pig farming, Malcolm traveled extensively throughout Africa, India, and Asia visiting Alaska on the recommendation of a Swede with an American accent.

During ten years in Alaska he ran an Exxon Valdez Oil Spill clean up crew, returned to university at Washington State to get his Masters degree in Environmental Science and worked for both the U.S. Forest Service and conservation organizations.

Malcolm will be working out of the Anchorage office at 2221 East Northern Lights Boulevard and his phone number is: 279-5582.

The Home Environmental Stewardship program which Malcolm will be responsible for developing

in Anchorage and the Mat-Su Valley, is a first development phase. The program is designed to assist home and farm owners in addressing water quality issues and the general environmental wellbeing of their home and property. It includes a series of individual assessments and back up information to allow homeowners to make informed choices when protecting their family and property. The guidebook covers the following topics:

- Storm water management
- Wells and drinking water
- Onsite septic systems and waste disposal
- Household hazardous waste
- Lead pollution
- Yard and garden care
- Liquid fuels: their management and storage
- Managing household waste: prevention, reusing, recycling, & composting
- Heating and cooling systems
- Indoor air quality

Welcome Malcolm - we are also pleased to have the 'Home*A*Syst Environmental Risk Assessment Guide for the Home' available in Alaska.

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FEATURED ALASKA COOPERATIVE EXTENSION PUBLICATION

The featured [Alaska Cooperative Extension](#) publication this quarter is special. It was a collaborative effort of [Golden Valley Electric](#) and [Cooperative Extension at the University of Alaska Fairbanks](#). It's called "Emergency Electric Generators for Alaskan Residences: Advice & Installation."

Life in Alaska is often exciting and different. No small part of the spice of life here is the environment, the scenic beauty, the weather, and the scale of the natural forces. Storms, disasters, and accidents can and do cause electrical power failures and depending on temperature, an outage that lasts longer than six hours or so, can lead to serious problems. Frozen pipes, spoiled food, and even danger to family and livestock or pets can result.

The publication covers three basic sizes for your generator options. They are given in ranges of wattage produced. Range 1 is 500 to 3,000 watts which is a minimal power supply and typically the range available from small portable gasoline generators. This is definitely suited only for connection to an individual circuit mainly to keep you functioning with something like a heating system during a crisis situation. The range 2 option is 3,000 to 5,000 watts, generally has both 120 and 240 volt outputs and is suitable for powering essential loads, such as a furnace and in addition, water pumps and essential lighting. Range 2 option is obviously more expensive than the range 1 but it has obvious advantages. Range 3 is 5,000 to 15,000 watts which is considered a typical full load for a standby generator for providing all the needs of the house. The voltage rating for this size generator must be 120 to 240 to provide a correct alternative power source voltage to the house.

For Alaskans this is a publication that's long been necessary and has been produced as a public

service in cooperation with a utility so that it is done safely and wisely. The publication is available, free of charge, from the office of the [Energy and Housing Specialist](#) at [Alaska Cooperative Extension](#), 474-7201 or 1-800-478-8324. The publication is also available from the Customer Service section of [Golden Valley Electric Association](#) in Fairbanks.

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MENU OF ACTION FOR RADON AWARENESS WEEK

Monday, 19th through 24th October 1998

Monday, 19th Oct. - As the heating season begins, make sure your heating system is in good repair. It's a good time for a tune-up, if you have an oil- fired or a gas furnace. At the same time, in order to eliminate the induction of radon into your house, now would be a good time to put a dedicated air supply in your furnace room to provide air for combustion. This ensures that air is not drawn from inside the house which would further enhance radon induction.

Tuesday, 20th Oct. - As the heating season begins, radon is more likely to be inducted into your house. Now would be a good time to do a three month radon test for the winter. Starting a radon test now will give you the maximum reading for the heating season, which is the time when most induction occurs.

Wednesday, 21st Oct. - If it's still warm enough and you can work easily in your basement or crawlspace, now would be a good time to do some last minute caulking, chinking, and sealing to eliminate those holes below the ground level in your house where radon might be inducted during the winter. Fixing any leaks and holes where air could be sucked in from below ground will help eliminate radon induction into the house.

Thursday, 22nd Oct. - If you have a smoker in your house, today would be as good a day as any to make it a "smoke-free" day and encourage people to try the Alaska Lung Association's smoke-out in conjunction with Radon Awareness Week. The recent BEIR VI study again firmly implicated radon as a factor which increases people's chances of getting lung cancer. In fact, if you smoke and you are exposed to higher than normal levels of radon your chances for getting lung cancer may be increased tenfold. Get the word out on this risk!

Friday, 23rd Oct. - Take the radon awareness to schools today. Radon is the second leading cause of lung cancer in the United States and there are many ways that informing children, both of the risks of second hand smoke and radon combined, may be helpful in encouraging their parents to change their habits and fix their homes for radon. Give a seminar to a school or distribute materials to school teachers.

Saturday, 24th Oct. - This is a good day to have a health fair focusing on the issues of indoor air quality for the month of October. All of the foci of the month could be featured in this workshop. Radon, since its risks are the highest of death from lung cancer of all indoor air pollutants save environmental tobacco smoke (or smoking), is a good place to start in high risk, zone 3 communities. A health fair could be organized around the theme of indoor air quality and focusing on those aspects which are most crucial to your local region is a great Saturday family outing!

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EXTERIOR VENTILATED CLADDING, CEDAR SIDING, AND WATER

It's long overdue that we deal with an old building technique that has gotten some recent new life in Alaska. Recently, failures have occurred regarding the use of Tyvek[®] and other exterior building wraps along with cedar siding. Most of the information related here is from a brief technical review in the September 1998, No. 118, [Fine Homebuilding Magazine](#), written by Zachary Gaulkin, and professional experience by [Alaska Building Science Network](#) member and Juneau contractor, Marquam George.

Marquam is one of the first adopters of exterior ventilated cladding for use in Alaska, and has documented his use of this system in Southeast Alaska's Juneau area, in excellent detail. The [Fine Homebuilding](#) article advocates back priming (painting) the underside of cedar siding, so that water penetration, especially in a wet climate, into the siding and behind the siding, doesn't lead to other problems. What happens with wet sheathing is that it wets the Tyvek[®] behind it and there is some chemistry which causes the oils in cedar siding particularly to start a surfactant reaction which increases the water and vapor permeability of the Tyvek[®] behind the clapboard. Joe Lstiburek is quoted in the article in [Fine Homebuilding](#), and believes there is another problem with house wraps.

House wraps are more vapor permeable than building paper and normally this quality is a blessing because it lets indoor moisture escape. But what happens when rain water gets trapped behind paint? Lstiburek says, and I agree with him, that the water gradually turns to vapor when the sun warms the siding. This allows it to pass through the house wrap and condense on the wall sheathing. This is bad enough, but if the sheathing (especially cedar) contains surfactants, the water resistance of the house wrap is compromised further.

Marquam uses exterior ventilated cladding in nearly all his houses now. He vents both the top and the bottom of the cladding to allow for maximum ventilation behind siding. This detail is advocated in the [Fine Homebuilding](#) article as well. Canadians have been revisiting this rain screen idea. It is fully described in our publication, *Exterior Ventilated Cladding*, [Alaska Cooperative Extension](#) publication HCM-01558, a translation of the Norwegian Historical description of this type of wall system.

The rain screen is not a terribly expensive detail. For a little more money you can put a rain screen in and get longer paint life. Back priming and the rain screen go hand-in-hand. We recommend this for Alaskan applications.

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THE "SHISHMAREF MOVE" WITH JOHN WOODWARD

Over the past year a great deal of beach erosion has occurred in the village of Shishmaref on the

North side of Seward Peninsula in our beautiful state. Many reasons and speculations have been given as to why this is occurring now and why the village site is suddenly being eroded, after many years of successful habitation. Regardless of the primordial causes of the emergency, it became necessary for the State Division of Emergency Services to hire [ABS N](#) member, John Woodward also known as the Mountain Man and the Wild Man of Borneo (formerly he lived there), to come in and help move seven houses to a new site at higher ground and protected from beach erosion. John did this and Rich Seifert had the opportunity to interview him in early September on this event. That interview follows. It's very elucidating for the use of Triodetic Space Frames as a technology suited for rural Alaskan applications on various types of difficult soils.

Q: John, what are some things you learned about using Triodetic Space Frames[®] in the Shishmaref project?

A: As long as you keep the base plates out of standing water, so that they are not in puddles all the time, and you lose the bearing capacity of the soil when it turns to a slurry, if you can keep that from happening and you've got dry and level ground, you're good to go with these foundations.

Q: How many did you install out in Shishmaref?

A: I installed seven houses on Triodetic Space Frames.

Q: And what was your biggest problem?

A: Well, there wasn't any problem at all related to the frames. The biggest problem with this particular project was the fact that we went in on frozen ground in the winter time. We had to jack houses that were basically on grade to start with. They were old owner-built houses that were half rotten, and they had a lot of different elevations on the four bottom caps. So we had to fir them all out to plane so they'd sit the way they were supposed to.

Q: And how did you do this? Did you jack them up and do it from below?

A: Yes. The hardest part was leveling the ground because when you're trying to pick a house up six feet in the air with a lot of different additions, which is basically a loose, half rotten structure, you have to start out extremely level with all of your cribbing. So the hardest part was chipping the frozen ground out from underneath the house.

Q: You did all this in winter?

A: Yes. It had to be hand-worked because you can't get any machinery underneath these houses. And there wasn't any machinery available in the village anyway even if you could devise a system to do that. So, the hardest part was chipping out multiple blocking points underneath the house, and leveling it using a smart level. When you start out with your cribbing you have to start with a pyramidal type design. You start with a large base and then gradually decrease the size and get some stability (Photo 1). To get the houses up six feet in the air and not have them fall over (and we had a lot of high wind loads up there because it was the winter time on a barrier island) well, this all made it a tough project to get staged. We raised the houses about 60 inches. The triodetics are 42 inches to the saddle brackets. That gave us enough room to get beams and slip them over the saddle brackets and underneath the floor systems with enough room to work underneath the

houses. I worked with a triodetic engineer. We got the floor plans drawn out, and that's what we based the installations on. Then we ordered the foundations from these floor plans. It worked out quite well. Once we got the houses up in the air, it took about a day to a day and a half to erect the frames underneath and about another half day to lower the houses down onto the frames and get them secured. So with the jacking process which was the longest, and putting up the blocking and cribbing, installing that underneath the house, it was about a week per house.



Photo 1: House on Cribs as Triodetic Frame is Installed.

Q: But considering the retrofit and the fact that you had to jack them and everything, that's not a bad time for completion?

A: No. Since it was winter time, there's nothing else that could have touched it. Once you get these things settled down onto the frames, they're secured. Nothing is going to happen to the houses because the frames are so rigid and stable. We had a detail to secure the beams to the foundation itself and another detail to secure the beam to the floor.

Q: And there are photos also? (Photo 2)



Photo 2: Close-up of the Frame and Saddle

A: Yes. Should be.

Q: What are we talking on costs here? Do you have any idea how much per house this cost?

A: This particular project, from beginning to end, cost between \$35,000 - \$37,000 a house to do, counting labor and materials. Of course it's much cheaper to do any exterior retrofit in the summer time. That's the time it needs to be done. The only reason it was so expensive is because it was an emergency. We had to fly the foundations in. We had to charter a Herc. And it's really labor

intensive to do this stuff in bad weather conditions. We got blown out quite a bit, and we had to chip through frozen ground in order to start our cribbing sequence. So if you were trying to do a cost effective project, it wouldn't be on an emergency basis. You'd do it at the best building time and you wouldn't have to mess with any frozen ground. There are ways that you can bring costs way down.

Q: I think this project would be worth a lot to the Triodetic folks? Did they know you did this?

A: Oh yes. They're happy as clams.

Q: They've done this before?

A: No this is a new experience. We developed this system of skis to tow the assemblies (Photo 3).



Photo 3: Close-up of the Ski Skid.

I was wondering how it would work and how many days it would take to move these houses about a mile and a half over to the new ground. With Eskimos driving them, we cleared the obstacles in town. That was the hardest part. We had to take some electric lines down and some cables and so on. We had to tear a porch off a guy's house so we could make a corner and get down the street. Once we got out of town, the dozer operator just put it in third gear and headed off about 15/20 mph and just towed them. It only took 15 minutes to drive them around to the new housing site.

Q: How far are you going for the new village? How far from the original off shore island?

A: We stayed on the island. There is high ground at the east end of town. They were on the ocean side, so we had to go around town and come round to the south and then relocate them at the other end of town. It's about a 15/20 minute walk over to where we were moving the houses. I never looked at my odometer but it's more than a mile anyway. We went across the road, the airport road, and we got up on this road section. The road was about 20 feet wide with a crown in the middle of it and we had a big ditch on either side, so we built ramps to get up there. When we got up in the middle of this road, I looked and there was only about five or six feet of each ski bearing on the road with a 40 foot house. I opened and closed the windows and the doors in the

house. The reveal was perfect on everything. I sighted down the connectors (they've got bullet heads coming out of the top of them) and they were all in plane. You couldn't see any deflection of the frame at all.

Q: This is a test you didn't intend, but it was certainly a test?

A: Right. And I looked at them all when we did that and I didn't see any noticeable deflection in the frame at all. We towed them around and people still left their TV sets in there! I told people, "hey you're going to have to watch out, cupboards might come ripping off the walls, who knows what's going to happen when you start moving these things down the trail here". Basically people did not do that much in the way of prep. work. But it didn't tear up anything in the houses. It was great. The hardest part of the project was getting them jacked up and then lowered down and secured onto the frames. If you had any equipment to speak of, a decent budget that you could prorated the equipment over the amount of houses that you were doing, and if you could do it in the normal building months, it would be a decent project. Technically there wasn't anything that was very difficult about the whole job.

Q: How do you get the skis off once you get the house on the frame at the site?

A: There are multiple jacking points on the frame, so you just jack up one side of it, release the bolts and then pull out the skis. We were pulling them around with snow machines. (Photo 4).



Photo 4: House in Tow on Skis.

Q: The skis themselves?

A: Yes. The skis were a little wimpy for what we tried to do, but they worked through this project, and they were still in workable condition when we finished. But we went through an evolution

where we talked about four or five different design changes that we could do on skis to make them more rigid and more user friendly and so on. It was the first time it was ever done. Now that it's over we've got a new design for the next ones when we make them: stronger, more user friendly, more versatile.

Q: I was just thinking here, you know what we might do with these photos, is put them on ABSN's homepage. I think we'll just do that.

A: Yes that would be good.

Q: We're trying to do a collaboration with the [NORTH Committee](http://www.north-rthn.org/) which is Northern Research and Technology for Housing. We can offer this to that homepage as well. (<http://www.north-rthn.org/>)

A: The reason that I got involved with this project, is not because I want to spend two and half months in Shishmaref doing this job, but because the applications have enormous potential. The residents have already voted to move the village of Kivalina for instance. The projected cost is \$50 to \$75 million to rebuild all the infrastructure on the mainland. Well of course you can't get out of having to rebuild your septic installation and your runway for the air strip and all that. But with this system, you could even move the water tanks! The school, it's modular, it can come apart in pieces. There is no building too big to move, it's just a matter of triage on which ones are worth moving and saving. You could move every other building in either of those villages, Kivalina or Shishmaref, which would probably cut the cost by a factor of ten. You could move just about everything. You could even move the telephone poles, jack them up out of the ground and lay them down on one of these frames and haul them where they're needed. It's got enormous potential for defraying costs for a move like that.

Q: But the flip side of this is, with the ski arrangement, it's much easier to do in the winter?

A: Well you can stage them in the summer time and then get them ready to go. Then in the winter time you do the move. You can't move in the summer time. It's all permafrost and tundra.

Q: It would be a mess to move in the summer time?

A: You can't do it. You don't have the bearing capacity. You would have to put these things on Rollagon tires or something like that, where you can reduce the load to two or three lbs a square foot. That would be incredibly expensive plus Rollagon tires are so tall that you'd have to get these houses way up in the air. But why, when all you've got to do is wait? It'll be winter time soon enough.

Q: That's one thing you can count on?

A: You can pretty much count on winter to work for that phase of the project.

Q: I don't know if there's anything quite equivalent that's been done in the north?

A: There's nothing like it. Nobody's ever done anything like this. There have been a few isolated moves with these things, but mostly they drag them on the base plates.



Photo 5: Unpacking the Tubular Triodetic Space Frame.



Photo 6: Assembling the Triodetic Space Frame Underneath a Crib Supported House.

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CALENDAR OF EVENTS



Healthy Indoor Air for America's Homes

October 1998
Home Indoor Air Quality Awareness Month



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
October 4-10 Environmental Tobacco Smoke Awareness Week						
October 11-17 Bugs, Mold & Rot (Biologicals) Awareness Week						
October 18-24 Radon Action Week						
October 25-31 Combustion Gases/Carbon Monoxide Awareness Week						

14th - 16th October 1998 - The 11th Annual Professional Development Conference, Sheraton Anchorage Hotel in Anchorage. This is a professional development conference for vocation ed. professionals and teachers and will include a session on "Tools for Schools" - how to maintain and help secure good indoor air quality for your schools, tools available for teachers and students alike, as well as maintenance professionals.

24th October 1998 - the first of the season, "Cold Climate Homebuilding Techniques" seminar for prospective home owners and buyers at Schaible Auditorium, Bunnell Building, University of Alaska Fairbanks campus, 9am - 5pm. This is a Saturday workshop which it would be wise for you to call and reserve a space as these workshops fill up and we like to know how many people to expect. The course is free of charge and reservations for it should be made at 474-7201 in Fairbanks.

10th - 12th November 1998 - Health House Advantage Training, Amer. Lung Assoc. of AK. 10th in Fairbanks at the Fairbanks Princess Hotel; 11th in Anchorage at the UAA; and 12th in Juneau at the Baranof Hotel. For more information call ALA of AK at 1-800-LUNGUSA.

12th - 15th November 1998 - The statewide Alaska Homebuilder's Convention in Homer, Alaska.

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Alaska Building Science Network Courses - Tentative

1998

13th and 14th October: Weatherization Tech I: Juneau (confirmed)

Week of 19th or the 26th October: Weatherization Tech I and II: Anchorage

Week of 2nd November: Weatherization Tech I, II: Barrow

14th November: Intro to AkWarm & Indoor Air Quality (State Convention: Homer) (confirmed)

Week of 15th November: Cold Climate Building: Dillingham

Week of 1st December: Cold Climate Building, BEES Overview: Bethel

Week of 7th December: Cold Climate Building, IAQ?: Anchorage

Week of 13th December: IAQ, Window Technology: Delta Junction

1999

Week of 10th January: Cold Climate Building: Dutch Harbor

Week of 25th January: Cold Climate Building, Ventilation: Juneau

[Alaska Building Science Network:](#)

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9th - 12th March, 1999 - Cold Comfort '99, Westmark Fairbanks Hotel & Conference Center, Calling all Home builders, Weatherization people, Auditors, Inspectors, Realtors, Housing Authorities, Foresters, & interested people, mark your calendars now! For more information call: (907) 455-6864.

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Alaska Building Science News' sole purpose is to bring timely building science information to Alaskans in order to improve the quality and durability of the housing stock in Alaska as well as save energy and maintenance expenses for home owners.

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