CHAPTER ONE

STORM CHASING

Storm chasing, in its simplest terms, is the art and science of meeting with a thunderstorm, for any reason. Tornadoes are widely regarded as the main target for storm chasing activity, but anything photogenic, unique in structure, or awe-inspiring fits the definition of a chase target. The photographers throughout Arizona and New Mexico who head to the foothills in pursuit of a perfect lightning shot are storm chasers, too, and many have just as much skill and experience as the Great Plains storm chasers.

The ultimate goal of storm chasing is incredibly multifaceted and varied. Some chasers focus on honing their photography skills. Some chase to supplement their income. Others see it as a great alternative to a dull beachfront vacation in Hawaii. Others are invested intellectually as part of a university research project. Regardless of the goal, a common thread binds all of these activities together: the need for an unrivalled degree of perseverance and a requirement for scientific understanding. Almost no chasers get very far before they have to turn to the books and to the latest scientific research to get a grasp of what they are seeing in the sky. This shapes field strategy and determines success.

Finally, a unique attribute of storm chasing is that it shares common roots with flying and computer gaming: it was made possible only by 20th century technological advances. Storm chasing requires a dense, efficient road network; reliable automobiles with low operating costs and fast speed; and an understanding of storm-scale meteorology and forecasting. The first two ingredients did not exist in the United States until the 1930s, and still do not exist in many parts of the world that get tornadic storms. The latter prerequisite, storm knowledge, did not appear until the 1950s, as the work of storm researchers Horace Byers, Roscoe Braham, and later Theodore Fujita slowly solidified into an primordial understanding of storm cell character. With this knowledge, storm chasing slowly began to flourish.

The essence of chasing

The whole chase experience is surreal. It's a nomadic existence for one or more weeks, never knowing where you'll lay your head that night. It's an excuse to live on junk food, eat at greasy spoon cafes, have bacon every day, and be blissfully unaware of slow service. It's the beauty of the endless flat prairie, which before I chased I saw as boring but have come to love. It's soothing, like being on a boat in the middle of an endless sea.

It's a refreshing feeling of freedom that makes the East Coast seem claustrophobic with its hills and trees. It's the tiny "blink-and-you-miss-it" towns. It's the way the sky, even on a fair-weather day, demands your attention. It's the pride of knowing the geography: the obscure towns and knowing its motels and restaurants.

And last but not least, it's the fellow chasers as well as the offbeat characters who call the Great Plains home.

JIM CARUSO
Pennington, NJ chaser

David Hoadley, one of the first recreational chasers.

Neil Ward, one of the first research chasers.

Roger Jensen, one of the first severe weather photographers.

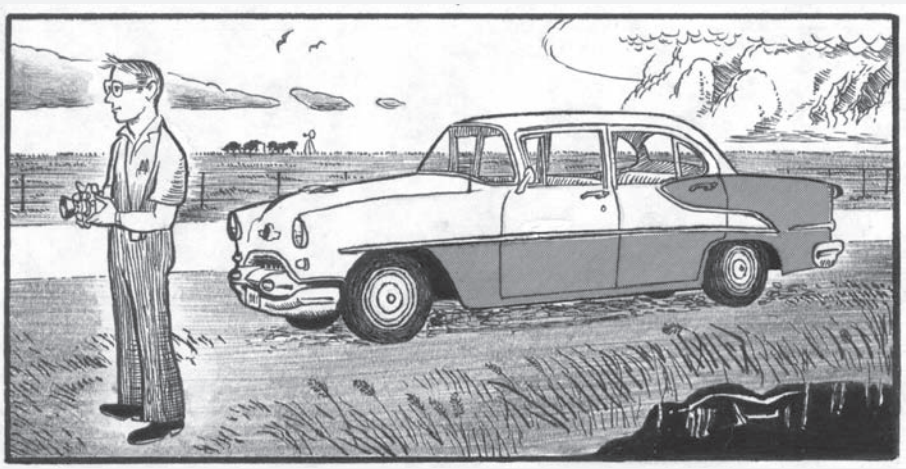
The history of chasing

One of the first storm chasers is **David Hoadley** (1938-) who in 1956 began chasing storms in North Dakota. He was a prolific artist and later founded *Stormtrack* magazine. Further south in the late 1950's, Weather Bureau employee **Neil Ward** (1913-1972) unwittingly became the first scientific chaser. Initially he pursued Oklahoma storms out of curiosity but soon developed an interest in seeking visual correlation with radar signatures and forming conceptual models of storms. The late **Roger Jensen** (1933-2001), a published Minnesota photographer, is considered in some circles to be a storm chasing pioneer. Jensen was among the first storm photographers and had a great passion for weather which sustained him through his later years of declining health.

Though there were airbone storm chases in 1946 during the federally-operated Thunderstorm Project in Florida, the first research chases by car date back to the mid-1960s, in which various universities and research facilities fanned out to collect fresh hailstone specimens. Hurricane chasers were also becoming active, starting in the 1950s with **Arthur Pike** of the National Hurricane Research Laboratory and **Clarence Gibbons** of CBS News. Later in the 1960s chasers affiliated with Florida State University's weather department began chasing hurricanes.

The first full-scale thunderstorm research chase program began on 18 April 1972 in Oklahoma. The University of Oklahoma (OU), in cooperation with the National Severe Storms Laboratory (NSSL), created the Tornado Intercept Project (TIP). Designed to investigate characteristics of tornadic storms, this project was a turning point in the history of storm scale meteorology. Its core group created the first generation of storm chasers, some of whom are are still active today. The program also quickly paid off with rich documentation of the famous Union City, Oklahoma tornado in 1973.

Soon a fusion of storm chasing roots occurred. At an American Meteorological Society conference in October 1977, pioneer David Hoadley, chaser Randy Zipser, and TIP veterans Charles Doswell, Alan Moller, and Richard Anthony gathered in a hotel room and screened their thunderstorm slides. The group resolved to keep in touch, and that very night, Dave Hoadley began working on the first issue of



David Hoadley's self-portrait: the early years.

The Early Years of Chasing

David Hoadley

I began storm chasing in 1956, a few years after the late Roger Jensen blazed that first, brave trail on which we all now follow. My early range was from the Dakotas to western Minnesota, but usually centered on the eastern half of my home state: North Dakota.

My first chase car was the family "Olds 88," which we bought new in 1955 and to which I added many of the 163,000 miles. It was later traded for a Buick. I used it on weekends — a Saturday here, a Sunday there — when it wasn't needed at home and storms were brewing. My family was always very supportive, if a little apprehensive, and enjoyed my chase accounts after each return.

I saw my first tornado on August, 1958 near Wing, North Dakota — but that was mainly luck, since the next one didn't come for another four years near Leola, South Dakota. After another few years, my learning curve began to kick in and more were seen as skill added to luck.

My particular memories of those early Dakota chases, besides traveling many more graded farm roads than are found today, were the blizzard of bugs and carpet of frogs that followed many heavy storms. On warm summer nights, when returning from a chase, the Dakota ponds that dot the eastern half of the state quickly served up an instant generation of flying insects that swarmed to the only headlights for 20 miles and soon rendered my windshield a greasy mess.

On other nights, the insects took a break and the amphibians took over. Then my headlights showed a pavement covered with thousands of small, leaping frogs. I always slowed since traction quickly becomes a problem. The frogs were impossible to dodge. You just kept going, quietly saying to no one in particular, "Sorry. Sorry. Sorry."

One thing I especially miss from those Dakota years were the northern lights. That, plus the long drives across once-Indian country and the remembered history of pioneer settlements have etched that experience indelibly in the mind. It was a good place to hone both my patience and skills for the later, more abundant years in the heartland of "tornado alley."

Merits of *Twister*

I know most people look at this movie as nothing more than a big, dumb special effects movie, but I seem to get MUCH more out of it. I adore this film. Why is *Twister* something more then just your normal dumb summer movie? Well there are a few reasons. One that comes to mind is how gorgeous this film is. No other film I can think of so beautifully captures middle America as well as *Twister*. There are over a hundred shots in this film that could easily be made into a postcard — they are that gorgeous!

Anonymous reviewer
imdb.com

Stormtrack, sent to a dozen individuals. It would be the first of many issues.

In the public arena, storm chasing emerged into the American conscience with the airing of *In Search Of...* (Alan Landsburg Productions) in 1978. This show profiled chase and research operations at NSSL. Years later, the PBS program *Nova: Tornado!* (WGBH) aired in November 1985, touching again on NSSL chase operations and the TOTO tornado observatory. The hour-long scientific documentary and publicity surrounding the program stirred interest among many weather enthusiasts and inspired future meteorologists, leading to drastic increases in the Stormtrack subscription roster. In May 1986, Dave Hoadley retired from *Stormtrack*, handing the enterprise to Tim Marshall, a damage engineer and meteorologist in Texas.

During the early 1990s, television once again seized on tornado chasing, though this time the dry educational content was replaced with the cocktail of unpredictable content from home video, which had recently exploded into popularity. Tornado clips showed frightened families, merry narrators, and reckless chasers. In spite of this content, the storm chasing hobby saw another generation of productive beginners who saw past the hype and took inspiration.

The final wave that sent ripples through the storm chasing community was the May 1996 release of the Warner Brothers film *Twister*, a scientifically-bankrupt blockbuster

A long day's sunset. *(Tim Vasquez)*

film that promoted massive interest in storm chasing. In spite of the temporary chaos it brought to the hobby, including an overnight doubling of the *Stormtrack* ranks, countless *Twister* enthusiasts dropped out of sight by 2000, probably having discovered that chasing was nothing like the movie.

The storm chasing hobby saw its biggest revolution with the arrival of the Internet, which completely redefined how storm pictures and video gets published. Moving with the times, *Stormtrack* discontinued its paper magazine in 2002 and provided its followers with a discussion forum, currently the largest online community that caters to chasers. Many storm chasers maintain their own websites and post photo galleries, chase logs, and streaming video. Today's storm saturation is a far cry from that mild October night in 1977 when chasers were blessed with an unimaginable, rare chance to feast on amazing storm imagery and uncharted chase stories.

What is a chaser?

Storm chasers are individuals who share a common interest in severe thunderstorms. They are not necessarily meteorologists or researchers; in fact the vast majority of them are engineers, cooks, salespeople, programmers, mechanics, and so forth. Storm chasing is largely a hobby, and nearly all storm chasers pay for their pursuits out of their own pockets. A sum of $50 per day for a chase is a typical expense, not counting lodging or car rental.

It's important at this point to make a distinction between *storm spotters* and *storm chasers*. Storm spotters are amateur radio operators who travel within or just outside of a city to observe and monitor severe weather as part of a local emergency management program. Spotters operate under the centralized guidance of a team leader at the base station, and operations focus entirely on interpreting existing storm structure. This is an important distinction, because storm chasers are free to travel anywhere

Not just the sky: the ground!

I took several geology classes in school and I often find myself searching the ground for unusual rocks and minerals. I've found several arrowheads and fossils over the years. I especially enjoy checking out the rocky, hilly terrain of southwest Oklahoma. Although I'm not particularly fond of botany or zoology, it is still interesting to see the different types of plants and animals across the region. Makes the bust days a little more interesting. Well, sometimes!

ROB SATKUS
Oklahoma City, OK chaser

Storm chasing in the 1970s wasn't just about chase vehicles. It depended on a sophisticated nowcasting operation that used impressive legacy technology but relied on an assortment of coarse surface, satellite, and radar data and very limited forecast experience. *(NOAA)*

About research chasing

There are definite pros and cons to chasing with a major field project compared to chasing on your own. The advantages include low-cost chasing (gas and lodging is paid for, and sometimes a small stipend or per diem is even paid), meeting and networking with some of the leading meteorological scientists in the world, learning about the instrumentation and equipment used in the project, and being able to take part in a project with research goals designed to benefit all of society.

There are disadvantages. You do not have any control over the daily target area. Most people are not able to participate in the forecasting and decision making except for the core scientists, so most volunteers are basically a worker doing exactly the task they are assigned.

On individual chase vacations downtime can be used to go home briefly, visit friends, go to scenic or historics sites or any other number of entertaining ways to spend time. During a major project, they will likely be spent in an individual city, sometimes small and fairly rural, with a full workload on vehicles repairs, data backups, and analysis etc.

These programs can be difficult to get into, depending on the number of volunteers and the number of positions available. However, if an individual is interested in the scientific benefits from chasing, this can be an excellent opportunity to learn and lot in a fun environment, while meeting many people and observing high tech data collection methods.

DANNY CHERESNICK
Longmont, Colorado chaser

Great storm experiments

TIP (1972-1986) — *Tornado Intercept Project*. The first scientific field project on severe thunderstorms, undertaken by NSSL.

SESAME (1979) — *Severe Environmental Storms And Mesoscale Experiment*. Sampled southern plains storm activity at different scales of motion.

VORTEX (1994-95) — *Verification of the Origins of Rotation in Tornadoes Experiment*. Sought to understand the origins of tornado development.

SUB-VORTEX (1997) — Explored mobile mesonet systems.

ROTATE (1998-99) — *Radar Observations of Tornadoes And Thunderstorms Experiment*. A Doppler on Wheels field project conducted by OU.

IHOP (2002) — *International H_2O Project*. NCAR project studying water vapor evolution on the Plains.

VORTEX 2 (2009-2010) — An effort to study supercells and tornadoes with maximum density in surface, upper-air, and radar measurements.

they wish and do whatever they like near the storm. With freedom comes the burden of having to forecast for these broad areas using relatively little weather data. This book is specifically written for the storm chasers.

Another distinction needs to be made: *research chasers*. These individuals consist of meteorology students and faculty that participate as part of an institutional research program. For students and volunteers, there is no pay for this activity except for free lodging and food, as well as a small travel stipend. The group chases as a team, and important field decisions are made by a complement of team leaders. While this does take the guesswork out of the chase, the structured objectives make it difficult for participants to personally develop their own forecast methodologies and test their own tactics in the field. Therefore it's no surprise that a lot of research chasers head to the field by themselves, living and dying by their own decisions to see what fortune brings.

A meteorology degree is not any kind of prerequisite for being a chaser. However a formal education can help provide insight into forecasts and storm theory, as well as make sense of the latest research papers. No type of credentials, certification, or licensing is required to chase storms and there is no sanctioning body nor even a national storm chaser association. It is largely a loose-knit community. Storm chasing is in no way regulated by Federal, state, or

local laws. Chasers operate freely, and are simply expected to abide by all laws that apply to the general public.

There's a popular misconception, especially among school-age children, that a career can be made in storm chasing. The reality is that with rare exception there is no such thing as a storm chaser job. Getting paid any sizable sum to storm chase can only be accomplished through two avenues: either as a self-motivated entrepreneur such as a tour operator or photographer, or as a university researcher specializing in severe weather and having completed the right graduate work. With the former, the financial risks are high, and with the latter, research dollars are chronically scarce.

Some storm chasers have cultivated a business of selling their video and photographs to media companies and stock agencies. For decades this has been a favored way of increasing the chase budget, though in the 1990s a few chasers earned thousands of dollars for their pictures. The tide, however, is changing due to a glut of weather stock photos, amateur pictures, and freelancers, and the outlook for this line of work has already clouded.

Perhaps it's only fair that storm chasing remains primarily a hobby. A chaser becomes their own boss, going where they want to go rather than where a team member or agenda dictates, and success is measured not by how many tornadoes were logged but by whether it was a memorable, awe-inspiring day that taught us all something new.

Shooting for TV stations

If you shoot some great footage and the chase is still ongoing, you may be expected to stop your chase to send in the video. Also, on chase days where your target is out of the viewing area, there still may be a chance of severe weather in the viewing area.

On these days, you may be asked to stay in the area. This is not always a bad thing. On May 1, 2008, everyone was roaming around Kansas watching the storms line out, but I was in perfect position to intercept tornadoes from the surprise Stillwater storm. Chasing for a TV station paid off on this day. It's also a great way to get some easy gas money, even on non-chase days. In certain situations, being a member of the media will get you certain privileges that being a regular chaser will not.

MIKE SCANTLIN
Tulsa, Oklahoma chaser

Chase convergence. *(Tim Vasquez)*

Chasers upload storm video at an Arby's restaurant in Enid, Oklahoma to regional news stations. Chasers pictured are (left to right) Andrea Miller, Heather Briggs, and Matt Patterson. Selling chase footage is a sacrifice that sometimes requires breaking off from the chase to deliver the goods. *(Steve Miller, www.hamwx.com)*

Caution with the media

Storm chasers should be careful when dealing with the media since any off-color remark will be quoted and used out of context. When I give interviews, I emphasize the beauty of storms, the importance of calling in storm reports, and my hope that a storm will occur in an unpopulated area.

BILL HARK
Richmond, VA chaser

Philosophy and objectives

To some readers, it might appear that a section on philosophy is chasing abstracted into psychological babble. Perhaps so! But sooner or later, participants in nearly every type of human activity begin dwelling on our relationship with the activity itself. This yields intriguing insights on what we do, giving us more avenues for appreciation and even helping to sharpen our skills.

Consider the definition of philosophy: the study of how we think. Storm chasing is certainly a thinking, intellectual activity, and how we think during the culmination of a chase day shapes not only our result but also the notion of whether we've succeeded of failed. This is largely why there is such a tremendous range of attitudes in the hobby: negative and positive alike. *Philosophy is the framework that helps us clarify the definitions of success or failure*. Without having a philosophy, how can we define what chase success is and find real satisfaction in what we do?

The art of storm chasing is rooted deeply in the dualism between subjectivity and objectivity, probably more so than any other hobby. For example, to a journalist it seems quite simple: a chaser uses intellectual methods to pick out target areas, and then emotionally experiences the fruits of labor. It's certainly an acceptable perspective, but in a sense being pigeonholed into this method of thinking keeps a chaser

from enjoying all aspects of the experience. In many cases, we have personalities that are "stuck" to one end of this spectrum throughout the entire chase!

Take the romantic storm chaser. His objectives are excitement, inspiration, and visual beauty. The contact with nature and with others humans is the essence of the experience. To reach the storm, however, the romantic chaser must grudgingly look at the underlying form using scientific tools: maps and data. Perusing these, he applies only sage experience and pattern recognition, rather than sound principles and logic. When omega diagnostic charts, thermodynamic diagrams, and journals are pulled out, the romantic chaser's eyes become glazed over. He says, "Those charts are ugly, dull, and complicated. Let's look outside! The atmosphere is something real, not expressed in these coarse abstractions!" Once out in the field, the romantic chaser fails to synthesize what he sees visually with actual data and conceptual models, and has a hard time in finding consistent chase success.

At the opposite extreme, there's the classical chaser. She focuses on the mechanics behind the storm. To her, the chase day is an incredible puzzle box. She enjoys perusing the morning data, and she makes use of the mobile mesonet on her SUV to fill in the data gaps. Seeing a tornado, she sees a dramatic example of structure and form. It evokes questions of, "How is it all linked together? What's going on above the tornado? How does this relate to the conceptual structures I remember from the journals?" The interplay of colors on the cloud surface and the rich smell of June on the Great Plains suggest unique combinations of sun angles, vegetation, and calendar date. The classical chaser looks at the spotters down the road and grows concerned over whether anyone is reporting the developing wall cloud. To simply go out and lie on the hood and soak up the experience would be hedonistic and shallow. The storm is objectified, so much to the point that subtle, beautiful features of the storm are filtered out — ones which might represent some sort of critical process taking place in the atmosphere. The tornado fascinates, but fails to make a deep, haunting impression that encourages the thirst for knowledge. The classical chaser might simply become bored and move on to other pursuits after a couple of years.

It can be seen that there's fantastic value and beauty in each of these mindsets: not just through the romantic perspective but in the classical form, too. How is it possible

The importance of receptivity

One of chase veteran Al Moller's favorite books is Gross & Shapiro's *The Tao of Photography*. In order to convey some of its potential application to chasing, Moller strung together several passages with his 30 years of experience to form the following pearl of wisdom:

"The Tao *sage* or wise man has an open mind. It is not an empty mind, but one that is uncluttered from constricted awareness and/or bloated sense of self. This is critical for achieving storm chase success. "Little thinking" has a chaser worried about yesterday's failures, rather than the beauty of being on the road and searching actively for today's environmental clues.

"Receptivity allows one's thoughts to balance properly the daily stream of observational data, model data, and environmental clues, while enjoying the process of determining which clues are most critical. Receptivity allows the chaser to accept what happens, and to maximize the event, whether during scientific data collection during a field experiment, or photography during an unstructured chase. And it allows the chaser to respond instantaneously to chance encounters.

"The more you love the forecasting, navigating, and ingestion of data and environmental clues, the greater the success you will have. Get lost in the joy of the process!"

The ideal chase

I see chasing in many ways a metaphor for how we do life. In both cases, we are pursuing a goal, and how we pursue that goal as well as how we react to it when we reach our intended target tells us alot about what we may learn about ourselves and where we still may grow.

For instance, what if that supercell that seemed certain to produce a tornado for you when it was 60 miles away and being the only storm anywhere on the horizon - collapses just as you arrive and you instead see a lightning show or full double rainbow instead? How do you handle this? Do you cuss and kick the ground, or do you say "thank you Creator for the opportunity to engage in this hunt today."?

When I chase, my most successful times include the attitude of gratitude.. On my way to a target region, if I see a beautiful pearly TCU towering into blue sky, I give thanks to Creator, and state that even if nothing else comes out of the chase today, this scene made the trip worth it.

When I have an attitude of gratitude, I seem to tap into the flow intuitively better. If I have an attitude of impatience or grouchiness, then I tend to make mistakes or in general forget the possibility of enjoying the journey in zen-like fashon.

STEPHEN LEVINE
Garland, Texas chaser

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for the chaser benefit from each of them? Should a chase philosophy be constructed in terms of the moment? Is it wrong to be stuck in one mental way of thinking or the other?

A much more prudent chase philosophy is to strive for a fusion of the two modes, not simply gravitating towards one perspective or the other but casting it aside completely. This is done through total awareness. Gusty southeast winds are noticed, enjoyed, savored, contemplated in the context of the forecast situation. The mesocyclone is obviously getting its act together above the widening cloud base, portending of imminent chase action yet evoking a sense of timelessness, this same scene conceivably unfolding on a Wednesday a billion years ago, man's presence just a speck within the Holocene sliver in which we live.

It's very likely that a chaser who is immersed in total awareness understands all the subtleties of the atmosphere and can enjoy enormous success rates. Robert Pirsig, in *Zen and the Art of Motorcycle Maintenance*, suggests that the fusion of classicism and romanticism in our culture is rare. It can probably never be achieved perfectly, but can be strived for. It's the mechanism that breeds quality through inspiration and moments of genius. Through this fusion, storm

Gene Rhoden and Scott Peake check on a radar image to help fine-tune their position. *(Andrew Ryan / shearamazement.com)*

chasing becomes an art form, a philosophy, way of looking at life, and a source of inner happiness and contentment.

Pirsig suggests that the only way to reach this fusion is to cultivate an inner quietness. This allows one to be completely in tune with the surroundings. But there are three main requirements before this can actually occur. First, comfort is required. This means taking breaks for meals, suppressing distractions, and keeping the vehicle at a comfortable temperature. Second, adequate tools are needed. Carry in moderation the partners, gadgets, and equipment you need to chase successfully. A laptop or cell phone may not be such a bad idea.

Finally, and most important, avoid traps which make inner quiet elusive. These include destructive mindsets that result from anxiety, ego, boredom, impatience, and chase partner conflicts. If you sense a mental trap developing, learn to short circuit this way of thinking, figure out what *really* matters to you at the lowest common denominator, and work on finding happiness by living only in the moment. If you're delayed by one of the many Kansas Specials (50-mile construction zones), let go, enjoy the timeless scenery along the highway, and perhaps reflect on your good fortune not being stuck in an office building on this chase day.

A chaser who is pursuing a total-awareness approach to chasing exhibits both the classic and romantic aspects of chasing. By being in tune with all aspects of the chase and the brain freed from stress and frustration, storm chasing opens the mind, broadens the ability to process and sort knowledge to make a correct decision, and encourages a sense of delight no matter what the forecast brings.

Ethics

For a hypothetical chaser alone on a desert island and separated from other forms of life, ethics are meaningless. For the rest of us, however, chasing brings contact with other individuals, other chasers, local residents, and TV viewers, requiring a framework of respect to everyone involved. The opportunities for a chaser to embarrass or offend others are surprisingly numerous. This can harm the hobby over the long term through pervasive public attitudes, law enforcement harassment, a bad stigma precipitated by the media, and even the appearance of legislation. All of these are bad long-term investments for future chases. A measure making an emergency situation a national security

A British perspective

For me, the central Plains states have long held a place in my heart, having seen pictures of tornadoes at an early age in various books. For years before I came to the USA chasing, the most evocative image of states like Kansas, Oklahoma, and Texas was one of a road stretching into the far distance, with a line of telegraph/power poles down one side of the road. And far from being some kind of romantic personal vision of the region, my trips have yielded uncountable such scenes, each of which makes my desire to get back to the region the following year even stronger.

Also, it's very interesting to me to garner a fuller understanding of the history of the region, including that of the Native American people. I like to stop and look at historical markers, etc, when given the chance. The quieter days relaxing by the pool in a motel, and waiting for the next potential round of severe weather, is intoxicating. And quite apart from this, and, of course, the storms, I just love the massive skies, flat lands, and, above all, the empty roads - the latter only something we can dream of on our crowded British islands.

PAUL KNIGHTLEY
Reading, England chaser

Ten "Nevers" Of Storm Chasing

Never ignore the traffic, the road, and other drivers; they're the biggest danger.
Never ignore the lessons of the chase: the bad ones as well as the good ones.
Never talk about storms with unrestrained delight around local residents.
Never block lanes of traffic with your vehicle, equipment, or yourself.
Never follow another chaser on their chase except by permission.
Never frivolously core-punch or frivolously chase at night.
Never trespass on private land except by permission.
Never chase without a learning objective in mind.
Never put yourself or your passengers in danger.
Never chase without safety and courtesy.

An Italian viewpoint

I have to admit that when you chase in the United States, it's so fine the feeling to be part of the chase community. You find other chasers on the road and it's simple to make friends with them! You wait for convection and you meet someone that offers his congratulations on your hail dents! You speak about meteorology as if those guys were longtime friends. I mean you feel great and it's very funny.

Moreover when you speak with normal people as a chaser, they don't treat you as a crazy man. To them you are a man who helps people to defend their own safety, and that, believe me, is great. And about American people: it's incredible to see how a Greensburg survivor puts himself forward to rebuild his city, confident in the future and in his country. I love this positive spirit.

ANDREA GRIFFA
Cantù, Italy chaser

area and prohibiting photography would not be a surprising development in today's political climate.

To help deal with issues like these, many hobbies and professions in similar predicaments have developed codes of ethics. Ethics are guiding philosophies which establish a moral code: a set of right and wrong choices. One of the first efforts to bring ethics to storm chasing occurred in 1992 when Alan Moller wrote "Ethics of Storm Chasing" for Stormtrack. It subdivided core ethics into two key points: safety and courtesy.

Safety is a topic so important that further discussion of it will be relegated to its own chapter here within this book. Not only does safety protect the chaser's life: it protects passengers and other drivers and sets an example for newcomers to the hobby.

Courtesy is defined as "respect for others". It's a way of channeling positive energy and goodwill into all interactions with fellow chasers and the general public, which in turn makes those facets of chasing easier and much more enjoyable. It's worth noting that many *dojos* stress that martial arts without courtesy demonstrates a lack of spirit, equated with chaos or violence. Lack of courtesy breeds ill will, and in chasing it sows the seeds for awkward, unpleasant encounters in the field.

One principle which has increased in importance during recent years is courtesy toward locals and respect for storm victims. A surprising number of individuals in the Great Plains have lost property, family, and friends in severe weather and tend to become fearful and irrational

during severe weather outbreaks. They staff the gas stations and wait tables at the restaurants where chasers congregate, who might be innocently raving over storm chase success. Be aware of your conduct. Damage is another area where chasers can extend courtesy. Leave unless you're saving life or property.

A May 3 crowd

A chaser crowd gathers near Binger, Oklahoma on May 3, 1999 in central Oklahoma. This one was unexpectedly created by a roadblock. Many chasers turned around and picked alternate routes. *(Tim Vasquez)*

The yahoo

A yahoo is any individual chasing a storm who practices *harmful or unethical conduct*. Reckless driving is the prime example, as is blocking roads and trespassing onto private property. We all share the responsibility of not tolerating unsafe, unethical behavior and demonstrating good chasing by example.

Unfortunately, yahoos attract attention and bask in it. During the late 1990s, broadcasters capitalized on this to drive up ratings. Some yahoos became de-facto ambassadors for the hobby. Fortunately this perspective has run its course and media programming has drifted back to some semblance of quality. Some local news outlets and Internet video sites like YouTube, however, do play a part in perpetuating yahoo stereotypes.

It must also be pointed out while a few yahoos are indeed experienced chasers who have a fringe affiliation with the chasing community, *most of them are not part of the chaser community at all*. With only a local outlet for their weather interests (often just their own families or neighbors), they're known as "local yokels". One local yokel example is the truckload of teenagers driving into a storm, getting directions via cellphone from a girlfriend watching the local television weathercast. Most local yokels are completely unaware of storm chasing history and meteorology, aside from a few casual Internet searches, and have little understanding of how to chase safely.

For the experienced chaser, this makes defensive driving even more important. Yahoo behavior will probably never go away, but by recognizing it and understanding its roots, we can all give ourselves a better margin of safety and personal enjoyment when out in the field. For those who want to enjoy storms without the "circus" crowds, a common

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The reward

You can't begin to imagine the struggle that I have to endure to achieve the proper outlook on chasing. When I achieve it I'm rewarded as my criteria for success broadens. No longer is a chase day consumed by worries that I might not get the right storm, or that someone else has a better view. In the right state, I live the moment, enjoy what the sky unfolds, and my intuition governs my decisions without distraction. The tornado is no longer the only requirement for satisfaction. Enjoyment and success are delivered in many ways including capturing a photogenic sky, meeting friends in the field, even the thought of letting the sky, instead of society, be in control.

JIM LADUE
Norman, OK chaser

Who is the yahoo?

The "yahoo" is the chronically inconsiderate bonehead, the normally sane person who often loses his ability to think clearly and act safely in the heat of the moment — under pressure to catch up and get that intense footage — or the vacuum-brain who doesn't have that ability at all. These are the people who run others off the road, set up tripods in traffic lanes, drive 90 mph on a wet two-lane, and roar across private property. Then there are a few yahoo media crews, justifying all sorts of dangerous actions on the roadways to get the most extreme possible close-up footage of neighborhoods being shredded apart, all in the name of "serving the viewing public" and winning an Emmy.

Dangerous behavior crosses all experience levels in chasing. I do argue it is *less common* among the veterans. In some ways, the handful of guys who have many years of experience as unsafe, inconsiderate chase bozos do make things worse! By getting away with it for so long without either dying in a crash or being thrown in jail, they are setting a terrible example for others who may accompany them or observe the way they operate. Propagation of stupidity is indeed possible!

ROGER EDWARDS
Norman, OK chaser

strategy is to separate from the main show and take a risk on the long shots. Some amazing events have unfolded away from all the action.

How to start chasing

The very first thing a new chaser should do is, in the words of chase veteran Tim Marshall: "Read all you can." There is no way that a chaser can pursue storms, stay safe, and improve their skill without drawing on the rich body of meteorological knowledge that's blossomed during the past twenty years. A number of web sites offer links to excellent resources and can be found throughout this book. Also there is substantially more which is available in the form of books and publications. These are listed in the appendix. Check them out. After educating yourself on storm fundamentals, keep note of the angles that interest you. Use them as teasers to encourage yourself to learn more. The rest will fall in place.

Chasers must also spend time putting their knowledge into actual practice. Obviously you can't repair a Honda Accord by reading car manuals at bedtime every night — you have to put your knowledge to use by actually seeing the engine and trying your hand at making a few repairs. Likewise, there is a wealth of real-time weather information on the Internet. Seize every opportunity to use this information and prepare your own weather forecasts and chase predictions, even if you're not going anywhere. Chasing vicariously is done by many veterans when they can't make it out the door.

It pays dividends to go on a couple of chases with an experienced chaser. This allows you to get a firsthand look at the decisionmaking process. Unfortunately, many experienced chasers have grown weary of e-mail contacts with individuals who have no sense of what chasing really involves, who expect the chaser to fit their schedule, or are only participating for the thrill. To ride with an experienced chaser, you'll have to do your homework and demonstrate substantial amounts of flexibility, dedication, and commitment. The opportunities are there; a perusal of the Stormtrack web site or various E-mail lists will present many options for those with persistence.

One surefire way to get involved right away is to buy your seat on a chase. There are a handful of excellent commercial chase tour operators who are happy to take you

along and teach you as you intercept spring storms. Always look for a tour operator who is recommended by other chasers and look for indicators of safety and quality rather than mere statistics. More tips are provided in the appendix.

And if you have to start chasing the hard way, as many of us do: start small! Don't head out the door hoping to see a wedge tornado your first season. Try your hand at intercepting even the smallest garden-variety storms, and enjoy the success that comes from simply making it to a given storm, holding an observing position, and correlating the storm structures to textbook conceptual models. These smaller, simpler storms serve as an important foundation for understanding bigger thunderstorms and offer many visual puzzles that will sharpen your skills. As you chase, pay careful attention to your mistakes and your errors, and make efforts to learn from them after the fact.

Finally, it's important to cultivate some interests that you can draw upon when storms fail to materialize or the weather patterns go bad. Geology, ornithology, photography, antique-hunting, hiking, and even local history are among some popular pursuits. Find some aspect of the Great Plains that captures your interest. The last half of this book contains an extensive description of various parts of the Great Plains, proving that there's much more than meets the eye!

A common thread?

The anecdotal evidence strongly suggests that while there might be a semblance of gender parity at the casual level, it fades away as one approaches the inner sanctum of [this] obsessive [activity]. The Nobel-prizewinning Dutch ethnologist Nikolaas Tinbergen speculated [this hobby] was some sort of sublimated expression of the ancient hunting instinct — an observation so screamingly true it seems rather petty of Tinbergen to have bothered to slap his name on it.

Every healthy, red-blooded man knows the experience of being jolted awake, sometimes at four in the morning, by an aching conviction that he really should be out there on his belly in the undergrowth stalking a fellow organism. If one happens to have binoculars at hand, [it] is a more than decent outlet for this atavistic hunger.

BRUNO MADDOX,
discussing birdwatching
Blinded by Science: Birding Brains
Discover Magazine, 2006

The agitation and pressure of making your own forecast is what creates skill and instills intuition. Never be afraid to think outside the box and live or die by your own forecast! *(David Hoadley)*